Seed plants of southern tropical Africa: families and genera

Supplement to SEED PLANTS OF SOUTHERN AFRICA (Leistner 2000), covering Angola, Zambia, Zimbabwe, Malawi, and Mozambique

by

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After the publication of *Seed plants of southern Africa: families and genera* (Leistner 2000) the Executive of SABONET expressed the wish to have the scope of this work extended to cover all 10 countries in which the organisation is active. In response to that wish the present project was undertaken. As indicated on the title page, it is a supplement to Leistner (2000) and it will generally be necessary to consult the two works together. During the compilation it was apparent how many plant groups are still poorly known. The present work should therefore be considered no more than a small tentative step towards that grand goal—a *Flora africana*.

**Area covered**

The area covered is referred to as *southern tropical Africa* (abbreviated: *sthn trop. Afr*.). Five countries are included: Angola, Zambia, Zimbabwe, Malawi, and Mozambique which lie in a broad belt from the Atlantic to the Indian Oceans to the north of the five countries in the southernmost part of Africa dealt with in Leistner (2000), namely Namibia, Botswana, South Africa, Swaziland and Lesotho.

**Arrangement and circumscription of families and genera**

As in Leistner (2000) the families are alphabetically arranged within the three groups: (1) *Gymnosperms* or non-angiosperm seed plants (pp. 26–29), (2) *Dicotyledons* or Magnoliopsida (pp. 30–374) and (3) *Monocotyledons* or Liliopsida (375–458). The Magnoliids, Ceratophyllales and the Basal families Cabombaceae and Nymphaeaceae are again treated within the alphabetical system of the dicotyledons.

Relationships between families are shown in the simplified cladograms taken from Angiosperm Phylogeny Group (APG II) (2003), on p. 3. The position of every family is also given in brackets underneath the family name in the text treatment: (1) in the first line according to the system of Cronquist (1988) as given in Mabberley (1997), which, in practice at least, has not yet quite replaced (2) the system of APG II, which is shown in the second line.

**Compilation and main sources**

This work was compiled almost exclusively from literature consulted up to October 2003. Information was freely copied, often verbatim, from the cited references. The main sources of information were Lebrun & Stork (1991–1997 and 2003), an unpublished checklist of families and genera of the region compiled by Dr Neil Brummitt and placed at my disposal by the author with kind permission of the Director of the Royal Botanic Gardens, Kew, *Kew Records* and the following Floras: *Flora zambesiaca*, *Conspectus florae angolensis*, *Flora de Moçambique*, *Flora of tropical east Africa*, *Flora of west tropical Africa*, *Flore d’Afrique centrale*, *Flore du Gabon* and *Flore du Cameroun*. The most frequently consulted journals were *Kew Bulletin* and *Bulletin du Jardin Botanique National de Belgique*.

**Descriptions and notes**

Descriptions of families and genera dealt with in Leistner (2000) are generally not repeated in this book. At the beginning of these families is a reference to that publication starting with the name of the compiler of the family account and giving the page on which it starts. Important family characters recorded for southern tropical Africa but not for southern Africa, are noted. The aim in compiling both family and genus descriptions was to reflect characters found in local representatives, rather than those found outside the region. Distribution and size of families and genera on a worldwide basis are given only for taxa not dealt with in Leistner (2000). Occurrence within the region is expressed in terms of the five countries covered. The presence of a genus in *southern Africa* is also generally recorded even though this fact is immediately visible by the absence of a description in the text. A genus recorded for both southern tropical and southern Africa with a single representative in *southern tropical Africa* is not necessarily represented in *southern Africa* by the same species. The number of genera in the region and the number of species by which they are represented is given.

**Exotics**

Full treatment is again given to genera represented by one or more exotic species considered to be growing spontaneously in natural vegetation and therefore likely to be taken as indigenous. Information on this issue is very sparse and there are likely to be many more naturalised exotics than listed here. Entirely exotic families, genera, and species are marked with an asterisk.

**Synonyms**

Synonyms cited are mainly those found in commonly used literature. Generic synonyms do not necessarily embrace the entire content of the current genus.

**Identification of genera**

Genera of families represented by only one genus will obviously key out in the key to families. In families with more than one genus there is either a key to genera, or notes describing how the genus can be keyed out using the key in Leistner (2000). In families in which all genera are also dealt with in Leistner (2000), no identification aids are given.
INTRODUCTION

Number of taxa represented
The flora of the five countries, as reflected here, comprises 228 families, 2,032 genera, and 11,637 species. These figures are fairly similar to those for the five countries of southern Africa with regard to families and genera, but strikingly different with regard to species: 237 families, 2,242 genera, 20,677 species (Germishuizen & Meyer 2003). The vast difference in species numbers can be ascribed mainly to two factors: (1) the species-rich Cape Flora in southern Africa, and (2) the less complete knowledge of the flora of parts of the northern countries. The 18 largest genera in the Cape Flora are represented by 2,687 species (Goldblatt & Manning 2000). Of the same genera five are absent from southern tropical Africa and the rest comprise a mere 221 species. The 18 largest genera in southern tropical Africa contain a total of 1,993 species. The same genera are all well represented in southern Africa by a total of 1,444 species. Genera in southern tropical Africa are mostly smaller than in the region to the south, with an average of 5.7 species to the genus compared to 9.2.

Glossary
A glossary is given on p. 459.

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My sincere thanks go to the Executive of SABONET, specifically Prof. Gideon Smith, and Mr Chris Willis and Dr Stefan Siebert for entrusting me with the task of compiling this work. It kept this pensioner out of mischief and out of the kitchen sink. The Chief Executive of the South African National Biodiversity Institute, Prof. Brian Huntley, is thanked for facilitating the contact with the Directorate of the Royal Botanic Gardens, Kew, which resulted in the assistance by researchers of that institution: Dr R.K. Brummitt, Dr Neil Brummitt, Dr Alan Paton and Dr Gerald Pope. The Publication Section of the SANBI again rendered sterling support; my particular thanks go to Emsie du Plessis, who helped me take the first faltering steps towards computer literacy; Sarie Brink and Daleen Maree provided technical support. Clare Archer of the SANBI (National Herbarium, Pretoria) gave me access to her draft checklist of Zambian Cyperaceae. Mariette, Elke, and Ninette provided the required computer literacy; Sarie Brink and Daleen Maree provided technical support. Clare Archer of the SANBI (National Herbarium, Pretoria) gave me access to her draft checklist of Zambian Cyperaceae. Mariette, Elke, and Ninette provided the required congenial atmosphere at home base.

Literature
The literature consulted in the compilation of families is given at the end of each family treatment. The page on which a family is given is Leistner (2000) and the name of the compiler is shown at the beginning of all relevant families, but the work is not routinely listed under the References of the family. The work by Lebrun & Stork (1991–1997), which was very frequently consulted, is also not routinely cited. Literature referred to above, as well as much-used sources of a general nature, include the following:


In this work, families are arranged alphabetically under (1) gymnosperms, (2) dicotyledons, and (3) monocotyledons. The relationships between families are therefore scarcely reflected by their position. A knowledge of the phylogenetic situation of a family, however, is essential if it is to be seen in a wider context. In the simplified cladograms below, families are arranged according to the system proposed by the Angiosperm Phylogeny Group II (2002, *Botanical Journal of the Linnean Society* 141: 399–436). Only families recorded from southern tropical Africa are included. The order to which each family is assigned is also given in the Index (p.479). Unplaced families are listed after the asterids (p.4). Exotic families are not marked with an asterisk.

**GYMNOSPERMS**

- **Cycadales**: Cycadaceae, Stangeriaceae, Zamiaceae
- **Coniferales**: Cupressaceae, Pinaceae, Podocarpaceae
- **Gnetales**: Gnetaceae, Welwitschiaceae

**ANGIOSPERMS**

- Basal families: Cabombaceae, Nymphaeaceae
- **Canellales**: Canellaceae
- **Piperales**: Aristolochiaceae, Hydnoraceae, Piperaceae
- **Laurales**: Hernandiaceae, Lauraceae, Monimiaceae
- **Magnoliales**: Annonaceae, Myristicaceae
- **Alismatales**: Alismataceae, Aponogetonaceae, Araceae (includes Lemnaceae), Cymodoceaceae, Hydrocharitaceae (includes Najadaceae), Juncaginaceae, Limnocharitaceae, Potamogetonaceae (includes Zannichelliaceae), Ruppiaceae, Zosteraceae
- **Asparagales**: Agavaceae (includes Anthericaceae and Behniaeae), Alliaceae, Amaryllidaceae, Asparagaceae (includes Dracaenaceae), Asphodelaceae, Eriospermaceae, Hemerocallidaceae, Hyacinthaceae, Hypoxidaceae, Iridaceae, Orchidaceae, Tecophilaeaceae
- **Dioscoreales**: Burmanniaceae, Dioscoreaceae (includes Taccaceae)
- **Liliales**: Colchicaceae, Smilacaceae
- **Pandanales**: Pandanaceae, Velloziaceae
- **Araceae**: Arecaceae
- **Poales**: Cyperaceae, Eriocaulaceae, Flagellariaceae, Juncaceae, Mayacaceae, Poaceae, Restionaceae, Typhaceae, Xyridaceae
- **Commeliniales**: Commelinaceae, Pontederiaceae
- **Zingiberales**: Costaceae, Marantaceae, Musaceae, Strelitziaceae, Zingiberaceae

**EUDICOTS**

**Basal families**

**Magnoliids**

**Monocots**

**Commelinids**

**Seed plants of southern tropical Africa: families and genera**
CLASSIFICATION OF FAMILIES

**EUDICOTS**

**Ranunculales**: Berberidaceae, Fumariaceae, Menispermaceae, Papaveraceae, Ranunculaceae

**Proteales**: Proteaceae

**Eudicots**: Buxaceae

**Gunnerales**: Gunneraceae, Myrothamnaceae

**Core Eudicots**: Dilleniaceae

**Caryophyllales**: Aizoaceae (includes Mesembryanthemaceae), Amaranthaceae (includes Chenopodiaceae), Basellaceae, Cactaceae, Caryophyllaceae, Droserraceae, Gisekiaceae, Molluginaceae, Nyctaginaceae, Phytolaccaceae, Plumbaginaceae, Polygonaceae, Portulacaceae, Tamariaceae

**Santalales**: Loranthaceae, Olicaceae, Opiliaceae, Santalaceae (includes Viscaceae)

**Saxifragales**: Crassulaceae, Haloragaceae, Hamamelidaceae

**Rosids**: Vitaceae (includes Leeaceae)

**Geraniales**: Geraniaceae, Melianthaceae

**Myrtales**: Combretaceae, Heteropyxidaceae, Lythraceae (includes Trapaceae), Melastomataceae, Myrtaceae, Oliniaceae, Onagraceae

**Eurosids I**: Zygophyllaceae (includes Balanitaceae)

**Celastrales**: Celastraceae (includes Brexiaceae)

**Malpighiales**: Achariaceae, Aphloiaceae, Chrysobalanaceae, Clusiaceae, Ctenolophonaceae, Dilleniaceae, Elatinaceae, Erythroxylaceae, Euphorbiaceae, Humiriaceae, Irvingiaceae, Oxalidaceae, Linaceae, Malpighiaceae, Ochnaceae, Pandaceae, Passifloraceae, Podostemaceae, Rhizophoraceae, Salicaceae (includes Flacourtiaceae), Turneraceae, Violaceae

**Oxalidales**: Connaraceae, Oxalidaceae

**Fabales**: Fabaceae, Polygalaceae, Surianaceae

**Rosales**: Cannabaceae (includes Celtidaceae), Moraceae, Rhamnaceae, Rosaceae, Urticaceae (includes Cecropiaceae)

**Cucurbitales**: Anisophylleaceae, Begoniaceae, Cucurbitaceae

**Fagales**: Casuarinaceae, Myricaceae

**Brassicales**: Brassicaceae (includes Capparaceae), Caricaceae, Moringaceae, Pentadipandraceae, Resedaceae, Salvadoraceae, Tropaeolaceae

**Malvales**: Bixaceae, Cochlospermaceae, Dipterocarpaceae, Malvaceae (includes Bombacaceae, Sterculiaceae, Tiliaceae), Thymelaeaceae

**Sapindales**: Anacardiaceae, Burseraceae, Kirkiaaceae, Meliaceae, Rutaceae (includes Pterocelastraceae), Sapindaceae, Simaroubaceae

**Cornales**: Cornaceae (includes Alangiaceae), Hydrostachyaceae

**Ericales**: Balsaminaceae, Ebenaceae, Ericaceae, Lecythidaceae (includes Scythopteraceae), Maesaceae, Myriniaceae, Primulaceae, Sapotaceae, Theaceae

**Euasterids I**: Boraginaceae (includes Hydrophyllaceae), Icacinaceae, Vahliaeeae

**Gentianales**: Apocynaceae (includes Asclepiadaceae, Periploceae), Gelsemiaceae, Gentianaceae, Loganiaceae (includes Strychnaceae), Rubiaceae

**Lamiales**: Acanthaceae (includes Avicenniaceae), Bignoniacese, Gesneriaceae, Lamiaceae, Lentibulariaceae, Oleaceae, Orobanchaceae, Pedaliaceae, Plantaginaceae, Scrophulariaceae (includes Buddlejaceae), Verbenaceae

**Solanales**: Convolvulaceae, Montiniaceae, Solanaceae, Sphenochloeaceae

**Euasterids II**: Escalloniaceae

**Aquifoliales**: Aquifoliaceae

**Apiales**: Apiaceae, Araliaceae, Pittosporaceae

**Asterales**: Asteraceae, Campanulaceae, Goodeniaceae, Lobeliaceae, Menyanthaceae

**Dipsacales**: Dipsacaceae, Valerianaceae

**Families unplaced**: Balanophoraceae, Rafflesiaeeae
This supplement, used in conjunction with *Seedplants of southern Africa: families and genera* (Leistner 2000), aims to help the reader identify seed plants from *southern tropical Africa* down to genus level and, in the case of genera represented only by one species, down to species level. The key to families, given later in this section, covers all families dealt with. Descriptions of families and genera given in Leistner (2000) are not repeated and only important family characters not occurring in plants from southern Africa are listed. Keys to genera are provided or, in some families, with only a few genera additional to those in the original work, notes are provided to indicate where the genus would run in the key in Leistner (2000).

**Characteristics found only in a limited number of families**

Certain distinctive attributes encountered in some or all members of a limited number of families may prove helpful when identifying plants (G—gymnosperms; M—monocotyledons; all others—dicotyledons):

**Water plants, free-floating or with floating leaves:**
Alismataceae (M), Aponogetonaceae (M), Araceae (including Lemnaceae) (M), Cabombaceae, Crassulaceae, Droseraceae, Hydrocharitaceae (M), Lentibulariaceae, Limnocharitaceae (M), Lythraceae, Mayacaceae (M), Menyanthaceae, Nymphaeaceae, Onagraceae, Podostemaceae, Pontederiaceae (M), Potamogetonaceae (M), Scrophulariaceae, Trapaceae.

**Water plants, with submerged stems and leaves:**
Alismataceae (M), Aponogetonaceae (M), Ceratophyllaceae, Cymodoceaceae (M), Droseraceae, Elatinaceae, Haloragaceae, Hydrocharitaceae (M), Hydrostachyaceae, Lentibulariaceae, Limnocharitaceae (M), Lythraceae, Mayacaceae (M), Najadaceae (M), Onagraceae, Podostemaceae, Potamogetonaceae (M), Ranunculaceae, Ruppiaceae (M), Scrophulariaceae, Zannichelliaceae (M), Zosteraceae (M).

**Parasitic plants:**
(1) Without chlorophyll: Balanophoraceae, Convolvulaceae, Hydroraceae, Lauraceae, Rafflesiaeaceae, Scrophulariaceae (including Orobanchaceae); (2) growing on aerial parts of trees and shrubs: Loranthaceae, Viscaceae.

**Grasses and grass-like plants:**
Cyperaceae (M), Juncaceae (M), Poaceae (M), Restionaceae (M), Typhaceae (M).

**Succulent plants:**
*A* Agavaceae (M), Aizoaceae, Amaranthaceae, Amaryllidaceae (M), Apocynaceae, Asphodelaceae (M), Asteraceae, Balsaminaceae, Begoniaceae, Boraginaceae (*Heliotropium curassavicum*), Cactaceae, Chenopodiaceae, Crassulaceae, Dracaenaceae (M), Euphorbiaceae, Geraniaceae, Goodeniaceae, Hyacinthaceae (M), Hydroraceae, Lamiales, Loranthaceae, Menispermaceae, Mesembryanthemaceae, Molluginaceae, Orchidaceae (M), Passifloraceae, Pedaliaceae, Phytolaccaceae, Piperaceae, Polygonaceae, Portulacaceae, Rafflesiaeaceae, Rubiaceae (*Phylohydrax*), Scrophulariaceae, Viscaceae, Vitaceae, Zygophyllaceae.

**Plants with true bulbs:**
Alliaceae (M), Amaryllidaceae (M), Hyacinthaceae (M).

**Plants with milky or coloured to conspicuous watery sap:**

**Stem twining:**
Annonaceae, Apocynaceae, Aristolochiaceae, Basellaceae, Behniiaceae (=Luzuriagaceae) (M), Convolvulaceae, Dioscoreaceae (M), Euphorbiaceae, Fabaceae, Flagellariaceae (M), Gnetaceae (G), Hyacinthaceae (M), Lauraceae, Linaceae, Malpighiaceae, Menispermaceae, Oleaceae, Polygonaceae, Solanaceae.

**Tendrils present:**
Apocynaceae, Bignoniaceae, Colchicaceae (M), Cucurbitaceae, Fabaceae, Flagellariaceae (M), *Fumariaceae*, Linaceae, Menispermaceae, Passifloraceae, Rhamnaceae, Sapindaceae, Smilacaceae (M), Vitaceae.

**Leaves absent or reduced to scales:**
Amaranthaceae, Apocynaceae, Araceae (including Lemnaceae) (M); Asparagaceae (M), Asteraceae, Burmanniaceae (M), Cactaceae, Campanulaceae, *Casuarinaceae*, Chenopodiaceae, Convulvulaceae, Cucurbitaceae, Cupressaceae (G), Euphorbiaceae, Geraniaceae, Hyacinthaceae (M), Hydroraceae, Juncaceae (M), Lauraceae, Mesembryanthemaceae, Orchidaceae (M), Podostemaceae, Rafflesiaeaceae,
Identify Families

Restionaceae (M), Santalaceae, Scrophulariaceae (including Orobranchaceae), Viscaceae, Zannichelliaceae (M).

Leaves digitately compound (3 to many leaflets):
Anacardiaceae, Apiaceae, Araliaceae, Araceae (M), Arecales (M), Bignoniaceae, Burseraceae, *Cannabaceae, Capparaceae, Ceratophyllaceae, Cucurbitaceae, Dioscoreaceae (M), Droseraceae, Euphorbiaceae, Fabaceae, *Fumariaceae, Geraniaceae, Lamiaceae, Lentibulariaceae, Malvaceae (in broad sense), Oleaceae, Oxalidaceae, Passifloraceae, Pedaliaceae, Ranunculaceae, Rosaceae, Rutaceae, Sapindaceae, Verbenaceae, Vitaceae, Zygophyllaceae.

Leaves paripinnate:
Araliaceae, Balanitaceae, Cycadaceae (G), Fabaceae (especially Caesalpinioideae), Hydrostachyaceae, Meliaceae, Oxalidaceae, Pteroxylaceae, Sapindaceae, Stangeriaceae (G), Zamiaceae (G), Zygophyllaceae.

Leaves imparipinnate:
Anacardiaceae, Apiaceae, Araliaceae, Araceae (M), Arecaceae (M), Asteraceae, Bignoniaceae, Brassicaceae, Burseraceae, *Cannabaceae, Capparaceae, Ceratophyllaceae, Cucurbitaceae, Dioscoreaceae, Droseraceae, Euphorbiaceae, Fabaceae, *Fumariaceae, Geraniaceae, Haloragaceae, Hydrostachyaceae, Kirkiaeeae, Leeaceae, Meliaceae, Meliaceae, Melianthaceae, Moringaceae, Oleaceae, Proteaceae, Ranunculaceae, Resedaceae, Rosaceae, Rutaceae, Sapindaceae, Simaroubaceae, Stangeriaceae (G), Valerianaceae, Zamiaceae (G), Zygophyllaceae.

Leaves 2x or 3x pinnate:
Apiaceae, Araliaceae, Araceae (M), Asteraceae, Bignoniaceae, Fabaceae, *Fumariaceae, Geraniaceae, Hydrostachyaceae, Leeaceae, Lentibulariaceae, Meliaceae, Moringaceae, Proteaceae, Ranunculaceae.

Flowers densely crowded, sessile, usually small to minute; in heads, or on a fleshy axis surrounded by a conspicuous bract, or enclosed as in a fig; inflorescence often resembling a single flower:
Amaranthaceae, Apiaceae, Araceae (M), Araliaceae, Asteraceae, Balanophoraceae, *Casuarinaceae, Colchicaceae (M), Convolvulaceae, Dipsacaceae, Eriocaulaceae (M), Euphorbiaceae (*Euphorbia*), Fabaceae (Mimosoideae), Gentianaceae, Hamamelidaceae, Hyacinthaceae (M), Juncaceae (M), Moraceae, Pandanaceae (M), Portulacaceae, Proteaceae, Rhamnaceae (*Phylica*), Rubiaceae, Thymelaeaceae, Urticaceae, Verbenaceae, Xyridaceae (M).

Flowers in an umbel or pseudo-umbel:
Alismataceae (M), Alliaceae (M), Amaryllidaceae (M), Anthericaceae (M), Apiaceae, Apocynaceae, Araliaceae, Brexiaceae, Capparaceae, Crossiaceae (M), Euphorbiaceae, Fabaceae, Geraniaceae, Giselliaceae, Hydrocharitaceae (M), Iridaceae (M), Leucaeneae, Limnocharitaceae (M), Loranthaceae, Malpighiaceae, Menyanthaceae, Molluginaceae, Myrsinaceae, Myrtaceae, Nyctaginaceae, Oxalidaceae, Pandanaceae, Rhamnaceae, Ruppiaceae (M), Rutaceae, Smilacaceae (M), Solanaceae, Taccaceae (M), Thymelaeaceae, Viscaceae.

Perianth absent:
Amaranthaceae, *Casuarinaceae, Cheropodiaceae, Cupressaceae (G), Cymodoceaceae (G), Cynodonteae (M), Cyperaceae (M), Euphorbiaceae, Fabaceae (*Brachystegia*), Gunneraceae, Haloragaceae, Hydrostachyaceae, Moraceae, Myricaceae, Myrothamnaceae, Najadaeae (M), Pandanaceae (M), Pinaceae (G), Piperaceae, Poaceae (M), Podostemaceae, Podocarpaceae (G), Potamogetonaceae (M), Restionaceae (M), Ruppiaceae (M), Salicaceae, Stangeriaceae (G), Typhaceae (M), Viscaceae, Zamiaceae (G), Zannichelliaeeae (M), Zosteraceae (M).

Perianth dry, perigamentous:
Amaranthaceae, *Casuarinaceae, Cyperaceae (M), Eriocaulaceae (M), Juncaceae (M), Moraceae, Plantaginaceae, Poaceae (M), Restionaceae (M), Typhaceae (M), Xyridaceae (M).

Perianth spurred:
Balsaminaceae, Brassicaceae, Lentibulariaceae, Orchidaceae (M), Pedaliaceae, Scrophulariaceae, Tropaeolaceae, Valerianaceae, Violaceae.

Sex organs, at least of one sex, in cones or catkins:
*Casuarinaceae, Costaceae (M), Cupressaceae (G), Cymodoceae (G), Euphorbiaceae, Gunneraceae, Moraceae, Myricaceae, Myrothamnaceae, Pandanaceae (M), *Pinaceae (G), Podocarpaceae (G), Salicaceae, Stangeriaceae (G), Welwitschiaceae (G), Zamiaceae (G).

Anthers connate:
Apocynaceae, Araceae (M), Asteraceae, Balsaminaceae, Cucurbitaceae, *Fumariaceae, Hydroraceae, Campanulaceae (including Lobeliaceae), Rafflesiaceae, Scrophulariaceae, Violaceae.

Gynoecium of 2 or more free carpels with separate styles:
Alismataceae (M), Annonaceae, Aponogetonaceae (M), Arecales (M), Cabombaceae, Connaraceae, Crassulaceae, Cymodoceaceae (M), Giselliaceae, Juncaginaceae (M), Limnocharitaceae (M), Menispermaceae, Nymphaeaceae,
Phytolaccaceae, Potamogetonaceae (M), Ranunculaceae, Rosaceae, Ruppiaceae (M), Zannichelliaceae (M).

Fruit a circumscissile capsule: opening by a lid:
Aizoaceae, Convolvulaceae (*Oercutina*), Hypoxidaceae (M), Lentibulariaceae, Lythraceae, Plantaginaceae, Plumbaginaceae, Portulacaceae, Primulaceae, Rubiaceae (*Mitracarpus*), Sphaenonelaceae.

### Keys to families

**KEY TO MAJOR GROUPS**

1a Flowers absent; ovules/seeds borne on scales arranged in cones, or exposed, not in an ovary; pollen sacs on scales arranged in cones; trees to woody perennials; leaves mostly either linear to narrowly ovate or needle-like, scale- or palm-like ........................................... GYMNOSPERMS (key below)

1b Flowers present; ovules/seeds enclosed in an ovary; pollen borne in anthers; annual herbs to trees (ANGIOSPERMS):

2a Leaves usually net-veined, simple to variously compound, often with a petiole, base rarely sheathing the stem (e.g. Apiales, Ranunculaceae); stipules present or absent; flowers usually in 4s or 5s; vascular bundles in stem usually arranged in a cylinder; embryo usually with 2 cotyledons .................................................. DICOTYLEDONS (key below)

2b Leaves usually with parallel-convergent veins, simple or rarely compound or lobed but then leaflets or lobes parallel, not net-like venation, leaves rarely with a petiole but base usually sheathing the stem at least partly; stipules absent; flower parts usually in 3s; vascular bundles scattered in stem; embryo with 1 cotyledon .......................................................... MONOCOTYLEDONS (key on p. 23)

**KEY TO GYMNOSPERMS** (pp. 26–29)

1a Leaves 2, opposite, permanent, sprawling on the ground and often torn lengthwise by the wind .................................................. WELWITSCHIACEAE

1b Leaves indefinite in number, produced in succession from apex of stems:

2a Palm- or fern-like plants with fibrous stems or trunks, or stemless with a tuberous rootstock:

3a Stemless, somewhat fern-like plants with a tuberous rootstock; leaves deciduous from their base; leaflets with midrib and dichotomously branched lateral veins .................................................................................................................. STANGERIACEAE

3b Stems above and often below ground, covered with persistent leaf bases, sometimes up to 10 m tall, with a crown of palm-like leaves:

4a Leaflets with thick midrib and no lateral veins; (2–)4–10 pairs of ovules borne on the margins of the up to 0.3 m long female fronds spirally arranged in a dense whorl at apex of stem ............................................................................................................. CYCADACEAE

4b Leaflets with longitudinal parallel venation and no midrib; 2 ovules are borne on the adaxial (upper) side of stalked scales tightly packed in large cylindrical or ovate cones borne at or near the apex of the stem ............................................................................................................. ZAMIACEAE

2b Trees or shrubs with hardwood stems, or remotely branched lianes; leaves simple:

5a Remotely branched lianes with decussate leaves ............................................................................................................. GNETACEAE

5b Trees or shrubs with hardwood stems; leaves spirally arranged, whorled or decussate:

6a Leaves small and scale-like; ovules/seeds borne between scales of a rounded woody, rarely fleshy cone ........................................... CUPRESSACEAE

6b Leaves well-developed, linear to narrowly ovate or needle-like:

7a Dioecious trees or shrubs; leaves linear to narrowly ovate; ovules/seeds 1 or 2 borne on a receptacle (often swollen and fleshy), not in cones .................................................................................................................. PODOCARPACEAE

7b Monoeccious trees or shrubs; leaves mostly needle-like, 1 or few united at base by a membranous sheath; female cones with many spirally arranged scales, leathery or fleshy at first, mostly becoming stiff and woody later, each scale bearing 2 ovules/seeds .......... *PINACEAE*

**KEY TO DICOTYLEDONS** (pp. 30–374)

1a Gynoecium composed of 2 or more free carpels with separate styles and stigmas (in Nymphaeaceae the carpels are sunk in a fleshy disc):

2a Petals absent; perianth members all ± similar .................................................................................................................. Group 1 (p. 8)

2b Petals present ..................................................................................................................................................................... Group 2 (p. 8)

1b Gynoecium composed of 1 carpel or of 2 or more ± united carpels with united or free styles, or if carpels free below then styles or stigmas united:

3a Placentation parietal or marginal: ovules 2 or more in the ovary, borne on its outer wall or sometimes on intrusions thereof:

4a Ovary superior:

5a Petals absent; perianth members, if present, all ± similar .................................................................................................. Group 3 (p. 8)

5b Petals free ..................................................................................................................................................................... Group 4 (p. 9)

6c Petals ± united ............................................................................................................................................................... Group 5 (p. 10)

4b Ovary ± inferior ............................................................................................................................................................... Group 6 (p. 11)

3b Placentation axile, basal or apical: 1 or more ovules in the ovary, borne on the central axis, or the base or apex of the ovary, or placentation indistinct:

6a Ovary superior:

7a Petals absent; perianth members, if present, all ± similar .................................................................................................. Group 7 (p. 11)

7b Petals free ..................................................................................................................................................................... Group 8 (p. 14)

7c Petals ± united ............................................................................................................................................................... Group 9 (p. 18)

6b Ovary inferior:

8a Petals absent; perianth members, if present, all ± similar .................................................................................................. Group 10 (p. 20)

8b Petals free ..................................................................................................................................................................... Group 11 (p. 21)

8c Petals ± united ............................................................................................................................................................... Group 12 (p. 22)
IDENTIFICATION OF FAMILIES

GROUP 1 (Carpels free; petals absent)

1a Stamens perigynous, arising at mouth of calyx tube; sepals united below, imbricate; leaves pinnate or digitate or palmately lobed; stipules present; trees, shrubs or herbs, sometimes scrambling and with prickles ................................................................. ROSEAE

1b Stamens hypogynous; sepals free or if united near base then valvate and stamens united into a column:

2a Stamens united into a column ............................................................................................................................... STERCULOIDEAE—MALVACEAE

2b Stamens free:

3a Leaves compound, sometimes decompound; sepals petaloid; herbs or soft-wooded climbing or trailing plants ............... RANUNCULACEAE

3b Leaves simple:

4a Flowers unisexual; plants dioecious; woody climbers with alternate leaves:

5a Sepals 6–18 in 2 or more whorls; stamens 3–6, free or united into a synandrium; flowers in cymes or racemes; leaves entire or palmately lobed ........................................................................................................ MENISPERMACEAE

5b Sepals 4 or 5 in 1 whorl; stamens 10–15, free; flowers in elongated racemes; leaves entire ........................................ PHYLLOCLACCEAE

4b Flowers bisexual; herbs with opposite or subopposite leaves:

6a Leaves entire; calyx herbaceous; flowers small, in cymes or panicles ................................................................. GISEKIACEAE

6b Leaves toothed or lobed; calyx petaloid; flowers large and conspicuous, solitary or few together............................... RANUNCULACEAE

GROUP 2 (Carpels free but sometimes pressed together; petals present)

1a Leaves opposite; stipules absent; carpels as many as petals; plants often succulent ........................................................ CRASSULACEAE

1b Leaves alternate, sometimes all radical:

2a Aquatic herbs with floating leaves on long petioles; leaf blades ± peltate; flowers solitary, on long scapes, often large and conspicuous:

3a Carpels sunk in a fleshy disc; petals many; leaf blades cordate as well as peltate .................................................. NYMPHAEACEAE

3b Carpels not sunk in a fleshy disc; petals 3; leaf blades peltate, not cordate .................................................................................................................... CABOMBACEAE

2b Terrestrial plants; leaf blades not peltate:

4a Stamens perigynous, arising at mouth of calyx tube; leaves pinnate or digitate; stipules present; trees, shrubs or herbs, sometimes scrambling with prickles ........................................................................................................ ROSACEAE

4b Stamens hypogynous, not arising on calyx:

5a Sepals 6–24 in 2 or more whorls, free or inner ones united; dioecious shrublets or woody climbers with small flowers .......... MENISPERMACEAE

5b Sepals 2–5 in 1 whorl, free or united:

6a Leaves compound or deeply divided:

7a Herbs ............................................................................................................................................................... MONOCTERACEAE

7b Trees or shrubs ............................................................................................................................................... CONNARACEAE

6b Leaves simple, entire:

8a Leaves succulent; a nectary gland present at base of each carpel; stamens 8–12 ....................................................... CRASSULACEAE

8b Leaves herbaceous; without a nectary at base of each carpel; stamens mostly more than 12, if 5 + 5 then grey-green maritime shrubs:

9a Herbs ............................................................................................................................................................... RANUNCULACEAE

9b Trees or shrubs, sometimes trailing:

10a Leaves palmatinerved ........................................................................................................................................ BROWNLOWIAEDE (Christiana)—MALVACEAE

10b Leaves penninerved or venation ± invisible:

11a Sepals 2 or 3, valvate, free or united; anthers often longer than filaments, often with a broad prolongation of the connective above the thecae; flowers solitary or fasciculate in or few-flowered cymes ......................................................... ANNONACEAE

11b Sepals 5, imbricate, free; anthers much shorter than filaments, and anther connective without prolongation:

12a Stamens many; ovules few to many per carpel ............................................................................................... DILLENIACEAE

12b Stamens 10 in whorls of 5; ovules 2 per carpel .............................................................................................. SURIANACEAE

GROUP 3 (Placentation parietal; ovary superior; petals absent)

1a Submerged aquatic herbs, fern-like owing to pinnately much-divided leaves; plants dioecious; flowers in elongated, pedunculate spikes; calyx absent ................................................................................................ HYDROSTACHYACEAE

1b Terrestrial plants, not fern-like in habit:

2a Leaves pinnate or 2-foliolate; trees ..................................................................................................................... FABACEAE

2b Leaves simple or digitately 3-foliolate, sometimes reduced to scales:

3a Flowers unisexual; plants dioecious or monoeccious; leaves simple, often with salicoid dentation; flowers usually with a disc or separate disc glands; trees or shrubs ........................................................................................................ SALICACEAE

3b Flowers bisexual; leaves simple or variously divided, if dentate then dentition not salicoid; disc and corona absent or present; plants herbaceous or woody:

4a Flowers with a fimbriate corona outside stamens; herbs or shrubs, often climbing with tendrils .................................. PASSIFLORACEAE

4b Flowers without corona; tendrils absent:

5a Herbs or low shrublets; fruit a small capsule, either 1-locular with many ovules or 2-locular with 1 or 2 ovules per locule:

6a Capsule (silicula) with 2 1- or 2-seeded locules divided by a persistent, often membranous partition ........................ BRASSICACEAE

6b Capsule 1-locular, often open at the top, with many ovules on 2–5 placentas ......................................................... RESEDACEAE

5b Shrubs or trees; fruit, if a capsule, with more than 2 seeds per locule:

7a Ovary borne on a distinct stalk (gynophore) ................................................................................................. CAPPARACEAE

7b Ovary sessile or subsessile:
GROUP 4 (Placentation parietal; ovary superior; petals free)

1a Stamens 6, tetradynamous (inner 4 long, outer 2 short); sepals 4; petals 4 or fewer; leaves without stipules; herbs ............... BRASSICACEAE

1b Stamens not tetradynamous:

2a Gynoecium composed of 1 carpel, thus with only 1 placenta in the ovary:

3a Flowers regular; petals 5 or fewer, sometimes 1; leaves simple or compound; trees or shrubs or herbs, sometimes climbing .......... FABACEAE

3b Flowers irregular:

4a Leaves 2-pinnate; stipules present; trees, shrubs or herbs, sometimes climbing; flowers in spikes or heads ......................... FABACEAE

4b Leaves simple, 1-pinnate or 1–3-foliolate:

5a Leaves pinnate or 3-foliolate, the leaflets dotted with pellucid glands, at least at margin; trees or shrubs ......................... RUTACEAE

5b Leaves simple or 1-foliolate, without pellucid glands:

6a Leaves toothed; stipules present; stamens as many as and opposite petals, united at base; herbs or small shrubs ...............................

................................................................. SALICACEAE

6b Leaves entire; stipules absent; stamens more numerous than petals; trees or shrubs, sometimes climbing:

7a Sepals 5; petals 5; flowers in few-flowered racemes ................................................................. CONNARACEAE

7b Sepals 3; petals 6; flowers solitary, axillary ............................................................... ANNONACEAE

8a Ovary with a single parietal placenta; style 1, short; stigma peltate; disc absent ................................................................. APHLOIACEAE

8b Ovary with 2 or more parietal placentas; styles 1–8, entire or branched; disc or disc glands usually present ....................... SALICACEAE

2b Gynoecium composed of 2 or more united carpels, thus with 2 or more placentas:

8a Ovary with a single parietal placenta; style 1, short; stigma peltate; disc absent ................................................................. APHLOIACEAE

8b Ovary with 2 or more parietal placentas; styles 1–8, entire or branched; disc or disc glands usually present ....................... SALICACEAE
26a Branches and inflorescence axis with rusty scales; petiole with basal and apical pulvinus; pedicels with 5 or 6 apical glands; fruit a loculicidal capsule with dense stiff bristles; anthers horseshoe-shaped, opening by short, apical, pore-like slits .............................................................. *BIXACEAE

26b Branches and inflorescence axis without scales; petioles without pulvinus; fruit a fleshy berry, a capsule, or large, globose and indehiscent but without dense bristles; anthers opening by longitudinal slits ................. .............................................................. SALICACEAE

24b Flowers without a disc or a corona:

27a Perennial or annual herbs:

28a Leaves prickly, often pinnately lobed; sepals 2 or 3, caducous; fruit a capsule dehiscing by 4–6 short valves at the top ................................................................. *PAPAVERACEAE
28b Leaves glabrous, entire; sepals 5; fruit a capsule opening by 3 septical valves .... (Sauvagesia) OCHNACEAE

27b Trees or shrubs:

29a Leaves palmately lobed; fruit a 3–5-valved capsule ........................................... COCHLOSPERMACEAE
29b Leaves simple; fruit a berry, a capsule, a nut or of separate drupelets:

30a Gynoecium of 5–15 ± free, 1-ovulate carpels united by their completely fused styles; fruit of separate 1-seeded drupelets ................................................................. OCHNACEAE
30b Gynoecium with a 1–5-locular ovary with 1–many ovules; fruit a capsule, nut-like or a berry:

31a Fruit nut-like, 1-seeded, with a very hard pericarp surrounded by 5 wing-like, accrescent, prominently veined sepals; leaves entire ................................................................. DIPTEROCARPACEAE
31b Fruit a capsule or berry, not surrounded by wing-like sepals; leaves entire or toothed ........................................ ACHARIACEAE

23b Stamens as many as and alternating with petals:

32a Styles 2–5, free or shortly united at base:

33a Leaves bearing many sticky, stipitate glands; insectivorous herbs ................................................. DROSERACEAE
33b Leaves without sticky glands; plants not insectivorous:

34a Flowers with a conspicuous, fimbriate or hairy corona outside stamens; herbs or shrubs, often climbing with tendrils ................................................................. PASSIFLORACEAE
34b Flowers without a corona or corona very small and inconspicuous; herbs without tendrils .... TURNERACEAE

32b Style 1:

35a Stamens variously united, connective of anthers prolonged above thecae into an appendage; leaves with stipules ................................................................. VIOLACEAE
35b Stamens ± free, anthers without an appendage; leaves without stipules ......................................... PITTSPORACEAE

GROUP 5 (Placentation parietal; ovary superior; petals ± united)

1a Gynoecium consisting of 1 carpel, therefore with only 1 placenta in ovary; leaves with or without stipules:

2a Leaves simple or compound, with stipules or stipular spines; fruit a legume ......................................................... FABACEAE
2b Leaves simple; stipules absent; fruit a drupe containing a solitary U-shaped seed ........................................... MENISPERMACEAE

1b Gynoecium consisting of 2 or more united carpels, therefore with 2 or more placentas in ovary; leaves without stipules:

3a Flowers irregular:

4a Leaves pinnately or ternately compound:

5a Leaves alternate; annual herbs with watery sap, sometimes with tendrils; outer petals often spurred or saccate at base .... *FUMARIACEAE
5b Leaves opposite; trees with large pendulous, sausage-like fruits ......................................................... BIGNONIACEAE
4b Leaves simple, sometimes reduced to scales; herbs:

6a Plants parasitic on roots; leaves reduced to scales; stamens 4 ................................................................. SCROPHULARIACEAE
6b Plants not parasitic; leaves (or solitary leaf) well-developed; stamens 2 ..................................................... GESNERIACEAE

3b Flowers regular; stamens as many as corolla lobes or more numerous:

7a Leaves opposite:

8a Petals many; succulent herbs or shrubs with succulent leaves ............................................................. MESEMBRYANTHEMACEAE
8b Petals 4–6:

9a Shrubs or woody climbers with latex; fruit a large berry ................................................................. APOCYNACEAE
9b Herbs without latex; fruit a capsule, rarely berry-like ................................................................. GENTIANACEAE
7b Leaves alternate or basal, sometimes small and scale-like:

10a Flowers unisexual; plants monoeccious or dioecious, with large leaves clustered at and near apex of unbranched to sparsely branched, sometimes prickly stems and branches ................................................................. CARICACEAE
10b Flowers bisexual, habit of plants not as above:

11a Leaves small, scale-like; trees or shrubs, often halophytic ................................................................. TAMARICACEAE
11b Leaves well-developed:

12a Stamens more numerous than petals; petals twice as many as sepals; trees or shrubs, sometimes climbing ....... ANNONACEAE
12b Stamens, petals and sepals all S(6):

13a Herbs, aquatic or wetland; stamens arising on corolla tube ............................................................. MENYANTHACEAE
13b Small trees or shrubs; stamens free from corolla tube ................................................................. PITTSPORACEAE
**GROUP 6 (Placentation parietal; ovary ± inferior)**

1a Plants parasitic on roots of shrubs or trees, low; ± fleshy:

2a Perianth tubular, 3- or (4-5)-lobed, resembling a fungus ................................................................. HYDNORACEAE

2b Perianth cup-shaped, 4-9-lobed, fused towards base ............................................................... RAFFLESIACEAE

1b Plants not parasitic:

3a Plants not parasitic:

3b Plants not parasitic:

5b Flowers bisexual; plants without tendrils; leaves mostly entire, rarely with palmate venation:

6a Leaves absent or reduced to scales; succulent shrubs or shrublets, sometimes epiphytic .................................................. CACTACEAE

6b Leaves mostly well-developed:

7a Succulent herbs or shrubs with succulent leaves; leaves mostly opposite; petals many ..................... MESEMBRYANTHACEAE

7b Plants not succulent; leaves opposite or alternate; petals fewer than 10:

8a Leaves opposite or whorled, with interpretiolar stipules ........................................................................ RUBIACEAE

8b Leaves alternate; stipules, if present, not interpretiolar:

9a Aquatic herbs with usually floating peltate leaves ........................................................................ NYPHAEACEAE

9b Trees or shrubs:

10a Petals mostly larger and more numerous than sepals; anthers longer than 1 mm, often linear; disc or separate disc glands mostly present ................................................................. ACHARIACEAE

10b Petals absent or present, mostly as many as and similar to sepals; anthers mostly shorter than 1 mm and not much longer than broad; disc or disc glands mostly absent ................................................................................ SALICACEAE

**GROUP 7 (Placentation axile, basal or apical; ovary superior; petals absent)**

1a Ovary with 2 or more ovules in each locule:

2a Plants terrestrial, not moss-like or liverwort-like in habit:

3a Leaves reduced to minute scales forming toothed sheaths surrounding nodes of pine needle-like, jointed branchlets; trees with unisexual flowers; male flowers in spikes, female flowers in heads; stamen 1; ovary 1-locular with 2 collateral ovules; style with 2 elongated branches ......................................................................................................................... *CASUARINACEAE

3b Leaves well-developed, not reduced to scales:

4a Leaves opposite or whorled or all radical:

5a Flowers unisexual; trees, shrubs or shrublets:

6a Calyx absent; leaves toothed at apex, fan-like; flowers in catkin-like spikes; ovules many in each locule ...... MYROTHAMNACEAE

6b Calyx present; leaves entire, not fan-like; flowers solitary or fasciculate in axes of leaves; ovules 2 in each locule:

7a Leaves with stipules; plants dioecious; stamens very many, spirally arranged on prolonged floral axis ........... EUPHORBIACEAE

7b Leaves without stipules; plants monoecious; stamens 4-6 ................................................................. BUXACEAE

5b Flowers bisexual; herbs:

8a Calyx spurred, spur adnate to pedicel; ovary beaked; leaves toothed or lobed ................................................ GERANIACEAE

8b Calyx not spurred; ovary without stout central axis; leaves entire:

9a Sepals fused below; stamens perigynous, arising on calyx tube:

10a Style 1; ovary 1-5-locular, with many ovules in each locule; fruit a capsule ................................................. LYTHRACEAE

10b Styles 2-5, or if 1 then ovary 1-locular with few ovules; fruit a circumcissile capsule .............................. Aizoaceae

9b Sepals free or almost so; stamens hypogynous:

11a Ovary 2-5-locular, with axile placentas ................................................................................................. MOLLUGINACEAE

11b Ovary 1-locular with basal or free-central placenta ............................................................................... CARYOPHYLLACEAE

4b Leaves alternate, not all radical:

12a Leaves pinnate; trees, polygamous or with flowers all unisexual; ovary 2-locular with 2 ovules in each locule; fruit indehiscent ................................................................. SAPINDACEAE

12b Leaves simple or digitate:

13a Ovary 1-locular; flowers in racemes or spikes:

14a Flowers mostly bisexual but plants sometimes polygamous:

15a Calyx scarious; fruit a ± circumcissile capsule; herbs ........................................................................ AMARANTHACEAE

15b Calyx of 4 thickish lobes; fruit consisting of 1 or more follicles; gland-dotted shrubs ................................ RUTACEAE

14b Flowers unisexual; plants dioecious; calyx, if present, not scarious; fruit a drupe or a capsule; trees or shrubs, sometimes climbing:

16a Perianth absent; inflorescences small dense catkins; seeds many, very small with a basal tuft of long dense hairs ............ SALICACEAE

16b Perianth present; combination of characters not as above:
**KEY TO DICOTYLEDONS: GROUP 7**

1a Leaves with stipules; calyx imbricate; stamens opposite sepals; styles 3, usually 2-lobed .................................. **EUPHORBIACEAE**

1b Leaves without stipules; calyx valvate; stamens alternating with sepals; style absent, stigma sessile and multiradiate .............. **ICACINACEAE**

13b Ovary 2- or more-locular:

18b Gynoecium composed of completely united carpels, in fruit forming a capsule, or indehiscent or finally separating into winged cocci:

19a Ovary borne on a distinct gynophore; flowers bisexual; shrubs with solitary, pedunculate, axillary flowers .......... **CAPARACEAE**

19b Ovary sessile or subssessile:

20a Flowers bisexual; perianth segments sepaloid externally and petaloid internally ........................................ **AIZOACEAE**

20b Flowers mostly unisexual; plants occasionally polygamous:

21a Leaves with stipules; fruit a capsule, or indehiscent, or separating into 2 winged cocci; trees or shrubs or herbs .............. **EUPHORBIACEAE**

21b Leaves without stipules; fruit a septicidal capsule with 2 or more longitudinal, membranous wings; shrubs or trees .... **SAPINDACEAE**

1b Ovary with 1 ovule in each locule:

22a Ovary 2- or more-locular:

23a Leaves pinnate or 3-foliolate:

24a Leaves pinnate, alternate; trees or shrubs ................................................................. **SAPINDACEAE**

24b Leaves 3-foliolate, opposite; subshrubs ............................................................................................................................................ **ZYGOPHYLLACEAE**

23b Leaves simple, sometimes lobed or much divided or reduced to scales or stipular spines:

25a Flowers unisexual or plants polygamous:

26a Ovary 5-locular, carpels loosely united and becoming separate in fruit; calyx present, valvate, sepals united below; stamens 5–10, united into a column; leaves alternate; trees or shrubs .................................................................................. **STERCULIOIDEAE—MALVACEAE**

26b Ovary 2–4-locular, carpels completely united and not becoming separate in fruit; leaves alternate or sometimes opposite, sometimes reduced to scales or stipular spines; calyx present or absent, sepals valvate or imbricate; stamens 1–many, free or variously united; habit varying from annuals to trees ...................................................................................................................................................... **EUPHORBIACEAE**

25b Flowers bisexual:

27a Sepals fused into a very short to long tube; stamens perigynous or hypogynous:

28a Stamens arising on upper portion of calyx tube, in 2 whorls; fruit a drupe; shrubs ............................................. **THYMELAEACEAE**

28b Stamens not arising on sepals, sometimes in groups; fruit a capsule or flat samara with membranous wings:

29a Trees with dentate leaves; fruit a flattened samara .............................................................................................. **CELTIDACEAE**

29b Herbs, shrublets or shrubs with entire, often somewhat succulent leaves; fruit a capsule ........................................... **AIZOACEAE**

27b Sepals free; stamens hypogynous or almost so:

30a Leaves ± toothed or pinnately lobed or divided; style 1; fruit a flattened silicule or separating into 2 cocci; herbs .......... **BRASSICACEAE**

30b Leaves entire; styles 2 or more, free or united at base:

31a Ovary 7–10-locular; fruit a berry; flowers in spike-like racemes; herbs or shrublets ............................................. **PHYTOLACCACEAE**

31b Ovary 2–5-locular; fruit a loculicidal capsule or separating into 2 cocci, cocci sometimes winged along back; flowers in lax or dense cyrnes; herbs ........................................................................................................ **MOLLUGINACEAE**

22b Ovary 1-locular:

32a Leaves absent or reduced to scales; flowers spicate;

33a Slender, twining, parasitic plants; flowers not immersed in rachis of spike; stamens 6–9, accompanied by staminodes; anthers opening by valves .................................................................................................................................................. **LAURACEAE**

33b Succulent, maritime herbs with articulated branches, not parasitic; flowers immersed in rachis of spike; stamens 1 or 2; anthers opening by longitudinal slits .................................................................................. **CHENOPODIACEAE**

32b Leaves present, well-developed, not reduced to scales:

34a Leaves with stipules, sometimes forming a sheath (oecra) surrounding the stem:

35a Leaves 3- or 4-pinnate; calyx petaloid; fruit a stipitate achene borne on a slender pedicel; herbs ................................ **RANUNCULACEAE**

35b Leaves simple or digitate:

36a Ovule pendulous from apex or near apex of ovary; flowers unisexual or plants polygamous:

37a Flowers densely spicate or capitulate, or crowded in or on an open or flat receptacle or inside a hollow, almost closed receptacle (fig), female flowers sometimes immersed in tissue of receptacle; calyx sometimes absent; trees, shrubs or herbs ................................................................. **MORACEAE**

37b Flowers solitary or fasciculate or in cymes or racemes or panicles; calyx sometimes reduced or absent in female flowers:

38a Annual herbs; leaves opposite or alternate, all or lower ones palmately divided; male flowers in elongated panicles; female flowers spicate, enclosed by bracts; fruit dry, indehiscent ......................................................... **CANNABACEAE**

38b Trees or shrubs; leaves alternate:

39a Stamens as many as calyx segments, 4 or 5; style 2-branched with simple or divided stigmas; fruit a drupe; trees or shrubs .................................................................................................................................................. **CELTIDACEAE**

39b Stamens more numerous than calyx segments; style unbranched, sometimes very short:
40a Flowers solitary or paired in axils of leaves; leaves 1–3-foliolate with small, narrow leaflets; heath-like shrubs ................................................................. **ROSACEAE**

40b Flowers in axillary racemes or panicles; leaves simple; trees ..................................................................................................................... **EUPHORBIACEAE**

36b Ovule arising from base or near base of ovary:

41a Leaves opposite, marked with cystoliths; flowers unisexual; herbs or shrubs .................................................................................... **URTICACEAE**

41b Leaves alternate:

42a Perianth absent; flowers minute, in dense spikes; shrubs, sometimes climbing ................................................................. **PIPERACEAE**

42b Perianth present:

43a Styles 2 or 3, free or united below; stamens 4–8; fruit a small nut; stipules often forming an ocrea surrounding the stem; herbs or shrubs, sometimes climbing ................................................................. **POLYGONACEAE**

43b Style 1 or absent; stamens 5 or fewer:

44a Flowers bisexual; sepals united below, free portions alternating with lobes of an epicalyx; style arising laterally from near base of ovary; herbs with palmately lobed leaves ..................................................................................... **ROSACEAE**

44b Flowers unisexual; sepals free or united, without an epicalyx; style or sessile stigma terminal:

45a Herbs, subshrubs or shrubs, sometimes softwooded small trees or climbers, sometimes with stinging hairs; leaves simple, sometimes 3–5(–7)-lobed, often marked with cystoliths; plants monoeocious or dioecious; stamens inflexed in bud, abruptly bending in dehiscence .............................................................................. **URTICACEAE**

45b Trees or shrubs, often with stilt-roots, without stinging hairs; leaves palmatifid to palmatisect, without cystoliths; plants strictly dioecious; stamens straight in bud, not abruptly bending in dehiscence ........... **CECROPIACEAE**

34b Leaves without stipules:

46a Submerged, aquatic herbs; leaves whorled, deeply and bifurcately divided into linear or filiform segments; flowers unisexual, solitary and sessile in axils of leaves ...................................................................................................................................... **CERATOPHYLLACEAE**

46b Plants not aquatic; leaves alternate or opposite, undivided or sometimes pinnately divided:

47a Perianth absent; flowers in spikes:

48a Flowers unisexual; stamens 3–12; styles 2, free or shortly united below; leaves alternate; trees or shrubs .............. **MYRICACEAE**

48b Flowers bisexual; stamens 2; style absent, stigma sessile; leaves alternate or opposite or whorled; herbs, sometimes trailing or climbing or epiphytic ................................................................................................................................. **PIPERACEAE**

47b Perianth present, at least in male flowers:

49a Stamens twice as many as calyx segments or more numerous:

50a Ovule erect from base of ovary; fruit enclosed in persistent, longitudinally 4-winged calyx tube; spiny shrubs with small, linear, often fasciculate leaves; plants polygamo-dioecious ..................................................................................... **NYCTAGINACEAE**

50b Ovule pendulous from apex of ovary; fruit not enclosed in winged calyx tube; plants not spiny:

51a Flowers bisexual; sepals united into an elongated tube; stamens arising on calyx tube; style elongated, slender; shrubs, often heath-like, or sometimes trees, with alternate or opposite leaves.............................................................................. **THYMELAEACEAE**

51b Flowers unisexual; plants dioecious; sepals shortly united at base; stamens not arising on calyx tube; style absent, stigma sessile; shrubs or trees with opposite or subopposite leaves ..................................................................................... **MONIMIACEAE**

49b Stamens fewer than twice as many as calyx segments, sometimes accompanied by staminodes:

52a Anthers opening by valves; calyx 6-lobed; stamens 6–9; accompanied by staminodes; trees ......................... **LAURACEAE**

52b Anthers opening by longitudinal slits; calyx with 3–5 segments or lobes:

53a Leaves opposite or subopposite:

54a Perianth lobes ± petaloid, united into a tube constricted above ovary, lower portion of tube persistent and enclosing fruit and often glandular on outside; stamens not accompanied by staminodes; herbs or climbing shrubs ................................................................. **NYCTAGINACEAE**

54b Perianth lobes dry and ± scarious, free or shortly united at base, not forming a tube constricted above ovary; stamens as many as and opposite calyx segments, often alternating with staminodes; herbs or shrubs ....... **AMARANTHACEAE**

53b Leaves alternate:

55a Twining herbs; sepals (petals?) united below into a tube with 2 adnate bracteoles outside; flowers in axillary, pedunculate spikes ................................................................................................................................. **BASELLACEAE**

55b Plants not twining, or if so, woody lianes; sepals free or united, without adnate bracteoles:

56a Perianth of 2–4 valvate segments; trees or shrubs:

57a Flowers bisexual, in large, bracteate heads or in elongated spikes or racemes; stamens 4, free, opposite to and arising on calyx segments; fruit a nut; seed not arillate ..................................................................................... **PROTEACEAE**

57b Flowers unisexual, in small, solitary or clustered (sometimes paniculate) heads; stamens 3–5, united into a column; fruit with a thick, fleshy, dehiscent pericarp; seed arillate ..................................................................................... **MYRISTICACEAE**

56b Perianth of 3–5 imbricate segments or sometimes almost completely tubular with indistinct segments; herbs, shrubs or woody climbers:

58a Stamens fewer than calyx segments and mostly alternating with them; leaves small, linear; flowers in elongated, simple spikes ................................................................................................. **PHYTOLACCACEAE**

58b Stamens as many as or fewer than calyx segments and opposite them:

59a Disc of 4 or 5 fleshy lobes alternating with petals (may be taken for sepals as calyx is reduced to a rim); woody climbers .................................................................................................................................................. **OPILIAEAE**

59b Disc absent:

**Seed plants of southern tropical Africa: families and genera**

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GROUP 8 (Placentation axile, basal or apical; ovary superior; petals free but may adhere to base of staminal tube)

1a Ovary 1-locular, sometimes septate towards base:

2a Sepals 1 or 2, free, sometimes caducous:

3a Flowers unisexual; plants dioecious; sepals 1 or 2; petals 1–4; stamens united into a synandrium; leaf blades peltate or subpeltate; woody climbers ................................................................. MENISPERMACEAE

3b Flowers bisexual or, if unisexual, then stamens free; sepals 2; petals 4 or 5; leaf blades not peltate; herbs:

4a Flowers irregular; ovary with 1 ovule; fruit a nut; leaves much divided ................................................................. ANACARDIACEAE

4b Flowers regular; ovary with many ovules; fruit a capsule; leaves entire, fleshy .......................... PORTULACACEAE

2b Sepals (or calyx lobes) 3 or more, sometimes ± obsolete (calyx annular):

5a Leaves opposite or whorled, not all radical:

6a Leaves with stipules; herbs or shrublets ........................................................................ CARYOPHYLLACEAE

6b Leaves without stipules:

7a Petals and stamens perigynous, arising on calyx tube:

8a Ovary with 1 apical, pendulous ovule; fruit indehiscent, dry or fleshy; often heath-like ............................................... THYMELAEACEAE

8b Ovary with many ovules on a basal or free-central placenta; stamens twice as many as petals or fewer; herbs, shrubs or trees ...........

7b Petals and stamens hypogynous or only slightly perigynous, not arising on calyx:

9a Herbs; ovary with 1–many ovules on a basal or free-central placenta; fruit a capsule ..................... CARYOPHYLLACEAE

9b Trees or shrubs; ovary with 1 or 2 ovules; fruit drupaceous; stamens as many as and alternating with petals:

10a Filaments united at base into a tube or cup ........................................................................................................ SALVADORACEAE

10b Filaments ± free:

11a Ovule 1; styles 3, free or united at base; flowers unisexual; plants dioecious or polygamous .................. ANACARDIACEAE

11b Ovules 2–8; style 1 or stigma sessile; flowers bisexual:

12a Ovules 2, pendulous from apex of ovary .............................................................................................. ICACINACEAE

12b Ovules 2–8, erect from base of ovary ........................................................................................................ CELASTRACEAE

5b Leaves alternate, sometimes all radical:

13a Leaves compound with 3 or more leaflets; trees or shrubs, sometimes climbing:

14a Leaves 2-pinnate; flowers bisexual; fruit winged, indehiscent ........................................................................ FABACEAE

14b Leaves 1-pinnate or 3-foliolate; flowers unisexual; plants polygamous or dioecious; fruit drupaceous ................ ANACARDIACEAE

13b Leaves simple or 1-foliolate:

15a Ovary with 1 ovule:

16a Flowers irregular; the inner 2 sepals larger than the others, the lowest (median) petal forming a keel, the upper 2 petals vestigial or absent; fruit long-winged, indehiscent; trees or shrubs, sometimes climbing .................................................. POLYGALACEAE

16b Flowers regular; fruit unwinged, but sometimes surrounded by persistent wing-like sepals:

17a Leaves with stipules; stamens as many as petals; herbs ........................................................................ CARYOPHYLLACEAE

17b Leaves without stipules:

18a Sepals united into an elongated tube; stamens mostly twice as many as petals, arising on calyx tube; shrubs, sometimes heath-like ........................................................................................................ THYMELAEACEAE

18b Sepals free or almost so; calyx sometimes reduced to a rim:

19a Stamens united into a synandrium; leaf blade peltate or subpeltate; woody, dioecious climbers . MENISPERMACEAE

19b Stamens free or almost so; leaf blade not peltate:

20a Plants polygamous or dioecious; stamens 1–10; trees or shrubs ........................................................................ ANACARDIACEAE

20b Plants with bisexual flowers; stamens as many as and opposite petals; woody climbers ......................... OPILIACEAE

15b Ovary with 2 or more ovules:

21a Anthers opening by 2 upcurving valves; shrubs with 3-partite spines at the nodes; fruit a berry ......................... BERBERIDACEAE

21b Anthers opening by longitudinal slits; combination of characters not as above:

22a Leaves with stipules:

23a Stamens as many as and opposite petals:

24a Stamens with filaments united into a tube; subshrubs or shrublets with stellate, tufted and simple hairs ........................................... BYTINERIDEEAE—MALVACEAE

24b Stamens with free filaments; scrambling or erect shrubs or trees, glabrous or hairs, if present, not stellate ..........................

............................................................................................................................................................................... Homalieae (Gerrardia)—SALICACEAE (in broad sense)

23b Stamens more numerous than petals, free:

25a Petals and stamens perigynous, arising at mouth of calyx tube ........................................................................ ROSACEAE

25b Petals and stamens hypogynous; small trees or shrubs; leaves palmately lobed .................................. COCHLORIPERMACEAE

22b Leaves without stipules; trees or shrubs:

26a Petals imbricate; stamens as many as and opposite petals; ovules on a free-central or basal placenta .......... MYRSINACEAE

26b Petals valvate:
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1b Ovary 2- or more-locular; if carpels ± free then they are united by their fused styles:

28a Stamens opposite to and usually as many as petals:
  29a Filaments ± united into a tube or cup, alternating with stamens; calyx lobes valvate; herbs or shrubs, often with stellate hairs
  29b Filaments connate only at base or quite free, not alternating with staminodes or staminodes absent; stellate hairs present or absent:
  30a Ovary with few to many ovules in each locule; fruit a loculicidal capsule; flowers in mainly terminal panicles; trees or shrubs:
    31a Small, aromatic trees or shrubs without stellate hairs; stipules rudimentary; flowers usually unisexual by abortion; style 1
    31b Herbs, shrublets or undershrubs, frequently stellate-pubescent; stipules often foliaceous, rarely absent; flowers bisexual; styles 5, rarely 1
    31c Herbs, shrublets or undershrubs, with stellate hairs
  32a Inflorescences leaf-opposed; herbaceous or woody plants, often climbing with tendrils; leaves simple (often lobed or divided) or digitate; ovules 2 in each locule; fruit a berry
  32b Inflorescences axillary; trees or shrubs, often spiny, without tendrils; leaves simple, undivided; ovules 1 in each locule; fruit drupaceous

28b Stamens, at least those of inner whorl, alternating with petals, as many as or more numerous or fewer than petals:
  33a Leaves compound, with 2 or more leaflets:
    34a Inflorescences bearing tendrils; climbing shrubs or herbs; leaves pinnate or 2-terned
    34b Inflorescences without tendrils:
      35a Herbs; stamens mostly twice as many as petals, sometimes as many as petals:
        36a Anthers 1-thecous; leaves digitate, 3–9-foliolate; stamens 10 or more, filaments united below
        36b Styles 5, rarely fewer; leaves alternate or radical, digitately or pinnately compound
      35b Trees or shrubs, sometimes climbing:
        37a Anthers 1-thecous; leaves digitate, 3–9-foliolate; stamens 10 or more, filaments united below
        37b Anthers 2-thecous; leaves pinnate or 2-pinnate or 2- or 3-foliolate:
  33b Leaves without stipules, or stipules modified into recurved spines:
    34a Inflorescences leaf-opposed; herbaceous or woody plants, often climbing with tendrils; leaves simple (often lobed or divided) or digitate; ovules 2 in each locule; fruit a berry
    34b Inflorescences axillary; trees or shrubs, often spiny, without tendrils; leaves simple, undivided; ovules 1 in each locule; fruit drupaceous

27a Ovules 2 per locule, pendulous from apex of ovary; stamens as many as and alternating with petals... ICACINACEAE
27b Ovules 2–5 per locule, pendulous from apex of a central placenta; stamens as many as and opposite petals, or up to twice as many, or reduced to 3 and accompanied by staminodes................................ OLACACEAE

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IDENTIFICATION OF FAMILIES

33b Leaves simple or 1-foliolate, sometimes deeply divided:

52a Perianth irregular; sepals 3 or 5, the median one extended into a hollow nectariferous spur or sac:

53a Leaves basifixed; petals 3; stamens 5, anthers united around ovary; fruit an explosively dehiscent capsule; herbs .... BALSAMINACEAE

53b Leaves peltate; petals 5; stamens 4 + 4; fruit dividing into 3 1-seeded fleshy mericarps .................................................. *TROPAEOLACEAE

52b Perianth regular or slightly irregular, not spurred:

54a Leaves opposite or whorled, not all radical:

55a Stamens more than twice as many as petals:

56a Leaves with stipules:

57a Trees or shrubs; stipules not interpetiolar; petals not fringed; stamens 15–45, filaments united below into 5 bundles .... RHIZOPHORACEAE

57b Leaves without stipules; sepals free; stamens and petals hypogynous; filaments irregularly arranged or ± united into bundles; styles 1–5 or absent; leaves usually dotted or streaked with pellucid or opaque glands; trees, shrubs or herbs ..... CLUSIACEAE

55b Stamens up to twice as many as petals:

58a Sepals united below into a tube:

59a Petals perigynous, arising at mouth of calyx tube; ovary with many ovules in each locule:

60a Anthers opening by apical pores; connective often appended below anther; leaves with 3 or more parallel longitudinal nerves; herbs or shrubs .......................................................... MELASTOMATACEAE

60b Anthers opening by longitudinal slits; connective unappendaged; leaves without parallel longitudinal nerves; herbs, shrubs or trees ................................................................................. LYTHRACEAE

59b Petals hypogynous, not arising on calyx tube; ovary with 1–3 ovules per locule:

61a Succulent annuals .................................................................................................................................................. ZYGOPHYLLACEAE

61b Trees or shrubs:

62a Stamens twice as many as petals; leaves with interpetiolar stipules; petals fringed at apex; plants not spiny .............. .......................................................................................................................... RHIZOPHORACEAE

62b Stamens as many as petals; leaves without stipules; petals not fringed; plants spiny .................................................. SALVADORACEAE

58b Sepals free or almost so:

63a Ovary with 1 ovule in each fertile locule (sometimes 1 or 2 of the locules empty); stamens twice as many as petals; fruit winged; shrubs, often climbing ............................................................................................................ MALPIGHIACEAE

63b Ovary with 2 or more ovules in each locule:

64a Leaves lobed or deeply divided; ovary beaked; herbs or shrublets .......................................................................... GERANIACEAE

64b Leaves not lobed or divided; ovary without a stout central axis:

65a Styles 3–5:

66a Ovary with many ovules in each locule; sepals entire; leaves with stipules .............................................................. ELATINACEAE

66b Ovary with 2 ovules in each locule; sepals toothed or lobed at apex; leaves without stipules ............... LINACEAE

65b Style 1:

67a Herbs or subshrubs; leaves succulent or glaucous ......................................................................................... ZYGOPHYLLACEAE

67b Trees or shrubs, sometimes climbing:

68a Stamens 10, twice as many as petals .......................................................................................................................... CTENOLOPHONACEAE

68b Stamens as many as or fewer than petals:

69a Stamens as many as petals, alternating with petaloid staminodes; leaves dotted with pellucid glands ......

69b Stamens as many or fewer than petals, not alternating with staminodes; leaves without translucent glands .............................................................................................................................................. CELASTRACEAE

54b Leaves alternate or fascicled, sometimes all radical:

70a Ovary with 1 ovule in each fertile locule (sometimes 1 or 2 of the locules empty):

71a Flowers unisexual (often by abortion) or plants polygamous:

72a Ovary of (1)2–5(6) free carpels; fruit of separate follicles, each with 1 large seed .......................................................... BROWNLOWIOIDEAE (Christiana) — MALVACEAE

72b Ovary of fused carpels:

73a Ovary 2-locular with 1(2) pendulous ovules per locule; stigma large, ± sessile; fruit a 2-valved capsule, each valve prolonged by 2 foliaceous wings ............................................................................................................ BROWNLOWIOIDEAE (Bryonia) — MALVACEAE

73b Combination of characters not as above:

74a Leaves with or without stipules; stipules sometimes spiny, especially in succulent species; milky to reddish latex often present; inflorescences basically cymose, sometimes flowers in cyathia (Euphorbia); fruit often a 3-lobed capsule dehiscing septicidally into 3 bivalved cocci, often leaving a ± persistent axis; ovules typically with an obturator; seeds mostly with a micropylar caruncle ................................................................................. EUPHORBIACEAE

74b Leaves without stipules, or stipules small, or one stipule of a pair often placed much higher than the other, never spiny; plants not succulent; latex absent; flowers in racemes, narrow panicles or fascicles; fruit a drupe or capsule, sometimes bladdery or winged; ovules without an obturator; seeds without a caruncle but sometimes with an arillode:
75a Stamens 5–24, often 8; disc usually well-developed; fruit a drupe or capsule, sometimes bladdery or winged; seeds often with an arillode; ovules anatropous, hemitropous or campylotropous ................................................. SAPINDACEAE
75b Stamens 5, or 10 in 2 whorls of 5, alternately longer and shorter; disc usually small or absent; fruit drupaceous, eventually dehiscing by valves; seeds without an arillode; ovules orthotropous or anatropous .................. PANDANACEAE

71b Flowers bisexual:
76a Stamens more numerous than petals: ......................................................... MALVACEAE
76b Stamens as many as or fewer than petals:
77a Anthers 2-thecous; leaves with stipules: .......................................................... CHRYSOBALANACEAE
77b Anthers 1-thecous:
78a Trees, shrubs or perennial scramblers; fruit of 2 hemispherical mericarps, often with a rough surface ........ MOLLUGINACEAE
78b Trees, shrubs or rhizomatous subshrubs; leaves without stipules, or stipules minute and early caducous: ................................................. MALPIGHIACEAE
79a Petals imbricate; leaves lobed or divided; ovary and fruit beaked; herbs or shrublets .................................................. BURSERACEAE
79b Petals and stamens hypogynous; ovary free from calyx:
80a Carpels ± united into a tube: ........................................................................ OCHNACEAE
80b Carpels fused into a 5-locular ovary:
81a Petals and stamens perigynous, arising at mouth of calyx tube; ovary fused on one side to calyx tube ..............
82a Carpels ± united into a tube: ........................................................................ MALVACEAE
82b Carpels fused into a 5-locular ovary:
83a Leaves penninerved, mostly glabrous ........................................................................ BROWNLOWIOIDEAE—MALVACEAE
83b Leaves palmatinerved, with dense stellate hairs .................................................. MALPIGHIACEAE
84a Stipules minute; anthers with disjunct thecae containing only 1 pollen sac and attached to lower portion of a thick fleshy, ovate-acuminate connective, dehiscing by detachment ............................................. HUMIRIACEAE
84b Stipules large, very long, folded around the terminal bud and leaving a distinct scar around stem; anthers 2-thecous, opening by longitudinal slits ................................................................. IRVINGIACEAE
85a Stamens as many as or fewer than petals:
86a Ovules many in each locule; flowers in axillary pedunculate umbels; trees or shrubs ............................................ BREXIACEAE
86b Ovules 2 in each locule:
87a Carpels ± united into a tube: ........................................................................ RUTACEAE
87b Carpels free or united only at base: ................................................................ LINACEAE
88a Leaves palmatinerved, with dense stellate hairs .................................................................................... LINACEAE
88b Leaves penninerved, mostly glabrous: ...................................................................................... BROWNLOWIOIDEAE—MALVACEAE
89a Petals not 2-lobed; styles 5: ........................................................................ SCYTOPETALACEAE
89b Petals 2-lobed or 2-fid; fruit a drupe; leaves entire ................................................................................. EUPHORBIACEAE
90a Petals 2-fid; fruit a drupe; leaves entire ................................................................................. EUPHORBIACEAE
90b Petals not 2-lobed:
91a Flowers bisexual; style 1 ................................................................................. THEACEAE
91b Flowers unisexual; styles 2 or 3, free or united at base, often lobed or branched ........................................ THEACEAE
92a Leaves without stipules, or stipules minute and early caducous:
93a Filaments ± united into a tube: ........................................................................ SCYTOPETALACEAE
93b Filaments free or united only at base:
94a Leaves dotted with translucent glands .............................................................................. RUTACEAE
94b Leaves without translucent glands:
95a Herbs with tubers or a woody rootstock ................................................................................. ERYTHROXYLACEAE
95b Trees, shrubs, or climbers:
96a Petals 12–16, valvate in bud, opening irregularly in 6 or 7 lobes free or joined at base; stamens ± 50 .......... ................................................................................................. ERYTHROXYLACEAE
96b Petals 4 or 5(6); stamens fewer than 20, or if more, then aggregated into fascicles or clusters:
97a Trees or shrubs, secreting resin; bark often peeling or flaking; stamens 8(4), arising on a disc; ovary 2-locular with 2 ovules per locule ................................................................................. BURSERACEAE
97b Trees, shrubs or woody climbers without resin and without peeling bark; stamens 9–many:
98a Stamens 9–13, borne at apex of a stout gynophore; ovary 4- or 5-locular with many axile ovules; style 1, 4- or 5-fid at apex .............................................................. PENTADIPLANDRACEAE
98b Stamens many, aggregated into fascicles or clusters, free or adnate to corolla base; styles 5 or 6, free with papillose stigmas ................................................................................. THEACEAE
99b Ovary with 2 or more ovules in each locule:
85a Stamens as many as or fewer than petals:
86a Ovules many in each locule; flowers in axillary pedunculate umbels; trees or shrubs ............................................ BREXIACEAE
86b Ovules 2 in each locule:
87a Carpels ± united into a tube: ........................................................................ RUTACEAE
87b Carpels free or united only at base: ................................................................ LINACEAE
88a Leaves palmatinerved, with dense stellate hairs .................................................................................... LINACEAE
88b Leaves penninerved, mostly glabrous: ...................................................................................... BROWNLOWIOIDEAE—MALVACEAE
89a Petals not 2-lobed; styles 5: ........................................................................ SCYTOPETALACEAE
89b Petals 2-fid; fruit a drupe; leaves entire ................................................................................. EUPHORBIACEAE
9a Sepals imbricate; plants without stellate hairs; ovary 5-locular with 2 ovules in each locule:
  10a Petals imbricate; ovary beaked, with a 5-branched style; herbs or shrublets ......................... GERANIACEAE
  10b Petals contorted; ovary without a stout central axis, with 5 free styles; trees or shrubs, sometimes climbing ........
  ......................................................................................................................................................... LINACEAE
9b Sepals (or calyx lobes) valvate; plants often with stellate hairs:
  10a Filaments free or almost so; trees, shrubs or herbs ......................... GREVIODOIDEAE, HELICEROPTERIDEAE—MALVACEAE
  10b Filaments ± united into a tube or into groups of 2 or 3:
    102a Anthers 2-theceous; trees or shrubs ................................................................. DOMBEYOIDEAE—MALVACEAE
    102b Anthers 1-theceous; herbs, shrubs or sometimes trees ................................. MALVACEAE

GROUP 9 (Placentation axile, basal or apical; ovary superior; petals ± united)
1a Ovary 1-locular, sometimes sepalate towards base:
  2a Flowers unisexual; plants dioecious; male flowers with 1–4 free petals; stamens united into a synandrium;
     leaf blades peltate or subpeltate; woody climbers ................................................................. MENISPERMACEAE
  2b Flowers bisexual; stamens free or with united filaments:
    3a Ovary with 1 ovule:
      4a Flowers irregular, papilionaceous, lowermost 2 petals united and forming a keel; stamens 10, diadelphous: uppermost 1 free, other 9 with
         ± united filaments; herbs ........................................................................................................ FABACEAE
      4b Flowers regular; stamens not diadelphous:
        5a Sepals 2; petals united only near base; ± succulent twining herbs or stout shrubs:
          6a Leaves alternate; perennials with twining stems ......................................................... BASELLACEAE
          6b Leaves opposite; succulent shrubs with stout, sometimes waxy branches ........................................ PORTULACACEAE
        5b Sepals more than 2:
          7a Stamens arising on elongated calyx tube, usually twice as many as calyx lobes; corolla ring-like, arising at mouth of calyx tube; ovule
             pendulous from apex of ovary; shrubs, sometimes climbing ............................................... THYMELAEACEAE
          7b Stamens not arising on calyx, as many as calyx lobes; corolla 4- or 5-lobed, not ring-like; ovule arising from base of ovary:
            8a Leaves alternate; stamens opposite petals; calyx covered with stalked glands; herbs or shrubs, sometimes climbing . PLUMBAGINACEAE
            8b Leaves opposite; stamens alternating with petals; calyx without stalked glands; shrubs or trees ................ SALVADORACEAE
        3b Ovary with 2 or more ovules:
          9a Stamens fewer than petals; flowers ± irregular; herbs, often aquatic:
            10a Stamens 2; corolla strongly irregular, tube spurred; leaves undivided or much divided and often bearing insectivorous bladders ....
              ............................................................................................................................................... LENTIBULARIACEAE
            10b Stamens 4; corolla only slightly irregular, tube not spurred; leaves undivided, without bladders .................. SCROPHULARIACEAE
          9b Stamens as many as petals; flowers regular or almost so:
            11a Stamens opposite petals:
              12a Trees, shrubs or lianas; fruit indeshicent, usually 1-seeded; leaves alternate ...................................... MYRSINACEAE
              12b Herbs; fruit a many-seeded circumscissile or 5-valved capsule, or sometimes 1-seeded and indehiscent; leaves opposite or
                 alternate ................................................................................................................................. PRIMULACEAE
            11b Stamens alternating with petals; trees or shrubs:
              13a Leaves opposite:
                14a Shrubs or woody climbers with milky sap ........................................................................ APOCYNACEAE
                14b Trees or shrubs, sometimes mangroves, sometimes leaves with 5(7) major veins from near the base:
                  15a Leaves with 1 major vein from the base; mangroves ........................................................ AVICENNIAE
                  15b Leaves with 5(7) major veins from near the base; savanna trees ........................................ STRYCHNACEAE
                13b Leaves alternate; stamens 5 or 10 or more; ovules 2 or 10 or more:
                  16a Trees, shrubs or lianas; sepals (3)4 or 5; stamens 5; fruit a drupe ................................................................ IACINACEAE
                  16b Subshrubs or perennial herbs, often with fleshy leaves; sepals 2; stamens 10 or more; fruit a chartaceous capsule ........
                    ................................................................................................................................. PORTULACACEAE
            1b Ovary 2- or more-locular:
              17a Petals 10 or more:
                18a Styles/stigmas 5; fruit a 5-valved capsule; herbs with fleshy leaves ........................................ MESEMBRYANTHEMACEAE
                18b Style 1; fruit aberry; trees or shrubs, sometimes climbing:
                  19a Stamens ± 50; petals (probably petaloid corona lobes) opening irregularly ........................... SCYTOPETALACEAE
                  19b Stamens mostly fewer than 20; petals opening regularly in 1–3 whors:
                    20a Petals in 2 or 3 whors, imbricate; stamens twice as many as inner petals, or as many as and opposite inner petals and alternating with
                       staminodes; ovary with 1 ovule in each locule; leaves alternate ................................................................ SAPOTACEAE
                    20b Petals in 1 whorl, imbricate; stamens 2; ovary with 4 or 5 ovules in each locule ................................. OLEACEAE
              17b Petals fewer than 10:
                21a Stamens more numerous than petals:
                  22a Leaves with stipules, often digitate or palmately lobed; flowers unisexual; trees, shrubs or herbs ..................... EUPHORBIACEAE
                  22b Leaves without stipules, or stipules minute and early caducous:
23a Flowers irregular, lowest (median) petal forming a keel; filaments united into a sheath split on upper side; ovary 2-locular with 1 ovule in each locule; herbs or shrubs ........................................... POLYGALACEAE

23b Flowers regular; filaments not united into a sheath but sometimes united at base; trees or shrubs:

24a Ovary with 1 or 2 ovules in each locule; fruit indehiscent, baccate; flowers bisexual or unisexual ...................... EBENACEAE

24b Ovary with several or many ovules in each locule; fruit a loculicidal capsule or a drupe:

25a Stamens 10 or fewer; plants often heath-like ................................................................. ERICACEAE

25b Stamens ± 50; glabrous trees .............................................................................. SCYTOPETALACEAE

21b Stamens as many as or fewer than petals:

26a Stamens fewer than petals: 2–4:

27a Ovary with more than 4 ovules in each stamen; flowers mostly irregular:

28a Leaves pinnate, opposite or ternate; stamens 4; fruit a loculicidal capsule with winged seeds; trees or shrubs, sometimes climbing .............................................................. BIGNONIACEAE

28b Leaves simple, sometimes deeply divided or reduced to scales:

29a Ovary completely or incompletely 4-chambered, each of 2 original locules becoming divided into 2 by a false septum; stamens 4; herbs or sometimes shrubs with mucilaginous glands ................................................. PEDALIACEAE

29b Ovary 2-locular, locules not becoming divided by false sepal:

30a Ovules arranged in more than 2 series on each placenta; stamens 4 or 2; fruit a capsule or sometimes a berry, seeds not borne on hardened hook-like funicules; leaves alternate or opposite or whorled, sometimes reduced to scales; herbs or shrubs or sometimes trees .............................................. SCROPHULARIACEAE

30b Ovules arranged in 1 or 2 series on each placenta:

31a Fruit a club-shaped to ellipsoid, loculicidally, often explosively dehiscent capsule, with seeds mostly borne on hard, hygroscopic, hook-like funicules; leaves opposite, mostly entire; herbs, shrubs or small trees ........ ACANTHACEAE

31b Fruit indehiscent or tardily dehiscent, armed with horns bearing recurved spines; flowers irregular, medium-sized, variously coloured, adaxially often gibbous, usually solitary, axillary; herbs, rarely shrubs or small trees .................... PEDALIACEAE

27b Ovary with 1–4 ovules in each stamen:

32a Stamens 3; peduncles adnate to petioles of subtending leaves; trees or shrubs with alternate leaves ........ DICHAPETALACEAE

32b Stamens 4 or 2; peduncles not adnate to leaves:

33a Perianth regular; stamens 2; leaves opposite or sometimes ternate or alternate; trees or shrubs, sometimes climbing ... OLEACEAE

33b Perianth irregular:

34a Ovary ± deeply 4-lobed, style gynobasic; fruit separating into 4 nutlets (or fewer by abortion); leaves simple, opposite or whorled or sometimes alternate; herbs or shrubs, often aromatic ........................................ LAMIACEAE

34b Ovary not deeply 4-lobed, style not gynobasic:

35a Fruit a capsule, loculicidally dehiscent or sometimes failing to dehisce; seeds often borne on hardened, hook-like funicules; ovary 2-locular with 2–4 ovules in each locule; herbs or shrubs with opposite, simple leaves .. ACANTHACEAE

35b Fruit separating into 2 or more pyrenes or cocci, or a capsule, but then seeds not borne on hardened hook-like funicules:

36a Flowers solitary, axillary; fruit indehiscent, armed with 2 or 4 spines, or longitudinally 4-winged; stamens 4; leaves opposite or subopposite, often toothed or pinnately lobed; herbs with mucilaginous glands ........ PEDALIACEAE

36b Flowers grouped in inflorescences; fruit without spines or wings:

37a Anthers 1-thecous; leaves mostly alternate, simple, narrow; ovary 2-locular with 1 apical, pendulous ovule in each locule; herbs or shrubs ........................................................... SCROPHULARIACEAE

37b Anthers 2-thecous; sometimes confluent; ovary 2–4(8)-locular with 1 basal or axile ovule in each locule; leaves opposite or whorled, simple, sometimes lobed or dissected .................................. VERBENACEAE

26b Stamens as many as petals: 4 or more:

38a Leaves absent or reduced to scales:

39a Slender, twining, parasitic plants; ovary with 2 ovules in each locule; fruit a capsule; corolla with or without infrastaminal scales (Cuscuta) ................................................................. CONVOLVULACEAE

39b Shrubs or succulent plants, not parasitic; ovary with many ovules in each locule; fruit formed of 2 separate follicular carpels (or 1 by abortion); flowers with corona ................................................. APOCYNACEAE

38b Leaves present, well-developed:

40a Stamens opposite petals, sometimes with staminodes; trees or shrubs with alternate leaves:

41a Leaves simple, entire; corolla lobes imbricate; stamens sometimes alternating with staminodes ......................... SAPOTACEAE

41b Leaves 2-pinnate; corolla lobes valvate; stamens not accompanied by staminodes, filaments united into a tube .... LEEACEAE

40b Stamens alternating with petals, sometimes partly connate:

42a Leaves opposite or whorled, sometimes in opposite or subopposite fascicles on small cushions, not all radical:

43a Stamens hypogynous, not arising on corolla; anthers opening by apical slits; heath-like shrubs ......................... ERICACEAE

43b Stamens arising on corolla tube or variously joined with gynoecium:

44a Petals imbricate in bud:

45a Ovary with 1 or 2 ovules in each locule; fruit drupaceous, or separating into pyrenes or nutlets, or a loculicidal capsule:

46a Petals and stamens 4; herbs, shrubs or trees .......................................................... VERBENACEAE

46b Petals and stamens 5:
47a Herbs, often with bulbous-based hairs; fruit drupaceous or separating into pyrenes or nutlets; flowers all similar .........................................................................................................................BORAGINACEAE
47b Shrubs, undershrubs or lianes, glabrous or with simple hairs; fruit a loculicidal capsule; flowers dimorphic ...
..................................................................................................................................GELESIACEAE

48b Ovary with several to many ovules in each locule; fruit a septicidal capsule, sometimes a berry:
48a Petals and stamens 5 or more; leaves pinnately compound, or simple and then rigid spiny shrubs with solitary
or paired flowers ..............................................................................................................BIGNONIACEAE

49a Herbs; flowers solitary or paired in leaf axils ..........................................................SCROPHULARIACEAE
49b Trees, shrubs or undershrubs; flowers in cymes, racemes or panicles ......................BUDDLEJACEAE

44b Petals contorted or valvate:
50a Petals valvate; leaves usually with 3 major veins from base; fruit a berry, often large, globose and with a woody
rind ........................................................................................................................................STRYCHNACEAE
50b Petals contorted:
51a Herbs with septicidal capsules or rarely trees with berries ........................................GENTIANACEAE
51b Herbs, often succulent, shrubs or trees, often with milky latex; flowers often with corona; fruit mostly a pair of
follicular mericarps ..............................................................................................................APOCYNACEAE

52a Leaves all radical; flowers small, in pedunculate spikes or heads; fruit a circumscissile capsule; herbs .....PLANTAGINACEAE
52b Leaves not all radical:

53a Ovary with more than 2 ovules in each locule:
54a Petals contorted; fruit formed of 2 follicular mericarps; shrubs or trees .................................APOCYNACEAE
54b Petals not contorted; fruit a capsule or berry:
55a Styles 2 or 3; petals imbricate; fruit a capsule; herbs ..................................................HYDROPHYLACEAE
55b Style 1:
56a Petals plicate or valvate; herbs, shrubs or trees ..............................................................Solanaceae
56b Petals imbricate:
57a Fruit a capsule with winged seeds; leaves simple or 3-foliolate; spiny shrubs .................BIGNONIACEAE
57b Fruit a berry or capsule, seeds unwinged; leaves simple; herbs or spiny shrubs ..............Solanaceae
53b Ovary with 1 or 2 ovules in each locule:
58a Filaments united into a sheath split on upper side; flowers irregular, lowest (median) corolla lobe forming a keel;
fruit drupaceous; shrubs or trees ....................................................................................POLYGALACEAE
58b Filaments not united into a sheath:
59a Corolla tube split down front, with 4 lobes; anthers 1-thece; ovary 2-locular with 1 apical, pendulous ovule
in each locule; herbs or shrublets with spicate flowers ..................................................SCROPHULARIACEAE
59b Corolla tube not split; anthers 2-thece:
60a Style absent; stigma sessile; flowers unisexual; fruit a globose berry .............................AQUIFOLIACEAE
60b Style(s) present, terminal or gynobasic; flowers bisexual; fruit a schizocarp or drupaceous or a capsule,
variably indehiscent: 61a Fruit a schizocarp of 4 (rarely 2) nutlets, or drupaceous with 4 (rarely 2) 1-seeded stones; petals imbricate
or contorted in bud ...........................................................................................................BORAGINACEAE
61b Fruit a capsule or indehiscent; petals convolute, folded and valvate in bud; plants often twining or
trailing .....................................................................................................................................CONVOLVULACEAE

GROUP 10 (Placentation axile, basal or apical; ovary inferior; petals absent)
1a Parasitic plants: either low, ± fleshy, ± leafless and growing on roots of woody plants, or shrublets growing on trees or shrubs:
2a Shrubslet growing on other trees or shrubs ........................................................................VISCACEAE
2b Low, ± fleshy, ± leafless root parasites:
3a Flowers unisexual, in many-flowered inflorescences; leaves scale-like; ovule 1 .............................................BALANOPHORACEAE
3b Flowers usually bisexual, solitary, with a tubular 3- or 4(5)-lobed perianth resembling a fungus ................................HYDNORACEAE
1b Plants not parasitic:
4a Ovary 2- or more-locular:
5a Flowers unisexual, in heads, cymes or panicles; leaves with stipules:
6a Flowers in heads; stamens as many as sepals; ovary with 1 ovule in each locule; trees or shrubs with entire leaves ....HAMAMELIDACEAE
6b Flowers in cymes or panicles; stamens many; ovary with many ovules in each locule; sepals petaloid; herbs, sometimes epiphytic,
with alternate, often unequal-sided leaves ................................................................................BEGONIACEAE
5b Flowers bisexual, often solitary, less often in fascicles or clusters, cymes or rarely in spikes; leaves without stipules:
7a Leaves opposite; flowers solitary and subsessile in axils of leaves; herbs ..................................................ONAGRACEAE
7b Leaves alternate:
8a Trees (mangroves); stamens and staminodes very many, the outer series of staminodes fused and resembling a corolla ....LEYCIDIDACEAE
8b Herbs or shrubs; stamens, if many, without fused staminodes:
9a Perianth fused into an S-shaped to ± straight tube; usually twining or scrambling herbs or shrubs; fruit a capsule .....................
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Seed plants of southern tropical Africa: families and genera

ARISTOLOCHIACEAE

AIZOACEAE

COMBRETACEAE

HALORAGACEAE

GUNNERACEAE

HAMAMELIDACEAE

HORNACEAE

LORANTHACEAE

MORACEAE

RHAMNACEAE

TRAPACEAE

IDENTIFICATION OF FAMILIES

GROUP I

PARASITIC

Ovule 1-locular:

1a Plants not parasitic; ovule or ovules clearly distinguishable within ovary:

2a Ovary 1-locular:

3a Leaves opposite; perianth tube deeply urn-shaped; anthers opening by 2 valves .................................................. LAURACEAE

3b Leaves mostly alternate:

4a Flowers bisexual, in axillary pairs; petals and stamens 5 ............................................................................................................. TRAPACEAE

4b Flowers unisexual, in axillary pairs; petals and stamens 4............................................................................................................. ARISTOLOCHIACEAE

5b Leaves with 1 main vein from base; fruit usually indehiscent, dry or sometimes fleshy, often variously winged or ridged; ovules usually 2, pendulous ......................................................................................................................... COMBRETACEAE

6a Ovules 1 in each locule:

7b Ovules 1–4, pendulous from apex of ovary; styles 4; flowers clustered in axils of leaves, unisexual or plants polygamous; herbs, not parasitic ............................................................ HORNACEAE

7a Ovules many on pendulous placentas; fruit a capsule dehiscing at apex; leaves opposite; flowers bisexual, in axillary pairs; petals and stamens 5 ............................................................................................................. VAHLIACEAE

8b Leaves large, on long petioles; flowers in terminal heads or compound spikes ...................................................................... GUNNERACEAE

9a Ovule 1 in each locule:

10a Stamens twice as many as calyx lobes; trees, shrubs or scramblers; flowers in racemes, spikes or heads; fruit indehiscent, often with 2–5 longitudinal wings ............................................................................................................. COMBRETACEAE

10b Stamens as many as calyx lobes:

11a Ovules 2 or more in the ovary:

11b Ovules 1 in the ovary:

12b Ovules 4, pendulous from apex of ovary; styles 4; flowers clustered in axils of leaves, unisexual or plants polygamous; herbs, not parasitic ................................................................................................. HALORAGACEAE

12a Ovules 2–4, pendulous from a free-central placenta; style 1 with an entire or divided stigma; flowers solitary or in cymes or racemes, bisexual or un bisexual; herbs or shrubs, often parasitic on roots and sometimes with reduced leaves .................................................................................. SANTALACEAE

11a Stamens twice as many as petals:

13b Ovules 1 in the ovary:

13a Leaves large, long-petiolate, toothed, kidney-shaped leaves; flowers small, paniculate-spicate .................. GUNNERACEAE

14a Ovules opposite; perianth tube deeply urn-shaped; anthers opening by 2 valves .................................................. LAURACEAE

14b Ovules 1 in each locule:

15a Flowers bisexual, in axillary pairs; petals and stamens 5 ............................................................................................................. TRAPACEAE

15b Flowers bisexual or unisexual, cymose in axes of upper leaves; latex absent; fruit a bony nut with long wings .... HORNACEAE

GROUP II

PARASITIC

1a Parasitic shrubs growing on other shrubs or trees; ovules scarcely distinguishable from surrounding tissue of ovary; calyx truncate or obsolete; stamens as many as and opposite petals and arising on them; leaves simple, entire, opposite or alternate, sometimes reduced to scales .................. LORANTHACEAE

1b Plants not parasitic; ovule or ovules clearly distinguishable within ovary:

2a Ovary 1-locular:

3a Leaves opposite; perianth tube deeply urn-shaped; anthers opening by 2 valves .................................................. LAURACEAE

3b Leaves mostly alternate:

4a Flowers bisexual, in axillary pairs; petals and stamens 5 ............................................................................................................. TRAPACEAE

4b Flowers unisexual, in axillary pairs; petals and stamens 4............................................................................................................. ARISTOLOCHIACEAE

5a Leaves with 1 main vein from base; fruit usually indehiscent, dry or sometimes fleshy, often variously winged or ridged; ovules usually 2, pendulous ......................................................................................................................... COMBRETACEAE

6a Ovules many on basal placenta; sepals 2, often deciduous; fruit a circumscissile capsule ................................................... PORTULACACEAE

6b Ovules pendulous from apex of ovary or on pendulous, apical placenta; sepals or calyx lobes 2–5; fruit not circumscissile:

7a Ovules 1–4, pendulous from apex of ovary; fruit indehiscent; leaves alternate or opposite, sometimes all radical; flowers bisexual or unisexual, paniculate-spicate or in axillary clusters:

8a Leaves small, sessile; flowers in axillary fascicles ................................................................................................................... VAHLIACEAE

8b Leaves large, on long petioles; flowers in terminal heads or compound spikes ...................................................................... GUNNERACEAE

9a Ovule 1 in each locule:

10a Stamens twice as many as petals:

11a Trees, shrubs or scramblers; petals 5 .......................................................................................................................... ANISOPHYLLEACEAE

11b Herbs; petals 2–4; stamens 4–8; ovary 1–4-locular:

12a Flowers small to minute, usually unisexual; aquatics or marsh plants ............................................................................. VAHLIACEAE

12b Flowers conspicuous with 4 usually sharply clawed petals ................................................................................................. HORNACEAE

10b Stamens as many as petals:

13a Stamens opposite petals; shrubs, often climbing with tendrils; fruit often separating into cocci, sometimes winged ... RHAMNACEAE

13b Stamens alternating with petals; plants without tendrils:

14a Flowers solitary in axils of leaves; floating aquatic herbs; leaves alternate, rosulate, with ± inflated petiole; fruit large, indehiscent, with hard endocarp and armed with 2 or 4 horns ............................................................................................................. TRAPACEAE

14b Flowers grouped in infl orescences; plants not aquatic:

15a Fruit separating into 2 cocci; herbs, sometimes arborescent; flowers in simple or compound umbels, sometimes capitulate; leaves often much divided or compound ............................................................................................................. APIACEAE

15b Fruit drupaceous or capsular, not separating into cocci; trees or shrubs:

16a Leaves pinnate or digitate or palmately divided; flowers in umbels or racemes or spikes; fruit drupaceous ... ARALIACEAE

16b Leaves simple, undivided:

17a Petals and stamens 4; fruit a drupe; leaves opposite, entire or toothed; flowers bisexual or unisexual, in panicles or umbel-like cymes .................................................................................................................. CORNACEAE

17b Petals and stamens 5; fruit a capsule; trees or shrubs ................................................................................................. HAMAMELIDACEAE
9b Ovules 2 or more in each locule:
   18a Leaves alternate:
      19a Leaves with stipules, often unequal-sided; flowers unisexual; plants monococious; stamens many; ovules very many in each locule; herbs, sometimes epiphytic ................................................................. BEGONIACEAE
   19b Leaves without stipules:
      20a Style absent; stigmas as many as locules, subulate to filiform; leaves ± succulent ......................... MESEMBRYANTHEMACEAE
      20b Styles 1 or 2:
         21a Styles 2; flowers unisexual or both bisexual and unisexual on same plant, in axillary panicles; stamens as many as petals; ovary 2-locular; shrubs ................................................................. ESCALONIACEAE
         21b Style 1, with an entire or lobed stigma; flowers bisexual or sometimes both bisexual and unisexual on same plant:
            22a Fruit a drupe; petals 2-fid or 2-lobed; leaves entire ............................................................... DICAPETALACEAE
            22b Fruit a capsule:
               23a Stamens as many or twice as many as petals:
                  24a Herbs or shrubs, sometimes aquatic; flowers bisexual ........................................................................ ONAGRACEAE
                  24b Shrubs or shrublets, dioecious; flowers small, male corymbose, female solitary ....................... MONTINIAE
               23b Stamens many, more than twice as many as petals; fruit a berry or drupe:
                  25a Flowers solitary or paired in axils of leaves; ovary 2-locular; leaves gland-dotted; shrublets ............... MYRTACEAE
                  25b Flowers in terminal racemes; ovary 4-locular; leaves not gland-dotted; mangroves ....................... LECYTHIDACEAE
   18b Leaves opposite:
      26a Leaves fleshy and succulent ............................................................................................... MESEMBRYANTHEMACEAE
      26b Leaves not succulent:
         27a Stamens as many as petals; petals alternating with incurved scales; trees or shrubs .................................. OLINIACEAE
         27b Stamens twice as many as petals or more numerous; petals not alternating with scales:
            28a Stamens many, more than twice as many as petals; trees or shrubs with gland-dotted leaves; stipules absent or very small ....
               ................................................................. MYRTACEAE
            28b Stamens twice as many as petals, if more, then interpretiolar stipules present or a scar line if they have fallen:
               29a Leaves with interpretiolar stipules; ovules 2 in each locule; viviparous mangroves, or forest trees or shrubs ................................................................. RHIZOPHORACEAE
               29b Leaves without stipules or stipules much reduced; ovules many in each locule; plants not viviparous:
                  30a Anthers opening by an apical pore; connective often appressed below anther; leaves with 3 or more parallel, longitudinal nerves; seeds without tuft of hairs; herbs or shrubs or small trees ........................................... MELASTOMATAE
                  30b Anthers opening by longitudinal slits; connective unappressed; leaves without parallel, longitudinal nerves; seeds often with an apical tuft of hairs; herbs ................................................................. ONAGRACEAE

GROUP 12 (Placentation axile; basal or apical; ovary inferior; petals ± united)

1a Parasitic shrubs growing on other shrubs or trees; ovules scarcely distinguishable from surrounding tissue of ovary; calyx truncate or shortly lobed; stamens as many as and opposite corolla lobes and arising on them; leaves simple, entire, opposite or alternate, sometimes ternate .......... LORANTHACEAE

1b Plants not parasitic; ovule or ovules clearly distinguishable within ovary:

2a Ovary 1-locular:
   3a Ovule 1; flowers regular or irregular, in involucrate heads; fruit indehiscent, often crowned by persistent calyx forming a pappus of bristles or scales:
      4a Anthers united into tube surrounding style; ovule erect from base of ovary; herbs, shrubs or trees; corolla of outer (ray) flowers often differing from that of inner flowers ........................................................................ ASTERACEAE
      4b Anthers free; ovule pendulous from apex of ovary; herbs with opposite leaves ................................................. DIPSACACEAE
   3b Ovules many; flowers regular, not in involucrate heads:
      5a Calyx composed of 2 often deciduous sepals; fruit a circumscissile capsule; stamens as many as and alternating with corolla lobes or more numerous; herbs ................................................................. PORTULACACEAE
      5b Calyx 4- or 5-lobed; fruit not circumscissile; stamens as many as and opposite corolla lobes:
         6a Trees or shrubs; flowers in axillary panicules or racemes; fruit indehiscent, dry or fleshy .......................................... MAESACEAE
         6b Herbs; flowers in terminal racemes; fruit a 5-valved capsule ............................................................... PRIMULACEAE
   2b Ovary 2- or more-locular (sometimes 3-locular with 1 fertile locule and 2 empty locules):
      7a Petals united into a deciduous mass (calyptra); stamens very many; trees or shrubs with gland-dotted leaves ......................................................... MYRTACEAE
      7b Petals more or less united into a tube, not into a deciduous mass; stamens not more than twice as many as corolla lobes:
         8a Ovary 3-locular with 2 empty locules, fertile locule with 1 apical, pendulous ovule; stamens 3; fruit indehiscent, often crowned by persistent calyx forming feathery pappus; herbs with opposite leaves ........................................................................ VALERIANACEAE
         8b Ovary 2- or more-locular, usually without empty locules:
            9a Trailing or climbing herbs or shrubs often with tendrils; flowers unisexual; stamens 3–5, anthers sometimes curved or flexuous or folded; leaves often palmately or pedately lobed or deeply divided ......................................................... CUCURBITACEAE
            9b Plants without tendrils; flowers bisexual or sometimes unisexual:
               10a Leaves opposite or whorled, with interpretiolar or intrapetiolar (sometimes leaf-like) stipules and entire margin; trees, shrubs or herbs, sometimes climbing ............................................................... RUBIACEAE
               10b Leaves alternate or opposite, or spirally imbricate, without stipules, sometimes reduced to scales:
11a Stamens indefinite; leaves fleshy .......................................................... MESEMBRYANTHEMACEAE
11b Stamens definite; leaves rarely succulent:
   12a Stamens twice as many as corolla lobes; anthers opening by apical pores; flowers in axillary racemes; trees or shrubs with alternate leaves .......................................................... ERICACEAE
   12b Stamens as many as corolla lobes; anthers opening by longitudinal slits:
      13a Fruit a drupe:
         14a Ovary with 1 ovule in each locule; flowers irregular, corolla tube split down back; maritime shrubs or undershrubs ... .................................................................................................................. GOODENIACEAE
         14b Ovary with 2 or more ovules in each locule; flowers ± regular; petals bifid or bilobed .......... DICHAPELALACEAE
      13b Fruit a capsule:
         15a Corolla lobes imbricate; capsule circumscissile; flowers regular, in terminal spikes; anthers free; hydrophytes ............ ........................................................................................................................ SPHENOCLEACEAE
         15b Corolla lobes valvate; capsule dehiscing by valves; flowers regular or irregular with 1- or 2-lipped corolla; anthers free or cohering in a tube around the style ........................................................................... CAMPANULACEAE

KEY TO MONOCOTYLEDONS (pp. 375–458)

1a Flowers white or otherwise brightly coloured; perianth wholly or partly petal-like:
   2a Ovary superior ................................................................................................................. Group 1 (below)
   2b Ovary inferior or half-inferior .......................................................................................... Group 2 (p. 24)
1b Flowers with perianth absent or papery, glumaceous to hyaline or sometimes herbaceous, or reduced to hairs or scales:
   3a Aquatic herbs, free-floating or submerged ................................................................ Group 3 (p. 24)
   3b Land plants, sometimes rooting in water:
      4a Flowers (florets) arranged in small spikes (spikelets) subtended or enclosed by bracts; grasses or grass-like plants ............... Group 4 (p. 25)
      4b Flowers not arranged in spikelets ................................................................................ Group 5 (p. 25)

GROUP 1 (Flowers white or otherwise brightly coloured; perianth wholly or partly petal-like; ovary superior)

1a Aquatic or marsh herbs:
   2a Perianth of 6 petal-like tepals in 2 whorls, blue, white or yellow; gynoeicum with an ovary of 3 fused carpels ................. PONTEDERIACEAE
   2b Perianth of 3 coloured sepals or tepals, often accompanied by 3 herbaceous sepals; gynoeicum composed of either 2-many ± free carpels or of 3 fused carpels forming a 1-locular ovary:
      3a Flowers solitary on long axillary pedicels; gynoeicum of 3 fused carpels ............................................................ MAYACACEAE
      3b Flowers whorled or in simple or 2-branched spikes or in simple to compound umbels; gynoeicum of 2-many ± free carpels:
         4a Flowers in a simple or 2-branched spike; perianth in a single whorl of 1–3 white to pink tepals .................................. APONOGETONACEAE
         4b Flowers whorled or in simple or compound umbels; plants often with white sap:
            5a Carpels each with 1 basal ovule; fruit of 3–many achenes ................................................................................ ALISMACTACEAE
            5b Carpels each with many ovules on a parietal/marginal placenta; fruit a head of follicles ........................................ LIMNOCHARITACEAE
   1b Land plants, sometimes rooting in water:
      6a Perianth composed of separate calyx and corolla, the calyx usually herbaceous:
         7a Style simple; ovary 2- or 3-locular; flowers in open to congested cymes, with conspicuous corolla often blue or yellow, often subtended by folded or boat-shaped bracts ............................................................................... COMMELINACEAE
         7b Style branched; ovary 1–3-locular; flowers small, crowded in bracteate heads or spikes on long, leafless peduncles:
            8a Flowers unisexual; corolla inconspicuous to minute; ovary 3- or 2-locular .......................................................... ERIOCAULACEAE
            8b Flowers bisexual; petals mostly yellow to white; ovary 1-locular ........................................................................ XYRIDACEAE
      6b Perianth composed of similar or subsimilar tepals, all petal-like:
         9a Anthers dehiscing by an apical pore, often unequal; filaments short, without a swelling below the anther, arising at mouth of perianth tube; rootstock a corn ............................................................. TECOPHILAEACEAE
         9b Anthers dehiscing by longitudinal slits (these rarely very short but then plants rhizomatous and filaments with a swelling below the anther); rootstock a rhizome, bulb or tuber:
            10a Fruit a fleshy berry or drupe:
               11a Leaves with 2 basal tendrils; flowers unisexual; plants dioecious ........................................................................... SMILACACEAE
               11b Leaves without basal tendrils; flowers bisexual:
                  12a Leaf tips narrowing into a coiled tendril ............................................................................. FLAGELLARIACEAE
                  12b Leaf tips not as above:
                     13a Flowers longer than 20 mm, tubular below, with exerted stamens, crowded in dense racemes or panicles; leaves large, tough and crowded; plants rhizomatous or tree-like .................................................. DRACAENACEAE
                     13b Flowers up to 10 mm long, in axillary or terminal racemes, panicles or cymes; plants herbaceous, shrubby or scandent:
                        14a Leaves reduced to scales with a spiny or soft spur; cladodes needle-shaped or leaf-like and without distinct cross-connections between parallel veins ................................................................. ASPARAGACEAE (in narrow sense)
                        14b Leaves developed, with many prominent parallel veins, often with distinct cross-connections:
                           15a Tepals fused into a short broad tube; scandent climbers or subshrubs; leaves not sheathing at base, not equitant ............

Seed plants of southern tropical Africa: families and genera 23
### IDENTIFICATION OF FAMILIES

<table>
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<tr>
<th>GROUP 1</th>
<th>GROUP 2 (Flowers white or otherwise brightly coloured; perianth wholly or partly petal-like; ovary inferior or half-inferior)</th>
<th>GROUP 3 (Aquatic herbs, free-floating or submerged (flowers sometimes emergent); perianth absent or capular or scale-like to well-developed)</th>
</tr>
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<tbody>
<tr>
<td>10b Fruit a capsule:</td>
<td></td>
<td>1a Plants floating freely on the surface, though sometimes attached to the substrate in very shallow water:</td>
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<tr>
<td>1a Terrestrial plants or emergent aquatics, but then rootstock cormous and stamens 6:</td>
<td></td>
<td><strong>1b Plants</strong></td>
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</table>
| 1b Flowers in spikes or racemes: | **Seed plants of southern tropical Africa: families and genera**

**KEY TO MONOCOTYLEDONS: GROUP 1**

10b Fruit a capsule:

16a Flowers in umbels subtended by 2 spathaceous bracts and borne on naked peduncles; plants usually smelling of onion or garlic; rootstock a bulb or rhizome .......................................................... ALLIACEAE

16b Flowers in spikes or racemes:

17a Rootstock a bulb; flowers borne on naked peduncles .................................................. HYACINTHACEAE

17b Rootstock a rhizome, corm or tuber:

18a Seeds woolly; flowering stems leafless except for a clasping basal leafy bract; leaves petiolar, often absent at flowering; rootstock a tuber ................................................................................................. (Convallariaceae in part) ERIOSPERMACEAE

18b Seeds glabrous; flowering stems leafy:

19a Rootstock a corm, rarely a tuber; seeds brown; flowers usually opposite the bracts .................. COLCHICACEAE

19b Rootstock a rhizome, sometimes short and with swollen roots; seeds black; flowers in axils of bracts:

20a Flowers borne singly in axils of bracts ................................................................................. ASPHODELACEAE

20b Flowers more than 1 in axils of bracts .................................................................................. (including Hemerocallidaceae in part) ANTHERICACEAE

**GROUP 2**

**1a Submerged aquatics rooting from a rhizome; flowers mostly unisexual, submerged or floating ................................ HYDROCHARITACEAE**

**2a Fertile stamens 5(6) or 1, but then supported by and not fused to the style; leaves pseudopetiolate with a broad base, midrib prominent and secondary veins pinnate-parallel:**

3a Fertile stamen 1:

4a Outer tepals/sepal free; anther 1-locular; ovary 1–3-locular with 1 ovule in each fertile locale ....................... MARANTACEAE

4b Outer tepals/sepal united into a tube; anther 2-locular; ovary 2- or 3-locular, usually with many ovules per locale:

5a Leaves distichous, usually with open sheaths; aerial parts aromatic ................................................. ZINGIBERACEAE

5b Leaves spirally arranged, with closed sheaths; aerial parts not aromatic ................................................... COSTACEAE

3b Fertile stamens 5(6):

6a Flowers unisexual, upper 5 tepals fused below; leaves spirally arranged; stems not woody, drying after fruiting, sometimes suckering; fruit a banana with seeds embedded in pith ................................................................................................................. MUSACEAE

6b Flowers bisexual, lateral inner tepals fused and enclosing style and stamens; leaves distichous; stems and rootstock perennial; seeds pea-like with a tuft of hairs ......................................................................................... STRELIITZIACEAE

2b Fertile stamens 3(4)6 or 1, but then fused to the style into a complex columnar structure; leaf venation never pinnate-parallel:

7a Stamen 1, united with style into a column (gynostemium); pollen agglutinated into masses (pollinia); upper or lower median tepal often elaborated and spurred ........................................................................................................... ORCHIDACEAE

7b Stamens 3(4)6; pollen not agglutinated into masses:

8a Flowers unisexual, in spikes or racemes; climbers with ± heart-shaped leaves ........................................... DIOSCOREACEAE

8b Flowers bisexual:

9a Leaves deeply divided with pinnatifid segments, radical; flowers in bracteate umbels, the outer bracts broad, the inner long and thread-like; herbs with a tuberous rootstock .......................................................................................... TACCACEAE

9b Leaves simple and undivided or sometimes absent:

10a Stamens 3, opposite outer tepals; leaves mostly unifacial; rootstock a corm or rhizome ............................ IRIDACEAE

10b Stamens 6 or 3, but then opposite inner tepals:

11a Inflorescence apparently an umbel (sometimes 1-flowered), subtended by 1 or more spathaceous bracts and borne on a naked scape; rootstock a bulb or rhizome .................................................. AMARYLLIDACEAE

11b Inflorescence a corymb, raceme, panicle, cyme or 1-flowered, not subtended by spathaceous bracts; rootstock a corm or rhizome (rarely reduced):

12a Small saprophytic herbs with a few narrow basal leaves, or leaves scale-like ........................................... BURMANNIACEAE

12b Photosynthetic plants with well-developed leaves:

13a Robust, rosulate plants with tree-like inflorescences and large, spine-tipped, leathery or succulent leaves persisting for several years ............................................................................................................. *AGAVACEAE

13b Smaller plants, often coarsely hairy; leaves never spine-tipped:

14a Flowers many, in helicoid cymes borne on bracteate stalks; ovules 1 or 2 per locule:

14b Flowers mostly solitary or few borne on leafless scapes or pedicels; ovules many per locule:

15a Shrubs or short-stemmed perennials; leaves fibrous, absiccing below, persistent bases stiffly fibrous and closely imbricate; flowers solitary, purple to mauve or white, with sepal nectaries; seeds white to yellowish ...... VELLOZIACEAE

15b Acaulescent perennials; leaves softer, decaying irregularly, bases loosely fibrous and not regularly imbricate; flowers 1 to many, yellow, white, pink to red, without nectaries; seeds black ...................... HYPOXIDACEAE

**GROUP 3 (Aquatic herbs, free-floating or submerged (flowers sometimes emergent); perianth absent or capular or scale-like to well-developed)**

1a Plants floating freely on the surface, though sometimes attached to the substrate in very shallow water:
Seed plants of southern tropical Africa: families and genera

IDENTIFICATION OF FAMILIES

KEY TO MONOCOTYLEDONS: GROUP 3

1a Small, disc-shaped to globular annuals not differentiated into stems and leaves; flowers borne in pouches or sheaths ................................................................. (including Lemnaceae) ARACEAE

1b Rosette-forming, stoloniferous herbs with oblong, hairy leaves; flowers borne on a small spadix surrounded by a tubular spathe (*Pistia*) .......... ARACEAE

1c Plants rooted or freely suspended with leaves submerged or floating:

1a Leaves pinnately or palmately compound; palms ...........................................................................................................................................(including Lemnaceae) ARACEAE

1b Leaves reduced to sheaths with free margins; plants dioecious; florets with a perianth of 6 tepals in 2 whorls...............................

1c Gynoecium composed of 2 or more free carpels with separate styles and stigmas:

2a Perianth absent or cupular; stamens 1 or 2:  

5a Flowers bisexual, in spikes above water at anthesis, spikes consisting of 2 naked flowers facing in opposite directions and borne at different heights; carpels 4–8, becoming stipitate in fruit and appearing umbrellate; stamens 2, free ......................................................... RUPIIACAE

5b Flowers unisexual, submerged, axillary, cymose or solitary; carpels 1–9, stipitate; stamens 1 or 2, united:  

6a Marine plants, dioecious; pollen filamentosum ......................................................................................................................... CYMODOCEAE

6b Brackish or freshwater plants, monococious; pollen globose .............................................................................................................. ZANNICHELLIACEAE

2b Herbaceous plants:

6a Tufted herbs with radical leaves and small to minute flowers crowded in terminal, compact, head-like inflorescences borne on naked peduncles:

7a Flowers unisexual; ovary 3- or 2-locular ................................................................................................................................. ZANNICHELlIACEAE

7b Flowers bisexual; ovary 1-locular .................................................................................................................................................. XYRIDACEAE

6b Combination of characters not as above:

8a Leaves reduced to sheaths; flowers unisexual, sexes on separate plants; ovary 1- or 3-locular with 1 ovule per locule .... RESTIONACEAE

8b Leaves with blades; flowers bisexual; ovary ± 3-locular with many ovules per locule ............................................................... JUNCACEAE

GROUP 4 (Flowers (florets) arranged in small spikes (spikelets) subtended or enclosed by bracts; grasses and grass-like plants)

1a Leaves reduced to sheaths with free margins; plants dioecious; florets with a perianth of 6 tepals in 2 whorls ............................................................... RESTIONACEAE

1b Leaves usually with a well-developed blade and a sheathing base; plants very rarely dioecious; florets mostly with 2–6 scale-like bracts or bristles:

2a Leaves 2-ranked; leaf sheaths usually with free, overlapping margins; stems terete or compressed, usually with hollow internodes; style branches and stigmas usually 2, feathery; anthers deeply sagittate and therefore appearing dorsifixed .......................... POACEAE

2b Leaves often 3-ranked, mostly crowded in a basal tuft; leaf sheaths usually closed; stems often 3-angled, with solid internodes; style branches and stigmas 2 or 3, not feathery; anthers basifixed ........................................................................................................ CYPERACEAE

GROUP 5 (Land plants, sometimes rooting in water; perianth glumaceous to hyaline, or sometimes herbaceous, or reduced to bristles or scales or absent)

1a Leaves pinnately or palmately compound; palms ................................................................................................................................. ARECACEAE

1b Leaves simple:

2a Palm-like dioecious trees with coriaceous, linear-ensiform leaves, often longer than 1 m, arising from apex of stem in 3 spiralling ranks .......... PANDANACEAE

2b Herbaceous plants:

3a Inflorescence a very dense cylindric spike with female florets below and male ones above; perianth segments reduced to bristles . TYPHACEAE

3b Inflorescence various, not as above:

4a Inflorescence a dense fleshy spike (spadix) subtended by a conspicuous, variously coloured spathe ....................................................... ARACEAE

4b Inflorescence various, not a spadix:

5a Perianth segments herbaceous; fruit separating into 3 cocci; leaves radical .............................................................................................. JUNCAGINACEAE

5b Perianth segments dry and glumaceous to hyaline; leaves basal, caulescent or reduced to sheaths; plants often rush-like:

6a Tufted herbs with radical leaves and small to minute flowers crowded in terminal, compact, head-like inflorescences borne on naked peduncles:

7a Flowers unisexual; ovary 3- or 2-locular ................................................................................................................................. ERIOCAULACEAE

7b Flowers bisexual; ovary 1-locular .................................................................................................................................................. XYRIDACEAE

6b Combination of characters not as above:

8a Leaves reduced to sheaths; flowers unisexual, sexes on separate plants; ovary 1- or 3-locular with 1 ovule per locule .... RESTIONACEAE

8b Leaves with blades; flowers bisexual; ovary ± 3-locular with many ovules per locule ............................................................... JUNCACEAE
Coates Palgrave (2002) notes that *Callitris endlicheri* (Parl.) F.M.Bailey, the Black Cypress from SE Australia, has escaped from forest plantations in moister parts of Zimbabwe and has become established in woodland and eucalyptus plantations.

*Cupressus L.*
Coates Palgrave: 90 (2002).

*Cupressus lusitanica* Mill., originally introduced from central America for timber, has escaped in eastern Zimbabwe.

*Juniperus L.*


*Widdringtonia* Endl.


**References**


Cycadaceae
(Cycadopsida)
(Cycadales)

Palm-like, rarely branched trees, up to 9 m high; trunk bearing spirally arranged, woody leaf bases and scale leaves, and crowned by a tuft of leaves. Leaves arranged in close spirals, pinnately compound, long; leaflets falcate, very narrowly lanceolate, entire, with 1 thick midrib and no lateral veins. Male scales (sporophylls) leathery, up to 50 mm long, arranged in apical, very narrowly ovoid cones, each scale with many pollen sacs, in groups of 3–5, on abaxial surface. Female sporophylls frond-like, up to 0.3 m long, lanceolate or narrowly ovate, irregularly dentate, thickened fertile central axis bearing 4 or 5 pairs of sessile marginal ovules, not forming a definite cone but spirally arranged in a densely crowded apical whorl. Seeds ovoid, ± 40 mm in diameter at maturity.

Genus 1, species 17, E Africa to Japan and Australia; sthn trop. Afr. species 1.

*Cycas L.*

Description as for family.

Species 17, E Africa to Japan and Australia; sthn trop. Afr.: 1: *Cycas thouarsii* Gaudich., Mozambique.

**References**


Gnetaceae
(Gnetopsida)
(Gnetales)

Dioecious, large-leaved, evergreen, loosely twining, remotely branched lianes; branches opposite or sometimes in whorls of 3, spreading to pendulous, somewhat thickened at nodes, glabrous. Leaves deciduate, petiolate, simple, ovate-oblong to elliptic-oblong, entire, pinnately nerved; stipules absent. Inflorescences simple or branched, axillary or cauline, unisexual spikes bearing ±8 whorls of small sessile flowers surrounded by moniliform hairs; each spike with 2 opposite basal scales. Male flowers with a “perianth” of 2 partly connate scales surrounding a central column bearing at the tip 1 or 2 yellow microsporangia which open by an apical median slit. Female flowers with 1 ovule enclosed in an outer fleshy envelope (“perianth”) and 2 thinner inner envelopes (“integuments”), the innermost produced into a straight micropylar tube; imperfect flowers usually sterile and lacking outer “integument”. Seed at maturity enclosed in outer fleshy, coloured “perianth”, and an outer “integument” which forms a hard, ridged testa and an inner one which is thin and silky; embryo small, embedded in copious endosperm.

Genus 1; species ±30, tropical America, western trop. Africa and tropical Asia; sthn trop. Afr. 1.

Gnetum L.

Description as for family.

Species ±30; ±7 in tropical America, 2 in western tropical Africa, the rest in tropical Asia; sthn trop. Afr. 1: Gnetum africanum Welw., Angola.

References

*Pinaceae
(Pinopsida)
(Coniferales)


Sthn trop. Afr.: genus 1, species 3.

*Pinus L.

Various species are cultivated in sthn trop. Africa. Coates Palgrave (2002) lists 3 species as invaders of natural vegetation in eastern Zimbabwe; one of them, *Pinus patula* Schiede ex Schltdl. & Cham., is also recorded for the adjacent Mozambique.

References

Podocarpus L’Hér. ex Pers.


Species 95, southern temperate regions and tropical highlands from West Indies to Japan; sthn trop. Afr. 3, Angola, Zambia, Zimbabwe, Malawi,
Gymnosperms

References


Stangeriaceae

(Cycadopsida)
(Cycadales)

Genera 2, species 3, Queensland, Australia and Africa; sthn trop. Afr.: genus 1, species 1.

Stangeria T. Moore


Monotypic genus: Stangeria eriopus (Kunze) Baill., southern border of Mozambique, and sthn Afr.

References


Welwitschiaceae

(Gnetopsida)
(Gnetales)


Sthn trop. Afr.: genus 1, species 1.

Welwitschia Hook.f.


Monotypic genus: Welwitschia mirabilis Hook.f., confined to the Namib Desert in Angola, and in sthn Afr. (Namibia).

References


Zamiaceae
(Cycadopsida)
(Cycadales)


**Encephalartos** Lehm.


**References**


Genus to be excluded from Acanthaceae: Thomandersia

Seed plants of southern tropical Africa: families and genera


Classification of Acanthaceae of sthn trop. Afr.

[after Scotland & Vollesen (2000)]

I. Subfamily NELSONIOIDEAE (retinacula 0; cystoliths 0; descending cochlear aestivation): Anisosepalum, Elytraria, Nelsonia, Staurogyne

II. Subfamily THUNBERGIOIDEAE (retinacula 0; primarily lianes; bristled anthers; capsules or drupes): Anomacanthus, Pseudocalyx, Thunbergia

III. Subfamily ACANTHOIDEAE (retinacula present; capsules explosive):

1. Tribe Acanthae (cystoliths absent; pollen colpate; anthers 4, 1-thecate): Acanthus, Blepharis, Crossandra, Sclerochiton, Stenandrium

2. Tribe Ruelliae (cystoliths present):
   a. Subtribe Ruelliniae (left-contort aestivation; filament curtains: filaments united 2 x 2 to the corolla tube thus forming 2 folds which extend to corolla base): Acanthropale, Brilliatiaisia, Deschistocalyx, Duosperma, Dyschoriste, Hygrophila, Melliera, Mimulopsis, Petaldium, Phaulopsis, Ruella, Strobilanthopsis
   b. Subtribe Justiciinae (ascending cochlear aestivation; ovules 2 or 4): Anisotes, Asystasia, Brachystemaphes, Dicliptera, Ecbolium, Hypoestes, Isoglossa, Justicia, Megalochlamys, Meteorunga, Monocha, Monothecium, Oreaenanth, Peristerope, Pseuderanthemum, Rhinacanthus, Rangia, Ruspolia, Ruttya
   c. Subtribe Barleriinae (quincuncial aestivation): Barleria, Crabbea, Lepidagathis

Unplaced within Acanthoideae: Neuracanthus, Whitfeldia

Genus to be excluded from Acanthaceae: Thomandersia

Key to genera

1a Seeds not borne on retinacula:

2a Fertile stamens 2:
   3a Plants with rosulate leaves and scapose inflorescences; scape covered with alternate bracts from base to tip ....................................................... Elytraria
   3b Plants prostrate, with internodes visible between leaves, rooting at the nodes .......................................................................................... Nelsonia

2b Fertile stamens 4:
   4a Ovary with 1 or 2 collateral ovules in each locule:
      5a Shrubs; calyx with 5 lobes; ovary with 1 large ovule per locule; fruit a large drupe with 2 subglobose pyrenes flattened on one side .............. ........................................................................................................................................... Anomacanthus
      5b Herbs of various habit or subshrubs; calyx mostly with 10–18 linear lobes or cupular; ovary with 2 collateral ovules per locule; fruit a globose, abruptly rostrate capsule:
         6a Anthers opening by apical pores .................................................................................................................................................. Pseudocalyx
         6b Anthers mostly opening by ± distinct longitudinal slits: ........................................................................................................... Thunbergia
   4b Ovary with 4–14 ovules in 2 rows in each locule:
      7a Bracteoles fused to base of calyx, resembling anterior calyx lobes and covering the rudimentary lateral lobes ........................................ Anisosepalum
      7b Bracteoles not fused to base of calyx; lateral calyx lobes slightly shorter than anterior ones but neither much reduced nor covered by the bracteoles .......................................................................................................................... Staurogyne

1b Seeds borne on retinacula:

8a Corolla 1-lipped, with the adaxial suture slit; stamens 4, all 1-thecous:
   9a Stamens included in corolla tube, filaments epipetalous for most of their length, slender; corolla yellow, orange or red ....................... Crossandra
   9b Stamens exserted beyond corolla throat; filaments epipetalous for up to half their length, stout; corolla white, blue or purple or various combinations of these:
      10a Calyx with 5 lobes .................................................................................................................................................. Sclerochiton
      10b Calyx with 4 lobes:
         11a Seed surface with feathery hygroscopic structures; anticous filaments produced into a protuberance ........................................ Blepharis
         11b Seed surface glabrous, filaments not forming a protuberance .................................................................................. Acanthus
   8b Corolla 2-lipped, subregular or regular, adaxial suture not slit; stamens 2 or 4, 1- or 2-thecous:
      12a Seeds with hygroscopic uniseriate hairs; corolla aestivation contorted or occasionally imbricate (Ruellia) or induplicate (Neuracanthus), but then not ascending; fertile stamens mostly 4, sometimes 2:
         13a Calyx lobes 4, abaxial and adaxial lobes larger than lateral lobes; stamens not didynamous ................................................. Barleria
         13b Calyx lobes 5, rarely 4 (Hygrophila), but then these are ± equal in size; stamens didynamous:

30 Seed plants of southern tropical Africa: families and genera
ACANTHACEAE: Key to genera

14a Corolla regular or subregular:
15a Calyx ± 2-lipped:
16a Calyx with upper lip 3-fid, lower lip 2-fid; corolla with induplicate aestivation in bud ................................................. Neuracanthus
16b Calyx with 2 segments free nearly to base and 3 segments fused nearly to middle; corolla with quinuncial (imbricate) aestivation in bud ........................................................................................................................................ Ruellia
15b Calyx regular to subregular; corolla withcontorted aestivation in bud:
17a Inflorescences highly congested dichasial cymes surrounded by bracts ........................................................................ Crabbea
17b Inflorescences paniculate, spike-like, ± capitulate, thyrses, cymes, or flowers solitary:
18a Ovary with 3 or more ovules per locule:
19a Anthers blunt at base; ovules many per locule .............................................................................................................. Dischistocalyx
19b Anthers with 1 theca long-spurred; ovules 3 or 4 per locule ......................................................................................... Mimulopsis
18b Ovary with 2 ovules per locule:
20a Densely branched glandular undershrubs with unpleasant smell ........................................................................ Strobilanthes
20b Erect or scrambling shrubs or undershrubs, not glandular, without unpleasant smell ................................................. Acanthopale

14b Corolla distinctly 2-lipped:
21a Calyx lobes 4 ........................................................................................................................................................................ Hygrophila
21b Calyx lobes 5:
22a Fertile stamens 2:
23a Flowers in a terminal or lateral thyrs; ovary with many ovules per locule ...................................................................... Brachystephanus
23b Flowers in axillary dichasial cymes; ovary with 2 ovules per locule ................................................................................ Chaetacanthus
22b Fertile stamens 4:
24a Capsule with 1 seed per locule .............................................................................................................................................. Duosperma
24b Capsule with 2 or more seeds per locule:
25a Capsule with 2 seeds per locule:
26a Calyx 2-lipped: upper lip 4-lobed, lower lip of 1 much enlarged lobe ................................................................................. Phaulopsis
26b Calyx regular or subregular with 5 similar to unequal lobes:
27a Ultimate 2 bracts large, enclosing calyx; calyx regular, glandular, lobes 4 or 5 ................................................................. Petalidium
27b Ultimate bracts/bracteoles shorter than calyx; calyx regular or subregular, not glandular, lobes 5:
28a Calyx regular, tube longer than lobes, cylindric or narrowly campanulate, 5-ribbed ......................................................... Dyschoriste
28b Calyx subregular, tube shorter than lobes, lobes unequal: posterior one usually longer and broader than the others, and lateral lobes often pointed or spinescent .................................................. Lepidagathis
25b Capsule with 3 or more seeds per locule:
29a Calyx ± 2-lipped with 3 teeth connate almost to the middle ......................................................................................... Ruellia
29b Calyx divided almost to base into 5 linear lobes .................................................................................................................. Mellera

12b Seeds without hygroscopic uniseriate hairs (although they may have tubelecs or hygroscopic glochidiate hairs); corolla aestivation ascending (imbricate); fertile stamens 4 or 2:
30a Fertile stamens 4:
31a Anthers 1-theccous ......................................................................................................................................................... Stenandrium
31b Anthers 2-theccous:
32a Ovary with 8 or more ovules in 2 rows .......................................................................................................................... Staurogyne
32b Ovary with 2 ovules per locule:
33a Bracteoles large, membranous, often coloured ............................................................................................................. Whitfieldia
33b Bracteoles small to absent
34a Bracteoles filiform-subulate; anther thecae superposed; capsule stipitate ........................................................................ Assystasia
34b Bracteoles scale-like at base of calyx; anther thecae at same level; capsule sessile ........................................................................ Thomandersia [to be excluded from Acanthaceae fide Scotland & Vollesen (2000)]

30b Fertile stamens 2:
35a Anthers 1-theccous:
36a Flowers resupinate (3-lobed lip of corolla above 2-lobed lip); flowers appearing as though enclosed by 2 opposite bracts which may be connate into a tube .......................................................................................................................... Hypoestes
36b Flowers not resupinate (2-lobed lip of corolla above 3-lobed lip); bracts small:
37a Ovary and style base hairy ................................................................................................................................................. Monotheccium
37b Ovary and style base glabrous:
38a Flowers small, corolla tube shorter than 10 mm; inflorescence a many-flowered, terminal, viscid panicle ............. Oreacanthus
38b Flowers larger, corolla tube longer than 10 mm:
39a Staminodes 0; style ± capitate ........................................................................................................................................ Brachystephanus
39b Staminodes 2; style 2-branched:
40a Corolla tube considerably longer than upper lip ................................................................................................................. Ruspolia
40b Corolla tube shorter than or ± as long as upper lip .............................................................................................................. Ruttya

35b Anthers 2-theccous:
41a Flowers resupinate (3-lobed lip of corolla above 2-lobed lip):
42a Capsules with inelastic placentals bases .......................................................................................................................... Peristrophe
Acanthopale C.B.Clarke  
(Acanthoideae—Ruellieae—Ruelliiinae)  
Clarke: 62 (1899); Bremekamp: 142 (1943); Heine: 15 (1966a); Binns: 12 (1968); White et al.: 112 (2001).

Shrubs or subshrubs, branched, pubescent or glabrescent; branches often obliquely quadrangular. Leaves ± cuneate at base, narrowing gradually into petiole; apex caudate-acuminate; margin ± entire; cystoliths often conspicuous, at least when plant dry. Inflorescence spike-like, terminal or axillary; bracts obovate, longer than calyx; bracteoles linear to linear-oblong at base.

Capsule ellipsoid, glabrous.


Anisosepalum E.Hossain  
(Nelsonioideae)  

Herbaceous to suffrutescent, erect to procumbent. Leaves opposite, sometimes ternate, entire to crenate-serrate, variably pilose, lower surface often paler than upper. Inflorescences: flowers usually many, in spike-like racemes or spikes, terminal or on very short lateral branches, sometimes only 2 or 3; bracts and bracteoles present. Calyx of 5 very dissimilar sepals; style mostly glabrous, bifid at apex. Capsule ellipsoid, woody, shiny brown, 2–4-seeded. Seeds discoid, glabrous.

Species 30, tropical and warm Old World; sthn trop. Afr. 2, Angola, Zambia, Malawi.

Anisotes Nees  
(Acanthoideae—Ruellieae—Justiciinae)  

**Anomacanthus R.D.Good**
(Thunbergioideae/Mendoncioideae)
Good: 161 (1923); Good: 312 (1925); Brummitt: 710 (1990).

**Gilletteilla** De Wild. & T.Durand; Moore: 129 (1930); Benoist: 5 (1950).

Scandent shrubs. **Leaves** shortly petiolate, ovate, entire; without cystoliths. **Flowers** single or few, axillary; bracteoles large, fused, keeled, acuminate, with conspicuous veins, enclosing corolla. **Calyx** annular, very short, truncate. **Corolla** ± 2-lobed, lower lip with anterior lobe smaller than others, lobes of upper lip ± fused. **Stamens** 4, of equal length, arising in corolla throat, included; filaments curved, thick, shorter than anthers; posterior anthers 2-locular; anterior ones 1-locular. **Disc** annular, very prominent. **Ovary** subglobose, almost embedded in disc; ovules large, 1 per locule; style elongate, included; **retinacula** absent. **Capsule** small, oblong, usually 4-seeded. **Seeds** obovoid, compressed, muricate, without hairs.

**Monotypic**: *Anomacanthus congestus* (De Wild. & T.Durand) Brummitt (= *A. drupaceus* R.D.Good), Western Zaire and Angola (Cабinda).

**Asystasia Blume**
(Acanthoideae—Ruellieae—Justiciinae)

**Barleria L.**
(Acanthoideae—Ruellieae—Barleriinae)
Eyles: 483 (1916); Obermeyer: 123 (1933); Benoist: 15, 34 (1950); Heine: 419 (1963); Heine: 161 (1966a); Balkwill & Balkwill: 393 (1996).

**Blepharis Juss.**
(Acanthoideae—Acantheae)

**Brachystephanus Nees**
(Acanthoideae—Ruellieae—Justiciinae)

**Crabbea** Harv.
(Acanthoideae—Ruellieae—Barleriinae)
Ficalho & Hiern: 24 (1881); Clarke: 118 (1899); Eyles: 483 (1916); Binns: 13 (1968); Phiri (Unpublished).

**Crossandra Salisb.**
(Acanthoideae—Acantheae)

**Dicotyledons**


**Brillantaisia P.Beauv.**
(Acanthoideae—Ruellieae—Ruelliaeinae)
Burkitt: 37 (1899); Benoist: 7 (1950); Heine: 83 (1966a); Binns: 12 (1968); Sidwell: 67 (1998).

Erect to prostrate herbs to erect, sturdy shrubs; stems square, glabrous to densely pubescent; cystoliths longitudinal, narrowing towards one end. **Leaves** broadly ovate to ovate, occasionally elliptic or linear-lanceolate; base cordate to cuneate; margin entire to regularly toothed; glabrous to pubescent; petiolar, lamina decurrent in top half of usually winged pediole. **Inflorescence** a terminal or lateral thyrse; bracts foliaceous; bracteoles linear to obovate. **Calyx** with 5 equal or unequal, linear to spathulate sepals. **Corolla** 2-lipped, purple to blue, occasionally white; tube cylindric with 2 brown-yellow markings in throat; upper lip hooded, 2-lobed; lower lip broad, reflexed at edges, 3-lobed, 2 lateral membranous pouches at base of lower lip forming a hinge with apex of tube. **Androecium** with 2 posterior stamens fertile; filaments white, flattened; anthers sagittate, dorsifixed; 2 anterior ones reduced to slender staminodes, often with vestigial anther, occasionally minute or absent. **Gynoecium**: style slender, not exserted; stigma a single flattened lobe; second lower lobe reduced to a minute tooth; ovules many. **Capsule** linear, pointed, with deep longitudinal grooves down centre of the 2 valves. **Seeds** rounded to slightly kidney-shaped, flattened, borne on retinacula, covered with adpressed hygroscopic hairs.

**Dicliptera Juss.**  
(Asparagaceae—Ruellieae—Justiciaeinae)  
*Species*: 30 (1950); *Binnis*: 13 (1968); *Balkwill et al.*: 1 (1996).


**Dischistocalyx T.Anderson ex Bentham. & Hook.f.**  
(Asparagaceae—Ruellieae—Ruellieae)  
*Bentham & Hooker*: 1080 (1876) as *Distichocalyx*; *Clarke*: 60 (1899) as *Distichocalyx*; *Bennet*: 130 (1930); *Heine*: 394 (1963); *Heine*: 656 (1971).

Subshrubs, geniculate and ± ascending, with multicellular hairs, especially on young parts and inflorescence. *Leaves* petiolate, ovate-elliptic or lanceolate, acutely cuneate at base, acuminate, entire or faintly crenulate; with many short, rod-like cystoliths on both surfaces. *Inflorescences* terminal, dense, few-flowered spikes to ± capitulate; bracts early deciduous. *Flowers* sessile with minute subulate bracteoles at base of calyx. *Calyx*: lobes unequal; anterior 2 free to base, linear-narrowly elliptic, posterior 3 fused half-way or further. *Corolla* large to medium-sized; lower ± 1/3 of tube narrowly cylindric, upper portion campanulate-funnel-shaped; lobes 5, rounded, spreading. *Stamens* 4, arising in narrow, cylindric portion of corolla tube, didynamous; filaments and connectives of anthers finely pubescent; shorter stamens arising above longer ones; anthers all similar, not spurred. *Ovary* glabrous; ovules many; style ± glabrous; stigma with 1 branch well-developed, recurved, other branch rudimentary. *Capsule* linear to narrowly obovate, glabrous, containing ± 10 seeds in each locule. *Seeds* with a ring of hygroscopic hairs.


**Disperma Dayton**  
(Asparagaceae—Ruellieae—Ruellieae)  

*Disperma* C.B.Clarke in part; *Binnis*: 13 (1968); *Mapaura* (Unpublished).


**Dyschoriste Nees**  
(Asparagaceae—Ruellieae—Ruellieae)  
*Clarke*: 71 (1899); *Eyles*: 481 (1916); *Benoist*: 8, 34 (1950); *White*: 382 (1968); *Brummitt*: 785 (1985); *Hansen*: 1 (1985); *Msekandiana & Mlangeni*: 34 (2002).


**Elytraria Michx.**  
(Nelsonioideae)  
*Morton*: 49 (1956); *Dokosi*: 256 (1971); *Mapaura* (Unpublished).


**Hygrophila R.Br. emend. Heine**  
(Asparagaceae—Ruellieae—Ruellieae)  
*Burkill*: 30 (1899); *Eyles*: 481 (1916); *Benoist*: 7, 34 (1950); *Heine*: 394 (1963); *Heine*: 656 (1971).


**Hypoeastes Sol. ex R.Br.**  
(Asparagaceae—Ruellieae—Justiciaeinae)  
*Clarke*: 227 (1900); *Eyles*: 486 (1916); *Brummitt*: 785 (1985); *Hansen*: 1 (1985); *Msekandiana & Mlangeni*: 34 (2002).


**Isoglossa Oerst.**  
(Asparagaceae—Ruellieae—Justiciaeinae)  
*Clarke*: 227 (1900); *Eyles*: 486 (1916); *Brummitt*: 785 (1985); *Hansen*: 1 (1985); *Msekandiana & Mlangeni*: 34 (2002).


**Justicia L.**  
(Asparagaceae—Ruellieae—Justiciaeinae)  


**Lepidagathis Willd.**  
(Asparagaceae—Ruellieae—Barleriinae)  
*Clarke*: 120 (1900); *Eyles*: 483 (1916); *Benoist*: 20, 35 (1950); *Morton*: 333 (1988).


**Megalochlamys Lindau**  
(Asparagaceae—Ruellieae—Justiciaeinae)  

Mellera S. Moore  
(Acanthoideae—Ruellieae—Ruelliiinae)  
Moore: 225 (1879); Lindau: 297 (1896); Clarke: 50 (1899); Eyles: 481 (1916); Binns: 15 (1968); White et al.: 116 (2001).

Mimulopsis Schweinf.  
(Acanthoideae—Ruellieae—Ruelliiinae)  
Schweinfarth: 677 (1868); Lindau: 301 (1896); Clarke: 54 (1899); Binns: 15 (1968); White et al.: 116 (2001); Bingham (Unpublished).

Nelsonia R. Br.  
(Nelsonioideae)  

Neuracanthus Nees  
(Unplaced within Acanthoideae)  

Oreacanthus Bentham.  
(Acanthoideae—Ruellieae—Justiciinae)  

Peristrophe Nees  
(Acanthoideae—Ruellieae—Justiciinae)  

Petalidium Nees  
(Acanthoideae—Ruellieae—Ruelliiinae)
by apical pores, not by longitudinal slits. 

**Phaulopsis Willd.**

(Acanthoideae—Ruellieae—Ruellinae)


**Pseuderanthemum Radlk.**

(Acanthoideae—Ruellieae—Justiciinae)


**Eranthemum L., in part**; Clarke: 169 (1899); Binns: 13 (1968).


**Pseudocalyx Radlk.**

(Thunbergioidae)


Lianes with ± 4-angled, sparsely stellate branchlets. **Leaves** petiolate, ± elliptic, entire to somewhat crenulate. **Inflorescence** an axillary or terminal raceme; bracteoles enveloping calyx and corolla tube. **Calyx** thin, cupular. **Corolla** slightly 2-lipped with contorted lobes; lower lip 3-lobed, upper one 2-lobed. **Androecium**: stamens 4, enclosed, arising ± in middle of corolla tube; anthers 2-theecous, opening by apical pores. **Disc** cupular, glabrous. **Gynoecium**: ovary slightly laterally compressed; ovules 2 per locule; stigma 2-lobed. **Capsule** subvoid, beaked. **Seeds** ovoid to dorsally compressed, smooth or warted, not borne on retinaculum.

Species 5, trop. Africa, Madagascar; sthn trop. Afr. 1: Pseudocalyx saccatus Radlk. (=P. africana S.Moore), Zambia, Zimbabwe, Mozambique. Essentially the genus differs from Thunbergia only in the anthers, which dehisce by apical pores, not by longitudinal slits.

**Rhinaclanthus Nees**

(Acanthoideae—Ruellieae—Justiciinae)

Clarke: 224 (1900); Benoist: 26 (1950); Heine: 200 (1966a); BALKWILL: 11 (1995); Bingham (Unpublished).


**Ruellia L.**

(Acanthoideae—Ruellieae—Ruellinae)

Clarke: 44 (1899); Benoist: 8 (1950); Eyles: 483 (1916); Furness & Grant: 231 (1996); Bingham (Unpublished).


**Rungia Nees**

(Acanthoideae—Ruellieae—Justiciinae)

Nees: 77, 109 (1832); Clarke: 252 (1900); Moore: 138 (1930); Heine: 429 (1963); Heine: 204 (1966a).

Subshrubs, up to 3 m high, pubescent to glabrous. **Leaves** long-petiolate, elliptic-lanceolate, acuminate, entire. **Inflorescence** axillary to terminal strobilate spikes with large membranous, veined bracts arranged in 4 rows of which 2 do not subtend flowers. **Flowers** small, sessile, solitary in axils of bracts and accompanied by 2 large to very small membranous or transparent bracteoles. **Calyx** with 5 subequal pointed teeth, usually membranous or transparent. **Corolla** 2-lipped; tube short, straight, slightly widening towards mouth; upper lip inside in bud, straight, concave, entire or 2-toothed; lower lip usually longer than upper, spreading, 3-lobed. **Stamens** 2, arising in mouth of tube, shorter than upper lip; anthers with 2 separate, slightly displaced thecae, lower one or both spurred; staminodes absent. **Gynoecium** pubescent; stigma slightly 2-lobed; ovules 2 per locule. **Capsule** compressed globose, ovoid or oblong; placentas arising elastically in fruit to throw out seeds. **Seeds** 4, flattened, reniform-suborbicular, rugose.

Species 50, tropical Old World; sthn trop. Afr. 1: Rungia grandis T.Anderson, Angola; specimen Gomes Pedro 4246 (PRE) from Mozambique was identified as Rungia sp.

**Ruspolia Lindau**

(Acanthoideae—Ruellieae—Justiciinae)

Milne-Redhead: 269 (1936); Benoist: 36 (1950).

Eranthemum L., in part; Clarke: 169 (1899).


**Ruttya Harv.**

(Acanthoideae—Ruellieae—Justiciinae)

Specimen in PRE: O.B. Miller 7234; Brummitt (Unpublished).

Sthn trop. Afr. 1: Ruttya ovata Harv., Mozambique (specimens in PRE: O. B. Miller 7234 and others), and sthn Afr.

**Schlerochiton Harv.**

(Acanthoideae—Acanthae)


**Staurogyne Wall.**

(Nelsonioidae)

Wallich: 80 (1831); Bremerkamp: 162 (1955); Champluvier: 98 (1991); Champluvier: 1322, 1328 (1994); Bingham (Unpublished); Phiri (Unpublished).

Erect to ascending forest herbs, usually densely pubescent in upper parts. **Leaves** narrowly elliptic to elliptic-oblong, sometimes obovate, rarely ovate, entire, petiolate. **Inflorescences** terminal or sometimes terminal and axillary, spicate; bracts narrowly elliptic to linear-elliptic, acuminate; bracteoles linear-elliptic. **Calyx** almost free to base, posterior one broader than others. **Corolla** 2-
lipped; upper lip 2-lobed with lobes divided by a notch; lower lip 3-lobed. **Androecium**: stamens 4, didynamous, rarely 2, included or hardly exserted; anthers 2-thecous, thecae ± parallel, ± macrostome at base, opening by longitudinal slits; staminode small or absent. **Gynoecium**: ovary ellipsoid-cylindrical, with 8–14 ovules per locule in 2 rows; style glabrous; stigma unequally 2-lobed. **Capsule** slightly compressed, ± ovoid-conical; retinaculum 0. **Seeds** subglobose, without hairs.

Species ± 140, pantropical, 5 in Africa; sthn trop. Afr. 1: *Staurogyne letestuiana* Benoist, Angola (Cabinda); Zambia.

**Stenandrionium Nees**
(Acanthoideae—Acanthaceae)

*Stenandrionius* S.Moore; Benoist: 25 (1950); Heine: 99 (1966a).

Perennial herbs or shrubs. **Leaves** opposite, elliptic to obovate; apex subacute to long-acuminate; base cordate to decurrent on petiole; margin entire to shallowly crenate. **Inflorescence** dense or lax terminal or axillary spikes; bracts imbricate or not, lower usually sterile; bracteoles 2, glabrous, linear to narrowly ovate. **Calyx** divided almost to base into 5 sepals, thickened and horny at base. **Corolla** 2-lipped; tube cylindrical, straight or slightly curved; upper lip 2-lobed; lower lip 3-lobed. **Androecium**: stamens 4, included; filaments filiform; anthers 1-thecous, oblong with apiculate tip; staminode sometimes present. **Gynoecium**: ovary with 2 ovules per locule; style filiform; stigma ± distinctly 2-lobed. **Capsule** 4-seeded, oblong-ellipsoid, sessile, glabrous, beaked. **Seeds** discoid, turbulcate.

Species ± 50, sthn USA to Argentina and Chile, 8 in trop. Africa, 10 in Madagasgar; sthn trop. Afr. 2, Angola (Cabinda).

**Strobilanthopsis S.Moore**
(Acanthoideae—Ruellieae—Ruelliniae)
Moore: 202 (1900); Milne-Redhead: 344 (1932).

*D. pseudacanthopale* Moore: 8, 33 (1950); Heine: 143 (1966a); Blue: 352 (1962); Heine: 32 (1966a); Furness & Vollesen: 729 (1991); Bingham (Unpublished); Phiri (Unpublished).

Perennial herbs or shrubs. **Leaves** opposite, elliptic to obovate; apex subacute to long-acuminate; base cordate to decurrent on petiole; margin entire to shallowly crenate. **Inflorescence** dense or lax terminal or axillary spikes; bracts imbricate or not, lower usually sterile; bracteoles 2, glabrous, linear to narrowly ovate. **Calyx** divided almost to base into 5 sepals, thickened and horny at base. **Corolla** 2-lipped; tube cylindrical, straight or slightly curved; upper lip 2-lobed; lower lip 3-lobed. **Androecium**: stamens 4, included; filaments filiform; anthers 1-thecous, oblong with apiculate tip; staminode sometimes present. **Gynoecium**: ovary with 2 ovules per locule; style filiform; stigma ± distinctly 2-lobed. **Capsule** 4-seeded, oblong-ellipsoid, sessile, glabrous, beaked. **Seeds** discoid, turbulcate.

Species ± 50, sthn USA to Argentina and Chile, 8 in trop. Africa, 10 in Madagasgar; sthn trop. Afr. 2, Angola (Cabinda).

**Thunbergia Retz.**
(Thunbergioideae)
Benoist: 6, 33 (1950); Heine: 58 (1966a); Blue: 383 (1962); Heine: 32 (1966a); Furness & Vollesen: 729 (1991); Bingham (Unpublished); Phiri (Unpublished).


**Whitfieldia Hook.**
(Unplaced within Acanthaceae)
Hooker: t. 4155 (1845); Clarke: 65 (1899); Benoist: 8 (1950); White: 383 (1962); Heine: 32 (1966a); Furness & Vollesen: 729 (1991); Bingham (Unpublished); Phiri (Unpublished).

ACANTHACEAE: References

DICOTYLEDONS


Achariaceae

(in broad sense) (including Kiggelariaceae)

(Dilleniidae—Violales)

(Eurosids I—Malpighiales)

Trees or shrubs, usually containing cyanogenic glucosides. Leaves alternate, simple, entire or toothed, teeth not salicoid; stipules present or 0. Inflorescence: axillary racemes, sometimes spike-like cymes, cymose panicles, fascicles, or flowers solitary. Flowers unisexual or bisexual, regular, variously sized. Sepals 3–5, free to partly fused at base, sometimes unequal, sometimes spirally arranged and similar to petals, or sepals and petals in distinct whorls. Petals (4)5–14, free, often with an adnate adaxial scale; when arranged in whorls and clearly distinct from sepals, then often larger and more numerous than sepals. Disc and glands usually absent. Stamens (5–)8–many, free; anthers mostly relatively large and linear or oblong, 2-

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theous, opening by longitudinal slits or sometimes terminal pores. **Ovary** superior or rarely half-inferior, 1-locular with several to many ovules on (2)3–8 parietal placentas; style 1, simple and subentire to ± deeply divided into (2)3–8 branches. **Fruit** a capsule dehiscing with 3–8 valves, sometimes woody and dehiscing very tardily, sometimes with 4–6(–8) wings. **Seeds** several to many, sometimes arillate and sometimes pubescent; endosperm usually copious; embryo straight with broad cotyledons.


Archer, R.H. in Leistner: 45 (2000), under Flacourtiaceae.

Chase et al.: 171 (2002). See under Flacourtiaceae (in broad sense) for a discussion on the breaking up of that family.

**Key to genera**

1a Sepals 4 or 5; petals ± as many as sepals; stamens 8–many;  
2a Petals whorled (cyclically arranged); stamens 8–12 .......................................................... **Kiggelaria**  
2b Petals spirally arranged; stamens either 5 or 16 or more:  
3a Stamens 5 .................................................................................................................................. **Scottellia**  
3b Stamens 16 or more:  
4a Sepals free, ± half as large as petals; racemes subspicate, rather short .................................................................................................................. **Rawsonia**  
4b Sepals connate in lower third, ± as large as petals; racemes slender, elongate  
5a Fruit with 4–6 crenate membranous wings:  
6a Petals 5–7; style short, with (2)3(4) ± horizontally diverging stigmas as long or longer than style .............................................................................. **Grandidiera**  
6b Petals 10–12; style simple, entire ............................................................................................ **Buchnerodendron**  
5b Fruit a capsule, often woody, or indehiscent, smooth or with spines or soft bristles:  
7a Sepals valvate; fruit echinate with branching soft bristles or spines ........................................ **Poggea**  
7b Sepals imbricate; fruit echinate with simple bristles or spines:  
8a Style filiform, entire, rarely shortly divided; fruit 1–3-seeded: .................................................. **Lindackeria**  
8b Style with 5–8 stigmatic lobes or branches; fruit many-seeded:  
9a Fruit with a thick woody pericarp; petiole not swollen distally .............................................. **Xylotheca**  
9b Fruit a capsule with a leathery or fibrous pericarp; petiole swollen distally .......................... **Caloncoba**

**Buchnerodendron Gürke**  
(Lindackerieae)  

Unarmed small bushes; sometimes dioecious; branches stiffly erect, golden-tomentose at first, later glabrescent. **Leaves** ovate-oblong, broadly ovate or obovate, base cordate, margins serrate; petiolate with ± caducous stipules. **Flowers** in axillary, cymose panicles, racemes or fascicles, bisexual or unisexual. **Sepals** 3, subvalvate, free to base. **Petals** 6–12, imbricate, larger than sepals. **Stamens** very many, in two series, outer somewhat longer than inner ones; filaments slender, rather short; anthers linear, dehiscing by slits. **Ovary** 1-locular, with 3–5 parietal, multi-ovulate placentas; style simple, apex subentire. **Fruit** a globose, tardily dehiscent (? or indehiscent), echinate capsule splitting into 3–5 longitudinal valves. **Seeds** moderately numerous, ovoid or compressed, with a crustaceous testa, arillate at base, sometimes pubescent; embryo straight, cotyledons folicaceous, ovate.

Species 2, trop. Africa; sthn trop. Afr. 2, Angola (Cubinda), Mozambique.

**Caloncoba Gilg**  
(Lindackerieae)  

Small shrubs or small to medium trees with unarmed branches. **Leaves** on long petioles or almost sessile; lamina glabrous, scaly or hairy, sometimes glandular-punctate; stipules caducous. **Flowers** often large, in axillary fascicles or solitary, bisexual and male, often appearing before leaves. **Sepals** 3, imbricate, concave. **Petals** 8–12, larger than sepals. **Stamens** many, with linear or sagittate-linear anthers dehiscing by slits or pores. **Ovary** 1-locular with 5–8 multi-ovulate placentas; style simple with 5–8 distinct stigmas, or stigmatic apex only slightly lobed and somewhat peltate. **Fruit** an echinate or smooth, dehiscence, ovoid, globose or ellipsoid capsule splitting into 5–8 valves, many-seeded and sometimes with a fleshy or gelatinous pulp.


**Dasylepis Oliv.**  
(Erythrospermeae)  
Olive: 170 (1865); Burtt Davy & Hoyle: 54 (1958); Wild: 263 (1960); Sleumer: 6 (1975).

Trees with glabrous vegetative parts; branches slender, dark brown, striate. **Leaves** entire or serrulate, often somewhat undulate, petiolate with caducous stipules. **Flowers** bisexual or male by abortion, in lax racemes or crowded and ± spicate. **Sepals** 4 or 5, almost free, outer ones scarcely smaller, usually orbicular. **Ovary** 4–7, imbricate like inner sepals but larger, with thick hairy scales adnate at base within. **Stamens** indefinite, free; anthers linear to narrowly lanceolate, dehiscing longitudinally. **Ovary** free, glabrous or hairy, 1-locular with 2–4
Species 6, trop. Africa; sthn trop. Afr. 1: *Dasylepis hurti-davyi* Edlin, endemic, as far as is known, to Mt Mlanje, Malawi.

**Grandidiera Jaub.**

*(Lindackeriaceae)*

Jaubert: 467 (1866); Wild & Vidigal: 8 (1973); Sleumer: 11 (1975).

Shrubs or trees. *Leaves* alternate, persistent, petiolate, oblancoceolate to obovate, entire or undulate, pinnernerved; stipules subulate, pubescent. *Flowers* unisexual or bisexual; bisexual flowers with slightly larger sepals and petals and with fewer (35–50) stamens than male flowers. *Inflorescences* short, axillary, few-flowered, spike-like, shortly hairy racemes from upper axils; terminal flower bisexual, lower flowers male; racemes shortly 4–6–8-winged; style short; stigmas subulate, pubescent. *Filaments* filiform; anthers dorsifixed near base, longitudinally dehiscent. *Stamens* many; filaments filiform, glabrous; anthers longitudinally dehiscent. *Ovary* superior, 1-locular, with 2–5 multi-ovulate parietal placentas; style simple, entire, persistent in fruit, glabrescent. *Capsules* ovoid, with 4–6 broad coriaceous wings, tardily dehiscent. *Seeds* many, ovoid, angular, finely pubescent.


**Kiggelaria L.**

*(Pangieae)*


**Lindackeria C.Presl**

*(Lindackeriaceae)*


Unarmed shrubs or trees. *Leaves* simple; lamina usually rather large, glabrous or hairy, hairs stellate or simple, margins usually toothed; petioles sometimes elongate; stipules present. *Flowers* bisexual or male by abortion, in racemes or solitary in axils. *Sepals* 3, imbricate, concave. *Petals* 6–12, imbricate, not much longer than sepal. *Stamens* many; filaments slender, free or rarely connate in a tube; anthers linear. *Ovary* stalked, smooth, tuberculate or shortly echinate, usually hairy, 1-locular with 3 parietal placentas; placentas multi-ovulate or with relatively few ovules; style simple with inconspicuous stigmas. *Fruit* a globose, woody, echinate or warted capsule dehiscing tardily into 3 longitudinal valves. *Seeds* 1–3, with copious endosperm and a large embryo with flat, coriaceous cotyledons.


**Poggea Gürke**

*(Lindackeriaceae)*


**Rawsonia Harv. & Sond.**

*(Erythrospermeae)*

Sleumer: 79 (1937/1951); Wild: 262 (1960); Wild & Vidigal: 3 (1973); Killick: 54 (1976); White et al.: 276 (2001); Coates Palgrave: 748 (2002); Msekandiana & Mlangeni: 41 (2002); Lebrun & Stork: 420 (2003); Mapaura (Unpublished).


**Scottellia Oliv.**

*(Erythrospermeae)*

Oliver: t. 2265 (1893); Sleumer: 79 (1937/1951); Bamps: 9 (1968); Sleumer: 275 (1972); Hul: 32 (1995).

**Dasypetalum Pierre ex A.Chev.**

Trees up to 30 m high; trunk straight, slightly fluted; branchlets glabrous. *Leaves* alternate, persistent, simple, entire to crenulate, petiolate, cuneate at base, acuminate at apex, coriaceous, glabrous, with 5–8 pairs of secondary nerves; petiole thickened at both ends; stipules 0. *Inflorescences* racemes grouped in pseudopanicles, axillary; rachis slender to subfiliform; bracts minute, caducous. *Flowers* bisexual. *Sepals* 5, elliptic-ovate, ciliate. *Petals* 5, similar in size to sepals but usually thinner, oblong-ovate to elliptic-obovate, each with a basal scale-like hairy appendage. *Stamens* 5, alternating with petals; filaments linear-subulate, ± twice as long as anthers; anthers acutely triangular in outline, deeply bifid up to basal attachment of filament, longitudinally dehiscent. *Ovary* subglobose, 1-locular with 3 pluri-ovulate parietal placentas; style short, shortly trifid at apex. *Fruit* a subglobose capsule splitting into 3 eventually ± reflexed valves; pericarp coriaceous to almost woody, pubertal or verruculose outside, smooth or wrinkled inside. *Seeds* 1 or 2(3), subglobose-angular, smooth, covered by a thin bright red or orange-red arillus.


**Xylotheca Hochst.**

*(Lindackeriaceae)*

Sleumer: 81 (1937/1951); Wild: 272 (1960); Wild & Vidigal: 11 (1973);
Aizoaceae (including Tetragoniaceae)
(Caryophyllidae—Caryophyllales)
(Core Eudicots—Caryophyllales)


Aizoanthemum
Dinter ex Friedrich

Aizoon

Aizonea L.

Sesuvium L.
Zaleya Burm.f.


References


Alangiaceae

(Asteridae—Comales)

(Trees; twigs pubescent to glabrescent. Leaves alternate, simple, entire to undulate, often asymmetric at base, 5- to 7-nerved from base; stipules 0. Flowers bisexual, regular, in few-flowered axillary cymes with articulated pedicels; buds flask-shaped. Calyx: tube ± funnel-shaped; limb spreading, with 5–8 teeth. Petals 5–8, free or slightly coherent at base, strap-shaped, pubescent outside. Stamens as many as and alternating with petals, free or slightly cohering at base, with a fringe of hairs on inside; anthers 2-thecous, linear, basifixed, introrse, opening longitudinally. Disc subglobose, above ovary at base of style. Ovary inferior, 1- or 2-locular with 1 anatropous, unitegmic, pendulous ovary from apex of each locule; style 1, cylindric; stigma slightly lobed. Fruit a small, 1- or 2-seeded, ± globose drupe crowned by remnants of disc and sepals. Seeds 1 per locule; endosperm abundant, oily; embryo large, straight.

Genus 1, species 21, Old World tropics; sthn trop. Afr. 1.


Alangium Lam.


Description as for family.

Species 21, trop. Africa, Madagascar, eastern and tropical Asia to eastern Australia and New Caledonia; sthn trop. Afr. 1: Alangium chinense (Lour.) Harms, Angola, Zambia, Zimbabwe, Malawi, Mozambique.

References


Amaranthaceae

(Core Eudicots—Caryophyllales; including Chenopodiaceae)


Identification of additional genera using the key in the above reference:

Blutaparon: runs to Gomphrena from which it differs in having the inner 3 tepals smaller than the outer 2 and in flowers which are strongly compressed, with carinate tepals with tips incurved towards the stigmas.

Centemopsis: runs to Achyropsis from which it differs in its linear to filiform (not elliptic to ovate) leaves.

Mechowia: specimens with alternate leaves run to Sericocoma from which they differ in having glabrous (not hairy) tepals; specimens with opposite leaves run to Achyropsis from which they differ in having densely hairy (not glabrous) ovaries.
Sericostachys: runs somewhat uncomfortably to Pandiaka from which it differs in having broad panicles, and sterile flowers formed of long plumose hairs alongside the fertile ones.


**Achyranthes L.**


**Achyropsis (Moq.) Hook.f.**


**Aerva Forssk.**


*Alternanthera* Forssk.


**Amaranthus L.**
Brown: 414 (1810); Townsend: 45 (1988).


**Blutaparon Raf.**
Rafinesque: 45 (1838); Mears: 111 (1982); Townsend: 90 (1993).

**Celosia L.**


**Centemopsis Schinz**

Annuals or short-lived perennials with tough, wiry stems. Leaves opposite, ± linear, entire. Inflorescences spiciform to capitulate or cymose-fasciagitate; bracts persistent, each subtending 1 or 2 flowers; bracteoles and perianth falling with fruit. Flowers bisexual. Tepals 5, indurate and ± coalescent at base in fruit, glabrous to sparingly floccose in lower half. Stamens 5, shortly fused at base, alternating with fringed staminodes; anthers 2-thecous. Ovary uni-ovulate, glabrous to thinly hairy; style slender; stigma capitate. Capsule thin-walled, indehiscent.


**Centrostachys Wall.**


**Cyathula Blume**


**Dictyotyledons**

**Hermbstaedtia Rchb.**


**Kyphocarpa (Fenzl) Lopr.**

Leucosphaera Gilg


Marcelliopsis Schinz


Mechowia Schinz

Perennial herbs with a stout rootstock and slender erect stems. **Leaves** opposite to alternate, broadly elliptic to almost filiform, entire. **Inflorescences** capitate, dense; bracts each subtending 1 flower, persistent after fruit falls; bracteoles deciduous with fruiting perianth. **Flowers** bisexual. **Tepals** 5, 3–5-nerved, free, glabrous. **Stamens** 5; filaments free, delicate, flattened; pseudostaminodes tooth-like or notched, alternating with stamens; anthers 2-locule. **Ovary** uni-ovulate, densely lanate at least in upper two-thirds; style elongate; stigma capitulate. **Capsule** thin-walled, irregularly dehiscent. **Seeds** somewhat compressed, yellow or reddish.

Species 2, Central Africa; sfn Afr. 2, Angola, Zambia.

Nelsia Schinz


Nothosaerva Wight


Pandiaka (Moq.) Hook.f.


Psilotrichum Blume


Pupalia Juss.


Sericorema (Hook.f.) Lopr.


Sericostachys Gilg & Lopr.

High-scandent perennials with opposite branches. **Leaves** opposite, broadly ovate to lanceolate-ovate, entire; indumentum of jointed, barbellate hairs. **Inflorescence** a broad panicle with spike-like branches; each persistent bract subtending a central, bisexual, fertile and 2 lateral sterile flowers, consisting of several hair-like appendages, elongating and imparting to inflorescence branches a Clematis-like look. **Fertile flowers** bisexual, with 2 greatly accrescent bracteoles. **Tepals** 5, free, ± pilose. **Stamens** 5, very shortly fused into a disc-like rim at extreme base, alternating with very small pseudostaminodes; anthers 2-locule. **Ovary** uni-ovulate, glabrous; style slender; stigma capitulate. **Capsule** thin-walled, indehiscent, enclosed by and falling with persistent perianth and bracteoles.


References


**Anacardiaceae**
*(Rosidae—Sapindales)*
*(Eurosid II—Sapindales)*


Sthn trop. Afr.: genera 12, species ± 108.

*Spondias mombin* L., is cultivated and may be subsponstaneous in Angola [Exell & Mendonça: 127 (1954/1956)].

**Key to genera**

[after Fernandes & Fernandes (1966)]

1a Leaves simple:

2a Style and stigma 1; male flowers with 1(2) fertile stamens, and staminodes ± developed; fruits large; leaf lamina glabrous; flowers polygamous:

3a Pedicel and receptacle swollen and fleshy in fruit, finally becoming larger than the fruit; fruit not fleshy, reniform, compressed; stamens 7–10 (usually only 1 fertile) with the filaments connate in a ring at the base ..........................................................  *Anacardium*

3b Pedicel and receptacle not fleshy; drupe ovoid or subglobose, pulpy, stamens 5(10–12), 1(2–5) fertile, the others ± reduced, with the filaments not connate in a ring ........................................................................  *Mangifera*

2b Styles 3, sometimes slightly connate at the base; male flowers with 5 stamens; fertile drupes black and shining, generally somewhat compressed, up to 13 mm broad, leaf lamina ± hairy; flowers dioecious ................................................................................................................  Ozoroa

1b Leaves compound (rarely 1-foliolate):

4a Hairs on the inflorescences (and usually on the young leaves) stellate; flowers 4-merous; stamens 8; styles 3 or 4, persistent in fruit ..............  *Lannea*

4b Hairs (if present) simple:

5a Leaves 3-foliolate (very rarely 5-foliolate); drupes up to 8 mm in diam., globose or compressed; flowers (4)5(6)-merous with imbricate petals; ovary usually 1-locular and 1-seeded, styles 3; flowers dioecious .......................................................................................  *Rhus*

5b Leaves pinnate or, if 1–3-foliolate, then drupes ellipsoid or ovoid:

6a Inflorescence spike-like; young leaves dentate; stamens more than 10 .........................................................  *Sclerocarya*

6b Inflorescence panicle-like; leaves entire to undulate; stamens 10 or less:

7a Style 1; ovary 1-locular and 1-seeded:

8a Flowers 5-merous, unisexual; stamens 10–20; petals valvate .................................................................................  *Sorindeia*

8b Flowers 3-merous, bisexual; stamens 6, unequal; petals imbricate ..................................................................................  *Haematostaphis*

7b Styles several or stigmas sessile:

9a Ovary 5-locular; styles 5; stamens 10 ...................................................................................................................  *Antrocaryon*

9b Ovary 1–4(5)-locular; styles 2–4(5); stamens 4–10:

10a Stamens 4(5); ovary hairy; stigmas 2-lobed ........................................................................................................  *Trichoscypha*

10b Stamens 6–10; ovary glabrous; stigmas truncate:

11a Ovary 3 or 4(5)-locular; flowers 3- or 4(5)-merous; sepals free ..............................................................................  *Pseudospondias*

11b Ovary 1-locular; flowers 4- or 5-merous; sepals connate below ...........................................................................  *Harpephyllum*

**Anacardium** L.


Species 11, tropical America; *Anacardium occidentale* L., the Cashew nut tree, is cultivated and is reported naturalised in Angola [Exell & Mendonça: 127 (1954/1956)].

**Antrocaryon** Pierre

Pierre: 23 (1898); Engler: 177 (1921); Van der Veken: 63 (1960); Fernandes: 107 (1975).

Tall, dioecious to polygamous trees. **Leaves** alternate, imparipinnate with 5–9 pairs of ± oblong-lanceolate, entire leaflets with rounded base and long-acuteum apex. **Inflorescence** lax, subterminal-axillary panicles. **Male flowers**: calyx with 5 triangular, pubescent sepals; petals 5, oblong-ovate, reflexed, yellowish white; stamens 10, antlers ellipsoid, pistillode minute; disc thick, ± lobed. **Female flowers**: ovary subglobose, with 5 1-ovulate locules; styles 5, short, subterminal, diverging. **Fruit** a subglobose, somewhat horizontally flattened, weakly 5-lobed drupe with thin fleshy mesocarp and woody endocarp forming a nut with 5 elliptic, subapical operculums corresponding to the 5 locules. **Seeds** 3 or 4 per nut, oblong, flattened, curved; testa thin.

Species 3, trop. Africa; sthn trop. Afr. 1 or 2, Angola.

**Haematostaphis** Hook.f.

Hooker: 169 (1860); Engler: 186 (1921); Exell: 91 (1928); Exell & Mendonça: 130 (1954/1956); Keay: 733 (1958).

Tall, erect, dioecious trees. **Leaves** alternate, imparipinnate with many leaflets, glabrous, crowded towards ends of branches. **Inflorescence** elongate, laxly branching axillary panicles longer than leaves; flowers small. **Calyx** unequally 3-fid; sepals obtuse. **Petals** 3, obovate-oblong, imbricate. **Stamens** 6, unequal, alternately longer, all fertile. **Ovary** 1(2)-locular; style 1. **Fruit** an oblong, crimson, edible drupe with resinous mesocarp and 1(2)-locular, 1-seeded, bony endocarp. **Seed** pendulous with curved, fleshy cotyledons and a minute radicle.

**Harpephyllum** Bernh.


**Lannea A.Rich.**


*Calesiam* Adans.; Hiern: 177 (1896); *Odina* Roxb.; White: 211 (1962) as synonym.

Lannea africana var. xanthophloea, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

**Ozoroa Delile**


Ozoroa africana var. xanthophloea, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

**Pseudospondias Engl.**


Dioecious trees or tall shrubs; bole usually short, twisted, strongly buttressed; bark greyish yellow, falling off in large flakes. **Leaves** alternate, imparipinnate, leaflets opposite or alternate, oblong-ovate to elliptic, asymptotic at base, petiolulate, discolorous, sometimes shining, with secondary nerves curved. **Flowers** unisexual, in axillary, much branched and lax, many-flowered panicles. **Male flowers**: sepals 3 or 4(5), imbricate; petals 3 or 4(5), imbricate; stamens 6–8(10), episepalous ones slightly longer, inserted below annullur crenulate disc; vestigial ovary 3- or 4-lobulate, at centre of disc. **Female flowers**: ± similar to male ones, with small staminodes; ovary globose, 3- or 4(5)-locular; styles 3 or 4(5), subterminal, very short. **Drupe** oblong-obovoid with resinous mesocarp and woody endocarp, 3 or 4(5)-operculate at apex, usually with only 1 locule fertile. **Seeds** 1(2), oblong; testa thin; cotyledons plano-convex.


**Rhus L.**


**Sclerocarya Hochst.**


**Sorindeia Thouars**


Shrubs, sometimes with stems in form of runners, or trees, dioecious, with light exudate. **Leaves** alternate, imparipinnate or rarely 1-foiliolate; leaflets (1)3–7(9), petiolulate; tertiary nerves generally collected into an oblique nerve directed towards angle between midrib and lateral nerves. **Flowers** unisexual, 5-merous, in axillary or terminal branched panicles. **Male flowers**: calyx ± cupuliform, shallowly 5-lobulate or 5-dentate; petals valvate, or sometimes imbricate, longer than calyx; stamens 10–20; filaments subulate, inserted below and on disc; anthers dorsifixed, introrse; disc crenulated, glabrous; pistillode absent. **Female flowers**: perianth similar to male; staminodes usually 5, small; ovary free, 1-locular, ovoid; ovule 1, pendent, apical; style 1; stigma 3-lobed, persisting on fruit. **Drupe** ellipsoid or asymmetrically ovoid; mesocarp thin, fleshy; endocarp chartaceous or woody. **Seed** ellipsoid.


**Trichoscypha Hook.f.**


Dioecious shrubs or trees; branchlets brownish, striate, lenticellate. **Leaves** alternate, imparipinnate, (1)2–11-foiliolate; petiole and rachis brownish; leaflets opposite, subopposite or alternate, concolorous, petiolulate. **Flowers** unisexual, in many-flowered panicles, female ones usually shorter and with thicker axis than in males. **Calyx** shortly cupuliform, with 4(5) triangular-ovate lobes, valvate in bud. **Petals** 4(5), patent, later reflexed, valvate, those of male flowers slightly larger. **Stamens** 4(5), smaller and sterile in female flowers; filaments filiform; anthers dorsifixed. **Disc** cupuliform, ferruginous-hirsute or glabrous. **Ovary** ovoid, 1-locular, 1-ovulate; styles 3 or 4, reflexed or erect, compressed, with 2-lobed stigmas (rarely sessile). **Drupe** ovoid, turbinate or subglobose, appressed-setulose or glabrous; exocarp and mesocarp ± fleshy; endocarp thin, coriaceous or crustaceous. **Seed** ovoid, with very thick cotyledons.
Species 50, trop. Africa; sthn trop. Afr. 5 or 6, Angola, Zambia, Zimbabwe, Malawi, Mozambique.

References


Anisophyleaceae
(Rosidae—Rosoideae)
(Eurosids I—Cucurbitales)

Trees, shrubs or subshrubs, sometimes polygamous, usually glabrous or glabrescent, young shoots often pubescent or pilose; without aerial roots. Leaves alternate, generally distichous and horizontally orientated on horizontally growing branches, simple, ± elliptic, entire, often ineqialateral, with ± 26 lateral nerves curving up from near base and soon becoming subparallel; petiole short; stipules 0 but often with alternating reduced, stipuliform leaves. Inflorescences many-flowered spikes. Flowers bisexual or unisexual, regular, small. Calyx (3)4 or 5(–7)-lobed; lobes ± erect; tube adnate to ovary. Petals usually as many as, and scarcely longer than calyx lobes, free, arising at mouth of calyx tube, lobed or lacinate, rarely entire. Disc obscure, crenulated or lobed. Stamens twice as many as petals, arising at mouth of calyx tube or epipetalous ones adnate to basal parts of petals; filaments usually unequal in length; anthers 2-thecous, dorsifixed, introrse or latrorse, opening by longitudinal slits, didymous, small. Ovary inferior, (3)4(–8)-locular, each locule with 1 apical-axile, pendulous, anatropous, unitegmic, crassinucellate ovule; styles as many as locules, ± free, short, ± thickened below, erect or recurved, arising from disc. Fruit an ellipsoid to pyriform drupe, usually 1-locular and 1-seeded. Seed with leathery testa; embryo linear to slightly fusiform, longitudinally embedded in seed, cotyledons minute or absent; albumen thick and hard; endosperm 0.

Genera 4, species ± 30, tropics of Old and New World. Anisophyleaceae have often been placed under Rhizophoraceae from which they differ as follows: leaves alternate, often distichous; stipules 0; inflorescences catkin- or spike-like; styles (3)4–8, ± free (stylodia). Sthn trop. Afr.: genus 1, species ± 5.


Anisophylella R.Br. ex Sabine


Description as for family.

Anisophylleaceae: References


Key to genera

[adapted from Kessler (1993)]

1a Climbing plants:
  2a Stellate hairs present:
    3a Ovules 1 per carpel; monocarps connate ................................................................. Letestudoxa
    3b Ovules many to few per carpel; monocarps free ........................................................ Uvaria
  2b Simple hairs present or plants glabrous:
    4a Climbers with leaf-opposed, laterally compressed hooks; ovules 2, basal; monocarps free .................................................. Artabotrys
    4b Climbers without hooks:
      5a Petals in 2 subequal whorls, or petals in 1 whorl:
        6a Petals in 1 whorl, 4–6, without appendages at top .................................................. Monanthotaxis
        6b Petals in 2 whorls:
          7a Petals, at least outer whorl, valvate .................................................................................. Sphaerocoryne
          7b Petals imbricate:
            8a Androgynophore absent or very short ........................................................................ Afroguatteria
            8b Androgynophore up to 13 mm long ............................................................................ Toussaintia
      5b Outer petals larger than inner ones:
        9a Stamens with apex of connective expanded-truncate:
          10a Stamens 12–15, in 2 whorls; carpels 3 ........................................................................ Exellia
          10b Stamens many; carpels many:
            11a Inner petals slightly shorter than outer ones, not concave at base; sepals persistent in fruit ........................................ Sphaerocoryne
            11b Inner petals much shorter than outer ones, not concave at base; sepals not persistent in fruit ........................................ Friesodielsia
        9b Stamens with apex of connective either not enlarged or tongue-shaped or conical, never truncate:
          12a Anther thecae transversely separte ............................................................................... Neostenanthera
          12b Anther thecae not transversely separte ........................................................................ Monanthotaxis
  1b Erect trees or shrubs:
    13a Hairs stellate:
      14a Petals 3 in 1 whorl ........................................................................................................ Annickia (=Enantia)
      14b Petals 6 in 2 whorls:
        15a Carpels 1; ovules many ............................................................................................... Dichistothamnus
        15b Carpels several; ovules 1 or 2:
          16a Inner petals caudate at apex; carpels connate at the base, enclosed by the receptacle; ovule 1, basal ........................................ Duguetia
          16b Inner petals not caudate; carpels free; ovules many to 1, lateral ................................... Uvaria
    13b Hairs simple or plants glabrous:
      17a Petals equal to subequal, mostly in 2 whorls, sometimes in 1:
        18a Inner petals clawed ........................................................................................................ Uvariopsis
        18b Inner petals not clawed:
          19a Stamens with an enlarged connective apex, or connective apex tongue-shaped or conical, never truncate:
            20a Sepals 2, connate to form a bilobed apex; petals 4(3), in 1 whorl ..................................... Uvrioplas
            20b Sepals 3; petals 6, in 2 whorls:
              21a Stamens with connective not developed above the anthers, replaced by a tuft of hairs ........................................ Mischogyne
              21b Stamens with connective apex conical to capitate, tongue-shaped, sometimes toothed:
                22a Petals transversely folded in bud; monocarps subsessile ............................................ Hexalobus
                22b Petals not transversely folded; monocarps stipitate .................................................. Greenwayodendron

Annonaceae
(Magnoliidae—Magnoliaceae)
(Magnoliids—Magnoliales)


DICOTYLEDONS

ANNONACEAE: Key to genera

19b Stamens with apex of connective expanded-truncate:

23a Petals in 1 whorl:

24a Petals 3 ................................................................................................................................................................. Annona

24b Petals 6; sepals 3 free, carpels united into a 1-locular ovary ................................................................. Isolona

23b Petals in 2 distinct whors:

25a Fruit formed by the united monocarps ............................................................................................................. Annona

25b Fruit formed by free monocarps:

26a Anther thecae transversely septate .............................................................................................................. Xylopia

26b Anther thecae not transversely septate:

27a Ovule 1, basal ................................................................................................................................................ Monodora

27b Ovules several, lateral, in two series; petals joined at the base; stigma cushion-shaped ............... Polyalthia

17b Petals of the 2 whors dissimilar or 1 whorl missing:

28a Outer petals shorter than inner ones .................................................................................................................. Piptostigma

28b Inner petals shorter than outer ones or inner whorl missing:

29a Inner whorl of petals absent ......................................................................................................................... Annona

29b Inner whorl of petals present:

30a Inner petals clawed or concave at the base:

31a Inner petals clawed:

32a Carpels several, united into a conical or globose 1-celled ovary with many ovules and parietal placentation .......... Monodora

32b Carpels several, free ........................................................................................................................................ Monanthotaxis

31b Inner petals concave at the base:

33a Anther thecae not transversely septate ................................................................................................. Cleistopholis

33b Anther thecae transversely septate:

34a Apex of the anther connective expanded-truncate ............................................................................... Xylopia

34b Apex of the anther connective triangular; monocarps stipitate ................................................ Neostem anthera

30b Inner petals neither clawed nor concave at base:

35a Ovule 1, basal:

36a Fruit formed by the united carpels ................................................................................................................ Anonidium

36b Monocarps free:

37a Calyx entire; inner petals not cohering about the reproductive organs.............................................. Cleistochlamys

37b Calyx of 3 sepals ± connate at base; inner petals cohering about the reproductive organs:

38a Inner petals slightly shorter than outer ones; sepals persistent in fruit .............................................. Sphaerocoryne

38b Inner petals much shorter than outer ones; sepals not persistent in fruit ......................................... Friesodielsia

35b Ovules many to few, lateral:

39a Monocarps sessile; stigma sessile, cushion-shaped; seeds without aril .......................................................... Polyceratocarpus

39b Monocarps stipitate:

40a Inner petals not cohering about the reproductive organs ........................................................................ Uvariastrum

40b Inner petals cohering about the reproductive organs:

41a Inner petals slightly shorter than outer ones; sepals persistent in fruit .............................................. Sphaerocoryne

41b Inner petals much shorter than outer ones; sepals not persistent in fruit ........................................ Friesodielsia

Afroguatteria Boutique
Boutique: 104 (1951a); Boutique: 298 (1951b); Paiva: 24 (1966); Kessler: 112 (1993); Lebrun & Stork: 22 (2003).

Climber, up to 4 m long, with simple hairs. Leaves elliptic-oblong to oblong-obovate, petiolate. Flowers bisexual, solitary or in 2-flowered cymes, leaf-opposed; buds subglobose; bracteole 1, caducous. Sepals 3, free, valvate. Petals 6, imbricate, in 2 whors, subequal. Stamens many, connective with a dilated capitule apex. Carpels many, free, cylindric, ± angular, 1(2)-ovulate. Fruit a fusiform, stipitate monocarp.


Annickia Setten & Maas


Trees with simple, fasciculate or stellate hairs. Flowers bisexual, solitary or rarely paired, extra-axillary; buds conical; bracteoles 1 or 2, caducous. Sepals 3, free, valvate, lanceolate. Petals 3, opposite sepals, free, valvate. Stamens many, connective with an ovoid, subpyramidal or truncate, dilated apex. Carpels many, free, usually cylindric, pubescent, with 1 basal ovule. Fruit an oblong to ellipsoid, stipitate monocarp.

Species ± 12, trop. Africa; sthn trop. Afr. 2: Angola (Cubinda).

Annona L.


Anonidium Engl. & Diels
Engler & Diels: 50, 56 (1900); Exell & Mendonça: 15 (1937/1951); Paiva:
Trees with simple hairs. Flowers bisexual or male, in fascicles, cauliflorous; buds subglobose; bracts cucullate; bracteoles 2. Sepals 3, connate at base, valvate. Petals 6, in 2 whorls, exterior ones valvate, interior ones imbricate. Stamen many, thecae linear, extrorse; connective with a truncate, dilated apex. Carpels many, with bases included in receptacle; ovule 1, basal. Fruit compound, fleshy, ± globose-ovoid, formed by united monocarps.

Species ± 5, trop. Africa; stfn trop. A. friesianum (Oliv.) Engl. & Diels var. brieyi (De Wild.) Fries (=A. friesianum Exell), Angola (Cabinda).

Artabotrys R.Br.

Shrubs or small trees, sometimes climbing, with stellate and sparse simple hairs. Flowers bisexual (rarely male), solitary, axillary, shortly pedicellate; buds globose; bracteoles 2, enclosing bud. Sepals 3, valvate, enclosing petals in bud. Petals 6, in 2 whorls, both valvate, free, outer whorl slightly larger. Stamens many, linear-obconic with thecae lateral and connective-prolongations obliquely capitate, apiculate; filaments short. Carpels solitary, cylindrical, with many ovules in two rows; style absent; stigma bilobed; ripe carpel indehiscent, sessile or subsessile, many-seeded. Seeds horizontal; aril absent.

Monotypic genus: Dielsiothamnus diuricatus (Diels) R.E.Fr. is apparently restricted to Tanzania in trop. Africa, and to Malawi and Mozambique in stfn trop. A. The genus has affinities with Uvaria and Hexalobus.

Duguetia A.St-Hil.

Trees with stellate hairs. Flowers bisexual, solitary, paired or in few-flowered fascicles on short thick branches; bracts many, caducous; receptacle conical. Sepals 3, valvate, free. Petals 6, in 2 whorls, imbricate, inner slightly shorter than outer ones and caudate at apex. Stamens many, connective truncate at apex. Carpels many, connate at base and enclosed by receptacle; ovule 1, basal. Fruit a globose, to subglobose-ellipsoid syncarp composed of united monocarps.

Species ± 100, tropics of the New World and W Africa; stfn trop. A. confinis (Engl. & Diels) Chatrou, Angola (Cabinda).

Exellia Boutique

Climbers with simple hairs. Flowers unisexual, solitary or paired, axillary or extra-axillary, rarely terminal; buds subglobose; bracteoles 1. Sepals 3, valvate, ± united at base, much smaller than petals. Petals 6, free, valvate, in 2 whorls, inner ones smaller than outer ones, shortly clawed. Stamens 12–15, in 2 whorls; thecae lateral, longitudinally dehiscent; connective with truncate dilated apex. Carpels 3, free, cylindric-obconical; ovules 15–20, in 2 series; style absent; stigma conical. Monocarps 1–3, globose, indehiscent, sessile, many-seeded.


Friesielsia Steenis

Oxymitra (Blume) Hook. f. & Thompson.

Species ± 50–60, tropical Asia and Africa. According to Verducourt (1971a)
the African species are probably not properly placed in this genus; *Friesiodielisa oborata* (Benth.) Verde, has been recorded in sthn trop. Afr. from Angola, Zambia, Zimbabwe, Malawi, Mozambique, and in sthn Afr.

**Greenwayiodendron** Verde.


Tall trees with simple hairs. **Flowers** unisexual or bisexual, solitary or in few-flowered fascicles, leaf-opposed. **Sepals** 3, slightly imbricate. **Petals** 6, in 2 whorls, outer ones valvate, inner ones imbricate, subequal. **Stamens** numerous in male flowers, few in female flowers; filaments linear to linear-oblong; anthers extrorse, connectives with an ovate, oblong, tongue-shaped, sometimes tooth-shaped apex. **Carpels** 10–20, free, 1–3-ovulate; style obsolete; stigma compressed-globose to rhomboid, obscurely lobed. **Monocarps** 2–18, indehiscent, globose, distinctly stipitate.


**Hexalobus** A.D.C.


**Isolona** Engl.


Trees or shrubs, glabrous or with simple hairs. **Flowers** bisexual, solitary, or in paired, axillary, extra-axillary or cauliflorous; buds ovoid-subglobose; bracteoles or 3–4, small; receptacle convex. **Sepals** 3, valvate, small. **Petals** 6, equal, valvate, in 1 whorl, fused at base into a tube. **Stamens** many, in 3 or 4 whorls; filaments short or absent; connective with a truncate, dilated apex. **Carpels** united into a 1-locular ovary; ovules many; placenta parietal. **Fruit** a globose to ellipsoid, stipitate syncarp with a dry to woody pericarp. **x = 8.**


**Letestudoxa** Pellegr.


Climbers with simple or fascicled hairs. **Flowers** bisexual, solitary, extra-axillary or ± leaf-opposed; buds gloular to ovoid; receptacle convex. **Sepals** united into a calyptra, falling off by a circular slit. **Petals** 6, imbricate, in 2 whorls, free, ± equal. **Stamens** very many, sessile; connective with a truncate dilated apex. **Carpels** many; ovary ± cylindric, with base included in receptacle; ovule 1, basal. **Fruit** a globose syncarp with mericarps joined in their lower quarter.


**Mischogyne** Exell.


Shrubs with simple hairs. **Flowers** bisexual, in axillary or extra-axillary fascicles; buds ovoid to ellipsoid; receptacle long-cylindric. **Sepals** 3, valvate, shortly connate at base. **Petals** 6, valvate, in 2 whorls, subequal. **Stamens** many; connective without a prolonged apex. **Carpels** 4–40, free, cylindric, stigmas bilobed; ovules many, 2-seriate.

Species 2; sthn trop. Afr. 1: *Mischogyne michelioides* Exell, Gabon; Angola.

**Monanthotaxis** Baill.


*Enneostemon* Exell: 209, t. 1 (1932); Exell & Mendonça: 26 (1937/1951); Robson: 128 (1960); White: 52 (1962); Paiva: 58 (1966), conserved name. *Popowia* in sense of many authors, not of Endlicher (1839); Exell & Mendonça: 23 (1937/1951); Robson: 122 (1960); White: 52 (1962); Paiva: 34 (1966).


**Monodora** Dunal


**Neostenanthera** Exell


Erect trees with simple hairs. **Flowers** bisexual, solitary or in fascicles, extra-axillary or leaf-opposed; bracteeolate minute. **Sepals** 3, valvate. **Petals** 6, valvate, in 2 whorls, outer ones longer than inner ones, inner concave at base, spoon-shaped. **Stamens** many, connective with triangular apex; anther cells transversely seporate. **Carpels** many, free, cylindric, with 1 basal ovule. **Monocarps** fusiform, stipitate. **x = 8.**

Species 5, tropical America and Africa; sthn trop. Afr. 1: *Neostenanthera gabonensis* (Engl. & Diels) Exell (= *N. micrantha* Exell), Angola (Cubinda).

**Piptostigma** Oliv.


*Brieya* De Wild.; Exell: 11 (1926); *Boutique*: 304 (1951b).
Trees or small trees with simple hairs. **Flowers** bisexual, solitary, in few-flowered fascicles or in panicles, sometimes cauliflorous; buds conical or subglobose. **Sepals** 3, valvate, free. **Petals** 6, in 2 whors, valvate, outer ones much shorter than inner ones and ± equal to sepals, inner ones concave at base. ** Stamens** many, connectives with truncate, dilated apex; filaments very short to absent. **Carpels** 2–8, free, cylindric or ± prismatic, with 4–20 ovules in 2 series. **Fruit** of monocarps free or ± united at base, cylindric-ellipsoid, fleshy, indehiscent. **Seeds** ± horizontal, ellipsoid.


**Polyalthia** Blume


Trees, shrubs or undershrubs, sometimes polygamous. **Leaves** glabrous or with simple hairs. **Flowers** bisexual, or sometimes unisexual, solitary or in 2–several-flowered axillary or extra-axillary fascicles, leaf-opposed or supra-axillary; bracts and bracteoles present. **Sepals** 3, free or united at base, valvate or very slightly imbricate, much shorter than petals. **Petals** 6, free, valvate, in 2 equal or ± unequal whorls. **Stamens** usually many, free or united at base, cuneate, with flat-topped or slightly convex connectives. **Carpels** many, free; ovules 1 basal or 2–5 lateral; style nearly always absent; stigma subcapitate, globose or irregularly shaped. **Monocarps** few to many, globose to ovoid, indehiscent, mostly stipitate. **Seeds** horizontal.

Species 100, Old World tropics; sthn trop. Afr. 2, Angola (Cabinda), Zambia (exotic), Mozambique.

**Polyceratocarpus** Engl. & Diels


Trees or shrubs with simple hairs. **Flowers** bisexual or male, solitary or paired, axillary or extra-axillary, sometimes cauliflorous; buds subglobose; bracteoles present; receptacle subglobose or shortly cylindric. **Sepals** 3, united at base, valvate, much smaller than petals. **Petals** 6, free, in 2 valvate whors, subequal or outer ones slightly longer than inner ones. **Stamens** many, linear to cuneiform, subsessile; connective with a capitate or truncate, dilated apex. **Carpels** 4–20, free, oblong-cylindric; ovules ± 20, in 2 series. **Monocarps** cylindric, sessile or subsessile, slightly constricted between seeds.

Species ± 7, tropical W Africa; sthn trop. Afr. 3: Angola (Cabinda).

**Sphaerocoryne** (Boerl.) Scheff. ex Ridl.

Ridley: 8 (1917); Verdcourt: 293 (1966); Coates Palgrave: 205 (2002); Lebrun & Stork: 48 (2003).


Shrubs, small trees or climbing shrubs; branchlets black, glabrescent or with sparse simple hairs, rarely densely velvety but soon glabrous. **Leaves**: bases of petioles ± prominent; blades oblong-ovate or obovate, acuminate at apex, cuneate at base, dark green and sometimes glossy above. **Flowers** bisexual, solitary or paired, terminal or axillary, stalked; bracteole small. **Sepals** 3, free or ± connate, persistent in fruit. **Petals** 6, in 2 whors, valvate or inner ones somewhat imbricate and slightly shorter than outer ones, remaining closed for long period. **Stamens** many; filaments not developed; connectives with obliquely capitate apex. **Carpels** 18–30, cylindric or oblong; ovules 1(2), near base. **Monocarps** ± 2–20, stipitate.

**Sphaerocoryne gracilis** (Engl. & Diels) Verdc. from tropical East Africa and Angola. Zambia and Mozambique probably belongs to a new genus [Verdcourt: 293 (1986); Kessler: 120 (1993)].

**Toussaintia** Boutique

Boutique: 97 (1951a); Boutique: 278 (1951b); Le Thomas: 29 (1969); Kessler: 113 (1993); Lebrun & Stork: [48] (2003).

Climbers with simple hairs. **Leaves** shortly petiolate, elliptic-oblong, with dense, fine reticulum. **Flowers** bisexual, solitary or in 2-flowered cymes, axillary or supra-axillary. **Sepals** 3, valvate. **Petals** 6–10, imbricate, in 2(3) whorls, subequal. **Torus** developed into an androgyrnophore. **Stamens** very many; filaments short; thecae linear, extrorse; connectives with a dilated, truncate apex; pollen in tetrads. **Carpels** many; ovules 14–20, in 2 rows; ripe carpels unknown.


**Uvaria** L.


**Uvariastrum** Engl.


Small trees, much branched, evergreen, glabrous or with simple hairs; bark flaking; branches plant, pendulous. **Leaves** petiolate, elliptic to oblong or oblongolate. **Flowers** bisexual (rarely unisexual), solitary or paired, axillary, sometimes on old wood; buds conic; bracteole 1, usually caducous. **Sepals** 3, valvate, free, enclosing petals and with margins folded to form ± prominent longitudinal wings in bud, often densely brown-pubescent. **Petals** 6, in 2 whors; inner whorl imbricate, expanding and spreading at anthesis, free, subequal; outer whorl usually slightly longer. **Stamens** many, linear, with thecae extrorse, and prolongations of connective ± capitellate. **Carpels** 3–10 or sometimes more numerous, free, cylindric or obconic, sometimes ± angular, with many ovules in two rows; style very short or absent; stigma ± expanded, bilobed or irregular; ripe carpels indehiscent, succulent (?) or sometimes dry), ellipsoid to cylindric, shortly stipitate, many- to few-seeded. **Seeds** ± horizontal; aril absent.

Species 8, trop. Africa; sthn trop. Afr. 1: **Uvariastrum hexaloboides** (R.E.Fr.)
DICOTYLEDONS

Uvariodendron (Engl. & Diels) R.E.Fr.


Uvaria sect. Uvariodendron Engl. & Diels

Shrubs or trees, not climbing, with simple hairs. Flowers bisexual, solitary or paired, axillary, sometimes on old wood; buds depressed-globose; bracteoles 2–6, usually biseriate, forming an involucre in sessile flowers. Sepals 3, valvate, free or united at base, not enclosing petals in bud, with plane margins, densely brown- or golden-sericeous outside, glabrous or united at base, not enclosing petals in bud, with plane margins, densely brown- or golden-sericeous outside, glabrous within. Petals 6 in 2 whorls, outer suberolate, inner valvate above and open below, expanding and spreading at anthesis or inner whorl remaining connivent at apex, free, subequal, thick. Stamens very many, linear, with thecae lateral or extrorse and prolongations of connective capititate. Carpels many, cylindric, with many ovules in 2 rows; style very short; stigma sessile, cylindric or depressed-obconic; ripe carpels indehiscent, ovoid or ellipsoid to cylindric, straight, subcylindric, many-seeded. Seeds ± horizontal; aril absent.

Species ± 12, trop. Africa; sthn trop. Afr.: 1. Uvariodendron molundense (Engl. & Diels) R.E.Fr., Angola (Cabinda). An unnamed species is also recorded from Mozambique by Robson (1960). The genus differs from Uvariastrum in the shape of the buds and in the sepals, which do not enclose the petals in bud. It is closely related to Polyceratocarpus Engl. & Diels in which the inner petals are wholly contiguous and the fruits are usually curved.

Uvariosiopsis Engl.


Tetrastemma Diels ex H.Winkl.

Shrubs or trees, not climbing, with simple hairs; monoeocious or dioecious. Flowers solitary or in fascicles, axillary, sometimes on old wood, pedicellate; female larger than male; bracteoles 2, respectively basal and median, ± persistent. Sepals 2, connate to form a bilobed or patelliform calyx, much shorter than petals in bud. Petals 4, in one whorl, valvate, expanding and spreading at anthesis, free or ± connate, subequal, thick. Stamens very many, oblong-obovoid, with thecae extrorse; prolongation of connective absent or very short; filaments absent or very short. Carpels many, free, obovoid, pubescent, with many biseriate ovules; stigma sessile, cylindric or depressed-obconic; ripe carpels indehiscent, succulent, cylindric or ellipsoid to obovoid, frequently constricted, stipitate, several-seeded. Seeds horizontal; aril absent.


XYLOPIA L.


References


BLUME, C.L. 1830. Flora javana. Frank, Bruxelles.


Aphloiacae
(Dilleniide—Violales)
(Eurosidae I—Malpighiales)

Trees or shrubs; cyanogenic glycosides absent. Leaves alternate, simple, narrowly elliptic or oblanceolate, serrated or sometimes incised, petiolate; stipules minute, caducous. Inflorescences axillary, few-flowered fascicles or racemes, or flowers solitary. Flowers bisexual, regular. Sepals 4 or 5(6), fused basally, imbricate, orbicular, concave, somewhat leathery. Petals 0. Disc and disc glands 0. Stamens many, arising outside or towards margin of disc; filaments free, terete, longer than sepals; anthers short, without appendages. Ovary superior, 1-locular, with few to several ovules on a single parietal placenta; style short, stigma peltate. Fruit a fleshy berry with ± 6 seeds. Seeds obovoid or globose; testa incurved, crustaceous; endosperm thin; embryo incurved, cotyledons ovate. 

Genus 1, species 1, polymorphic, E trop. Africa, Madagascar, Mascareignes, sthn trop. Afr.

Bredenkamp, C.L. in Leistner: 305 (2000), under Flacourtiaceae.

Takhtajan: 203 (1997); Chase et al.: 174 (2002). See under Flacourtiaceae (in broad sense) for a discussion of the separation of this family from Flacourtiaceae.

Aphloia (DC.) Benn.

Bennett: 192 (1840); Wild: 279 (1960); White et al.: 266 (2001); Coates Palgrave: 760 (2002); Bingham (Unpublished); Mapaura (Unpublished).

Description as for family.


References


**Key to genera**

1a Fruit (and to some extent the ovary) with silky to bristly or vescicular hairs, or straight to variously hooked spines:

2a Fruit with papillae, tubercles or vescicular hairs:

3a Flowers in dense heads surrounded by an involucre of partly fused stiff bracts; upper leaves with bristles around the margin ................. **Alepidia**

3b Flowers distinctly in umbels, if subcapitate then without an involucre of stiff, partly fused bracts:

4a Rigid, broom-like undershrubs with few to scale-like stem leaves ................................................................................. **Deverra**

4b Leafy annual to perennial herbs with leaves often mainly basal:

5a Bracts and bracteoles below the umbels conspicuous ........................................................................................................ **Physotrini**

5b Bracts and bracteoles below the umbels absent .................................................................................................................. **Pimpinella**

2b Fruit with silky to bristly hairs or straight to variously hooked spines:

6a Leaves simple or palmately lobed to palmately compound:

7a Bracts and bracteoles below the umbels present; fruit with long, hooked spines ........................................................................ **Sanicula**

7b Bracts and bracteoles below the umbels absent; fruit with silky to bristly hairs ........................................................................... **Pimpinella**

6b Leaves pinnate, palmately lobed or several times divided, sometimes basal leaves simple:

8a Fruit with silky to bristly hairs:

9a Leaves with strongly developed sheathing base; bracts and bracteoles conspicuous ........................................................................ **Diplolophium**

9b Leaves without prominent sheathing base; bracts and bracteoles absent .............................................................................. **Pimpinella**

8b Fruit with spines usually tipped with hooked hairs:

10a Spines arranged in distinct rows on the secondary ribs:

11a Involucral bracts entire .................................................................................. **Agrocharis**

11b Involucral bracts pinnatisect ........................................................................... *Daucus*

10b Spines not in distinct rows:

12a Ultimate leaf segment triangular-ovate .............................................................................................. **Torilis**

12b Ultimate leaf segment linear ...................................................................................... **Angoseseli**

1b Fruit and ovary glabrous:

13a Trees, shrubs or subshrubs with substantial woody caudex; leaves simple, ternate or 1-pinnate:

14a Leaves/leaflets entire; one mericarp with one (the central) dorsal rib winged and the other with two (the intermediate) dorsal ribs winged ....

.............................................................................................................................................................. **Heteromorpha**

14b Leaflets distinctly toothed, the teeth terminating in fine bristly points; fruit with both mericarps similarly winged ................. **Steganotaenia**

13b Annual, biennial or perennial herbs:

15a Flowers in dense heads surrounded by an involucre of partly fused stiff bracts; upper leaves with bristles around the margin ........... **Alepidia**

15b Flowers distinctly in umbels, if subcapitate then without an involucre of stiff, partly fused bracts:

16a Mericarps strongly dorsosentally compressed (measured without wings twice as wide as thick or wider):

17a Leaves 1-pinnate with 3–7 pairs of roundish to ± ovate, irregularly incised-toothed leaflets ........................................... **Heracleum**

17b Leaves mostly 2- or more pinnate or -pinnatisect, or 2-ternate, rarely simple:

18a Peduncles very slender ......................................................................................... **Lefelebvre**

18b Peduncles relatively stout and stiff:

19a Annual herbs; leaves compound-pinnate with filiform ultimate segments; petals bright yellow ........................................... *Anethum*

19b Perennial, rarely biennial or annual herbs; leaves, if compound-pinnate, with broader ultimate segments; petals white, cream or greenish yellow or purplish:

20a Mericarps without wings on the dorsal ribs; petals white, cream or greenish yellow .................................................................. **Pseudoladanum**

20b Mericarps with wings on the 3 dorsal ribs; petals purplish ...................................................................................... **Pseudoselinum**

16b Mericarps not strongly dorsosentally compressed, less than twice as broad as thick:

21a Leaves 1-pinnate:

22a Leaflets usually in more than 18 pairs, somewhat coriaceous, overlapping when young .................................................. **Afrocarum**

22b Leaflets in usually fewer than 16 pairs, not leathery, not overlapping when young:

23a Leaflets regularly neatly denticulate, each tooth with a carallaginous white macro incurved over the base of the next tooth .......... **Sium**

23b Leaflets irregularly dentate; macro on teeth not incurved over the next tooth ................................................................. **Berula**

21b Leaves mostly 2- or more pinnate, or 2-ternate, rarely simple:

24a Leaves strongly resembling leaves of *Ceratophyllum*: broadly linear to strap-shaped in outline, 3-pinnate with very finely divided ultimate segments .......................................................................................................................... **Frommii**

24b Leaves broader in outline and often finely divided:


Sthn trop. Afr.: genera 25, species 60.
25a Calyx teeth obvious, even in fruit ................................................................. *Coriandrum
25b Calyx teeth obscure or obsolete in fruit:

26a Bracts and bracteoles well-developed:
    27a Ultimate leaf segments linear, entire ......................................................... Aframmi
    27b Ultimate leaf segments broader than linear, variously cut or toothed ........... Conium

26b Bracts and bracteoles absent:
    28a Many umbels are ± sessile ........................................................................... Apium
    28b All umbels pedunculate:
        29a Glabrous, glaucous herbs with strong aniseed odour; leaves continually dissected in fine, very slender segments. ...

............................................................................................................................ *Foeniculum

29b Herbs of varying habit and colour, often at least shortly sparsely hairy, with aniseed odour; leaves various but not dissected in very slender segments throughout .............................................. Pimpinella

**Aframmi** C.Norman


Biennial or perennial herbs. **Leaves** finely divided. **Flowers** in terminal and lateral umbels with long wiry rays; bracts and bracteoles well-developed; bracts entire or slightly pinnatifid, probably frequently semicaducous. **Calyx**: teeth broadly triangular. **Petals** with inflexed apex, yellowish green. **Disc** with undulate margin. **Styles** short, divergent; stigmatic surfaces slightly clubbed; stylopodium low-conical. **Fruit** ovate to obovate, slightly laterally compressed; ribs well-developed, obuse; vittae large, 1 in each interval and 2 in commisural surface.


**Africanum** Rauschert


Perennial herbs. **Leaves** imbricated when young and bearing spinous cartilaginous teeth. **Flowers** in compound umbels; bracts and bracteoles many and well-developed. **Calyx**: teeth obsolete. **Petals** suborbicular to broadly obcordate, apex emarginated with an inflexed point. **Style** short, stiff, erect, slightly divergent; stigmatic surfaces slightly thickened; stylopodium well-developed, conical with a thickened, undulate margin. **Fruit** ovoid, slightly laterally compressed; ribs filiform but quite distinct. **Fruit**: mericarps pentagonal in section; commisural face flat; vittae 1 in each interval and 2 in commisural face. **Seed** with flat commisural face.

Monotypic genus: *Africanum inbricatum* (Schinz) Rauschert, centered in sthn trop. Afr., Angola, Zambia, Zimbabwe, Malawi, Mozambique; but also in Zaire and S Tanzania.

**Agrocharis** Hochst.


**Alepeidea** F.Delaroche


**Anethum L.**


Robust, rather glabrous annual herbs, with a strong characteristic odour; stem terete, with many fine grooves. **Leaves** 3- or 4-pinnate, ultimate segments narrowly linear to filiform. **Flowers** in terminal, compound umbels, equalled or exceeded by long-peduncled laterals; rays many, up to 40 mm long; bracts and bracteoles 0; partial umbels with up to 35 flowers, but those of small plants may have as few as 6. **Sepals** obsolete. **Petals** yellow with an obvious incurved apex. **Fruit** elliptic, strongly dorsiventrally compressed, with a moderately well-developed marginal wing paler in colour than body of fruit; stylopod low-conical; styles short, clubbed at apex, divergent and shed before fruit matures; dorsal ribs filiform; carpophore 2-cleft to base; vittae well-developed, 1 per interval and 2 in commisural face.

Monotypic genus: *Anethum graveolens* L., the culinary herb Dill, locally escaped from cultivation in Mozambique.

**Angoseseli** Chiov.


*Caucalis in the sense of Hiern: 432 (1898).*

Annual herbs dichotomously branched from base. **Leaves** pinnatisect with ultimate segments linear. **Flowers** in leaf-opposed and terminal umbels; bracts and bracteoles narrowly linear. **Calyx**: lobes obsolete or concealed by whitish hairs of densely setose ovary. **Petals** incurved at apex, broadly obovate. **Stamens** exserted; anthers violet. **Fruit** ovoid, laterally compressed; carpels almost terete; ribs not prominent, densely setose with irregularly arranged whitish prickles; vittae all solitary; stylopod conical, ± free from axis of bipartite carpophore; styles divaricate to nearly deflexed. **Seeds** somewhat dorsally compressed, broadly furrowed or almost hollowed on commisural face.

Monotypic genus: *Angoseseli mossamedensis* (Welw. ex Hiern) Norman, Angola.

**Apium** L.


Berula W.D.J.Koch

Monotypic genus: *Berula erecta* (Huds.) Coville, cosmopolitan weed recorded in sthn trop. Afr. from Angola and Zimbabwe, and from sthn Afr.

Conium L.

Sthn trop Afr. 1: *Conium maculatum* L., Hemlock, highly poisonous, cosmopolitan weed recorded from Zimbabwe, and Mozambique, and from sthn Afr.

*Coriandrum L.*


*Daucus L.*


Deverra DC.

Pituranthos Viv., illegitimate name.


Diplolophium Turcz.

Physotrichia Hiern, in part.


*Foeniculum Mill.*


Frommia H.Wolff

Presinuous herbs with a robust woody rootstock; base of stem with persistent fibrous remains of old leaf bases; stem terete, hollow, with fine striations. *Leaves* 3-pinnate, *Ceratophyllum*-like, with very finely divided ultimate segments, mostly grouped near base of stem. *Flowers* in compound umbels with ±7 fine rays; bracts and bracteoles 0. *Calyx*: teeth obsolete. *Petals* strongly inflamed apices. *Fruit* pyriform when mature; stylopodium low-conical; styles short, blunt and deflexed; mericarps slightly dorsally compressed, ribs only slightly developed; vittae prominent in mature fruit: 3 in each furrow and ±6 on commissural face; carphophore slightly 2-fid at apex. *Seed*: endosperm somewhat curved on inner face.

Monotypic genus: *Frommia ceratophylloides* H.Wolff, S Tanzania and adjoining parts of Zambia and Malawi.

Heracleum L.

Perennial or biennial herbs, with fleshy to woody taproots; stem terete, solid, rather coarsely striate with clearly marked ridges. *Leaves* pinnately divided, usually with 3–7 pairs of broad segments and 1 terminal one, petiole sheathing at base. *Flowers* in compound umbels; rays 7–14, subequal; bracts 0; bracteoles several. *Calyx*: teeth minute or obsolete, unequal. *Petals* white (sometimes flushed with pink, especially in bud), often markedly unequal and radiate, those on outer margin of umbel much larger than those on inside, whole umbel therefore tending to function like a capitulum in attracting insects, although individual flowers remain quite distinct. *Fruit* orbicular to broadly obovate, very strongly dorsally compressed, with a broad commissure; marginal ridges expanded to form a broad wing, dorsal ones filiform; wings somewhat thickened and closely appressed to those of opposing mericarp; vittae solitary in intervals, clearly visible from exterior, and tending to be club-shaped, narrowing towards base, with 2 on commissural face.

Species 65, N temperate and tropical mountains; sthn trop. Afr. 1: *Heracleum abyssinicum* (Boiss.) Norman, reaching its southern limit on the Nyika Plateau, Malawi.

Heteromorpha Cham. & Schldtl.

Annesorhiza Cham. & Schldtl.; Norman: 200 (1929). *Bupleurum in sense of Norman: 234 (1933).*


Lefebvrea A.Rich.

Robust, glabrous biennial or perennial herbs; stems terete, finely and regularly grooved. *Leaves* 2-ternate or 2-pinnate (often rather irregularly so); leaflets linear to lanceolate. *Flowers* in terminal and lateral compound umbels with 10–30 rays; bracts 0–2; bracteoles few to several but probably caducous. *Calyx*: teeth minute or 0. *Petals* pale yellow to greenish white, with inturned apices. *Fruit* broadly elliptic to pyriform, very strongly dorsiventrally compressed with a broad commissure; lateral wings very well-developed and surrounding stylopodium at apex; dorsal ribs filiform, stylopodium well-developed, conical to elongate-conical; vittae large and conspicuous, 1 per interval and 2 on commissural face; carphophore divided to base.

Species 6, trop. Africa; sthn trop. Afr. 3, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr. A rather poorly defined generic group of
5–10 species widely distributed in trop. Africa. Its relationship to *Peucedanum* is in grave need of clarification.

**Peucedanum L.**


**Physotrichia Hiern**


**Pseudoselinum**

**Sium L.**


**Steganotaenia Hochst.**


**Torilis Adans.**


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Seed plants of southern tropical Africa: families and genera

describes the subfamilies of the Apocynaceae, including the key to genera and some notes on species of Peucedanum.

Apocynaceae (in broad sense)

(Asteridae—Gentianales)

(Euasterids I—Gentianales)


The classification of the Apocynaceae reflected here and the keys to subfamilies and tribes are based on Endress & Bruyns (2000). See also Endress (2001) and Omino (2002). The keys to genera are adapted from Leeuwenberg (2001), Omino (1996) and Victor et al. (2000). The key to genera of the Asclepiadaceae is very tentative as the group still requires much further study (Meve 2002).


Key to the subfamilies of the Apocynaceae (in broad sense)

1a Anthers free from the style head; aestivation of corolla lobes in bud typically sinistrorse (overlapping to the left), rarely dextrorse; fruit dehiscent or indehiscent, syncarpous or apocarpous, a berry, drupe, follicle, or capsule; seeds naked, with wings, or arils, but almost never with a coma (tuft of hairs) at one end ................................................................. Rauvolfioideae (Plumerioideae) [below]

1b Anthers adnate or ± adherent to the style head; aestivation of corolla lobes in bud dextrorse (overlapping to the right) or valvate, rarely sinistrorse; fruit dehiscent, almost always apocarpous, a pair of follicles, sometimes reduced to one by abortion or postgenitally fused; seeds small, compressed, almost always with a coma at one end:

2a Anthers 4-locular, adherent to style head by hairs or secretions, lower part often sterile; style head secretions for pollen transport normally a foamy adhesive or gummy, undifferentiated translators; nectaries, if present, in a ring around the base of the ovary ................................................................. Apocynoideae [p. 61]

2b Anthers 2- or 4-locular, adnate to style head, fertile through style, filaments free or fused; pollen shed as tetrads or gathered in pollinia; style head secretions for pollen transport forming differentiated translators with a sticky end (viscidium) or pollinaria consisting of 2(4) pollinia attached by flexible arms (caulicles) to a sticky clip (corpuscle); nectaries located in alternistaminal troughs at base of filaments or staminal column:

3a Pollen shed in tetrads into spoon-shaped translators with a sticky end which can adhere to a pollinator for removal; anthers 4-locular ................................................................. Periplocoideae [p. 63]

3b Pollen gathered in pollinia attached in pairs (or 4s) to a ± spherical corpuscle which can become attached to a pollinator for removal; anthers 2- or 4-locular:

4a Anthers 4-locular; pollen gathered in 4 very small pollinia attached to a soft, pale corpuscle .................................................. Secamonoideae [p. 63]

4b Anthers 2-locular; pollen gathered in 2 pollinia attached to a dark hard corpuscle .................................................. Asclepiadoideae [p. 63]

Subfamily Rauvolfioideae (Plumerioideae)

Sthn trop. Afr.: genera 24, species 72.

Key to tribes of Rauvolfioideae (only for sthn trop. Afr.)

1a Anthers usually sagittate at the base and with lignified gynostegial grooves (guide rails); fruit fleshy, either a pair of dehiscent follicles with arillate seeds or an indehiscent berry ................................................................. Tabernaemontanaceae (Genera 7, species 16: Callichil, Carvalhoa, Crucaea, Schizozygia, Tabernaemontana, Tabernance, Voacanga)

1b Anthers some of the subfamilies and tribes are based on Endress & Bruyns (2000). See also Endress (2001) and Omino (2002). The keys to genera are adapted from Leeuwenberg (2001), Omino (1996) and Victor et al. (2000). The key to genera of the Asclepiadaceae is very tentative as the group still requires much further study (Meve 2002).


Key to the subfamilies of the Apocynaceae (in broad sense)

1a Anthers free from the style head; aestivation of corolla lobes in bud typically sinistrorse (overlapping to the left), rarely dextrorse; fruit dehiscent or indehiscent, syncarpous or apocarpous, a berry, drupe, follicle, or capsule; seeds naked, with wings, or arils, but almost never with a coma (tuft of hairs) at one end ................................................................. Rauvolfioideae (Plumerioideae) [below]

1b Anthers adnate or ± adherent to the style head; aestivation of corolla lobes in bud dextrorse (overlapping to the right) or valvate, rarely sinistrorse; fruit dehiscent, almost always apocarpous, a pair of follicles, sometimes reduced to one by abortion or postgenitally fused; seeds small, compressed, almost always with a coma at one end:

2a Anthers 4-locular, adherent to style head by hairs or secretions, lower part often sterile; style head secretions for pollen transport normally a foamy adhesive or gummy, undifferentiated translators; nectaries, if present, in a ring around the base of the ovary ................................................................. Apocynoideae [p. 61]

2b Anthers 2- or 4-locular, adnate to style head, fertile through style, filaments free or fused; pollen shed as tetrads or gathered in pollinia; style head secretions for pollen transport forming differentiated translators with a sticky end (viscidium) or pollinaria consisting of 2(4) pollinia attached by flexible arms (caulicles) to a sticky clip (corpuscle); nectaries located in alternistaminal troughs at base of filaments or staminal column:

3a Pollen shed in tetrads into spoon-shaped translators with a sticky end which can adhere to a pollinator for removal; anthers 4-locular ................................................................. Periplocoideae [p. 63]

3b Pollen gathered in pollinia attached in pairs (or 4s) to a ± spherical corpuscle which can become attached to a pollinator for removal; anthers 2- or 4-locular:

4a Anthers 4-locular; pollen gathered in 4 very small pollinia attached to a soft, pale corpuscle .................................................. Secamonoideae [p. 63]

4b Anthers 2-locular; pollen gathered in 2 pollinia attached to a dark hard corpuscle .................................................. Asclepiadoideae [p. 63]

Subfamily Rauvolfioideae (Plumerioideae)

Sthn trop. Afr.: genera 24, species 72.

Key to tribes of Rauvolfioideae (only for sthn trop. Afr.)

1a Anthers usually sagittate at the base and with lignified gynostegial grooves (guide rails); fruit fleshy, either a pair of dehiscent follicles with arillate seeds or an indehiscent berry ................................................................. Tabernaemontanaceae (Genera 7, species 16: Callichil, Carvalhoa, Crucaea, Schizozygia, Tabernaemontana, Tabernance, Voacanga)

1b Anthers rarely sagittate at the base, without lignified gynostegial grooves; fruit fleshy or dry, berries, drupes, follicles, or capsules; arils absent:

2a Fruit indehiscent, a berry; leaves almost always opposite:

3a Ovary consisting of 2–5 separate carpels; pericarp mostly fibrous ................................................................. Hunterieae (Genera 3, species 5: Hunteria, Picealima, Pleiocarpa)

3b Ovary consisting of 2 partly fused carpels; pericarp not fibrous:

4a Placentas becoming lignified in fruit, forming a thin woody partition; spines are often present in leaf axils; indole alkaloids absent .... Carisseae (Genera 2, species 8: Acakanthera, Carissa)

4b Placentas not lignified in fruit; without spines in leaf axils; indole alkaloids present:

5a Corolline corona scarcely discernible; shrubs or small trees ................................................................. Melodineae (Genus 1, species 1: Diplorhynchus)

5b Corolline corona absent; trees, shrubs, or lianes (the latter often with tendrils) .................................................. Willughbieae (Genera 8, species 34: Ancylobotrys, Chamaecitandra, Clistandra, Cylindropsis, Dictyophleba, Landolphia, Saba, Vahadenia)

2b Fruit either indehiscent or dehiscent, but not a berry; leaves opposite, alternate or whorled:
6a Seeds without wings or hairs, sometimes with flattened edge, but without well-developed wing(s) or hairs on margin; fruit indehiscent and drupeaceous or a pair of dehiscent follicles; style head mostly with basal collar; disc mostly present; herbs, shrubs or trees .......................... Vincae
   (Genera 2, species 6: Catharanthus, Rauvolfia)

6b Seeds mostly with well-developed (often membranous) wing(s) or hairs on margin; fruit usually a pair of dehiscent follicles; style head with or without a basal collar; disc mostly absent or adnate; trees, shrubs or lianas:
   7a Corolline corona absent; anthers without apical or basal extensions; leaves whorled, sometimes opposite .............................................................................. Alstionieae
      (Genus 1, species 2: Alstonia)
   7b Corolline corona often present as small lobes in throat or ridges behind anthers; anthers sometimes with short, sterile appendages; leaves opposite; plants of the Old World .......................................................................................................................... Melodineae
      (Genus 1, species 1: Diplorhynchos)

For key to genera of Rauvolfioideae see under Apocynoideae (below).

Subfamily Apocynoideae

Sthn trop. Afr.: genera 12, species 57.

Key to tribes of Apocynoideae (only for sthn trop. Afr.)

1a Style head spool-shaped, slender in the middle, greatest in diameter at the base; a membranous collar is usually present at the base; a disc is absent or present ............................................................................................................................................................................ Wrightieae
   (Genera 4, species 24: Adenium, Placoceras, Strophanthus, Wrightia)

1b Style head globose with slender, elongate, conical apex or broadly ovoid to broadly fusiform, broadest at about the middle and tapering at both ends, or style head cylindric with 5 vertical ribs; a membranous collar is absent at the base; a disc is almost always present:
   2a Style head globose with slender, elongate, conical apex, ± round in cross section; anthers attached (sometimes only very weakly so) at about the middle of the style head; thecae are free; a chalazal zone is often present; mostly trees, sometimes lianas .................................................. Malouetieae
      (Genera 5, species 15: Alafia, Funtumia, Holarrhena, Mascarenhasia, Pachypodium)
   2b Style head broadly ovoid to very broadly fusiform; stamens generally arising near the base of the corolla; anthers attached to the style head by a slender tuft of hairs with a broader sweeping brush of hairs below this; ovary often semi-inferior .......................................................... Apocynae
      (Genera 3, species 18: Baissea, Motandra, Oncinotis)

Key to genera of Apocynoideae and Rauvolfioideae (Plumerioideae)

[adapted from Leeuwenberg (2001) and Omino (1996)]

1a Leaves alternate:
   2a Plants spiny and succulent ...................................................................................................................................................................................... Pachypodium
   2b Plants not spiny, succulent; corolla ample, pink .................................................................................................................................. Adenium

1b Leaves opposite or whorled:
   3a Leaves whorled:
      4a Ovary composed of 2–5 separate carpels ........................................................................................................................................................................ Pleiocarpa
      4b Ovary composed of 2 partly fused carpels:
         5a Leaves dull glaucous beneath, with many dense straight secondary veins; large trees; fruits long, slender, dry follicles; seeds with hairs chiefly at both ends .............................................................................................................................................................. Alstonia
         5b Leaves green beneath; secondary veins not dense, usually curved; small trees or shrubs ............................................................................. Rauvolfia
   3b Leaves opposite, sometimes subopposite:
      6a Ovary composed of 2–5 separate carpels; pericarp often fibrous:
         7a Sepals completely glabrous on both sides; style head subglobose to oblong; inflorescence sessile, predominantly axillary and on old wood; bracts shorter than 0.4 mm .................................................................................................................................................................. Pleiocarpa
         7b Sepals glabrous outside, with colleters inside; style head with a stigmatic oblong to subglobose basal part and a stigmoid apex up to 1.5 mm long; inflorescence predominantly terminal and sometimes axillary; bracts at least 0.5 mm long:
            8a Sepals imbricate even at anthesis, (3.5–)5.5–7.5 mm long, with colleters covering up to 1/4 of their length; testa coriaceous; cotyledons with secondary nerves; fruits 110–200 x 80–150 mm, wall very hard and very fibrous .............................................................................................................................. Picralima
            8b Sepals imbricate in bud, 7–25 mm long, with colleters covering up to almost half of their length; testa membranaceous; cotyledons without visible secondary nerves; fruits 20–50 x 10–50 mm, wall mostly fleshy ................................................................................................. Hunteria
      6b Ovary composed of 2 partly fused carpels; pericarp not fibrous:
         9a Spiny shrubs, climbers or sometimes trees; corolla white or pink; fruit a red to black berry ............................................................................................... Carissa
         9b Spineless plants; corolla variously coloured; fruit baccaceous or capsular:
            10a Herbs or undershrubs; corolla with a narrow almost cylindrical tube and a wide flat limb, white and/or pink ......................... *Catharanthus roseus
            10b Plants woody; corolla various:
               11a Corolla lobes overlapping to the left:
                  12a Carpels completely fused:
                     13a Trees or shrubs:
                        14a Repeatedly dichotomously branched shrub with clearly pedunculate inflorescences in the forks; corolla pale yellow with red, purple or violet stripes or dots; fruits orange, often bumpy, 29–64 mm long, resembling mandarins or limes ........................................................................................................................................................................ Tabernanthe iboga
1b Carps nearly free:

25a Inflorescences of elongate, branched terminal panicles:
   19a Anthers keeled along the back; ovary and fruit glabrous; stipules absent ........................................... \textit{Ancylobotrys}
   19b Anthers not keeled; ovary glabrous and fruit usually glabrous; stipules interpetiolar, early caducous ..........
       \hfill \textit{Dictypophleba}

30b Corolla tube almost cylindric, contracted at the mouth, widest just above the base and therefore often
     lumpy and separate and with soft blunt prickles............................................................

32a Corolla tube campanulate, not contracted at the mouth, \( \pm \) as long as the corolla tube; corolla lobes often longer than the tube ................\textit{L. fasswelleri, L. lanceolata and L. thollonii} \hfill \textit{Landolphia}
32b Corolla tube almost cylindric, contracted at the mouth, widest just above the base and therefore often
     lumpy and separate and with soft blunt prickles............................................................

11b Corolla lobes overlapping to the right:

33a Repeatedly dichotomously branched shrubs; inflorescences in the forks .............................................. \textit{Schizozygia}
33b Trees or shrubs; corolla lobes not caudate:
   34a Repeatedly dichotomously branched shrubs; inflorescences in the forks .............................................. \textit{Schizozygia
34b Shrubs or trees, not repeatedly dichotomously branched; inflorescences terminal and/or axillary:

35a Leaves with domatia, often consisting of pits ................................................................. Funetania

35b Leaves without domatia (see also Funetania africana):

36a Fruit a drupe with a fleshy mesocarp; peduncle usually longer than 20 mm; corolla slightly irregular ........ Rauvolfia

36b Fruit a dry follicle; peduncle up to 10 mm long; corolla regular:

37a Corolla lobes conduplicate in bud, ovate, acute or acuminate, tube clearly widened around the stamens; leaves coriaceous ................................................................................................................................................... Mascarenhasia

37b Corolla lobes not conduplicate, narrowly obovate, rounded or nearly so, tube cylindric, not widened around the stamens; leaves herbaceous, papyry when dry ........................................................................................................................................ Holarrhena

33b Climbers, if shrubs then corolla caudate:

38a Corolla with paired corona appendages between the (frequently long-tailed) corolla lobes; when corolla lobes not long-tailed then tube 24–45 mm long .............................................................................................................................. Strophanthus

38b Corolla with non-paired corona lobes or without corona; tube shorter than 10 mm; if corolla tube up to 21 mm long then stamens exerted:

39a Supra-axillary glands absent on the petiole; corolla limb usually spreading or recurved ................................................. Alafia

39b Supra-axillary glands present on the petiole; corolla limb often suberect:

40a Inflorescence terminal; follicles widest near the base, with a deciduous brown tomentum ........................................ Motandra

40b Inflorescence axillary and often at the same time terminal; follicles widest near the middle or cylindric:

41a Anther tails straight, acute; corolla lobes 0.6–2.9 mm long, often suberect or halfway recurved; follicles narrowly cylindric, up to 0.5(–1) m long, mostly up to 10 mm in diameter .................................................... Baisea

41b Anther tails curved, obtuse; corolla lobes 1.7–7.3 mm long, usually spreading; follicles from less than 10 mm to 60 mm wide ............................................................................................................................................. Oncinotis

Subfamily Periplocoideae

Sthn trop. Afr.: genera 8, species 35.

Key to genera of Periplocoideae

1a Gymnostegium enclosed and concealed within the corolla tube:

2a Corona lobes arising in the mouth of the corolla tube .............................................................................................................. Stomatostemma

2b Corona lobes arising lower down in the corolla tube, mostly around the middle of the tube ................................................... Cryptolepis

1b Gymnostegium exserted from the mouth of the corolla:

3a Corolla tube well defined, broadly campanulate to cylindric; stamens arising at or near the mouth of the corolla tube .................. Raphionacme

3b Corolla rotate, lobed almost to the base; stamens arising ± from the base of the corolla:

4a Corona small, annular, shortly 5-lobed; translators rhombic, deeply cleft ............................................................................. Batesanthis

4b Corona relatively large; translators spatulate:

5a Corona lobes broadly obcordate, usually with a linear dorsal appendage ............................................................................. Mondia

5b Corona lobes ± filiform to linear, simple or divided:

6a Stamens hairy ........................................................................................................................................................................... Periploca

6b Stamens glabrous:

7a Corona lobes linear to very narrowly ovate or obovate; corona double: outer one fused into a basal ring with 5 linear segments often bifid at apex; inner one of 5 free filiform segments; pollen in pollinia ........................................................................................................ Schlechterella

7b Corona lobes broadly ovate to oblound-ovate; corona simple, of filiform to narrowly ovate segments; pollen in tetrads ............ Tacazzea

Subfamily Secamonoideae

Sthn trop. Afr.: genus 1, species 11.

Only genus in sthn trop. Afr. ......................................................................................................................................................... Secamone

Subfamily Asclepiadoideae


Key to tribes of Asclepiadoideae (only for sthn trop. Afr.)

1a Pollinia pendent ................................................................................................................................................................. Asclepiadeae

1b Pollinia erect:

2a Pollinia with insertion crest:

3a Insertion crest present on inner or lower edge of pollinium; coronal elements absent beneath gymnostegial grooves ................. Marsdeniaceae

(Genera 4, species 12: Ciborithza, Fockea, Gongronema, Telosma)

3b Insertion crest present on upper or outer edge of pollinium; coronal elements present beneath gymnostegial grooves ................. Ceropogieae

(Genera 12, species 110: Brachystema, Ceropogia, Duvalia, Hoodia, Huernia, Neeschumannia, Orbea, Orphanhiera, Riocrewia, Sixyranthus, Stapelia, Tavaresia)

2b Pollinia without insertion crest:
4a Carpels narrowing gradually into a slender neck below the style head; anther appendages with a basal horizontal slit .................. Asclepiadeae

(Genera 24, species 110: Aidomene, Asclepias, Aspidoglossum, Calotropis, Cynanchum, Emicocarpus, Glossostelma, Gomphocarpus, Kanahia, Margaretta, Odontostelma, Pachypetalum, Pentarrhinum, Pergularia, Periglottis, Pleurostemma, Sarcostemma, Schizostephanus, Sphaerocondon, Stathmopetalum, Stemnostelma, Trachycalymma, Tylophora, Xysmalobium)

4b Carpels without a slender neck, style head therefore sessile on carpels; anther appendages without a basal horizontal slit ............. Marsdenieae

(see above for number of genera and species)

**Key to genera of Marsdenieae**

1a Pollinia attached directly to the corpuscle (caudicles absent):

2a Corona petal-like, more conspicuous than corolla:

3b Corona on staminal tube present; anther appendages elongate, membranous, incumbent on style apex or applied to side of conical tip or beak ..

2b Corona present as 2 or 3 series with outer series sometimes much reduced to a low ridge between the anthers:

3a Corona on staminal column absent; corona on corolla tube present as pubescent ridges with inward directed tips ..........................................

3b Plant with subsessile, lanceolate to narrowly oblong leaves; corona lobes usually

4b Corona consisting of very small lobes beneath the gynostegial grooves (guide rails) (sometimes absent), often accompanied by much larger

**Key to genera of Ceropegieae**

1a Stems herbaceous to fleshy, erect, prostrate or twining, with well-developed leaves to ± leafless and tuberculate, but tubercles not arranged into angles; flowers not fleshy:

2a Corona present only as a spreading, somewhat arched ridge behind the anthers; style head with slender apex covered by anthers; follicles single by abscission (corolla with a slender tube inflated at the base) ............................................................... Orthanthera

2b Corona present as 2 or 3 series with outer series sometimes much reduced to a low ridge between the anthers:

3a Anthers ascending to erect, pressed into the sides of the style head:

4a Corolla tubular, often with an inflated base, 1–3 times as long as the lobes .......................................................... Riocreuxia

4b Corolla lobes free .........................................................................................................................................................

3b Anthers horizontal and pressed into the top of the style head:

5a Corolla rotate to campanulate, tube broader than long, if longer, then inner corona lobes not exceeding the anthers ............. Brachystelma

5b Corolla tube longer than broad; inner corona lobes exceeding the anthers, connivent into a column above the style head (rarely shorter than the anthers) ................................................................. Ceropegia

1b Stems fleshy; leaves reduced to small rudiments or absent, leaf rudiments borne on tubercles arranged into 4 or more angles along the stem; flowers fleshy:

6a Outer and inner series of corona lobes vertically well separated on the staminal tube and partly or wholly fused to one another (outer corona often disc-like):

7a Leaf rudiments with small stipular denticles; corona stipitate, outer series resting on the rim or the sides of the cup formed by the annulus ....

........................................................................................................................................................................ Duvalia

7b Leaf rudiments without stipular denticles; corona not stipitate, outer series spreading on the base of the tube and often partly fused to it ..... Huernia

6b Outer and inner series of corolla lobes not vertically separated on the staminal tube and partly or wholly fused to one another (outer corona never disc-like):

8a Tubercles on stems arranged into 6 or more angles; each tubercle armed with 1 or more spines:

9a Spines 3 per tubercle; flowers deeply tubular; outer corona with long slender lobules, each tipped with a tear-like knob .............. Tavaresia

9b Spines 1 per tubercle; flowers rotate to shallowly bowl-shaped; lobes of outer corona short, without an apical knob ................ Hoodia

8b Tubercles on stems arranged into 4 or 5(6) angles; tubercles not spiny:

10a Stems, pedicels, sepals and outside of corolla pubescent (stems sometimes ± glabrous); leaves deciduous, erect; flowers often covered inside with fine slender hairs ................................................................. Stapelia

10b Stems, pedicels, sepals and outside of corolla glabrous; leaves spreading or absent .................................................................................. Orbea

**Key to genera of Asclepiadeae (a tentative approximation)**

1a Corona in 3 series; leaves deeply cut into 5 or 7 narrowly triangular lobes; follicles with 4 spines, strongly resembling fruits of Emex .. Emicocarpus

1b Corona in 1 or 2 series; leaves entire; follicles not spiny:

2a Corona petal-like, more conspicuous than corolla:

3a Plant with grass-like habit and sessile, narrowly linear leaves; corona lobes ligulate-spatulate, entire, with margins involute at base and with 2 wing-like excrescences inside the margins near the base forming a cup- to basin-like structure ................................................... Aidomene

3b Plant with sessile, lanceolate to narrowly oblanceolate leaves; corona lobes usually ± oblong-obovate with irregularly shallowly lobed to entire margin, base claw-like with 2 or 3 teeth next to and on the midrib .............................................................. Margarettia

2b Corona not petal-like, less conspicuous and usually than the corolla:

4a Corona consisting of a ± uniformly tall outer series of fused lobes encircling the gynostegium, often with an inner series of 5 lobes adpressed to the backs of the anthers:

5a Stem succulent climbers or shrubs with ± leafless, rod-like stems; outer coronal series ± cupular near base of gynostegium, much shorter than and separated from the inflated vesicular inner lobes adpressed to the backs of the anthers ...................................................... Sarcostemma

5b Leafy geophytes; stems succulent or not; outer coronal series cupular to tubular, sometimes divided nearly to the base, but equalling or exceeding and obscuring the gynostegium, and fused to the inner lobes if these are present ............... Cynanchum and Schizostephanus

4b Corona consisting of very small lobes beneath the gynostegial grooves (guide rails) (sometimes absent), often accompanied by much larger
Acokanthera G.Don
(Plumerioideae—Carisseae)

Adenium Roem. & Schult.
(Apocynoideae—Wrightieae)
Aidomene Stopp
(Asclepiadoideae—Asclepiadeae)
Stopp: 17 (1967).

Geophytic perennial herbs with grass-like habit and slender, flexuose stems and globose tuber. Leaves sessile, narrowly linear, subulate. Flowers in a terminal pseudo-umbel, on long erect pedicels. Sepals lanceolate, largely free, densely hairy. Petals ovate, twice as long as sepals, brown with white, membranous margin, glabrous. Corona simple, campanulate at base, ending in 5 white, ligulate-spathulate lobes almost twice as long as petals, and more conspicuous than petals, with margins involute at base, and with 2 wing-like excrescences inside margins near base forming a cup-like structure. Pollinia ovate, pellucid towards apex; caddicules short. Follicles always solitary, narrowly fusiform, erect at maturity.

Species ± 45, Old and New World tropics; sthn trop. Afr. 2, Angola (Cabinda).

Ancylobotrys Pierre
(Rauvolfioideae—Willughbeieae)

Alafia Thouars
(Apoynoideae—Maloueteieae)


Asclepias L.
(Asclepiadoideae—Asclepiadeae)

Species ± 10, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Aspidoglossum E.Mey.
(Asclepiadoideae—Asclepiadeae)

Lagarinthus E.Mey.; Bullock: 420 (1952). Schizoglossum E.Mey. in broad sense, as to spp. from outside sthn Afr.; Norman & Moore: 95 (1929); Binnis: 22 (1968); Martins: 58 (1994).

Baissea A.DC.
(Apoynoideae—Apoynceae)

Zygodia Benth.; Good: 89 (1929).


Batesanthis N.E.Br.
(Periplocoideae)


Alstonia R.Br.
(Rauvolfioideae—Alstonieae)
Brown: 64 (1810) conserved name; Staf: 120 (1902); Huber: 68 (1963); De Jong: 1 (1979); De Jong: 985, 986 (1986).

Tall glabrous trees. Leaves in whors of 3–6, more rarely opposite, with more than 25 pairs of lateral veins; stipules absent, but usually with many small colleters in a fringe or covering holowed base of petiole. Flowers relatively small, usually in many-flowered, compound, terminal, umbelliform, corymbose or panicked inflorescences. Calyx small, divided almost to base; segments broadly ovate. Corolla salver-shaped; tube slender, cylindric, sparsely pubescent within, villous at mouth; lobes somewhat obliquely ovate, contorted, overlapping to right. Stamens in widened part of corolla tube; filaments filiform, short; anthers free from stigma, 2-lobed at base, polliniferous to base. Disc absent or obscurely annular. Ovary of 2 free carpels; style filiform, short; stigma with a ring of reflexed frills at base. Mericarps 2, follicular, cylindric, slender. Seeds oblong, compressed, with hairs all around edges, but chiefly at both ends.

Species ± 45, Old and New World tropics; sthn trop. Afr. 2, Angola (Cabinda).
Seed plants of southern tropical Africa: families and genera

**APOCYNACEAE**: Batesanthus

- **Style head** shortly conical. **Follicles** fusiform, shortly beaked, ± woody, suberect, coriaceous at base. **Seeds** ovate-lanceolate, flattened, acutely keeled on one side, blackish, fringed all around margin, but more densely at two ends, with very long white hairs.


**Brachystelma R.Br.**

(Asclepiadoideae—Ceropogieae)


**Callichilia Stapf**

(Rauvolfioideae—Tabernaemontaneae)


**Calotropis R.Br.**

(Asclepiadoideae—Asclepiadaceae)


Sthn trop. Afr. 1: *Calotropis procera* (Aiton) R.Br., widely distributed; possibly introduced; also in sthn Afr.

**Carissa L.**

(Rauvolfioideae—Carisseae)


**Carvalhoa K.Schum.**

(Rauvolfioideae—Tabernaemontaneae)


Shrubs or small trees, repeatedly dichotomously branched and with 2 inflorescences in forks when flowering; with white latex. **Leaves** opposite, those of a pair equal or unequal, shortly petiolate or sometimes sessile; petioles or leaf bases of a pair united at the base and forming a very short ocrea, with a single row of colleters in axils; lamina elliptic, narrowly elliptic, or narrowly obovate, cuneate, rounded or subcordate at base. **Inflorescence** pedunculate, corimbosely, pendulous, lax; bracts caducous before flowers open. **Flowers** regular except for the slightly curved corolla tube. **Calyx** pale green, persistent, even under fruit. **Corolla** white, creamy, or pale yellow, with many red longitudinal lines at base of lobes and at apex of tube; tube longer than calyx; lobes spreading or suberect, in bud overlapping to the left. **Stamens** included; anthers sessile, narrowly triangular, acuminate at sterile apex, sagittate at base, hirtro-pubescent outside on connective and inside between tails, introrse. **Ovary** glabrous, broadly ovoid, composed of 2 free carpels, surrounded by an entire disc, which is united with distal sides of ovary; style only slightly widened at apex; clavuncula composed of an entire, thin, slightly recurved ring and a subglobose head, topped by 2 parallel, linear, erect stigma lobes; style and stigma remaining on ovary when corolla is shed. **Fruit** composed of 2 free carpels which usually both develop and which dehisce adaxially; wall soft, orange inside. **Seeds** in 2 irregular rows, surrounded by a darker orange pulpy aril, few, rather large, obliquely ellipsoid or ovoid; at hilar side with one deep groove to half their width, less deeply grooved at the other sides, minutely pustulate; endosperm copious, starchy, creamy, ruminate, surrounding the spathulate embryo.


**Catharanthus G.Don**

(Rauvolfioideae—Vinceae)


*C. roseus* (L.) G.Don, indigenous to Madagascar but a widespread, sometimes cultivated weed throughout the tropics; also in sthn Afr.

**Ceropogia L.**

(Asclepiadoideae—Ceropogieae)


**Chamaeclitandra (Stapf) Pichon**

(Rauvolfioideae—Willughbeieae)


**Clitandra henriquesiana** K.Schum. ex Warb.; Good: 84 (1929).

Rhizomatous shrubs with straight stems; latex present, abundant in rootstocks; spines and tendrils absent. **Leaves** very neatly arranged, of uniform shape, characteristically deflexed on stem, ovate to lanceolate, with distinct round-tipped acumen and obtuse base, petiolate; stipules absent. **Inflorescences** compact, terminal and lateral, few-flowered cymes. **Calyx** lobes ± free to base. **Corolla** hypocrateriform; tube glabrous without pilose, within around stamens and near mouth; lobes contorted, overlapping to the left, ± equalling tube, glabrous or ciliate. **Stamens** arising in lower third of tube, anthers subsessile, without carina. **Ovary** hairy; ovules few, in 2 series in each locule; style, clavuncle and stigma very short. **Fruit** a few-seeded glabrous berry without sclerotized pericarp.


**Cibirhiza Bruyns**

(Asclepiadoideae—Marsdeniaceae)

Perennial herbs or shrublets with milky sap. **Stems** prostrate to scrambling; tuber turnip-shaped, up to 0.3 m (or more?) in diameter. **Leaves** opposite, deciduous, broadly ovate to obovate; petiole 1/2 to almost as long as blade; 1–3 collars at base of leaf. **Inflorescence**: 5–10 (–20)-flowered, umbelliform axillary clusters; floral bracts ovate, ciliate, small. **Sepals** ovate, obtuse, without collars. **Corolla** rotate; tube shallowly campanulate; lobes triangular, ± as long as tube, spreading. **Corona** double, purple-brown, composed of: (1) an outer ring of staminial and interstaminal portions, with the 5 interstaminal portions each forming a nectar cup below guide rails; (2) 5 inner free parts, each consisting of 3 members, all overlapping staminal column; lower (outer) ± narrowly triangular member sheathing 2 subulate inner members of which the innermost one ends in an erect filiform adaxial appendage twice as long as remainder of corona. **Staminal column**: filaments fused, forming a cylindrical tube surrounding ovaries; central veins in 6–16 pairs. **Inflorescences** axillary, single or paired, thyrsoid, with 10–80 flowers, congested or pseudo-axillary. **Leaves**: 5, small, ovate, ciliate; colleters absent. **Corolla** urceolate, salver-shaped, developing glandular areas in its 5 corners. **Fruits** and **seeds** unknown. x = 11.

Species 2, 1 in Oman; 1: *Cibirhiza albersiana* H.Kunze, Meve & Liede, in Zambia.

**Clitandra Benth.**
(Rauvolfioideae—Willughbeieae)

Large lianas climbing up to 40 m high in trees; latex white; branches densely lenticellate. **Leaves** opposite, shortly petiolate, arising on leaf cushions; simple, entire, elliptic to narrowly elliptic, acuminate with a long obtuse point, cuneate at base; secondary veins in 6–16 pairs. **Inflorescences** axillary, single or paired, thyrsoid, with 10–80 flowers, congested or lax; lower bracts sepal-like, deciduous. **Corolla** fragrant (like *Jasminum*). **Sepals** green, ovate, equal or subequal, ± pubescent outside, without collars. **Corolla** urceolate; lobes narrowly oblong to narrowly obovate. **Stamens** included, arising shortly above base of corolla; filaments very short, incurved, glabrous; anthers with some hairs at apex, introrse, peniculate or pointing towards centre. **Ovary** broadly ovoid, 1-locular but often apparently 2-locular due to the 2 parietal placentes almost conflate at base and apex; each placenta with 6–15 ovules; style cylindrical, glabrous; pistil head conical, glabrous. **Fruit** a fleshy, globose or pyriform berry with seeds embedded in a red, fibrous, acid pulp. **Seeds** 6–25, ovoid, black; testa thin, smooth; endosperm copious.

Cynanchum L.
(Asclepiadoideae—Asclepiadeae)

Diplorhynchus Welw. ex Ficalho & Hiern
(Rauvolfioideae—Willughbeieae)

Duvalia Haw.
(Asclepiadoideae—Ceropegieae)

Emicocarpus K.Schum. & Schltr.
(Asclepiadoideae—Asclepiadeae)
Schumann & Schlchter: 21 (1900).
Perennial herbs with slender, terete, prostrate stems minutely puberulous along one line when young. Leaves petiolate, hastate, deeply, almost palmately incised into 5 or 7 very narrowly triangular lobes, middle lobe twice as long or more than lateral ones; petiole canaliculate above. Inflorescences few-flowered, axillary umbels on long peduncles minutely plicate along one line. Flowers pedicellate; bracteoles minute, subulate. Sepals oblong-lanceolate, acuminate, with solitary interposed finger-shaped colleters. Corolla rotate, with glabrous lobes overlapping to the right. Corona triple: outer one of tongue-shaped, obtuse lobes opposite the petals; middle one of 10 paired, slightly longer and narrower lobes alternating with lobes of outer corona; lobes of inner corona similar to those of outer corona but somewhat smaller and opposite stamens and slightly adnate to corolla. Stamens ending in a 2-lobed, membranous connective; corolla very small; translator arms twisted. Style head swollen, ellipsoid, raised well above gynostegium. Ovary with two ovules. Follicles resembling fruit of Emex: with 3 spines, 2 lateral and 1 apical; pedicel short and spiny. Seed horseshoe-shaped, brown.

Monotypic genus: Emicocarpus fissifolius K.Schum. & Schltr. This incredible plant was recorded from near Maputo, coastal Mozambique.

Fockea Endl.
(Asclepiadoideae—Marsdenieae)

Funtumia Stapf
(Apocynoideae—Malouetieae)
Stapf: 2 (1899); Good: 88 (1929); Zwetsloot: 484 (1985); Zwetsloot: 966, 967 (1986); Coates Palgrave: 958 (2002).
Evergreen trees or shrubs, with white sticky latex; bark smooth, sometimes with a few lenticels; wood of low density, soft; branches terete, sometimes lenticellate, very dark brown; branchlets smooth, terete or laterally compressed with a longitudinal groove below the ocrea. Leaves opposite, petiolate, those of a pair connate into a short ocrea, with many small colleters in 2 or 3 rows in axils; lamina ovate, elliptic or oblong, decurrent into petiole, acuminate at apex, entire, glabrous above; often with domatia in axils of secondary veins; margin both undulate and revolute. Inflorescences congested, terminal and axillary, cymose, much shorter than leaves; peduncle short; bracts ovate or elliptic, often with small colleters in axils. Flowers regular, fleshy, fragrant. Sepals free, thick, ovate or nearly so, obtuse or subacute at apex, often membranous and minutely ciliate at margin, inside with a single row of colleters at base. Corolla: tube ventricose at middle, inside thickened at throat, densely hirt-pubescent from insertion of stamens to level of apex of ovary; lobes overlapping in bud to the right, entire, recurved. Stamens included; filaments very short or absent; anthers narrowly triangular, introrse. Ovary of 2 almost free carpels united by base of style; clavuncula grading into a conical stigma; disc 5-lobed; ovules pendulous. Follicles 2, connate at base. Seeds slender, fusiform, apex with long straight hairs; testa rugose; embryo straight.


Glossostelma Schltr.
(Asclepiadoideae—Asclepiadeae)
Slender or robust, erect perennial herbs with a short, often stout vertical rhizome with fusiform lateral roots; stem usually solitary, simple, often with a line of pubescence running along stem. Leaves petiolate, linear to ovate or

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spathulate. **Inflorescences** umbelliform, with or without peduncle, arising terminally and axillary at upper 1–4(–6) nodes. **Corolla** campanulate, lobed almost to base, medium to large. **Corona** 5-lobed, often fleshy, united very shortly at base and attached to staminal column near base of anthers; staminal column usually with a conspicuous stalk below attachment of corona lobes. **Style head** 5-angled, generally ± level with top of anthers and largely obscured by anther appendages; corpuscle ovoid, brown or black; caudicles flattened, held ± at right angles to axis of corpuscle; pollinia pendulous, flattened. **Follicles** erect, lanceolate or ovate-lanceolate in outline, apex attenuate; fruiting pedicel not contorted; usually only 1 follicle developing. **Seeds** flattened with one face convex, ovate to ± circular in outline with a narrow convoluted rim surrounding a verrucose disc.


**Gomphocarpus R.Br.**
(Asclepiadoideae—Asclepiadeae)

**Asclepias** L., in part; Brown: 313 (1902/1903).

Shrubs or trees up to 40 m high; stems and leaves completely glabrous; latex present; spines and tendrils absent. **Leaves** opposite, oblong to elliptic, entire, ± connarurbous; petiolate; stipules absent. **Inflorescences** cymose, terminal, rarely also axillary, few- to many-flowered; pedicels present, up to 10 mm long. **Corolla** hypocrateriform, externally glabrous, internally hairy above and below stamens; tube not developing splits (as in *Pleiocarpus*); lobes contorted, overlapping to the left, not ciliate. **Stamens** included, arising at or above middle of corolla tube; filaments short, anthers dorsifix, longitudinally dehiscent, introrse, without calyx. **Ovary** of 2 separate, glabrous mericarps diverging at 90–180°, with 2–30 ovules per mericarp; pistil head composed of a subglobe basal stigmatic part and a stigmatic apex. **Fruit** composed of 2 separate diverging subglobe to ovobovoid, fleshy to fibrous mericarps. **Seeds** somewhat angular, smooth, brown; embryo straight, spathulate, surrounded by thick, rather starchy and hard endosperm, leaving a hole around radicle base; cotyledons thin, leafy, radical almost cylindric.

Species 12, trop. Africa with 1 of them also in tropical Asia; sthn trop. Afr. 2, Angola (Cabinda), Mozambique.

**Kanahia L.**
(Asclepiadoideae—Asclepiadeae)

**Leaves** opposite, oblong to elliptic, entire, ± connarurbous; petiolate; lobes free or connate at extreme base, herbaceous, imbricate, not revolute, with collettes inside covering part of ventral surface of sepals. **Corolla** hypocrateriform, externally glabrous, internally hairy above and below stamens; tube not developing splits (as in *Pleiocarpus*); lobes contorted, overlapping to the left, not ciliate. **Stamens** included, arising at or above middle of corolla tube; filaments short, anthers dorsifix, longitudinally dehiscent, introrse, without calyx. **Ovary** of 2 separate, glabrous mericarps diverging at 90–180°, with 2–30 ovules per mericarp; pistil head composed of a subglobe basal stigmatic part and a stigmatic apex. **Fruit** composed of 2 separate diverging subglobe to ovobovoid, fleshy to fibrous mericarps. **Seeds** somewhat angular, smooth, brown; embryo straight, spathulate, surrounded by thick, rather starchy and hard endosperm, leaving a hole around radicle base; cotyledons thin, leafy, radical almost cylindric.

Species 12, trop. Africa with 1 of them also in tropical Asia; sthn trop. Afr. 2, Angola (Cabinda), Mozambique.

**Huernia R.Br.**
(Asclepiadoideae—Ceropegieae)

Perennal vines or subshrubs, glabrous. **Leaves** opposite. **Inflorescences** umbel-like cymes or umbels. **Corolla** 5-partite, small, ovate-acuminate. **Flowers** small or of moderate size. **Corolla** campanulate, often constricted at the throat; lobes erect to spreading, overlapping to the left. **Corona** of 5 small, wart-like fleshy lobes with basal parts adnate to staminal column. **Anthers** 2-locular, terminated by membranous appendages which are free or connate. **Pollinia** sessile, erect, attached by short to elongated caudicles. **Style head** conical or truncate. **Follicles** with a thick pericarp, smooth, sometimes winged. **Seeds** crowned with a tuft of hairs.

Species 12, Old World tropics; sthn trop. Afr. 20, Angola, Zambia, Zimbabwe, Malawi, Mozambique.

**Hoodia Sweet ex Dehec.**
(Asclepiadoideae—Ceropogieae)

**Landolphia P.Beauv.**
(Rauvolfoideae—Willughbeieae)

**Holarrhena R.Br.**
(Apocynoideae—Malouetieae)
De Kruif: 456 (1985a); De Kruif: 969, 971 (1986); Coates Palgrave: 951 (2002).

**Sthn trop. Afr. 3, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.**

**Huernia R.Br.**
(Asclepiadoideae—Ceropegieae)

Shrubs or trees up to 40 m high; stems and leaves completely glabrous; latex present; spines and tendrils absent. **Leaves** opposite, oblong to elliptic, entire, ± connarurbous; petiolate; stipules inside covering part of ventral surface of sepals. **Corolla** hypocrateriform, externally glabrous, internally hairy above and below stamens; tube not developing splits (as in *Pleiocarpus*); lobes contorted, overlapping to the left, not ciliate. **Stamens** included, arising at or above middle of corolla tube; filaments short, anthers dorsifix, longitudinally dehiscent, introrse, without calyx. **Ovary** of 2 separate, glabrous mericarps diverging at 90–180°, with 2–30 ovules per mericarp; pistil head composed of a subglobe basal stigmatic part and a stigmatic apex. **Fruit** composed of 2 separate diverging subglobe to ovobovoid, fleshy to fibrous mericarps. **Seeds** somewhat angular, smooth, brown; embryo straight, spathulate, surrounded by thick, rather starchy and hard endosperm, leaving a hole around radicle base; cotyledons thin, leafy, radical almost cylindric.

Species 12, trop. Africa with 1 of them also in tropical Asia; sthn trop. Afr. 2, Angola (Cabinda), Mozambique.

**Kanahia L.**
(Asclepiadoideae—Asclepiadeae)
Drege: 512 (1952); Field et al.: 787 (1986); Bingham (Unpublished); Phiri (Unpublished).

**Lanolinia P.Beauv.**
(Rauvolfoideae—Willughbeieae)

**Holarrhena R.Br.**
(Apocynoideae—Malouetieae)
De Kruif: 456 (1985a); De Kruif: 969, 971 (1986); Coates Palgrave: 951 (2002).

**Sthn trop. Afr. 3, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.**
Seed plants of southern tropical Africa: families and genera

Margaretta Oliv.
(Asclepiadoideae—Asclepiadeae)

Herbaceous perennials with a carrot-shaped tuberous rootstock; stems usually simple. **Leaves** opposite, subsessile. **Inflorescence** terminal and lateral, umbellate. **Corolla** deeply 5-lobed, commonly revolute. **Corona** 5-lobed, petaloid, more showy than corolla, variable in shape, 2- or 3-toothed on claw. **Style head** capitate, hemispherical, subconical, truncate or obtuse. **Follicles** in pairs, fusiform, beaked, smooth, pubescent; fruiting pedicle not contorted.


Mascarenhasia A.DC.
(Apocynoidae—Malouetiae)

Shrubs or small trees with milky latex; spines and tendrils absent. **Leaves** opposite, obovate-oblong, oblong or elliptic; with petiolar glands; without domatia; stipules absent. **Flowers** often large and conspicuous, solitary or in few-flowered fasciculate cymes, terminal. **Corolla** hypocrateriform; tube divided into 2 distinct regions of varying shape and proportions; lobes 5, with induplicate aestivation, straight in bud or twisted to the right. **Stamens** 5, sessile, inserted at base of upper region of corolla tube; anthers conniving in a cone around gynoecium, polliniferous in upper part only, joined to clavuncle by a retinacule. Receptacular disc cupular or represented by sepaloid cupula. **Style** arising above base of corolla tube; filaments filiform-clavate, short; anthers sagittate, conniving into a cone, included, linear, terminating in a minutely plumose mucro; appendages slightly shorter than polliniferous part; tails short, obtuse, recurved; foot of connective projecting. **Disc** cupular, 5-lobed, fleshy. **Carps** free, slightly inferior, adnate to disc up to or beyond middle; style very short; stigma spindle-shaped, with 2 linear lobes; ovules many, in many rows. **Mericarps** 2, follicular, lanceolate in outline, divative. **Seeds** oblong, with a long deciduous apical coma; endosperm scanty.


Neoschumannia Schltr.
(Asclepiadoideae—Ceropegieae)

Large, woody climbers with slender stems, glabrous; latex clear. **Leaves** large, with long petioles, elliptic to broadly ovate. **Inflorescences** 3- to many-flowered, extra-axillary, pedunculate, bostrychoid, lax, with small floral bracts; pedicels filiform, ± pendulous. **Coralyx** fused at its swollen base, one colletor in each intersepal sinus. **Petals** not fused at base, lanceolate, lax. **Corona** gynostegial, tripartite [formula: C(is) + Cs]: Staminodial corona (Cs) is supported by a C(is) consisting of interstaminal lobes connate to a skirt with appendages predominantly developed in staminodal position; skirt membranous, basally ± fused, interstaminal parts of C(is) sicle-shaped, bidentate, villous; staminodial corona lobes (Cs) erect, lanceolate to obovate, with a basal hump. **Gynostegium** borne on a column; guide rails short, oblique, protruding. **Anthers** subquadangular; pollinarium (sub)erect, pollinia broadly ovate to quadrangular, with pellucid germination mouth on inner margin, yellow, corpusculum elliptic; style head flat or depressed, white. **Follicles** long, slender, glabrous. **Seeds** not seen.


Odontostelma Rendle
(Asclepiadoideae—Asclepiadeae)
Rendle: 161 (1894); Norman & Moore: 96 (1929); Bullock: 619 (1956).

Large, woody climbers with slender stems, glabrous; latex clear. **Leaves** large, with long petioles, elliptic to broadly ovate. **Inflorescences** 3- to many-flowered, extra-axillary, pedunculate, bostrychoid, lax, with small floral bracts; pedicels filiform, ± pendulous. **Coralyx** fused at its swollen base, one colletor in each intersepal sinus. **Petals** not fused at base, lanceolate, lax. **Corona** gynostegial, tripartite [formula: C(is) + Cs]: Staminodial corona (Cs) is supported by a C(is) consisting of interstaminal lobes connate to a skirt with appendages predominantly developed in staminodal position; skirt membranous, basally ± fused, interstaminal parts of C(is) sicle-shaped, bidentate, villous; staminodial corona lobes (Cs) erect, lanceolate to obovate, with a basal hump. **Gynostegium** borne on a column; guide rails short, oblique, protruding. **Anthers** subquadangular; pollinarium (sub)erect, pollinia broadly ovate to quadrangular, with pellucid germination mouth on inner margin, yellow, corpusculum elliptic; style head flat or depressed, white. **Follicles** long, slender, glabrous. **Seeds** not seen.


Perennial, glabrous herbs with a solitary, slender, erect stem; tuber carrot-like with long neck. **Leaves** linear with revolute...
DICOTYLEDONS

APOCYNACEAE: Odontostelma

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margins. Inflorescence lateral, 4-6-flowered umbels; bracts absent or minute; flowers greenish brown. Sepals lanceolate, acute. Corolla broadly campanulate, 5-lobed nearly to base; lobes spatulate. Corona arising at base of staminal column, not reaching base of anthers, shortly annular at base, divided into 5 transversely oblong, truncate lobes with sides incurved at apex and with an oblong or tongue-shaped process on inner face at middle slightly longer than rest of lobe. Stamens: another appendages small, ovate, acute, inflexed over apex of style.

?Monotypic: Odontostelma welwitschii Rendle, only known from sthn trop. Afr.: Angola, Zambia, Zimbabwe. The status of this species is uncertain.

Oncinotis Benth.
(Apocynoideae—Apocynaeae)


Orbea Haw.
(Asclepiadoideae—Ceropegieae)


Oranthera Wight
(Asclepiadoideae—Ceropegieae)
Brown: 433 (1903); Norman & Moore: 98 (1929); Phiri (Unpublished).


Pachycarpus E.Mey.
(Asclepiadoideae—Asclepiadeae)


Pachypodium Lindl.
(Apocynoideae—Malouetieae)
Norman & Moore: 90 (1929); Coddi: 283 (1963); Kupicha: 462 (1985); Rapana and co. et al.: 1 (1999); Coates Palgrave: 959 (2002); Mapaura & Timberlake: 162 (2002).


Pentarrhinum E.Mey.
(Asclepiadoideae—Asclepiadeae)


Pergularia L.
(Asclepiadoideae—Asclepiadeae)
Brown: 323 (1907); Brown: 757 (1907–1909); Binns: 21 (1968); Liede: 63 (1990); Liede: 481 (1996c); Mapaura (Unpublished).


Periglossum Decne.
(Asclepiadoideae—Asclepiadeae)


Periploca L.
(Periplocoideae)


Twining or erect shrubs, glabrous; with milky latex. Leaves opposite, sometimes absent, herbaceous or coriaceous. Flowers small to medium-sized, in lax axillary or terminal cymes. Calyx 5-partite; lobes short; 5 intersepalar glands. Corolla rotate, 5-lobed nearly to base; lobes overlapping, slightly twisted. Corona of 5 filiform or linear lobes, arising from corolla at or a little above insertion of stamens and opposite them, simple or divided, with or without a ± broadly dilated base which is often ± spreading and adnate to base of corolla lobes and usually 2-keeled within. Stamens arising from corolla a little above its base; filaments free, short; anthers adnate to style at their base, with connective produced into an apiculus by which they are usually connate at their tips. Style shorter than anthers, convex or subtruncate at apex; translators spoon-shaped. Follicles smooth. Seeds crowned with a tuft of hairs.

Species 14, Mediterranean to E Asia and trop. Africa; sthn trop. Afr. 2, Angola, Malawi.

Picrodendron Pierre
(Rauwolfioideae—Hunterieae)
Pierre: 1278 (1896); Stapf: 96 (1902); Good: 85 (1929); Pichon: 81 (1953a); Omino: 128 (1996).

Trees or shrubs with white latex in all parts; branchlets glabrous. Leaves opposite, petiolate, those of a pair equal or subequal, elliptic to oblong, entire, glabrous. Inflorescence a compound, umbellate cyme, terminal or sometimes axillary, pedunculate. Flowers ± regular, fragrant. Sepals conuate at extreme base, imbricate, glabrous outside, with 2–4 rows of colleters at base. Corona white to yellow, tube almost cylindrical, often greenish, glabrous outside, pubescent inside below stamens; lobes overlapping to left in bud, entire, glabrous,
spreading and later recurved. **Stamens** arising above middle of corolla tube, included; filaments very short, filiform, glabrous; anthers ovate in outline, cordate at base, glabrous, thecae 2, parallel, longitudinally dehiscent. **Ovary** of 2 separate glabrous carpels united at base by a disc-like thickening; ovules many per carpel; pistil head composed of a basal cylindrical stigmatic part and a filiform stigmatic apex. **Fruit** composed of 2 separate divaricate, obovoid to ellipsoid mericarps with rounded apex and containing up to 80 seeds. **Seeds** somewhat angular, smooth, brown; testa hard; embryo straight, spathulate, surrounded by thick, rather hard starchy endosperm leaving a hole around radicle apex, cotyledons thick.


**Pleiocarpa** Benth.  
(Rauvolfioideae—Hunterieae)  

Evergreen shrubs or trees; stems and leaves completely glabrous; white latex present in all parts; spines and tendrils abundant. **Leaves** opposite or in whorls of 3–5, elliptic to obovate; petiole angled, often narrowly winged; stipules absent. **Inflorescences** cymose, axillary, rarely also terminal; pedicels short or absent. **Calyx** glabrous; lobes free to base, herbaceous, imbricate, not revolute, without scales on inner surface. **Corolla** hypocrateriform, externally glabrous, internally pubescent below stamens; tube often with 5 splits developing at level of stamens; lobes contorted, overlapping to the left, not ciliate. **Stamens** arising at or above middle of corolla tube; filaments short; anthers dorsifixed, introrse, longitudinally dehiscent. **Ovary** glabrous, composed of 2–5 separate carpels, with 1–4 ovules per carpel; clavuncle present; stigma reduced to a sessile area or rarely represented by a rudimentary apiculus. **Fruit** a compound berry of 2 variously shaped, fleshy to slightly fibrous mericarps with a rounded to hook-shaped apex. **Seeds** variously shaped, with smooth brown testa; embryo straight, spathulate, surrounded by a thick, rather starchy and hard endosperm, leaving a hole around radicle base; cotyledons elliptic, thin and leafy, radicle almost cylindrical.

Species 5, trop. Africa; sthn trop. Aft. 2, Angola, Mozambique.

**Pleurostelma** Baill.  
(Asclepiadoideae—Asclepiadae)  

Perennials with procumbent or twining stems. **Leaves** opposite. **Flowers** small, in few-flowered umbel-like cymes, subterminal between bases of petioles. **Calyx** deeply 5-lobed; lobes small, oblong-ovate. **Corolla** campanulate; tube short; lobes lanceolate, overlapping and twisting to left in bud. **Corona** of 5 minute lobes or teeth alternating with anthers at their base. **Staminal column** arising a little above bottom of corolla tube; filamental part very short; anthers oblong, erect, strongly convex at back, with horny margins or wings forming gynostegial grooves, strongly incurved towards centre of flower; appendages suberect, membranous; pollinia pendulous, with very short caudicles. **Style** produced into a bead beyond anther appendages. **Follicles** lanceolate-acuminate, smooth. **Seeds** crowned with a tuft of hairs.

Species 2, E African coast from Somalia to Mozambique, Madagascar, and Aldabra islands; sthn trop. Aft. 1: *Pleurostelma cernuum* (Deene.) Bullock, Mozambique.

**Raphionacme** Harv.  
(Periplocoideae)  
Norman & Moore: 92 (1929); Bullock: 59 (1953a); Bullock: 353 (1953b); Binns: 21 (1968); Venter & Verhoeven: 72 (1988a); Venter & Verhoeven: 380 (1988b); Venter & Verhoeven: 705 (1997); Verhoeven & Venter: 46 (1997); Venter & Verhoeven: 169 (2000).

**Chlorocytthus** Oliv.: t. 1557 (1887). **Pentagonanthus** Bullock: t. 3583 (1962b); Bullock: 85 (1963); Bingham & Smith: 154 (2002).


**Riocreuxia** Decne.

(Asclepiadoideae—Ceropegieae)


Ceropegia in sense of Huber: 167 (1957), in part.


**Saba** (Pichon) Pichon

(Rauvolfioideae—Willughbeieae)

Tendrilless lianes climbing to 30 m; stem terete; slash pink; latex abundant in all parts; spines absent. **Leaves** elliptic or ovate, glabrous; petiolate; stipules absent. **Inflorescences** terminal, many-flowered paniculate cymes forming large dense heads, or lax and tendrilless. **Flowers** large, white, very sweetly scented. **Calyx**: lobes imbricate, free to base. **Corolla** hypocrateriform; tube cylindric, slightly enlarged at level of anthers, pilose within, especially towards mouth; **Ovary** with a ring of stiff erect hairs at apex; style glabrous, clavuncle inserted below middle of corolla tube; anthers subsessile, without carina. **Inflorescences** regular except for the sometimes slightly unequal sepals. **Calyx** green; sepals free, subsheath, entire. **Corolla** with tube yellow and limb creamy to yellow; tube slightly shorter to much longer than calyx; lobes in bud overlapping to the right, spreading. **Stamens** included or nearly so; anthers sessile, narrowly triangular, acute at apex, sagittate at base, glabrous or sometimes papillose, introrse, with upper 2/3 fertile. **Ovary** glabrous or nearly so, subglobose, composed of 2 free carpels; disc adnate to ovary for ± 7/10 of its height; clavuncula cylindric; stigma minute, 2-lobed. **Fruit** composed of 2 almost free adaxially dehiscent carpels, wall thinly coriaceous, irregularly striate, grooved when dry. **Seeds** few, surrounded by a thin red or orange pulpy aril, obliquely ellipsoid, with a deep groove to 1/4 their width at hilar side and shallowly grooved at other sides, minutely rugose; endosperm copious, starchy, white, ruminate, surrounding spathulate embryo.


**Sarcostemma** R.Br.

(Asclepiadoideae—Asclepiadaceae)

Bullock: 504 (1957); Liede & Meve: 223 (1992); Liede: 31 (1996d); Liede & Täuber: 133 (2000); Bruyns: 433 (2003); Bingham (Unpublished); Phiri (Unpublished).


**Schizostephanus** Hochst. ex Benth. & Hook.f.

(Asclepiadoideae—Asclepiadaceae)


Erect to scrambling perennial; shoots perennial, herbaceous to succulent, woody at base, glabrous. **Leaves** opposite, petiolate, with colleters at base; lamina glabrous, broadly ovate, base lobed, apex acute. **Inflorescence** botryochoid cymose, sometimes basally dichasial, 15–30-flowered; flowers small. **Sepals** fused at base; lobes ovate-acute, abaxially glabrous. **Corolla** rotate, 5-lobed nearly to base, adaxially with very long slender trichomes, abaxially glabrous; lobes oblong, obtuse, decurved. **Corona** tubular, terminating in 10 teeth, longer than gynostegium; staminal and interstaminal corona equally long but largely fused. **Gynostegium** borne on a long slender stipe. **Anthers** trapezoid; anther wings vaguely differentiated, basally widening; pollinia clavate, attached along a dorsal rim. **Follicles** ellipsoid, smooth, glabrous. **Seeds** pyriform, with entire marginal wing and a tuft of hairs.


**Schizozygia** Baill.

(Rauvolfioideae—Tabernaemontaneae)


Shrubs or small trees, repeatedly dichotomously branched and with 2 inflorescences in each fork; with white latex; branchlets terete. **Leaves** opposite, those of a pair equal, petiolate, with 1 or 2 rows of colleters in axils; lamina obovate, cuneate at base. **Inflorescences** corymbose, congested. **Flowers** regular except for the sometimes slightly unequal sepals. **Calyx** green; sepals free, subequal, entire. **Corolla** with tube yellow and limb creamy to yellow; tube slightly shorter to much longer than calyx; lobes in bud overlapping to the right, spreading. **Stamens** included or nearly so; anthers sessile, narrowly triangular, acute at apex, sagittate at base, glabrous or sometimes papillose, introrse, with upper 2/3 fertile. **Ovary** glabrous or nearly so, subglobose, composed of 2 free carpels; disc adnate to ovary for ± 7/10 of its height; clavuncula cylindric; stigma minute, 2-lobed. **Fruit** composed of 2 almost free adaxially dehiscent carpels, wall thinly coriaceous, irregularly striate, grooved when dry. **Seeds** few, surrounded by a thin red or orange pulpy aril, obliquely ellipsoid, with a deep groove to 1/4 their width at hilar side and shallowly grooved at other sides, minutely rugose; endosperm copious, starchy, white, ruminate, surrounding spathulate embryo.


**Schlechterella** K.Schum.

(Periplocoideae)

Schumann: 462 (1899); Venter & Verhoeven: 350 (1998); Venter & Verhoeven: 564 (2001).

Climbers with white latex; roots tuberous; stems subterranean and aerial: subterranean stems perennial, sprouting from top of root tuber; aerial stems annual or perennial, twining, with interpetiolar, purplish maroon, acicular colleters. **Leaves** opposite, those of a pair equal, petiolate, with 1 or 2 rows of colleters in axils; lamina obovate, cuneate at base. **Inflorescences** born in the leaf axils or on leafy shoots. **Flowers** regular, epipetalous, directly below outer corona lobes, free, glabrous; sepals 5, epipetalous, directly below outer corona lobes, free, glabrous; petals 5, united, rotate, 5-lobed nearly to base, adaxially with very long slender trichomes, abaxially glabrous; lobes oblong-obtuse, decurved. **Corona** tubular, terminating in 10 teeth, longer than gynostegium; staminal and interstaminal corona equally long but largely fused. **Gynostegium** borne on a long slender stipe. **Anthers** trapezoid; anther wings vaguely differentiated, basally widening; pollinia clavate, attached along a dorsal rim. **Follicles** ellipsoid, smooth, glabrous. **Seeds** pyriform, with entire marginal wing and a tuft of hairs.
filaments filiform; anthers basally fused to stigmatic head and conniving in a cone above it, glabrous, connective apically short, acute, pollinia subreniform. **Ovaries** 2, half-inferior, many-ovuled; styles basally free, apically fused; stigmatic head broadly pentagonal-deltoid with obtuse apex; pollen translators with receptacle oblong-ovate to oblong-elliptic, folded scoop-shaped, stipe terete, adhesive disc subcircular. **Follicles** paired, horizontally divergent, very narrowly ovoid with acuminate apex.


**Secamone R.Br.**
*(Secamonoideae)*


**Sisyranthus E.Mey.**
*(Asclepiadoideae—Ceropegieae)*
Weimarck: 402 (1935); Mapaura (Unpublished).

**Sphaerocodon** Benth.
*(Asclepiadoideae—Asclepiadeae)*

**Stapelia** L.
*(Asclepiadoideae—Ceropegieae)*

**Stathmostelma** K.Schum.
*(Asclepiadoideae—Asclepiadeae)*

**Stenostelma** Schltr.
*(Asclepiadoideae—Asclepiadeae)*
Bullock: 417 (1952); Bullock: 342 (1953b).

**Stomatostemma** N.E.Br.
*(Periplocoideae)*
Venter & Verhoeven: 50 (1993).

**Telosma Coville**
(Asclepiadoideae—Marsdeniaceae)

**Trachycalymma (K.Schum.) Bullock**
(Asclepiadoideae—Asclepiadaceae)
Bullock: 348 (1953b); Bullock: 620 (1956); Binns: 22 (1968) as Trachycalymma; Goyder: 129 (2001).

Perennial herbs with annual stems arising from tuberous rootstocks; stems usually single, erect, mostly unbranched, densely pubescent with spreading white hairs; latex milky. **Leaves** opposite, sessile or petiolate; lamina linear to lanceolate, oblong or ovate, pubescent or subglabrous, margins pubescent. **Inflorescences** extra-axillary, pedunculate, umbellate; flowers mostly nodding. **Calyx** lobed to base. **Corolla** campanulate, or occasionally reflexed. **Corona**: staminal corona lobes diverse, but always arising from base of staminal column and adnate to it by their entire length, weakly to strongly cucullate, frequently somewhat pouched, with or without a laterally flattened tooth within cavity of lobe. **Anther**: appendages flexed over apex of stigma head. **Pollinia** with flattened and geniculate translator arms, mostly with a clasping overlap to the pollinia; pollinia flattened, obovate to obtriangular. **Follicles** erect, narrowly fusiform to ovoid, not inflated, densely pubescent, at least when young; fruiting pedicel contorted or not. **Seeds** flattened or somewhat convex, ovate, comose.


**Voacanga Thouars**
(Rauvolfioideae—Tabernaemontanaceae)


**References**


Seed plants of southern tropical Africa: families and genera
Aquifoliaceae
(Asteridae—Aquifoliales)
(Euasterids II—Aquifoliales)

References


Ilex L.

Exell & Mendonça: 348 (1951); Mendes: 353 (1966); Mendes: 1 (1973); White et al.: 150 (2001); Coates Palgrave: 587 (2002).


Araliaceae
(Rosidae—Apiiales)
(Euasterids II—Apiiales)


Identification of additional genus using the key in the above reference: Polyscias will run to 1b but differs from all other genera beyond that couplet in having pinnately compound leaves.

Centella L.


Polyscias J.R.Forst. & G.Forst.


Trees, often tall and with noticeably regular branching. Leaves petiolar, pinnately compound, glabrous to densely tomentose with stellate or simple hairs; leaflets simple, ± entire. Inflorescence paniculate, regularly compound, racemose branched with ultimate divisions of racemes or umbellules. Calyx forming a shallow cup, subentire or shallowly 5-toothed. Petals 5. Stamens 5. Ovary 2-locular; styles 2 (or 5), divergent for nearly their entire length; stylodipodium not well-developed. Fruit terete or slightly compressed. Seeds rounded or laterally compressed, ellipsoid, smooth or sometimes ribbed; endosperm not ruminate.

**Schefflera J.R. Forst. & G. Forst.**


**References**


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**ARALIACEAE: Polyscias**

**Aristolochiaceae**

(Magnoliidae—Aristolochiales)

(Magnoliids—Aristolochiales)


Sthn trop. Afr.: genera 2, species 5.

**Key to genera**

[partly after Verdcourt (1986)]

Fruit dehiscent, short; stigmatic lobes up to 6; anthers up to 6; flowers borne on leafy shoots .......................................................... **Aristolochia**

Fruit indehiscent, elongate, strongly ribbed; stigmatic lobes 6–12; anthers 6–24; flowers mostly on the old wood .......................................... **Pararistolochia**

**Aristolochia L.**


Sthn trop. Afr. 4, including the introduced *Aristolochia elegans* Mast., which is widely cultivated and naturalised in many places, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and introduced in sthn Afr.

**Pararistolochia Hutch. & Dalziel**


Climbing woody shrubs; stems mostly little-branched, older stems bilobed in transverse section. **Leaves** ± undulate or 3-lobed, mostly deeply cordate at base, glabrous, long-petiolate; pseudostipules absent. **Flowers** mostly borne on old wood in clusters of 1(2) or 3; without foliaceous prophyll; with odour of carrion. **Perianth** obliquely tubular, base inflated-globose, pouched; throat of tube with downwardly projecting ivory-white or violet hairs; lobes 3, equal, triangular-lanceolate, horizontally spreading. **Gynostemium**: lobes and anthers 9. **Ovary** 6-locular; ovules many. **Fruit** woody, cucumber-like, indehiscent, strongly 6-ribbed, straight or curved. **Seeds** ± 100 per locule, triangular, flattened, arranged in line in each locule.


**References**


**DICOTYLEDONS**

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Key to tribes

1a Corollas all strap-shaped, equally 5-toothed at apex; latex present ................................................................. Cichorieae (p.83)
1b Corollas not strap-shaped, OR if some or all strap-shaped, than these with 3(4) or fewer apical teeth:
   2a Involutural bracts in 1 row, cohering by their overlapping margins, or partly or wholly connate; with or without a calypculus of small, often black-tipped, external bracts; pappus present:
      3a Involutural bracts with evident elongated oil glands; mature cypselas black ................................................. Heliandreae (p. 85)
      3b Involutural bracts without elongated oil glands; cypselas not black ................................................................. Senecioneae (p. 88)
   2b Involutural bracts imbricate, in 2 or more rows, free or connate; OR if in one row then pappus absent, or capitula unisexual or cypselas densely villous with long hairs:
      4a Style branches with conspicuous, ± clavate papillose appendages; capitula discoid, with all flowers bisexual, not yellow; corollas with 5(4) relatively short, broad apical teeth; mature cypselas black ................................................................. Eupatorieae (p. 84)
      4b Style branches, capitula, corolla and cypselas not showing the above combination of characters:
         5a Capitula homogamous, all florets tubular and bisexual, OR if capitula unisexual, then plants dioecious:
            6a Leaves spiny:
               7a Anthers tailed; receptacle densely setose ............................................................................................... Arctotieae (p. 83)
               7b Anthers not tailed; receptacle honeycombed with fringed pits .................................................................
         5b Capitula heterogamous, OR if homogamous, then florets with 5, 4 or 3 relatively short and wide lobes, OR involucral bracts with appendages or margins which are thin and dry and often brownish, OR if capitula unisexual then plants monoeccious:
            10a Style branches of bisexual disc florets connate nearly to the tips, with upper part of style shaft abruptly or gradually thickened below them; involucral bracts, if connate in lower part, in several rows; capitula always bisexual ........................................ Arctotieae (p. 84)
            10b Style branches of disc florets long to short or absent but upper part of style shaft not thickened as above, or capitula unisexual and monoeccious; involucral bracts, if connate, in 1 row:
               11a Receptacle scaly, OR if not scaly then pappus of scales, and/or leaves opposite, and/or cypselas black, and/or capitula unisexual ................................................................. Heliandreae (p. 85)
               11b Receptacle not scaly OR if so, then leaves not opposite, cypselas not black and capitula not unisexual:
                  12a Style branches with a subulate to triangular appendage ................................................................. Astereae (p. 86)
                  12b Style branches without a subulate to triangular appendage, acute to rounded, or truncate and fringed with short hairs or pappillae:
                     13a Involutural bracts with thin, dry, usually brown, often erose margins; style branches truncate and fringed; pappus of hairs absent ................................................................. Anthemieae (p. 84)
                     13b Involutural bracts green and herbaceous or with almost transparent margins or with thin, dry, membranous appendages; pappus of hairs present, OR if absent, then style branches not truncate and fringed, or involucral bracts in 1 row:
                        14a Pappus present; anthers tailed, sometimes minutely so ................ Inuleae (including Gnaphalieae and Pluchieae) (p. 87)
                        14b Pappus absent; anthers not tailed:
                           15a Fruits large, curved or angular or winged cypselas or smooth drupes ............................................. Calenduleae (p. 84)
                           15b Fruits small columnar cypselas .............................................................................................................. Senecioneae (p. 88)

Tribe Mutisieae

1a Plants dioecious; shrubs or trees:
   2a Pappus of scabrid bristles ......................................................................................................................... Brachylaena
   2b Pappus 0 .................................................................................................................................................. Tarchonanthus
1b Plants monoeccious; suffrutescent with annual stems from woody rootstocks, or annual herbs:
   3a Scales present on receptacle, resembling the inner involucral bracts ........................................................ Erythroxylemaphum
   3b Scales on receptacle 0:
      4a Plants acaulescent but possessing a scape (Dicoma plantaginifolia sometimes apparently acaulescent but never possessing a scape) ........ Gerbera
      4b Plants caulescent, not scapigerous; stems occasionally much abbreviated with capitula borne at ground level:
         5a Capitulum radiate; ray florets neuter with strap-shaped, ± ob lanceolate, erect limb; pappus of narrow scales .................... Passacordoa
ASTERACEAE: Key to genera of Mutisieae

DICOTYLEDONS

5b Capitulum discoid or disciform; outer florets sometimes filiform, neuter and/or bilabiate but not strap-shaped; pappus of barbellate or plumose setae:
6a Apices of involucral bracts rounded or narrowly obtuse; corolla limb well exserted above pappus and involucre; leaves usually stem-sheathing at the base ................................................................. Pleiotaxis
6b Apices of involucral bracts tapering-pungent; corolla hardly visible above the pappus; leaves not stem-sheathing at the base, or if so then innermost involucral bracts shorter and broader than outer ones .................................................. Dictoma

Tribe Cardueae

Key to genera
1a Leaves and stem-wings, if present, not spinescent at the margins; outer involucral bracts with a distinct apical appendage spinose on the margins; pappus of scale-like setae free to the base; capitula heterogamous, radiate; plants not thistle-like ................................................................. Centaurea
1b Leaves and stem-wings spinescent at the margins; outer involucral bracts without obvious apical appendages, apices ± spinescent, sometimes pectinate-spinescent or lacerate on the margins about the apex; pappus setae connate at the base into a ring; capitula homogamous; plants thistle-like:
2a Pappus setae feathery; margins of outer involucral bracts pectinate-spinescent ........................................... Cirsium
2b Pappus setae not feathery; margins of involucral bracts entire ......................................................................................................................................................... Carduus

Tribe Vernonieae

Key to genera
1a Capitula aggregated in many secondary capitula surrounded by bracts; involucral bracts ± 8, decussate .................................................. Elephantopus
1b Capitula free or in clusters, but without bracts surrounding the clusters; involucral bracts more than 8, imbricate:
2a Pappus in 1 whorl of few free bristles or scales, or ± fused into a tubular to cup-shaped structure, or a short rim, or an undulate to denticate corona, or pappus absent:
3a Leaves pinnatisect; cypselas 4-angled, pappus 0 ........................................................................................................................ Raphsiophyllum
3b Leaves entire, serrate or dentate:
4a Hairs on stem T-shaped, with short stalk and two long equal arms ......................................................................................................... Gutenbergia
4b Hairs on stem simple or asymmetrically T-shaped (one short and one long arm):
5a Receptacle with scales between the florets; pappus tubular to cup-shaped, or a short denticate corona:
6a Pappus a membranous tubular cupule; cypselas subcylindric ........................................................................................................... Gossweileria
6b Pappus a short denticate corona; cypselas 5-angled ................................................................................................. Omphalopappus
5b Receptacle without scales between the florets; pappus various:
7a Pappus of 4–8 scales ....................................................................................................................................................... Ageratiniastrum
7b Pappus a short rim or corona, or of bristles, or absent:
8a Pappus absent or a short rim or corona: ............................................................................................................................... Muschleria
9a Pappus absent or represented by a short apical rim; cypselas ± turbinate, (3–)5(6)-ribbed .............................................................. Ethulia
9b Pappus a short undulate corona; cypselas obovoid, ± 10-ribbed .......................................................................................... Muschleria
8b Pappus of few bristles:
10a Cypselas with glands in sunken pits; pappus of few coarsely barbellate bristles; corolla lobes hairy ............................................ Erlangea
10b Cypselas with raised glands, or glands only in grooves, or absent; corolla lobes mostly glabrous .................................................. Bothriocline
2b Pappus in 2 or more whorls, the inner whorl composed of setae, the outer whorl of setae or scales or reduced to a low ring of free or ± united brief scales:
11a Inner pappus copious, with many bristles:
12a Corolla orange-yellow ......................................................................................................................................................... Distephanus
12b Corolla purple, mauve, blue, green or white .......................................................................................................................... Vernonia
11b Inner pappus of few bristles or scales:
13a Receptacle with scales between the florets/cypselas ................................................................................................. Dewildemania
13b Receptacle without scales:
14a Pappus of 4–7 broad, ± united scales alternating with 4–7 paleaceous setae .............................................................................. Ageratiniastrum
14b Pappus of small scales and larger bristles:
15a Inner pappus bristles longer than 3 mm or if shorter, then plant with T-shaped hairs; outer pappus of scales ....................... Vernonia
15b Inner pappus bristles 1.5–2.5 mm long, or if longer, then outer pappus a rim .............................................................................. Brachythrix

Tribe Cichorieae (Lactuceae)

Key to genera
1a Pappus of a small rim of scales up to 2 mm long; stalks of individual capitula widened just below the capitulum ........................................... *Cichorium
1b Pappus of hairs or bristles at least 4 mm long; stalks of individual capitula not widened:
2a Pappus hairs (at least the inner ones) plumose ......................................................................................................................... *Hypochaeris
2b Pappus hairs at most barbellate:
3a Cypselas distally tuberculate, with long, slender beak; scape with a single capitulum, the stalk hollow ............................................ *Taraxacum
3b Plants not scapose, or cypselas and scapes not as above:
4a Cypselas beaked or attenuate distally, with ascending hairs or projections on the ribs or margins:
5a Cypselas ± compressed, abruptly constricted; involucral bracts without setae (except in Lactuca glandulifera); flowers yellow, blue, purple or white ............................................................................................................. Lactuca

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ASTERACEAE: Key to genera of Cichorieae

5b Cypselas terete, gradually tapering; involucral bracts setose; flowers yellow only ............................................................... Crepis
4b Cypselas truncate, without ascending hairs or projections (but occasionally slightly beaked with muricate ribs in Launaea):
6a Flowers pink or purple; leaves ± peltate ......................................................................................................................... Prenanthes
6b Flowers yellow; leaves sessile, or with petiole proximally:
7a Cypselas compressed; involucral bracts usually pale tomentose at base .................................................................................. Sonchus
7b Cypselas columnar; involucral bracts glabrous or hairy, but not tomentose proximally:
8a Involucral bracts glabrous or with a minute tuft of hairs at the apex (Launaea cornuta with a single seta near the apex) ........... Launaea
8b Involucral bracts hairy or setose:
9a Cypselas 2.0–3.5 mm long, obconic, truncate above, pappus of comparatively few coarse scabrid bristles; involucral bracts 6–10
   mm long, glandular, pubescent to tomentose ........................................................................................................................ Tolpis
9b Cypselas and pappus not as above; involucral bracts 6–17 mm long, setose, sometimes also pubescent or glandular:
10a Leaves with attenuate base; mature cypselas 6–10 mm long ......................................................................................... Crepis newii
10b Leaves sessile, with large basal auricles; mature cypselas 2.5–4 mm long ............................................................................. Sonchus oleraceus

Tribe Arctotideae

Key to genera
1a Involucral bracts ± free, apices obtuse (at least in inner bracts), scarios at the tips and on the margins:
2a Cypselas with 2 linear grooves or longitudinal chambers on one face; alveolae on receptacle setose ......................................... Arctotis
2b Cypselas obscurely longitudinally ribbed, not developing longitudinal chambers on one face; alveolae on receptacle ± fimbriate, not long-setose:
3a Cypselas glabrous or pubescent with a basal tuft of short or long upward-pointing hairs; ray florets female; pappus of overlapping scales ....
   .............................................................................................................................................................................................. Haplocarpha
3b Cypselas densely woolly, without a basal coma of hairs; ray florets neuter; ovary rudimentary; pappus ± fused, coroniform .............. Arctotheca
1b Involucral bracts connate at the base or higher, apices acute or acuminate, often spine-tipped:
4a Involucral bracts connate at the base only, always spiny ..................................................................................................... Berkheya
4b Involucral bracts connate to higher up forming a cup-shaped involucrum, mostly bristly, hardly spiny:
5a Pappus in 1 whorl or in 2 whorls and dimorphic, the outer whorl of overlapping sessile scales, the inner whorl of much smaller stiptate scales;
   plants ± bristly-setose or glabrescent, rarely glandular-hairy ................................................................. Hirpicium
5b Pappus in 2 whorls of subequal slender accrescent scales, scales of outer whorl not overlapping, scales of inner whorl ± similar in length and
   shape to the outer but with a short stalk; plants ± araneose or glabrous, not hispid .............................................................. Gazania

Tribe Eupatorieae

Key to genera
1a Anthers truncate at the apex or minutely apiculate; pappus of 3 or 5 gland-tipped processes ........................................................... Adenostemma
1b Anthers with an apical appendage; pappus of eglandular bristles or scales:
2a Pappus of scales, sometimes accompanied by bristles ........................................................................................................ *Ageratum
2b Pappus of bristles:
3a Involucral bracts 4 or 5; plant a twiner or scrambler ........................................................................................................... Mikania
3b Involucral bracts many, if few then plant erect, not twining:
4a Involucral bracts with coloured tips, deciduous; pappus of many capillary bristles ................................................................. *Chromolaena
4b Involucral bracts and pappus not as above; cypselas 5- to 8-ribbed, with many small bristles ...................................................... Stomataantas

Tribe Anthemideae

Key to genera
1a Ray florets present:
2a Pappus 0; ray florets female ........................................................................................................................................ Phymaspermum
2b Pappus of 1 whorl of rounded scales; ray florets sterile ...................................................................................................... Ursinia
1b Ray florets 0:
3a Corolla of bisexual flowers 4-lobed:
4a Capsula solitary ................................................................................................................................................................. Cotula
4b Capsula in corymbiform or subglobose groups ..................................................................................................................... Schistostephium
3b Corolla of bisexual flowers 5-lobed:
5a Pappus of small scales; anthers distinctly tailed; plant not markedly aromatic ................................................................. Inulanthera
5b Pappus 0; anthers not tailed; plants very aromatic .............................................................................................................. Artemisia

Tribe Calenduleae

Key to genera
1a Shrubs; involucral bracts in 2 or 3 rows; fruit a fleshy drupe .............................................................................................. Chrysanthemoides
1b Herbs or subshrubs; involucral bracts in 1(2) rows; fruit a cypsela:
2a Disc florets functionally male ........................................................................................................................................ Osteospermum
2b Disc florets mostly bisexual; disc cypselas laterally flattened with thickened margins ................................................ Dimorphophytotheca

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Seed plants of southern tropical Africa: families and genera
Tribe Heliantheae (including Helenieae)  

**Key to genera**

1a Plants monoeccious; capitula unisexual:

2a Involucral bracts of male capitula connate; female capitula 1-flowered; cypsela clasped by female involuce which bears 4–6 spines .... *Ammobosia*

2b Involucral bracts of male capitula free; female capitula 2-flowered; cypsela clasped by female involuce bearing many hooked spines *Xanthium*

1b Plants dioecious; capitula bisexual:

3a Receptacle without paleae:

4a Perennial herbs with somewhat fleshy roots; ray florets 0, or present and elugulate; involucral bracts many in 3–5 series; involucres more than 5 mm in diameter:

5a Leaves alternate; pappus of toothed scales; corolla yellow ......................................................................................................................... *Welwitschiella*

5b Leaves opposite; pappus of fimbriately winged setae, usually terminating in a hook point; corolla orange .................................................................... *Hypericophyllum*

4b Annual herbs, introduced weeds; ray florets 1–many, ligulate; involucral bracts few in 1–3 series; involucres usually less than 5 mm in diameter (up to 25 mm in *Tagetes patula*):

6a Leaves simple, all opposite; pappus 0; capitula sessile or very shortly pedicelled ......................................................................................... *Flavelia*

6b Leaves mostly pinnatisect, opposite or alternate; pappus present; capitula distinctly stalked:

7a Plants strongly aromatic when bruised; leaf lobes narrowly elliptic or lanceolate, margins serrate; involucral bracts united along their margins ................................................................................................................................................................................... *Tagetes*

7b Plants not strongly aromatic; leaf lobes filiform, margins entire; involucral bracts free ........................................................................ *Schknabria*

3b Receptacle with paleae:

8a Inner florets of disc functionally male:

9a Leaves opposite; cypsela tightly clasped by one of the inner involucral bracts with hooked spines; pappus 0 ......... *Acanthospermum*

9b Leaves alternate; cypsela clasped by an unarmed involucral bract and 2 paleae, or not clasped but paleae on receptacle strongly conduplicate; pappus of 2–4 stout awns:

10a Cypsela clasped by an involucral scale and 2 lateral, concave, involucral paleae; pappus of 2 recurved awns clasping the margin of the cypsela ......................................................................................................................................................................................... *Parthenium*

10b Cypsela often clasped or enfolded by the strongly conduplicate paleae on the receptacle; pappus of (2–)4 stout setae .. *Blepharispermum*

8b Inner florets of disc bisexual, fertile (if numerous florets present then innermost ones sometimes sterile):

11a Paleae on receptacle ± flat, not clasping the cypsela:

12a Involucral bracts quite free, the inner merging gradually into the receptacular paleae; leaves simple:

13a Pappus 0; lamina of ray florets golden yellow ................................................................................................................................. *Guizotia*

13b Pappus present; lamina of ray florets white, cream or yellow:

14a Pappus of 2 awns or of many bristles; ray florets female, strap-shaped or ± bilabiate, yellow or creamy:

15a Pappus of many densely plumose bristles; cypsela not winged ......................................................................................... *Tridax*

15b Pappus of 2 awns connate to the deeply lobate wings of the cypsela ......................................................................................... *Syndrelia*

14b Pappus of several scales; rays very small, white ...................................................................................................................................................... *Galinsoga*

12b Involucral bracts of the inner row connate at the base, outer row with fewer and mostly smaller or narrower bracts; leaves variously divided:

16a Leaves alternate ...................................................................................................................................................................................... *Chrysanthellum*

16b Leaves opposite:

17a Ray florets yellow, golden, orange or 0 .............................................................................................................................................. *Bidens*

17b Ray florets white, pink, lilac or red ......................................................................................................................................................... *Cosmos*

11b Paleae on receptacle ± conduplicate and clasping or ± enfolding cypsela:

18a Involucral bracts 4, in 2 rows of opposite pairs, leafy; flower heads axillary, sessile or subsessile ......................................................... *Enydra*

18b Involucral bracts 3 to many, but not in 2 rows of opposite pairs and leafy; capitula not sessile or subsessile and axillary:

19a Inner involucral bracts embracing fertile ray cypsela; involucral bracts spatulate and densely glandular .. *Sigesbeckia*

19b Inner involucral bracts not embracing outermost cypsela:

20a Leaves usually alternate; paleae of receptacle boat-shaped to slightly conduplicate:

21a Paleae clasping the cypsela produced above into a ± tubular neck; ray florets 0 or sterile .............................................. *Sclerocarpus*

21b Paleae of receptacle slightly conduplicate, if partly enfolding cypsela, then not produced into a tubular neck ..... *Athroisma*

20b Leaves opposite, sometimes alternate above:

22a Cypsela surmounted by a distinct, often lacerate cupule; additional pappus bristles present or not:

23a Ray florets sterile (although style and stigmas rarely present); all cyspsela ± alike, bilaterally convex or obscurely

4-angled ............................................................................................................................................................................................ *Aspilia*

23b Ray florets fertile (with style and stigmas, and producing mature cypsela); outer cypsela ± triquetrous; lamina small, white ........................................................................................................................................................................... *Blainvillea*

22b Cypsela without pappus, or with pappus of various kinds, but not a cupule:

24a Ray florets persistent; unbranched annual herbs up to 0.6 m high; leaves narrowly oblong-ovate ..................... *Zinnia*

24b Ray florets not persistent:

25a Cypsela 4-sided; capitula large and showy with orange-red or yellow ray florets; apex of peduncles becoming very thick ......................................................................................................................................................... *Tithonia*

25b Cypsela ± compressed or, if not noticeably compressed, peduncles not swollen above:
26a Paleae of receptacle obovate, truncate-crenate and caudate-spinescent at apex; perennial shrubs up to 6 m tall with white rays ................................................................. *Montanea
26b Paleae of receptacle not caudate-spinescent:
   27a Disc florets deep purple, at least above ................................................................. Helianthus
   27b Disc florets not purple:
      28a Disc florets white; paleae of receptacle very narrow and often setiform ............... *Eclipta
      28b Disc florets not white, ± yellowish to orange:
         29a Cypselas thick or angular, not compressed, pubescent at apex, not winged or margined ...... Melanthera
         29b Cypselas ± compressed, winged or with a hyaline cartilaginous margin:
            30a Receptacle flat; cypselas with broad, irregular margin; lamina of ray florets 10 mm long or more ....
               ........................................................................................................ *Verbesina
            30b Receptacle convex to narrowly conical; cypselas with hyaline, cartilaginous margin; capitula radiate or discoid:
               31a Capitula discoid; pappus of 2 or 3 rigid bristles ................................................ Spilanthes
               31b Capitula radiate; pappus 0 ........................................................................... Acnella

**Tribe Astereae**

1a Pappus in 1 series or rudimentary to 0:
2a Capitula distinctly radiate:
   3a Pappus of minute scales or a minute annular rim:
      4a Receptacle dome-like; leaves alternate, pinnatifid ...................................................... Gyrodoma
      4b Receptacle flat; leaves alternate or opposite, linear ..................................................... Jeffreya
   3b Pappus of scabrid or barbellate bristles:
      5a Scandent or twining shrubs ........................................................................................... Microglossa
      5b Herbs or shrubs, not scandent or twining ..................................................................... Felicia
2b Capitula discoid or disciform:
   6a Capitula discoid:
      7a Capitula laxly corymbose; pappus bristles stiff and tough, somewhat flattened and wider towards the base ............... Dacrytrichia
      7b Capitula mostly solitary, terminal, pedunculate; pappus bristles finely setaceous ............. Felicia
   6b Capitula disciform or shortly radiate:
      8a Outer female florets in one row ...................................................................................... Nolletia
      8b Outer female florets in 2 to many rows:
         9a Receptacle ± swollen; style branches with lanceolate appendages; pappus 0 or of 1 or 2 bristles .............................................. Dichrocephala
         9b Characters not as above:
            10a Pappus of few basally connate bristles, a corona present or not ................................... Grangea
            10b Pappus of many barbellate bristles:
               11a Disc florets functionally male; cypselas turbinate; shrubs ........................................... Psiadia
               11b Disc florets bisexual, rarely some functionally male; cypselas obovoid-oblong or ellipsoid, compressed; annual or perennial herbs, rarely shrubs:
                  12a Marginal florets (short rays) yellow ........................................................................ Nidorella
                  12b Marginal florets (short rays) white, pink or mauve:
                     13a Style branch appendages larger than stigmatic area, lanceolate-linear, acute or acuminate; cypselas obovoid-oblong, somewhat compressed, pubescent and glandular .................................. Aster
                     13b Style branch appendages lanceolate to triangular; cypselas obovoid-oblong, sometimes compressed, pubescent ... Conyza
               11b Marginal florets (short rays) yellow ........................................................................ Nidorella
   2b Capitula disciform or discoid:
      19a Capitula disciform; pappus of bristles only ................................................................. Conyza
      19b Capitula discoid:
         20a Pappus of bristles only .............................................................................................. Pteronia
         20b Pappus of bristles and scales:
            21a Leaves opposite ........................................................................................................... Engleria
            21b Leaves alternate, ericoid ........................................................................................... Chrysocoma

**Key to genera**

1a Pappus in 1 series or rudimentary to 0:
2a Capitula distinctly radiate:
   3a Pappus of minute scales or a minute annular rim:
      4a Receptacle dome-like; leaves alternate, pinnatifid ...................................................... Gyrodoma
      4b Receptacle flat; leaves alternate or opposite, linear ..................................................... Jeffreya
   3b Pappus of scabrid or barbellate bristles:
      5a Scandent or twining shrubs ........................................................................................... Microglossa
      5b Herbs or shrubs, not scandent or twining ..................................................................... Felicia
2b Capitula discoid or disciform:
   6a Capitula discoid:
      7a Capitula laxly corymbose; pappus bristles stiff and tough, somewhat flattened and wider towards the base ............... Dacrytrichia
      7b Capitula mostly solitary, terminal, pedunculate; pappus bristles finely setaceous ............. Felicia
   6b Capitula disciform or shortly radiate:
      8a Outer female florets in one row ...................................................................................... Nolletia
      8b Outer female florets in 2 to many rows:
         9a Receptacle ± swollen; style branches with lanceolate appendages; pappus 0 or of 1 or 2 bristles .............................................. Dichrocephala
         9b Characters not as above:
            10a Pappus of few basally connate bristles, a corona present or not ................................... Grangea
            10b Pappus of many barbellate bristles:
               11a Disc florets functionally male; cypselas turbinate; shrubs ........................................... Psiadia
               11b Disc florets bisexual, rarely some functionally male; cypselas obovoid-oblong or ellipsoid, compressed; annual or perennial herbs, rarely shrubs:
                  12a Marginal florets (short rays) yellow ........................................................................ Nidorella
                  12b Marginal florets (short rays) white, pink or mauve:
                     13a Style branch appendages larger than stigmatic area, lanceolate-linear, acute or acuminate; cypselas obovoid-oblong, somewhat compressed, pubescent and glandular .................................. Aster
                     13b Style branch appendages lanceolate to triangular; cypselas obovoid-oblong, sometimes compressed, pubescent ... Conyza
               11b Marginal florets (short rays) yellow ........................................................................ Nidorella
   2b Capitula disciform or discoid:
      19a Capitula disciform; pappus of bristles only ................................................................. Conyza
      19b Capitula discoid:
         20a Pappus of bristles only .............................................................................................. Pteronia
         20b Pappus of bristles and scales:
            21a Leaves opposite ........................................................................................................... Engleria
            21b Leaves alternate, ericoid ........................................................................................... Chrysocoma
Tribe Inuleae (including Gnaphalieae and Plucheaeae)

Key to genera

1a Stems without resin ducts; leaves generally entire, with hairs with 1 basal cell and a very long terminal cell; involucral bracts with entire or divided sclerenchymatous basal portion; pollen with 2-layered sexine (Gnaphalieae):

2a Leaves denticulate, dentate, serrulate, serrate or lobed; involucral bracts cartilaginous or herbaceous, without papery lamina:
   3a Capitula radiate:
      4a Receptacle ephalate ................................................................. Athrixia
      4b Receptacle paleate:
         5a Pappus of barbellate bristles and a crown of scales; corolla of disc florets yellow .................................................. Philyrophyllum
         5b Pappus of rigid awns; corolla of disc florets publisp ................................................................. Callilepis
   3b Capitula discoid or disciform:
      6a Stem and leaves villose; florets yellow; pappus of short rigid bristles and short scales ........................................ Artemisiospis
      6b Stem and leaves glabrous or puberulous; florets white or blue; pappus of 1 plumose capillary bristle only ......... Denekia

2b Leaves entire or else involucral bracts have a papery lamina:
   7a Involute bracts cartilaginous or herbaceous; capitula radiate; disc florets purplish black ............................................ Callilepis
   7b Involute bracts with papery lamina, or if otherwise then capitula disciform or discoid:
      8a Involute bracts entirely cartilaginous or herbaceous; capitula 1-flowered .................................................. Stoebe
      8b Involute bracts conspicuously papery:
         9a Florets purple, at least apically or basally:
            10a Cypselas with globose hairs; pappus basally connate .................................................. *Gamochaeta
            10b Cypselas with clavate or elongated hairs; pappus free .................................................................................. Gnaphalium
         9b Florets yellow:
            11a Pappus bristles apically plumose, basally connate; strowe undivided; cypselas with globose, myxogenic twin-hairs .............. Helichryopsis
            11b Pappus bristles barbellate, basally free; strowe divided; cypselas never with globose twin-hairs:
               12a Capitula with less than 20 florets ................................................................. Helichrysum:
               12b Capitula with more than 20 florets ................................................................. Pseudognaphalium

1b Stems with or without resin ducts; leaves dentate, denticulate, serrate or lobed; involucral bracts cartilaginous or herbaceous, without papery lamina:

13a Female florets in 1 row, radiate, miniradiate, rarely filiform or absent; style with acute sweeping hairs ending above furcation, rarely with obtuse sweeping hairs (Anisopappus) (Inuleae in strict sense):

14a Pappus 0, or of wide scales often with protruding mid-section or very short, not of capillary bristles:

15a Receptacle paleate ................................................................. Anisopappus
   15b Receptacle ephalate:
      16a Receptacle clothed with many bristles ................................................................. Geigeria
      16b Receptacle without bristles .................................................................................. Calostephane

14b Pappus of well-developed capillary bristles:

17a Pappus of bristles and scales:

18a Pappus bristles plumose ................................................................................. Pegolettia
18b Pappus bristles barbellate:

19a Pappus scales forming a short connate cup; capitula generally disciform ................................................. Pulicaria
19b Pappus scales ± free; capitula discoid .............................................................................. Pegolettia

17b Pappus of bristles only:

20a Capitula discoid:

21a Capitula small, few-flowered .............................................................................. *Pentanema
21b Capitula larger, many-flowered ............................................................................ Inula glomerata
20b Capitula radiate or disciform:

22a Marginal florets radiate or miniradiate ........................................................................ Inula paniculata
22b Marginal florets filiform:

23a Leaves linear-lanceolate, sessile, margin entire; involucral bracts linear-lanceolate, distinctly imbricate; stems sometimes narrowly winged .............................................................................. Pechnel-Loeschea
23b Leaves elliptic to ovate, petiolate, margins serrate; involucral bracts many, linear-filiform; stems never winged .................................. Blumea

13b Female florets in several rows, filiform or rarely radiate; style with obtuse sweeping hairs (Plucheaeae):

24a Capitula aggregated in dense compound heads:

25a Pappus absent; receptacle naked ............................................................................. Sphaeranthus
25b Pappus of free barbellate bristles in 1 row; receptacle paleate .............................................. Neojeffreya

24b Capitula free from each other, if densely grouped then individual heads distinct:

26a Pappus 0 or consisting of scales or of both small scales and bristles:

27a Stems winged; pappus absent, at least in outer florets ............................................................................. Litogyne
27b Stems not winged; pappus of both bristles and small scales ................................................ Porphyrstemma

26b Pappus of bristles (in one or more rows):

28a Pappus bristles few (1–6):
29a Leaves and/or stems glandular, not scabridulous; involucral bracts glandular, ± glabrous ........................................ Nicolasia
29b Leaves not glandular, scabridulous above; involucral bracts hispid ................................................................. Porphyrostemma
28b Pappus bristles many (more than 8):
30a Florets yellow or whitish:
31a Florets whitish; leaves long-decurrent; cypselas pilose ................................................................. *Pterocaule
31b Florets yellow; leaves not long-decurrent; cypselas glabrous or sparsely pilose ........................................ Pluchea
30b Florets pink or purple:
32a Style of outer florets entire or emarginate ........................................................................................................ Adelostigma
32b Style clearly 2-lobed:
33a Style branches truncate, sometimes with a central tuft of fused papillae .................................................... Cineraria
33b Style of outer florets entire or emarginate ........................................................................................................ Senecio
31b Florets yellow; leaves not long-decurrent; cypselas pilose ........................................................................ Pseudoconyza
31a Florets whitish; leaves long-decurrent; cypselas pilose ................................................................. Pluchea ovalis

**Tribe Senecioneae**

**Key to genera**

1a Capitula calyculate (with a calyculus: at least 1 but usually more additional small outer involucral bracts):

2a Petioles prehensile, thickened basally; anther bases with sterile tailed appendages:

3a Leaves auriculate at the base; capitula radiate ................................................................................................ Austrosynotis
3b Leaves exauriculate; capitula disciform ........................................................................................................ Mikaniosis

2b Petioles not prehensile; anther bases without tailed appendages:

4a Crystals in ovary wall simple, plate-like, needle-like or simple:

5a Outer (ray) cypselas dorsiventrally compressed ......................................................................................... Cineraria
5b Outer (ray) cypselas not compressed, or radiate florets 0:

6a Style branch apices without appendages, truncate or rounded ........................................................................ Senecio
6b Style branch apices with a very short to elongated appendage of fused papillae ........................................ Crassocephalum

4b Crystals in ovary wall compound, drusiform:

7a Plants truly succulent with fleshy leaves and/or stems; style branches with conical to somewhat elongated appendage ........................................ Kleinia
7b Plants at most sub succulent:

8a Style branches truncate, sometimes with a central tuft of fused papillae .................................................. Solanecio
8b Style branches with a long, tapering, papillose appendage ......................................................................... Gynura

1b Capitula ecalyculate: without any small outer involucral bracts:

9a Capitula radiate:

10a Annual herbs; pappus 0 ................................................................. Stenops
10b Perennial herbs, shrublets or herbs; pappus of fine bristles:

11a Disc florets bisexual ............................................................................................................................ Euryops
11b Disc florets functionally male ................................................................................................................. Othonna

9b Capitula discoid:

12a Plants truly succulent with fleshy leaves and/or stems ...................................................................................... Kleinia
12b Plants at most sub succulent:

13a Plants shrubby, sometimes sub succulent ................................................................................................ Lopholaena
13b Plants annual or perennial herbs:

14a Leaves rosulate, linear; cypselas obovoid, glandular; pappus of a few scabrid, soon caducous bristles ............... Pseudonitrichia
14b Leaves cauleine, mostly broader than linear; cypselas glabrous or pubescent, not glandular; pappus of a single ± linear scale or of many bristles:

15a Corolla longer than ovary; pappus of many fine bristles ........................................................................ Emilia
15b Corolla half as long as ovary; pappus of a single ± linear scale .................................................................. Emiliella

**Acanthospermum** Schrank (Heliantheae)

Mendonça: 89 (1943); Wild: 5 (1967).


**Acmella** Rich. ex Pers. (Heliantheae)


Annual herbs. **Leaves** opposite and/or basally rosulate. **Capitula** usually radiate, sometimes disciform or discoid, solitary or cymose. **Involucral bracts** in 1–3 rows, subequal or with outer row spreading and longer, entire or irregularly dentate. **Receptacle** narrowly conical, acuminate to obtuse at the apex, paleae laxly enclosing florets. **Ray florets** female, fertile, 3–22 per capitulum, usually small, 2- to 3-lobed, variously coloured. **Disc florets** bisexual, fertile, 4- to 5-lobed, small, variously coloured. **Cypselas** ciliate, glabrous or sometimes with glabrous margins; ray cypselas broadly ovate or elliptic, 3-angled; disc cypselas elliptic, strongly compressed. **Pappus** 0.

**Acleptostigma Steetz**  
(Plucheeae)  
Steetz: 428 (1864); Wild: 17 (1975); Anderberg: 297 (1994).

Erect annual herbs with resin canals. **Leaves** alternate, linear, entire or denticulate. **Capitula** disciform, solitary, terminal. **Florets:** outer florets female, filiform; central florets functionally male, tubular with 5 dark purple longitudinal lines commencing between lobes. **Anthers** very shortly tailed. **Style** almost undivided. **Cypselas** ellipsoid, sparsely hairy with straight hairs. **Pappus** of free, barbellate bristles in 1 series, each bristle with adpressed teeth.


**Adenostemma J.R.Forst. & G.Forst.**  
(Eupatorieae)  

Species 24, tropical America and Africa; sthn trop. Afr. 3, Angola, Zambia, Zimbabwe, Malawi, and sthn Afr.

**Ageratinastrum Mattf.**  
(Vernonieae)  

Perennial herbs with annual stems from a woody rootstock; vegetative indumentum of short-stalked flagelliform hairs. **Stems** many, densely leafy, with short internodes, branching above. **Leaves** alternate or spirally arranged, opposite or whorled, sessile to shortly petiolate, felted-tomentose, sparsely pilose or glabrescent, glandular-punctate. **Capitula** homogamous, many, in lax or dense clusters at ends of branches, or capitulum-clusters arranged in a large corymbiform cyme. **Involucre** campanulate to subglobose, florets exserted; phyllaries several-seriate, progressively larger to inside. **Receptacle** flat, shallowly alveolate. **Corollas** purple or mauve, darker in upper half, regularly 5-lobed, lobes lanceolate or pilose-hispid. **Anthers** with a broad hyaline apical appendage and short acute tails at base. **Style:** arms subulate, hairy outside. **Cypselas** obovoid-oblong or turbinate, 4- or 5-sided and obscurely ribbed on the angles, truncate at apex, smooth or strongly rugose on faces between ribs, glabrous or sparsely setulose, minutely brown gland-dotted. **Pappus** persistent, of ± united broad shiny scales lacerate on upper margin, or of scales sometimes free and alternating with paleaceous setae. **Pollcn** described as triplicate, lophate and emicropunctate.


**Ambrosia L.**  
(Heliantheae)  


**Anisopappus Hook. & Arn.**  
(Inuleae)  


**Arctotheca J.C.Wendl.**  
(Arctotideae)  

Species 4, sthn Afr. with 1: *Arctotheca populifolia* (P.J.Bergius) Norl., extending to the foreshore dunes of Mozambique.

**Arctotis L.**  
(Arctotideae)  


**Artemisia L.**  
(Compositae)  


**Artemisiopsis S.Moore**  
(Ganphalaeae)  


**Aspilia Thouars**  
(Heliantheae)  

Wedelia Jacq. in part; Mendonça: 91 (1943).


**Aster L.**  
(Asteraceae)  

Athrixia Ker Gawl.
(Gnaphalieae)

Athroisma DC.
(Helieaeae)


Blepharaspernum Wight ex DC.
(Helieaeae)

Shrubs, undershrubs or half-climbing shrubs. Leaves alternate, petiolate, simple, ovate or lanceolate, entire or sparsely serrate, glabrous or pubescent. Capitula disciform, small, aggregated into globose glomerules in terminal corymbs. Involucral bracts 3: 1 subtending and 2 opposite. Receptacle wart-like with strongly conduplicate, apically 3-lobed palea. Marginal florets 2, female, filiform. Disc florets 2 or 4, functionally male. Anthers caudate. Cypselas elliptic or obcordate, ± triquetrous. Pappus of 2–4 stout setae.

Species 15, Old World tropics; sthn trop. Afr. 2, Angola (Cabinda), Mozambique.

Blumea DC.
(Inuleaeae)


Bothriocline Oliv. ex Benth.
(Vernonieae)


Brachylaena R.Br.
(Tarchonantheae)


Brachythrix Wild & G.V. Pope
(Vernonieae)

Perennial herbs with annual stems from a small woody rootstock; rooterows with or without lanate tufts; roots many, thong-like and usually swelling to form root-tubers; vegetative indumentum a varying mixture of large, long-stalked, flagelliform hairs intermixed with short-stalked T-shaped hairs. Stems erect, usually branching above, leafy, sometimes scapiform. Leaves alternate, sessile or subsessile, bases cuneate to auriculate; upper surface ± scabrous, sparsely pubescent or glabrescent; lower surface pubescent or felted, sometimes finely pilose especially on the nerves, or glabrescent, glandular-punctate. Capitula homogamous, solitary or few to many in lax corymbiform cymes, or aggregated in ± dense 3–many-capitulate terminal or laterally borne ± scorpioidly cymose clusters. Involucre campanulate to broadly cup-shaped, occasionally subglobose or narrowly ovoid. Phyllaries imbr-
cate, several-seriate. Receptacle ± flat. Corollas purple, narrowly funnel-shaped, regularly deeply 5-lobed; lobes apically setulose or glabrous. Anthers with a narrowly triangular hyaline appendage at apex and short subobtuse tails at base. Style: arms subulate, hairy outside. Cypselas narrowly obovoid, 4- or 5-angular with narrow ribs on the angles, truncate to slightly rounded at apex, faces between ribs with large scattered brownish glandular cells, very sparsely hispid or glabrous. Pappus 2-seriate, outer one of short lacerate free or ± united scales or reduced to a low rim, inner one of short very barbellate setae. Pollen described as tricolporate, subechinolophate to echinate and micropunctate.


Callilepis DC.
(Gnaphalieae)


Calostephane Benth.
(Inuleae)


Carduus L.
(Cardueae)
Binns: 30 (1968); Pope: 49 (1992); Jeffrey & Beentje: 45 (2000).


Centaurea L.
(Cardueae)


*Chromolaena DC.
(Eupatorieae)

Sthn trop. Afr. 1: *Chromolaena odorata (L.) R.M.King & H.Robinson, Zambia, and sthn Afr. The first confirmed record for the region appears to be a collection from northern Zimbabwe from as early as 1967 (Baretta s. n. in U). Gautier (1992) lists Angola, Zambia, Malawi and Mozambique among the countries likely to be invaded soon.

*Chrysanthemoides Fabr.
(Calendulaceae)


Chrysocoma L.
(Asteraceae)


*Cichorium L.
(Lactuceae)
Lawalrée et al.: 4 (1986); Lisowski: 7 (1991); Jeffrey & Beentje: 64 (2000); Mapaura (Unpublished).

Sthn trop. Afr. 1: *Cichorium intybus L., cultivated but may become naturalised as in sthn Afr.

Cineraria L.
(Seneconieae)


Cirsium Mill. emend. Scop.
(Cardueae)


Conyza Less.
(Asteraceae)
Mendonça: 50 (1943); Binns: 31 (1968); Wild: 247 (1969b); Wild: 171 (1972a); Beentje: 400 (2002).


*Cosmos Cav.
(Heliantheae)


Cotula L.
(Anthemideae)
Mendonça: 109 (1943); Hilliard: 350 (1977); Beentje: 522 (2002); Bingham
DICOTYLEDONS


**Crassocephalum** Moench (Seneconieae)

Mendonça: 113 (1943); Jeffrey: 904 (1986).


**Crepis** L. (Lactucaeae)


**Dacryotrichia** Wild (Asteraceae)


Monotypic: *Dacryotrichia robinsonii* Wild, only known from Zambia.

**Denekia** Thunb. (Gnaphalieae)


**Dewildemania** O.Hoffm. (Vernonieae)


Perennial herbs with erect, usually tufted, annual stems from a small woody rootstock; roots radiating, thong-like. **Stems** ± strict, branching near apex, glabrous, sparsely pilose or pubescent, densely leafy with leaves often grading into phyllaries. **Leaves** spirally arranged, subsessile, filiform to ± elliptic or lanceolate, glabrous. **Capitula** homogamous, ±–many, solitary or in lax terminal corymbose cymes. **Involucrle** broadly cup-shaped to turbinate-campanulate; florets exserted. **Phyllaries** several-seriate, larger towards inside, appressed imbricate to somewhat spreading, outer ones often grading into bracts or leaves below, glabrous to pubescent. **Receptacle** flat or ± dome-shaped, paleaceous with paleae grading from inner phyllaries and usually exceeding them in length. **Corollas** purple, narrowly funnel-shaped, regularly 5-lobed; lobes sparsely to densely setose. **Anthers** with a small triangular hyaline apical appendage, anther thecae brownish with short acute tails at base. **Style**: arms terete, tapering to apex, hairy. **Cypselas** oblong-turbinate and ±–5-ribbed, sometimes somewhat angular and ±–5-sided, setulose to hispid, or glabrous, with scattered large brown cells on sides; pappus 2-seriate, outer series of 5–15 broad or narrow scales, inner series of somewhat larger narrow paleaceous setae.


**Dichrocephala** L’Hér. ex DC. (Asteraceae)


**Dicoma** Cass. (Mutisieae)


**Dimorphotheca** Vaill. ex Moench (Calenduleae)


**Distephanus** Cass. (Vernonieae)

Cassini: 151 (1817); Robinson & Kahn: 498 (1986); Jeffrey & Beentje: 156 (2000); Coates Palgrave: 1138 (2002).

**Gongrothamnus** Steetz; Mendonça: 109 (1943); Merxmüller: 84 (1967). **Vernonia** Schreb. in part; Pope: 69 (1992).


**Eclipta** L. (Heliantheae)

Mendonça: 89 (1943); Wild: 59 (1967); Binns: 31 (1968); Karis & Ryding: 583 (1994).


**Elephantopus** L. (Vernonieae)


Perennial ± hirsute herbs with annual stems from a woody rootstock; roots many, thong-like; vegetative indumentum sparse to dense, consisting of patent to appressed, stiff, bristle-like hairs. **Stems** 1–several, leafy or scapiform, branching
above. **Leaves** alternate, often basal, sessile, or narrowly at-
tenuate and petiole-like before widening into a ± stem-clasp-
ing, ± stem-sheathing base; upper leaves grading into leaf-
like bracts. **Capitula** homogamous, few-flowered, many, 
syncarpous in bracteate glomerules; glomerules terminal on 
offshoots flowers branches, laxly corymbiform-cymose tend-
ing to subscorpioid-cymose. **Involucre** narrowly ovoid-cy-
lindric; phyllaries few-seriate, ± carilaginous with pungent 
apices, strigose to densely hispid or glabrescent. **Receptacle**
small, plane. **Corollas** 5-lobed, asymmetric, more deeply cleft 
on one side. **Anthers** sagittate at base. **Style**: branches linear-
terete, hairy. **Cypsels** narrowly turbinate-cylindric, ± 10-ribbed, 
usually glandular between ribs, setulose; pappus 1-seriate, setae 
5–10 with bases broad, scale-like and usually overlapping, gradu-
ally or abruptly tapering and subterete, barbellate above.

Species ± 32, N and S America, Australia, Asia, Madagascar, ± 9 from Af-

**Emilia** Cass.
(Senecioneae)
Mendonça: 111 (1943); Jeffrey: 908 (1986).
Sthn trop. Afr. ± 25, Angola, Zambia, Zimbabwe, Malawi, Mozambique, 
and sthn Afr.

**Emiliella** S.Moore
(Senecioneae)
Moore: 225 (1918); Mendonça: 113 (1943); Torre: 85 (1975); Lisowski: 

Annual herbs. **Leaves** alternate, simple, sessile to shortly peti-
olate, oblong-obovate to lanceolate, slightly serrate. **Capitula**
discoid, small, solitary, with ± 8 florets, campanulate-cylind-
ric. **Involucre** of 1 series of bracts, ecalyculate. **Receptacle**
flat, naked. **Florets** all bisexual, tubular; corolla shorter than 
avery, pink to violet. **Style**: branches truncate, penicillate at 
apex. **Cypsels** linear, ribbed, glabrous. **Pappus** a single lin-
ear to linear-ovate scale (reduced bristle?) or 0.

Species 5, sthn trop. Af., Angola and Zambia.

**Engleria** O.Hoffm.
(Astereae)
Mendonça: 110 (1943); Merxmüller: 56 (1967).

**Engelomum** Welw. ex Hiern: 290 (1898).
Sthn trop. Afr. 1: *Engleria decumbens* (Welw. ex Hiern) Hiern, Angola, and 
sthn Afr.

**Enydra** Lour.
(Heliantheae)
Wild: 35 (1967).


**Erlangea** Sch.Bip.
(Vernonieae)
Mendonça: 4 (1943) (most species cited here are now placed under 

**Erythrocephalum** Benth.
(Mutisieae)
Bentham: 488 (1873); Mendonça: 139 (1943); Jeffrey: 201 (1967); Wild: 

Annual herbs, or suffrutescent with annual stems from a woody root-
stock; vegetative indumentum of appressed, fine, ± matted hairs 
usually intermixed with large, patent, many-celled uniseriate hairs 
each bearing a fine filamentous terminal cell. **Stems** 1–several, 
simple or branching near apex, araneose-lanate to coarsely pubes-
cent. **Leaves** alternate, semi-amplexicaul, usually discolorous, 
indumentum as for stem but denser on lower surface of lamina, 
sometimes ± scabrid. **Capitula** heterogamous, discoid or radiate, 
1–many, solitary and terminal on stem and branches when present. 
**Involucre** ± broadly campanulate, ± truncate at base. **Phyllaries** 
many-seriate, appressed imbricate, the innermost grading into 
paleae of receptacle. **Receptacle** paleate. **Ray florets** bisexual, 
with 2-1ipped, deep red corollas, outer lip (ray) large, 3-fid, inner 
lip shorter, consisting of 2 linear lobes, or ray florets absent. **Disc 
florets** deep red or creamy white, occasionally orange-tinted, bi-
sexual and regular, abruptly dilated from near base into a deeply 
lobed limb, lobes erect, linear. **Anthers** bases produced into 
oblong, fimbriate or ciliolate tails. **Styles** deeply 2-fid, branch 
apices shortly conical with a sub-distal fringe of hairs. **Cypsels** 
barrel-shaped to cylindric, ± 5-angled or ribbed, usually with a 
± swollen or lobed cartilaginous carpodome at base, 
minutely puberulous or glabrous; pappus of 4 or 5 caducous 
barbellate setae.

Species ± 12, trop. Africa; sthn trop. Afr. ± 8, Angola, Zambia, Zimbabwe, 
Malawi, Mozambique.

**Ethulia** L.f.
(Vernonieae)

**Hoehnelia** Schweinf.; Wild & Pope: 140 (1978b).
Species 19, trop. Africa and Indomalesia; sthn trop. Afr. 4, Angola, Zambia, 
Zimbabwe, Malawi, Mozambique, and sthn Afr.

**Euryops** (Cass.) Cass.
(Senecioneae)
Nordenstam: 1 (1968); Jeffrey: 931 (1986).

B.Nord., Zimbabwe; most species confined to sthn Afr.

**Felicia** Cass.
(Astereae)
*Flaveria* Juss.  
(Heliantheae)  

*S* Galinsoga Ruiz & Pav.  
(Heliantheae)  

*Gamochaeta* Wedd.  
(Gnaphalieae)  
Anderberg: 155 (1991a); Hind *et al.*: 71 (1993); Anderberg: 357 (1994); Beentje: 401 (2002); Mapaura (Unpublished).

*S* Gamochaeta purpurea (L.) Cabrera (= *G.* pensylvanica (Willd.) Cabrera; = *Gnaphalium purpureum* L.), Zimbabwe, widespread weed; 5 species naturalised in sthn Afr.

*Gazania* Gaertn.  
(Arctotideae)  

*Geigeria* Griess.  
(Inuleae)  

*Gerbera* L.  
(Mutisieae)  

*Piloselloides* (Less.) Jeffrey; Wild: 202 (1972b).

*Gnaphalium* L.  
(Gnaphalieae)  

*Amphidoxa* DC.; Mendonça: 61 (1943).

*Gnaphalium* purpureum L., Zimbabwe, widespread weed; 5 species naturalised in sthn Afr.

*Gazania* Gaertn.  
(Arctotideae)  

*Geigeria* Griess.  
(Inuleae)  

*Gerbera* L.  
(Mutisieae)  

*Piloselloides* (Less.) Jeffrey; Wild: 202 (1972b).

*Gnaphalium* L.  
(Gnaphalieae)  

*Amphidoxa* DC.; Mendonça: 61 (1943).

*Gazania* Gaertn.  
(Arctotideae)  

*Geigeria* Griess.  
(Inuleae)  

*Gerbera* L.  
(Mutisieae)  

*Piloselloides* (Less.) Jeffrey; Wild: 202 (1972b).

*Gnaphalium* L.  
(Gnaphalieae)  

*Amphidoxa* DC.; Mendonça: 61 (1943).

*Gazania* Gaertn.  
(Arctotideae)  

*Geigeria* Griess.  
(Inuleae)  

*Gerbera* L.  
(Mutisieae)  

*Piloselloides* (Less.) Jeffrey; Wild: 202 (1972b).

*Gazania* Gaertn.  
(Arctotideae)  

*Geigeria* Griess.  
(Inuleae)  

*Gerbera* L.  
(Mutisieae)  

*Piloselloides* (Less.) Jeffrey; Wild: 202 (1972b).

Annual or perennial herbs with simple to much-branched, erect or decumbent stems; vegetative indumentum of short-stalked, long-armed, symmetrical T-shaped hairs. Leaves opposite, at least those on lower stems, alternate or sometimes in whorls of 3, sessile or petiolate, upper surface of lamina sparsely pilose to scabridulous, lower surface closely whitish-silvery araneose-felted. Capitula usually small, few to many, laxly arranged in corymbiform cymes, or shortly stalked in small clusters, homogamous. Involucre obconic to cyathiform; phyllaries ± diverging, increasing in size to inside, membranous or scarious, usually with subhyaline margins. Receptacle plane or alveolate. Corollas purple or mauve, regular, narrowly infundibuliform, deeply 5-lobed, usually puberulous, lobes sometimes with acicular bristles and/or T-shaped to Y-shaped hairs. Anthers lanceolate-appendiculate at apex, obtuse at base. Style: arms linear, hairy. Cypselas obvoid-oblong or turbinate, rounded or truncate at apex and ecostate, or 4–6–, or 8–10-ribbed, polished or smooth and with hooked or ± straight, simple or bifid and globose-glandular trichomes. Pappus 0, or of a few short, caducous, barbellate setae, or of persistent overlapping scales.


*Gynura* Cass.  
(Senecioneae)  
Cassini: 391 (1825); Mendonça: 111 (1943); Davies: 335 (1978); Bremer: 503 (1994); White *et al.*: 203 (2001).

*Crassocephalum* Moench in part.
Seed plants of southern tropical Africa: families and genera

**Gyrodoma Wild**
(Astereae)

Annual herbs. **Leaves** alternate, pinnatifid. **Capitula** heterogamous, radiant, solitary, pedunculate. **Involucre** broadly campanulate to patelliform; bracts ± in 2 series. **Receptacle** hemispheric-conic, nude. **Florets**: ray florets female, in 1 series, white or pale blue; disc florets bisexual, many, yellow. **Anthers** appendiculate at apex. **Style branches** flattened with appendages broadly triangular to ovate and rounded or obtuse at apex. **Cypselas** obovoid, slightly compressed, pubescent. **Pappus** of minute scales.

Monotypic: *Gyrodoma hispida* (Vatke) Wild, only recorded from Mozambique.

**Haplocarpha Less.**
(Arctotideae)


**Helianthus L.**
(Heliantheae)
Wild: 57 (1967).


**Helichrysum Mill.**
(Gnaphalieae)


**Helichrysum Mill.**
(Gnaphalieae)


**Hirpicium Cass.**
(Arctotideae)

**Berkheyopsis** O.Hoffm.; Mendonça: 130 (1943).


**Hypericophyllum Steetz**
(Helienieae)
Mendonça: 106 (1943); Pope: 104 (1975); Lisowski: 482 (1991).


**Hypochaeris L.**
(Lactuceae)


**Inula L.**
(Inuleae)


**Inulanthera Källersjö**
(Anthemideae)

*Athanasia* L. in part; Mendonça: 108 (1943).


**Jeffreya Wild**
(Astereae)

Annual or perennial herbs, slender, erect. **Leaves** proximally opposite, distally alternate, sessile, linear, entire or sparsely serrulate. **Capitula** terminal, solitary, heterogamous and radiate. **Involucre** ovoid; bracts in 1 or 2 rows. **Receptacle** flat to conical, epeulate. **Ray florets** in 1 row, female. **Disc florets** many, bisexual, proximally cylindric, more distally campanulate and with 5 teeth. **Anthers** 5, obtuse at base, with triangular appendages at apex. **Style** cylindric; branches flattened, minutely puberulous. **Cypselas** ellipsoid, slightly compressed, smooth and glabrous with slightly ribbed margins. **Pappus** 0 or a minute annular rim.


**Kleinia Mill.**
(Senecioneae)

**Notonia DC.;** Mendonça: 113 (1943).


**Lactuca L.**
(Lactuceae)
Mendonça: 149 (1943); Pope: 196 (1992); Jeffrey & Beentje: 77 (2000);
**Laggera** Benth.  
(Pluchoae)  


**Launaea** Cass.  
(Lactuceae)  


**Litogyne** Harv.  
(Pluchoae)  

Epaltes Cass. in part, as to *E. gariepina* (DC.) Steetz; Mendonça: 60 (1943); Wild: 35 (1980).


**Lopholaena** DC.  
(Senecioneae)  

Othonna L. in part; Mendonça: 126 (1943).


**Melanthera** Rohr  
(Heliantheae)  


**Microglossa** DC.  
(Astereae)  


**Mikania** Willd.  
(Eupatorieae)  


**Mikaniopsis** Milne-Redh.  
(Seneconaeae)  


**Montanoa** La Llave & Lex.  
(Heliantheae)  

Sthn trop. Afr. 2, Zimbabwe, both originally from Central America; also naturalised in sthn Afr.

**Muschleria** S.Moore  
(Vernonieae)  
Moore: 89 (1914); Mendonça: 2 (1943) (as “Muschlera”); Bremer: 224 (1994).

Perennial herbs. Leaves linear. Capitula few-flowered and aggregated to secondary, campanulate or globose heads, which may be solitaire or arranged in a corymbosus-pauciflorous synflorescence. Florets purple. Cypselas obovoid, ± 10-ribbed, glandular between ribs. Pappus a short, undulate corona.

Monotypic: *Muschleria angolensis* S.Moore, Angola.

**Neojeffreya** Cabrera  
(Pluchoae)  


**Nicolasia** S.Moore  
(Pluchoae)  
Mendonça: 59 (1943); Merxmüller: 1 (1954); Wild: 26 (1980); Lisowski: 30 (1989); Beentje: 349 (2002).


**Nidorella** Cass.  
(Astereae)  


**Nolletia** Cass.  
(Astereae)  

Omphalopappus O.Hoffm.  
(Vernonieae)  
Hoffmann: 234 (1891); Mendonça: 91 (1943); Bremer: 224 (1994).  


Monotypic: Omphalopappus newtonii O.Hoffm., only recorded from Angola.  

Osteospermum L.  
(Calenduleae)  
Mendonça: 129 (1943).  

Tripteris Less.; Mendonça: 127 (1943); Norlindh: 146 (1978); Beentje: 531 (2002).  


Othonna L.  
(Senecioneae)  


*Parthenium L.  
(Heliantheae)  


Pasaccordoa Kuntze  
(Mutisieae)  
Kuntze: 354 (1891); Mendonça: 139 (1943) (as Passaccordoa); Jeffrey: 208 (1967); Wild: 192 (1972b); Pope: 26 (1992); Bremer: 104 (1994); Jeffrey & Beentje: 19 (2000).  

Annual herbs, or suffrutes with annual stems from a woody rootstock; vegetative indument of fine flagelliform hairs each consisting of an appressed filamentosus terminal cell borne on a uniseriate many-celled stalk. Leaves alternate, narrowly oblanceolate to elliptic, somewhat discolorous, densely araneose-lanate on underside, gland-dotted. Capitula heterogamous, radiate, few to many, solitary and terminal on branches sometimes also subsessile along branches, subtended by leaf-like bracts. Phyllaries many, many-seriate, araneose-lanate to puberulous, at least outer ones subulate-aristate with stiff, squarrose or recurved apices, or lamina straight and pungent. Receptacle deeply alveolate; paleale absent. Ray florets neuter, stamens and style absent or rudimentary, corollas deep red or creamy white; rays erect, 3-fid, inner lip wanting; ovary rudimentary, pappus of many narrow scales. Disc florets deep red or creamy white, bisexual and regular. Anthers: apical appendages narrowly triangular, theca bases sagittate with tapering-acute fimbriate or ciliolate tails. Style deeply 2-fid, apices subobtuse with a subdistal fringe of hairs. Cypselas subcylindric, 10-ribbed with many stiff white hairs; pappus several-seriate of many spreading narrowly lanceolate scales.  


Pechuel-Loeschea O.Hoffm.  
(Inuleae)  

Monotypic: Pechuel-Loeschea leubnitziae (Kuntze) O.Hoffm., Zimbabwe, and sthn Afr.  

Pegoletia Cass.  
(Inuleae)  
Mendonça: 79 (1943); Wild: 46 (1980); Anderberg: 158 (1986); Beentje: 332 (2002).  


*Pentanema Cass.  
(Inuleae)  

Vicoa Cass.; Mendonça: 80 (1943); Wild: 45 (1980); Lisowski: 52 (1989).  


Philyrophyllum O.Hoffm.  
(Gnaphalieae)  


Phymaspermum Less. emend. Källersjö  
(Anthemideae)  

Brachymeres DC.  

Pleiotaxis Steetz  
(Mutisieae)  
Moore: 64 (1927); Mendonça: 133 (1943); Pope: 11 (1992); Jeffrey & Beentje: 21 (2000); Bingham & Smith: 140 (2002).  


Pluchea Cass.  
(Plucheeae)  

ASTERACEAE: Omphalopappus  
DICOTYLEDONS
**Pseudognaphalium** Kirp.  
(Gnaphaliaceae)  


**Gnaphaliella** L. in part; Wild: 71 (1980).

**Pseudognaphalium**  
Species 18, tropics and warm regions of Old and New World; sthn trop. Afr.

*Pterocaulon* decurrens  
(L.) S.Moore, Zambia, Zimbabwe, Malawi, Mozambique.

**Pterocaulon** Elliott  
(Plucheaceae)  
Elliott: 323 (1823); Wild: 36 (1980); Anderberg: 302 (1994).

Herbs without resin canals. Leaves long-decurrent, dentate to serrate. Capitula disciform, terminal, forming dense glomerules, or arranged in long, ± dense spikes. Florets: outer ones female, filiform; central ones perfect. Style branches with acute hairs not reaching the furcation. Cypselas ellipsoid, with straight hairs. Pappus of free, barbellate bristles.

Species 18, tropics and warm regions of Old and New World; sthn trop. Afr.

**Pteronia** L.  
(Astereae)  
Hutchinson & Phillips: 277 (1917); Wild: 29 (1975); Bremer: 408 (1994).

Sthn trop. Afr. 1: *Pteronia smutsii* Hutch., only known from type gathering, Zambia; most species confined to sthn Afr.

**Pulicaria** Gaertn.  
(Inuleae)  


**Rastrophyllum** Wild & G.V.Pope  
(Vernonieae)  

Annual herbs. Leaves alternate, deeply pinnatisect. Capitula corymbose, homogamous, subglobose; involucral bracts in 4 or 5 rows; receptacle reticulo-foveolate. Florets bisexual, many, violet-purplish, glandular. Style branches subulate, hirsute. Cypselas obovoid, 4-sulcate, densely tubercululate. Pappus absent.

Species 2, Tanzania, and Zambia.

**Schistostephiun** Less.  
(Anthemideae)


*Schkuhria Roth (Helenieae)


Sclerocarpus Jacq. (Heliantheae)
Mendonça: 90 (1943); Wild: 37 (1967).


Senecio L. (Senecioneae)
Mendonça: 117 (1943); Jeffrey: 879 (1986); White et al.: 205 (2001); Mapaura & Timberlake: 163 (2002).

Sthn trop. ± 40, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Sigesbeckia L. (Heliantheae)
Mendonça: 89 (1943) (as Siegesbeckia); Wild: 36 (1967); Karis & Ryding: 612 (1994).


Solaneceio (Sch.Bip.) Walp. (Senecioneae)
Jeffrey: 920 (1986); Coates Palgrave: 1148 (2002).

Crassocephalum Moench in part; Mendonça: 113 (1943).


Sonchus L. (Lactuceae)


Sphaeranthus L. (Plucheeae)
Mendonça: 60 (1943); Wild: 96 (1980); Lisowski: 216 (1989); Beentje: 370 (2002).


Spilanthes Jacq. (Heliantheae)

Species 6, pantropical; sthn trop. Afr. 1: Spilanthes costata Benth. (=S. acmella (L.) Murray), Angola, and sthn Afr.

Stenops B.Nord. (Seneconceae)

Annual herbs. Leaves entire or slightly serrate. Capitula radiate, solitary or laxly corymbose, small, few-flowered. Involucre ecalyculate; bracts connate. Receptacle conical. Florets: ray florets white or pale mauve; disc florets perfect, yellow. Filaments: collar much dilated. Cypselas oblong, 5-ribbed or thickly 5- to 7-winged, glabrous. Pappus absent.


Stoebe L. (Gnaphalieae)
Mendonça: 76 (1943); Nogueira: 127 (1977); Wild: 67 (1980); Lisowski: 56 (1989); White et al.: 207 (2001); Beentje: 452 (2002); Coates Palgrave: 1146 (2002); Phiri (Unpublished).


Stomatanthes R.M.King & H.Rob. (Eupatorieae)

Eupatorium as to E. africanum Oliv. & Hiern; Mendonça: 41 (1943); Binns: 32 (1968).


*Synedrella Gaertn. (Heliantheae)

Annual or short-lived perennial herbs. Leaves opposite, crenate-serrate. Capitula radiate, glomerate or sometimes solitary. Involucral bracts few, in a single row. Receptacle with small, narrow paleae. Florets: rays female, yellow; disc florets 4-lobed, yellow. Anthers: appendages truncate to obtuse. Cypselas: ray cypselas elliptic, dorsiventrally compressed, with deeply lobate wings; disc cypselas clavate, tuberculate. Pappus in ray florets of 2 awns, connate to the wing; in disc florets of 2 or 3(4) awns.

Monotypic: *Synedrella nodiflora Gaertn., tropical America, naturalised throughout tropics; sthn trop. Afr.: Angola, Malawi.

*Tagetes L. (Helenieae)

*Taraxacum Weber ex F.H.Wigg.
(Lactuceae)

Sthn trop. Afr. 1 (aggregate) often referred to as *Taraxacum officinale,* Zambia, Zimbabwe, Mozambique, and sthn Afr.

**Tarchonanthus L.**
(Tarchonanthaceae)
Mendonça: 54 (1943); Pope: 9 (1992); Jeffrey & Beentje: 6 (2000); Coates Palgrave: 1144 (2002); Herman: 26 (2002).


**Tithonia Desf. ex Juss.**
(Heliantheae)


**Tolpis Adans.**
(Lactuceae)


**Verbesina L.**
(Vernoniaceae)
Mapaura (Unpublished).

Prassler: 363 (1967); Bremer & Humphries: 93 (1993); Bremer: 451 (1994); (Anthemideae)

**Ursinia Gaertn.**
(Geumaceae)


**Tridax L.**
(Heliantheae)


**Triplotaxis H. Hoffmann.**
(Asteraceae—Boraginaceae)
Bingh.: 259–392.


**Vernonia Schreb.**
(Vernoniaceae)


**Welwitschiella O.Hoffm.**
(Helioideae)
Hoffmann: 390 (1894); Mendonça: 107 (1943); Pope: 103 (1975); Karis & Ryding: 541 (1994).

Perennial herbs. **Leaves** alternate, simple. **Capitula** disciform, paniculate. **Involucral bracts** in 4 or 5 rows. **Receptacle** honeycombed with toothed margins to the pits. **Florets:** marginal ones female, 4-lobed, yellow; disc florets functionally male. **Cypselas:** ray cypselas narrowly obconic, 2- to 6-ribbed. **Pappus** in marginal cypselas of 2–5 irregularly toothed scales.


**Xanthium L.**
(Heliantheae)
Wild: 3 (1967).


**Zinnia L.**
(Heliantheae)


References
ASTEROIDEAE: References


**Avicenniaceae**  
(Asteridae—Lamiales)  
(Euasterids I—Lamiales; included in Acanthaceae)


Sthn trop. Afr.: genus 1, species 2.

**Avicennia L.**

Good & Exell: 146 (1930/1931); Steam: 34 (1958); Villiers: 59 (1975); Tomlinson: 186 (1986); Verdcourt: 144 (1992) under Verbenaceae; Coates Palgrave: 975 (2002).


**References**


**Balanitaceae**  
(Rosidae—Supinidales)  
(Eurosids I; included in Zygophyllaceae)


Sthn trop. Afr.: genus 1, species 5.

**Balanites Delile**


**References**


**Balanophoraceae**  
(Rosidae—Santalales)  
(Unplaced)


Sthn trop. Afr.: genera 2, species 2.

**Identification of additional genus using the key in the above reference:** *Thonningia* differs from *Sarcophyte* in having a spadix-like, unbranched inflorescence and a style.

**Sarcophyte Sparrm.**


**Thonningia Vahl**


Dioecious, fleshy, crimson to pink, later brownish root parasite arising from an underground tuber; tuber rhizome-like, cylindrical, branched, swollen at point of contact with host root. **Stem** densely covered with many spirally arranged, triangular–lanceolate scale leaves; flowering stems breaking through buds on tuber leaving a short-lobed volva at base. **Inflorescence** unbranched, spadix-like with obconic terminally obtuse axis bearing many flowers at apex. **Male flowers** pedicellate; perianth segments 2–6, spirally arranged, linear; anthers 3–6, linear-elongate, united but apices free, 2-theoucous, dehiscing extrorsely. **Female flowers** densely crowded, linear–prismatic; perianth tubular, obscurely 2- or 3-lobed; style 1, exerted. **Infrauctescence** a swollen hemisphere, bearing minute, 1-seeded achenes.

**References**


Sthn trop. Afr.: genus 1, species ± 25.

**Impatiens L.**


**References**


**Balsaminaceae**

(Rosidae—Geraniales)

(Asterids—Ericales)


**Basellaceae**

(Caryophyllidae—Caryophyllales)

(Core Eudicots—Caryophyllales)


**Basella L.**


**References**


**Begoniaceae**

(Dilleniidae—Violales)

(Eurosids I—Cucurbitales)


Sthn trop. Afr.: genus 1, species 23.

**References**


Berberidaceae

*(Magnoliidae—Ranunculales)*

*(Eudicots—Ranunculales)*

Shrubs, glabrous; branches with 3-partite spines, and short axillary shoots bearing leaves. **Leaves** alternate, usually clustered, sessile, apparently simple but 3-foliolate with a normal terminal leaflet articulated at its base; petiole short, bearing 2 short, subulate leaflets at its apex; lamina of terminal leaflet coriaceous with prickly dentate to entire margin, and midrib produced as a short prickle; petioles and lateral leaflets usually persistent; stipules 0. **Flowers** bisexual, regular, in axillary racemes or little-branched panicles, yellow, sometimes tinged red; bracts small, lanceolate-acuminate. **Perianth**: segments free, in 5 series of 3: 9 outer ones regarded as **sepals**, increasing in size towards centre, 6 inner ones as **petals** (?staminodes), imbricate, each with 2 linear glands near base; petals smaller than inner sepals. **Stamens** 6, opposite petals, free; filaments stout; anthers 2-theocous, opening by 2 wing-like apical valves. **Ovary** superior, 1-locular, with few, usually 4, basal, ascending anatropous, bitegmic ovules; stigma broad, capitate, subsessile. **Fruit** an ellipsoid berry with persistent stigma. **Seeds** 1–4, rugulose; endosperm abundant; embryo small.

Genera 15, species 680, north temperate to tropical mountains; sthn trop. Afr.: genus 1, species 1.


**Berberis L.**

Linnaeus: 330 (1753); Wild: 171 (1960); Polhill: 1 (1966); Phiri (Unpublished).

Description as for family.


References


**Bignoniaceae**

*(Asteridae—Scrophulariales)*

*(Euasterids I—Lamiales)*


Sthn trop. Afr.: genera 10, species 17.

**Key to genera**

1a Flowers in pendulous lax panicles, up to 1(1.5) m long; fruit fibrous-fleshy, sausage-shaped, up to 1 m long, indehiscent; seeds not winged; ovary 1-locular ........................................................................................................................................................................................................... Kigelia

1b Flowers in erect and shorter panicles or racemes or fasciculate or solitary; fruit capsular; seeds winged; ovary 2-locular:

2a Calyx spathe-like; leaves imparipinnate:

3a Corolla tube 50 mm long, narrowly cylindric, expanding in the throat; corolla white (in Africa only along the S Mozambican coast) ................................................................. Dolichandrone

3b Corolla tube shorter, campanulate; corolla yellow or greenish yellow, mottled brownish purple ............................................................... Markhama

2b Calyx lobed or toothed, not spathe-like; leaves imparipinnate, or 1-jugate or simple:

4a Leaves simple, greyish woolly; corolla white, or whitish pink with a long cylindric tube 40–80 mm long; capsule woody with warted valves ..... ................................................................. Cataphractes

4b Leaves imparipinnate, 1-jugate or simple, corolla, if white (*Rhigozum*), with a cylindric tube shorter than 20 mm; capsule neither woolly nor warted:

5a Capsule cylindric; corolla pale pink or orange to crimson with a yellow throat; leaves appearing after the leaves:

6a Corolla 35–55 mm long, pinkish; flowers in large, terminal, pubescent panicles .................................................................................................................. Stereospermum

6b Corolla ± 80 mm long, orange to crimson with a yellow throat; flowers in short, glabrous, axillary racemes ........................................... Fernandea

5b Capsule compressed; corolla of different colour; leaves and flowers borne at the same time:

7a Leaves short, up to 50 mm long, simple, 1-jugate or imparipinnate, clustered on cushions, perfect stamens 5; corolla deep yellow, pink or white; spiny shrubs or small trees ................................................................. Rhigozum

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DICOTYLEDONS

BIGNONIACEAE: Key to genera

7b Leaves large, 130–330 mm long, imparipinnate; perfect stamens 4; corolla orange to scarlet or lavender; shrubs or small trees, not spiny:
8a Corolla tube curved, narrowly funnel-shaped; stamens exserted; capsule usually 60–120 mm long .............................................. *Tecomaria
8b Corolla tube straight, cylindric below, campanulate above; stamens included:

9a Calyx inflated; scrambling shrubs or subshrubs; flowers pink or lilac ...................................................................................... Podranea
9b Calyx not inflated; if shrub then not scrambling; flowers yellow with red lines in the throat ...................................................... *Tecoma

Catophractes D.Don

Monotypic genus: *Catophractes alexandri* D.Don, Angola, Zimbabwe, and sthn Afr.

Dolichandrone (Fenzl) Seem.
Seemann: 31 (1862) conserved name; Diniz: 72 (1988); Coates Palgrave: 1010 (2002); Izidine & Bandeira: 49 (2002).

Unarmed shrubs or trees. Leaves opposite, imparipinnate, deciduous. Flowers borne in terminal racemes, panicles or racemose panicles, fragrant, opening during night. Calyx spathacously splitting along posterior side, beaked at apex. Corolla campanulate; tube narrowly cylindric, elongate, exceeding calyx; lobes 5, subequal, wavy at margin. Stamens 4, didynamous; anthers included, introrse, glabrous; staminode exceeding calyx; lobes 5, subequal, wavy at margin. Corolla spathacously splitting along posterior side, beaked at apex. Disc annular, thick. Ovary oblong, cylindric, 2-locular; ovules many, pluriseriate. Capsule narrowly linear in outline, terete or compressed parallel to false septum, straight or curved, bivalved, loculicidally dehiscent. Seeds flat, winged, 1–several on each side of wing.

Species 8, tropical Asia, Australia, Africa; sthn trop. Afr.

Ferdinando Welw. ex Seem.

Shrubs or trees. Leaves opposite, imparipinnate, frequently absent at flowering time. Flowers large, in short, few-flowered racemes or solitary, borne praecciously and in axils of fallen leaves. Calyx campanulate, irregularly 3–5-lobed, opening just before corolla anthesis. Corolla large, showy, brownish red to orange-red or yellow, broadly cup-shaped; tube short, narrowing abruptly into calyx; limb slightly bilabiate. Stamens 4, slightly exserted; staminode 1; thecae divergente. Disc cupular. Ovary cylindric, narrow, bilocular; ovules pluriseriate in each locule. Capsule subcylindric, dehiscing at right angles to the thin flat septum. Seeds many, compressed, with hylaine wings.

Species 8, 3 from Madagascar, 5 from African mainland; sthn trop. Afr. 3, Angola, Zimbabwe, Malawi, Mozambique.

Kigelia DC.


Markhamia Seem. ex Baill.


Podranea Sprague


Rhigozum Burch.
Giess: 31 (1968); Diniz: 67 (1988); Diniz: 13 (1990); Coates Palgrave: 1008 (2002).


Stereospermum Cham.
Chamisso: 720 (1833); White: 379 (1962); Diniz: 77 (1988); Diniz: 23 (1990); Diniz: 26 (1993); Coates Palgrave: 1012 (2002).

Glabrous or pubescent trees or shrubs. Leaves opposite, imparipinnate. Inflorescence terminal, many-flowered, large panicles. Calyx campanulate or tubular, irregularly 2–5-lobed. Corolla slightly irregular, pink; tube infundibuliform; lobes patent. Stamens 4, didynamous, arising in corolla tube, included; anther thecae divergent; staminode 1,5-developed. Disc entire or 5-lobed. Ovary bilocular, linear-oblong, 4-angled. Ovules many, 2-seriate. Capsule linear-cylindric. Seeds many, winged, rectangular in outline, arranged alternately along both sides of septum.


*Teoma Juss.

*Teoma stans* (L.) Juss. ex Kunth from C and S America is widely cultivated, and may become invasive. Also present in sthn Afr.

Tecoma (Endl.) Spach
Spach: 137 (1840); White: 380 (1962); Diniz: 64 (1988); Diniz: 9 (1990); Diniz: 13 (1993); Bingham (Unpublished); Coates Palgrave: 1007 (2002); Phiri (Unpublished).

Straggling, many-stemmed shrubs with scandent branches, or small trees. Leaves opposite, imparipinnate; rachis narrowly winged; leaflets 2–6-jugate, ovate to elliptic. Flowers in terminal racemes or racemose panicles. Calyx campanulate, 5-lobed ± to middle of tube; lobes broadly triangular. Corolla: tube narrowly funnel-shaped, almost cylindric, curved; corolla limb bilabiate, 5-lobed, orange to scarlet. Stamens didynamous, exserted; filaments adnate to corolla up to about
middle of tube, pubescent-glandular at base; thecae coninate in upper third, slightly divergent below. Disc cupular. Ovary bilocular; ovules many, 4-seriate in each locule. Capsule linear-oblong in outline, compressed, dehiscing at right angles to septum. Seeds with membranous wings, ± rectangular in outline.

Monotypic genus: Tecomaria capensis (Thunb.) Spach, sthn trop. and sthn Afr.; 2 subspecies occur in the region: subsp. capensis in Mozambique, and subsp. nyssaeae (Oliv.) Brummitt in NE Angola, Zambia, Malawi, Mozambique and sthn Afr.; subsp. capensis is widely cultivated as ornamental in the tropics and subtropics.

References


FLORA OF TROPICAL EAST AFRICA. Bixaceae: 1–3.


Ichthyophrynus

*Ichthyophrynus andrewsi* (J.G. Cooper) Link: 371 (1831).

Ichthyophrynus andrewsi (J.G. Cooper) Link: 371 (1831).

+Ichthyophrynus andrewsi* (J.G. Cooper) Link: 371 (1831).

Ictinogaster

*Ictinogaster bioculata* (J. Drude) Link: 371 (1831).

Ictinogaster bioculata (J. Drude) Link: 371 (1831).

+Ictinogaster bioculata* (J. Drude) Link: 371 (1831).

References


Boraginaceae

(Asteridae—Lamiales)

(Euasterids I)


Sthn trop. Afr.: genera 11, species 63.
**Key to genera**

[adapted from Martins (1990)]

1a Trees or shrubs; style terminal:
   2a Fruit dry, divisible into two 2-seeded mericarps; style almost absent; stigma 1, ring-like, subterminal .......................................................... Argusia

2b Fruit fleshy; style well-developed; stigmas 2 or 4, or 1 bilobed, not as above:
   3a Style with each branch again divided; stigmas 4, slender or clavate .......................................................... Cordia

3b Style cleft or subentire; stigmas 2, subcapitate or peltate, or 1 bilobed:
      4a Calyx shortly lobed or dentate; corolla lobes rounded; endocarp with thin longitudinal lamellae .......................................................... Bourreria

      4b Calyx lobed to near base; corolla lobes oblong or lanceolate; endocarp with small surface cavities .......................................................... Ehretia

1b Herbs or shrubs; style terminal or gynobasic:
   5a Ovary entire or subentire; style terminal:
      6a Styles 2; stigmas capitate; flowers 4-merous, solitary, extra-axillary .......................................................... Coldenia

      6b Styles 1; stigma ring-like below the apex of the style; flowers 5-merous, in scorpioid spikes or solitary .......................................................... Heliotropium

   5b Ovary deeply lobed; style gynobasic:
      7a Corolla throat naked:
         8a Flowers irregular; anthers without prolonged connectives .......................................................... *Echium

         8b Flowers regular; connectives prolonged above the anthers by lamellate appendages:
            9a Appendages of the anthers twisted; gynobase pyramidal; calyx strongly accrescent in fruit .......................................................... Trichodesma

            9b Appendages of the anthers straight; gynobase flat; calyx not or only slightly accrescent in fruit .......................................................... Cystostemon

      7b Corolla throat with folds or fornices:
         10a Nutlets ovoid (circular in cross section), erect, smooth, attached to the gynobase by the base; cymes conspicuously bracteate .......................................................... Lithospermum

         10b Nutlets ovoid-depressed (elliptic in cross section), covered with glochidiate spines, attached to the gynobase by the upper part; cymes not bracteate .......................................................... Cynoglossum

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**Argusia** Boehm.


Small trees, shrubs or perennial herbs. **Leaves** entire, sessile or shortly petiolate. **Inflorescence** of scorpioid ebracteate cymes arranged in terminal corymb or panicle. **Flowers** 5-merous, sessile or pedicellate. **Calyx** 5-lobed almost to base. **Corolla** regular, infundibuliform or hypocrateriform; limb deeply 5-lobed. **Stamens** included, sometimes reaching as far as throat or a little further, free. **Nectary** absent or minute. **Ovary** 4-locular; ovules solitary, pendulous; **style** terminal; stigmatic ring tipped by an entire to 2-lobed stigmatic appendix. **Fruit** dry, dividing at maturity into two 2-seeded, corky mericarps; the 2 fertile cells of each mericarp separated by a deep groove or a sterile cavity.

Species ± 5, America, West Indies, Europe, temperate Asia; sthn trop. Afr. 1: Argusia argentea (L.f.) Heine, Mozambique.

**Bourreria** P.Browne

Browne: 168 (1756); Martins: 72 (1990); Martins: 30 (1993b).

Trees or shrubs. **Leaves** alternate, sometimes crowded, petiolate, simple, usually entire. **Inflorescences** paniculate or corymbose, sometimes few-flowered, terminal but sometimes apparently lateral. **Flowers** bisexual, regular, subsessile or pedicellate. **Calyx** campanulate, closed in bud, 2–5-lobed. **Corolla**: tube usually campanulate; lobes 5, frequently rounded, spreading or reflexed. **Stamens** 5, arising on corolla tube, included or exserted; anthers oblong, on short filaments. **Ovary** 2(4)-locular, conical; style terminal on ovary, entire or very shortly bifid; stigmas 2, capitate or peltate, or 1, bilobed. **Fruit** drupaceous, subglobose; pyrenes 4, bilocular, 1-seeded, outer surface with thin woody lamellae.

Species ± 50, mostly in Central America and West Indies, 5 in Africa; sthn trop. Afr. 2, Mozambique.

**Coldenia** L.


Annual herbs; stems usually procumbent, branched, angular or ± laterally compressed, densely hairy to villous. **Leaves** alternate, usually many, oblong to almost circular, crenate or lobate, subsessile or petiolate. **Flowers** bisexual, 4-merous, solitary, extra-axillary, upper ones on leafy spicate branches. **Calyx** deeply lobed. **Corolla** regular, small, naked. **Stamens** arising below middle of corolla tube, included. **Nectary** absent. **Ovary** 4-locular, with 1 pendulous ovule per locule; styles 2, slightly united below, terminal; stigmas punctate. **Fruit** dry or slightly succulent, ovoid-pyramidal, 4-lobed, usually separating into 4 1-seeded nutlets. **Seeds** ovoid.


**Cordia** L.


**Cynoglossum** L.


Cystostemon Balf.f.
Balfour: 82 (1883); Miller & Riedl: 1 (1982); Martins: 99 (1990); Bingham & Smith: 140 (2002).

*Vanpelia* Brand; Good: 108 (1929); Taton: 46 (1971).

Annual or perennial herbs or shrubs. Leaves alternate, entire. Inflorescence a large panicle. Calyx 5-lobed, divided almost to base, sometimes accrescent in fruit. Corolla: tube short, cylindric or slightly funnel-shaped, without scales in throat; lobes 5, usually much longer than tube. Stamens 5, arising on corolla tube; filaments short, oblong, with a basal ciliate or hairy appendage; anthers much longer than filaments, prolonged above thecae by laminar appendages, straight, not twisted, coherent along their margins. Ovary 4-lobed; style gynobasic, elongated; stigma capitate, small. Fruit of 1–4 nutlets attached to flat gynobase only by the base.

A genus of 13 species, 1 confined to Socotra, 1 in SW Arabian Peninsula, the rest in NE and E Africa, and Zaire; and 4 in sthn trop. Afr.: Angola and Zambia.

**Echium L.**

Sthn trop. Afr.: *Echium plantagineum* L., naturalised in disturbed areas; reported from Angola, Zimbabwe, and sthn Afr.

**Ehretia P.Browne**

Sthn trop. Afr.: *Ehretia nevillii* (Fenzl) A.DC. non Brand (Boraginaceae).

**Heliotropium L.**


**Lithospermum L.**


**Trichodesma R.Br.**


**References**
BROWNE, P. 1756. The civil and natural history of Jamaica in three parts. Published by the author, London.

**Brassicaceae**
(Eurosids II—Brassicales)


Sthn trop. Afr.: genera 11, species 22.

**Key to genera**

1a Fruit less than 3x as long as broad (a silicule):

2a Fruit with more than 2 seeds, obtriangular ................................................................. *Capsella*

2b Fruit with 2 seeds, 1 in each locule, elliptic to suborbicular or of 2 suborbicular halves:

** DICOTYLEDONS**

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DICOTYLEDONS

BRASSICACEAE: Key to genera

3a Fruit dehiscent .................................................................................................................................................. Lepidium
3b Fruit indehiscent, breaking apart along the septum into 2 nutlets .................................................................................................................. *Coronopus

1b Fruit at least 3 x as long as broad (a silique):

4a Fruit constricted between the seeds, usually eventually dividing transversely into several joints ................................................................. *Raphanus
4b Fruit dehiscing by 2 valves (sometimes tardily):
5a Seeds in 2 rows in each locule:
   6a Fruit with a broad, flat, seedless distal beak, valves 1-nerved .......................................................................................................................... *Eruca
   6b Fruit not beaked but with a persistent style .................................................................................................................. Rorippa
5b Seeds in 1 row in each locule:
   7a Fruit tapered into a distal, sterile or few-seeded beak terminated by the stigma:
      8a Fruit 4-angled in cross section, valves keeled ................................................................................................................................. Erucastrum
      8b Fruit ± circular in cross section:
         9a Valves of the fruit with 1 conspicuous dorsal vein .................................................................................................................. *Brassica
         9b Valves of the fruit each with 3 or more veins .................................................................................................................. *Sinapis
   7b Fruit ± abruptly ending in a thin style:
      10a Fruit laterally compressed with flattened valves, dehiscing by the valves coiling explosively from the base ...................... Cardamine
      10b Fruit ± circular in cross section, valves not coiling at dehiscence, with 2 or more parallel nerves .................................................. *Sisymbrium

*Brassica L.

*Capsella Medik.


Cardamine L.

*Coronopus Zinn

*Eruca Mill.

*Eruca sativa Mill., Zimbabwe, and sthn Afr.; occasional escape from cultivation.

Erucastrum (DC.) C.Presl

Lepidium L.

*Raphanus L.

Rorippa Scop.

Sinapis L.
Exell: 188 (1960).

*Sinapis arvensis L., Zimbabwe, and sthn Afr.

*Sinapis L.
Exell: 188 (1960).


References

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BREXIACEAE

(Rosidae—Rosales; under Grossulariaceae)

(Eurosids I—Celastrales; included in Celastraceae)

Shrubs or small trees, evergreen, glabrous. Leaves alternate, simple, ± entire, petiolate; stipules minute, caducous. Flowers bisexual, regular, in axillary cymes, false umbels or fascicles, sometimes cauliflorous, rarely single. Sepals (4)5, free, imbricate, deciduous. Disc (4)5-lobed, lobes alternating with stamens and each lobe bearing 3 or 4(–6) stiff staminodes. Stamens (4)5, slightly perigynous, arising between and united with disc lobes; filaments dorsally compressed and slightly dilated near base; anthers 2-thecous, versatile, introrse. Ovary superior, 5(6 or 7)-locular, usually 5-angled; ovules many in each locule, on axile placentas, anatropous, unitegmic. Fruit drupaceous, usually 5-locular and 5-ribbed; mesocarp woody at first, but said to become pulpy at length and edible. Seeds many, irregularly compressed-ellipsoid, carinate, minutely rugulose in ridges; endosperm sparse; embryo as long as seed.

Genera 3, species 3, or ± 8, East Africa, Madagascar, Mascarenes, Seychelles; sthn trop. Afr. genus 1, species 1.

Loudon: 524 (1830); Robson: 59 (1978); Takhtajan: 343 (1997).

Brexia Noronha ex Thouars


Description as for family.

Species 1, very variable or ± 6 very closely related ones, Tanzania (including Zanzibar), Madagascar, Comoro Islands, Seychelles; sthn trop. Afr. 1: Brexia madagascariensis (Lam.) Ker Gawl., Mozambique.

References


References

**Burseraceae**
(Rosidae—Sapindales)
(Eurosids II—Sapindales)


Sthn trop. Afr.: genera 4, species ± 36.

**Key to genera**

[after Keay (1958) and Troupin (1958)]

1a Sepals and petals 4; stamens 8; receptacle concave; leaves simple, 3-foliolate or imparipinnate; leaflets often toothed ................. **Commiphora**

1b Sepals and petals 3; stamens 6; receptacle flat or convex; leaves imparipinnate; leaflets entire:

2a Fruit flattened, irregularly globose to ellipsoid; style lateral; ovary 3-locular; inflorescence glabrous .............................................................. **Santiria**

2b Fruit not flattened, symmetric, ovoid to subglobose; style terminal; ovary 2- or 3-locular; inflorescence pubescent:

3a Sepals free or basally united; indumentum of stellate and simple hairs; ovary 2(3)-locular, locules not separated by an axial intrusion .... **Dacryodes**

3b Sepals largely united; indumentum of simple hairs; ovary 3-locular, locules separated by a 3-winged axial intrusion and covered by mesocarpal lids forming a 3-gonous, spindle-shaped “stone” in fruit ................................................................. **Canarium**

Canarium L.

Dioecious trees. Leaves imparipinnate; leaflets in up to ± 24 pairs, usually entire. Inflorescences of axillary paniculate cymes; peduncle usually elongated; cymules surrounded by persistent or caducous bracts. Flowers unisexual. Calyx infundibuliform, campanulate or saucer-shaped; lobes 3. Petals 3, usually imbricate below but valvate towards apex. Stamens 6, free or connate below, inserted just outside disc, equal in size, with filaments broader towards base (smaller and infertile in female flowers). Disc annular but slightly lobed between stamens. Ovary (vestigial in male flowers) 2(3)-locular with 2 ovules per locule; style very short; stigma 3- or 4-lobed. Fruit an ovoid or ellipsoid drupe; endocarp thin and cartilaginous. Seed large; cotyledons very much thickened and deeply folded or conduplicate, thus appearing palatomedately lobed.

Species 40, tropical Old and New World; sthn trop. Afr. 2, Angola, Zambia.

**Santiria Blume**


Dioecious, or sometimes monoecious trees; branches usually with resin ducts. Leaves imparipinnate; leaflets 7 or 9, entire, with short petiolules; stipules absent. Inflorescences paniculate or racemose, usually axillary, glabrous; bracts ovate. Male flowers with sepals 3, free or united and then forming a subtruncate calyx; petals 3, free, valvate, thick, with inflexed apex; stamens 6, filaments short, anthers basi- or dorsifixed, dehiscing longitudinally. Disc intrastaminal, cupuliform to annular. Female flowers: sepals and petals as in male flowers; ovary 3-locular, 1 locule sometimes sterile; stigma sessile, 3-lobed. Fruit a drupe, ± obliquely globose to ellipsoid; stigma excentric, sometimes lateral and situated close to pedicel. Seeds rounded; cotyledons divided and conduplicate.


**References**

BURSERACEAE: References


DICOTYLEDONS

Buxaceae
(Dilleniidae—Buxales)
(Eudicots)

Buxus L.

Notobuxus Oliv.: t. 1400 (1882); Hutchinson: 375 (1915) as Euphorbiaceae.

Sthn trop. Afr.: genus 1, species 2.

References

Cabombaceae
(Magnoliidae—Nymphaeales)
(Basal families; included in Nymphaeaceae)


Sthn trop. Afr.: genus 1, species 1.

Brasenia Schreb.


References

Cactaceae
(Caryophylliidae—Caryophyllales)
(Core Eudicots—Caryophyllales)


DICOTYLEDONS

*CACTACEAE: *Cereus

* Cereus Mill.

  *Cereus jamacaru* DC., a declared weed in South Africa, is certain to be an invader, at least in Zimbabwe, judging by its distribution in South Africa [see Henderson (2001)].

*Opuntia Mill.

Several species have become naturalised in Africa, including sthn Afr.; judging by the distribution pattern of species in South Africa [Henderson (2001)], 5 or more species occur at least in Zimbabwe.

*Pereskia Mill.

  *Pereskia aculeata* Mill., naturalised in Africa, including sthn Afr.

Rhipsalis Gaertn.

Canarina L.

Glabrous terrestrial or epiphytic perennial herbs containing abundant white latex; stems erect and scandent or pendent, herbaceous, terete and hollow, di- or trichotomously branched from leaf axils; most leaf axils also producing small, usually rudimentary, accessory shoots; roots thickened, fleshy. Leaves opposite or ternate, ± triangular to ovate, dentate to serrate, petiolate. Flowers solitary in dichasial forks or terminal, large, pentent, (5)6(7)-merous throughout. Calyx: tube (hynpanshium) obconical, 6-ribbed; lobes entire or sometimes dentate, erect, spreading or reflexed. Corolla funnel-shaped or campanulate with short lobes. Stamens with bases of filaments broad, shield-like. Ovary inferior; style shorter than corolla, markedly thickened towards apex, with short style lobes. Fruit baccate, with persistent calyx. Seeds many; testa finely pitted or striate.

Species 3, 2 in trop. Africa, 1 on the Canary Islands; the latter, Canarina canariensis (L.) Vatke, is a common greenhouse plant; sthn trop. Afr. 1: Canarina eminii Aschers. ex Schweinf., Malawi.

References

Canarina L.


Glabrous terrestrial or epiphytic perennial herbs containing abundant white latex; stems erect and scandent or pendent, herbaceous, terete and hollow, di- or trichotomously branched from leaf axils; most leaf axils also producing small, usually rudimentary, accessory shoots; roots thickened, fleshy. Leaves opposite or ternate, ± triangular to ovate, dentate to serrate, petiolate. Flowers solitary in dichasial forks or terminal, large, pentent, (5)6(7)-merous throughout. Calyx: tube (hynpanshium) obconical, 6-ribbed; lobes entire or sometimes dentate, erect, spreading or reflexed. Corolla funnel-shaped or campanulate with short lobes. Stamens with bases of filaments broad, shield-like. Ovary inferior; style shorter than corolla, markedly thickened towards apex, with short style lobes. Fruit baccate, with persistent calyx. Seeds many; testa finely pitted or striate.

Species 3, 2 in trop. Africa, 1 on the Canary Islands; the latter, Canarina canariensis (L.) Vatke, is a common greenhouse plant; sthn trop. Afr. 1: Canarina eminii Aschers. ex Schweinf., Malawi.
**Craterocapsa** Hilliard & B.L.Burtt


**Cyphia** P.J.Bergius


**Gunillaea** Thulin

Thulin: 165 (1974); Thulin: 111 (1983); Phiri (Unpublished) as *Gunilaea*.


**Lobelia** L.


**Monopsis** Salisb.


**Wahlenbergia** Schrad. ex Roth


**References**


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**Canellaceae**

(Magnoliidae—Magnoliales)

(Magnoliids—Canellales)


Sthn trop. Afr.: genus 1, species 1.

**Warburgia** Engl.


**References**


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**Cannabaceae**

(Dilleniidae—Urticales)

(Eurosids I—Rosales)


Angiosperm Phylogeny Group (2003) include Celtidaceae in this family.
Seed plants of southern tropical Africa: families and genera

*Cannabis* L.

Wilmot-Dear: 13 (1991); Kubitzki: 205 (1993); Phiri (Unpublished).

*Cannabis sativa* L., a native of Central Asia, widely cultivated and locally naturalised; also in sthn Afr.

References


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**Capparaceae**

*(Capparidaceae)*

*(Dilleniidae—Capparidales)*

*(Eurosids II—Brassicaceae; included under Brassicaceae)*

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**Key to genera**

1a Herbs; fruit an elongated capsule with 2 valves separating from a persistent replum .......................................................................................................................... *Cleome*

1b Woody plants, or if apparently herbaceous, then with a woody rootstock:

2a Androphore elongated, longer than the sepals:

3a Leaves 3-foliolate; androphore with staminodes at its base; fruit globose .......................................................................................................................... *Cladostemon*

3b Leaves simple; androphore with a conspicuous nectar gland at its base; fruit cylindric .................................................................................................................. *Cadaba*

2b Androphore short or absent:

4a Calyx rupturing transversely; fruit with 8–10 longitudinal ribs .......................................................................................................................... *Thilachium*

4b Calyx not rupturing transversely; fruit not ribbed:

5a Branches with spines derived from stipules ................................................................................................................................................. *Capparis*

5b Branches without spines:

6a Receptacle tubular to narrowly funnel-shaped:

7a Androphore about as long as the receptacle; sepals spreading; disc present; flowers solitary, fascicled or in terminal racemes or corymbs ................................................................................................................. *Maerua*

7b Androphore very short; calyx lobes not or scarcely spreading; disc absent; flowers in abbreviated racemes on old wood ... *Bachmannia*

6b Receptacle widely cup-shaped to widely funnel-shaped:

8a Petals absent; leaves simple ........................................................................................................................................................................... *Boscia*

8b Petals present, at least in male and bisexual flowers; leaves mostly 3–5-foliolate:

9a Petals unequal; upper 2 much larger than lower 2 ........................................................................................................................................... *Euadenia*

9b Petals ± equal, 4–many:

10a Petals ribbon-like, ± 10 x as long as broad or longer; sepals valvate ........................................................................................................ *Ritchiea*

10b Petals broadly elliptic or ovate; sepals imbricate .......................................................................................................................... *Crateva*

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**Bachmannia** Pax


**Boscia** Lam.

Exell & Mendonça: 64, 359 (1937/1951); Wild: 229 (1960); White: 59 (1962); Wild & Gonçalves: 44 (1973); Coates Palgrave: 224 (2002).


**Cadaba** Forssk.

Exell & Mendonça: 61 (1937/1951); Wild: 207 (1960); White: 60 (1962); Wild & Gonçalves: 14 (1973); Coates Palgrave: 229 (2002); Lebrun & Stork: 126 (2003).

Cleome L.


Gynandropsis DC.; Exell & Mendonça: 58, 359 (1937/1951); Wild: 205 (1960).


Cratavea L.

Linnaeus: 144 (1753); Linnaeus: 203 (1754); Wild: 240 (1960); Lebrun & Stork: 141 (2003).

Shrubs or trees, deciduous, glabrous; bark smooth, brown; young branches with prominent yellowish lenticels. Leaves 3-foliolate, petiolate. Inflorescence of axillary or terminal, corymbose racemes. Flowers bisexual or unisexual by abortion. Sepals 4, open in aestivation, arising from a shallow receptacle. Petals 4(5), rather large, clawed, white. Androgynophore short, dilated. Stamens 8–50. Ovary ovoid or globose on a long gynophore, 1-locular or 2-locular by intrusion of 2 placentas, multi-ovulate; stigma subsessile. Fruit globose or ovoid with a coriaceous pericarp borne on a stout stipe. Seeds many, reniform with a coriaceous testa.

Species 6, tropics; sthn trop. Afr. 1: Cratavea adansonii DC. (= C. religiosa G.Forst.), Zambia.

Euadenia Oliv.


Sparsely branched subshrubs, ± glabrous. Leaves trifoliolate, long-petiolate; leaflets elliptic to oblong-elliptic with acute to acuminate apex and cuneate base, entire. Inflorescences elongate, terminal racemes; floral bracts simple, narrowly lanceolate to subulate. Flowers irregular, green. Sepals 4, imbricate, free, lanceolate to oblong-lanceolate, 3-nerved, glabrous, caducous. Petals 4, free, altermisepalous, in 2 dimorphic pairs: upper pair unguicate, spathulate, 3 times larger than lower pair. Stamens comprising 5 fertile ones with filaments free almost to base, and 4(–7) staminodes with filaments fused into a staminodial column crowned by sterile anthers; androgynophore absent. Ovary cylindric, 1-locular, glabrous, on a long gynophore; placenta 2, parietal; ovules many, arranged in 2 rows on each placenta; replum glabrous; stigma ± sessile and capitate. Fruit ± cylindric and torulose. Seeds many, ± reniform; endosperm absent or scanty; embryo curved.


Maerua Forssk.


Ritchiea R.Br. ex G.Don


Shrubs, trees or lianes. Leaves alternate or more rarely subverticillate or subopposite; petioles often rather long; blade 3–5-foliolate or by reduction 1-foliolate or simple. Inflorescence in terminal or axillary racemes. Flowers bisexual. Sepals 4, valvate, in a single series arising from a cupular receptacle with margin slightly thickened and annular. Petals 4 or more, often longer than sepals. Androgynophore very short. Stamens 12–many; filaments slender, long, outer ones sometimes sterile and petaloid. Ovary borne on a gynophore, 1-locular with 2–4 multi-ovulate placentas; stigma sessile or on a short style. Fruit cylindric, ellipsoid or ovoid, with 3–8 coriaceous valves or indehiscent. Seeds many, embedded in a fleshy pulp.


Thilachium Lour.


References


DICOTYLEDONS


Seed plants of southern tropical Africa: families and genera

CAPPARACEAE: References


**Caricaceae**

(Dilleniidae—Violales)

(Eurosids II—Brassicales)

Trees or shrubs, usually glabrous, with soft wood and usually unbranched stems with an apical cluster of leaves; monoecious or dioecious, rarely with bisexual flowers; milky latex present in all parts. **Leaves** alternate, large and long-petiolate, ± circular in outline, palmente lobed and -veined; stipule 0. **Flowers** usually unisexual, regular, in axillary inflorescences; male flowers in many-flowered panicles; female flowers solitary or in few-flowered racemes. **Sepals** 5, small, united into a subtentire or 5-lobed calyx. **Petals** 5, united into a slender tube in male flowers and a short to very short tube in female flowers. **Stamens** 10 in 2 series of 5, arising on corolla tube, absent in female flowers; filaments free or basally united into a short tube; anthers 2-thecous, intorse, opening by longitudinal slits. **Ovary** superior, of 5 carpels, 1-locular with deeply intrusive parietal placentas, or these meeting to create a 5-locular ovary with placentas on the partitions; ovules many, anatropous, bitegmic, with ± enlarged funicles; style short or absent; stigmas 5, connate at base, entire or lobed; rudimentary ovary with long style sometimes present in male flowers. **Fruit** a large, fleshy, many-seeded berry. **Seeds** with succulent outer sarcotesta and hard endotesta; embryo straight, spatulate; embedded in fleshy endosperm.

**Key to genera**

Upper part of trunk and branches armed with prickles; plants monoecious; leaves 3–5-lobed; ovary and fruit 5-locular..............................Cylicomorpha

Plants unarmed, usually dioecious; leaves 7–11-lobed; ovary and fruit 1-locular....................................................................................................

*Carica L.*


Trees, usually dioecious, fast-growing, unarmed; trunk usually simple, soft-wooded. **Leaves** clustered at apex of stem and at ends of branches, deeply 7–11-palmatifoliolobed, with lobes ± irregularly and deeply pinnatifid or coarsely toothed. **Male flowers** with small cupuliform calyx with 5 triangular to linear lobes; corolla lobes shorter than tube; filaments free, arising in corolla throat, those of outer series alternipetalous and exserted, those of inner series appendiculate; pistil ± orbicular calyx; petals free; androecium entirely absent; stigmas ± connate at base; ovary 5-locular, ± 5-angled; ovules many, borne in the angle between the septa and the ovary wall. **Fruit** 5-locular.

Species 2, trop. Africa; sthn trop. Afr. 1: *Carica papaya* L., the widely cultivated pawpaw, sometimes persisting as a relict of cultivation.

**Cylicomorpha Urb.**


Monoecious trees; trunk simple or sparsely branched at apex, upper parts and branches armed with short conical prickles. **Leaves** clustered at apex of stem and at ends of branches, shallowly to deeply 3–5-lobed, strongly cordate at base, ± orbicular in outline, lobes entire or with subsidiary lobes. **Male flowers** with calyx ± entire; corolla tube cylindrical, lobes shorter than tube; filaments connate into a ring at base. **Female flowers**: calyx ± entire; petals free; androecium entirely absent; stigmas free, connate at base; ovary 5-locular, 5-angled; ovules many, borne in the angle between the septa and the ovary wall. **Fruit** 5-locular.


**References**


Identification of additional genus: Polytepalum differs from all other local representatives of the family in having ±20 sepals and more than 10 ‘petals’.

Cerastium L.

Corrigiola L.

Dianthus L.

Drymaria Willd. ex Schult.

Krauseola Pax & K.Hoffm.

Pollichia Aiton

Polycarpacea Lam.

Polycarpion L.
DICOTYLEDONS

CARYOPHYLLACEAE: References

Berlin.


*Casuarinaceae
(Hamamelidaceae—Casuarinaceae)
(Eurosids I—Fagales)


Sthn trop. Afr.: genus 1, species 1.

*Casuarina L.


Sthn trop. Afr.: 1: *Casuarina equisetifolia L. is either indigenous or of very ancient introduction (fruits =sea-borne) on the coast of Mozambique and sthn Afr.; several other species are cultivated (Glen 2002), and at least *C. cunninghamiana Miq. has become naturalised.

References


Cecropiaceae
(Hamamelidaceae—Urticaceae)
(Eurosids I—Ranunculales; included in Urticaceae)

Trees or shrubs, dioecious, often with stilt-roots; sap watery, turning black. Leaves alternate, simple, palmatifid to -sect; stipules fused, fully amplexicaul. Inflorences paired in axils of leaves, pedunculate, bracteate. Flowers unisexual, regular, small, ± sessile. Male flowers in branched inflorences; tepals 2–4, free or basally united; stamens 1, 3 or 4; filaments straight in bud, not abruptly bending in dehiscence; anthers extrorse. Female flowers many in ± capitate inflorences; tepals 2–4; ovary superior, 1-locular, free or basally adnate to perianth, with 1 basal, orthotropous, bitegmic ovule; style 1; stigma 1, sometimes tongue-shaped. Fruit achene-like or forming a drupaceous whole with accrescent, fleshy perianth. Seed large and without endosperm, or small and with endosperm; embryo straight.

Genera 6, species 180, confined to the tropics, 1 genus in Asia and Australasia, 3 in Neotropics, 2 (9 species) in Africa; in sthn trop. Afr. genera 2, species 4.

Formerly treated as subfamily Conocephaloidea of Moraceae, later moved to Urticaceae, being intermediate between them. Berg (1978) raised the Conocephaloidea to family rank.


Key to genera

| Lamina peltate, palmatisect ............................................................................................................................................................................... | Musanga |
| Lamina basally attached, palmatifid ................................................................. ........................................................................................................................................................................ | Myrianthus |

Musanga R.Br.


Trees with stilt-roots. Leaves peltuate with 8–18 radiating segments; in young plants lamina changing from entire to palmatisect, and from basally attached to peltate. Male flowers in many-flowered, globose glomerules borne on the ultimate dichotomies of cymosely branching inflorences; tepals 2-lobed; stamen 1. Female inflorences very many in dense clavate, capitate, somewhat flattened spikes; perianth tubular, usually 2-lobed; ovary free. Fruit free, borne inside slightly enlarged, fleshy, greenish perianth; endocarp crustaceous; mesocarp mucilaginous; exocarp membranous. Seed small; endosperm present.


Myrianthus P.Beauv.


Trees or shrubs, often with stilt-roots. Leaves with lamina basally attached, palmatifid. Male flowers in spike-like to globose glomerules borne on ultimate to more proximal branches of repeatedly dichotomously branching inflorences; perianth of (3)4 ± imbricate tepals; stamens 3 or 4; filaments free or basally connate. Female flowers basally connate, in several- to many-flowered...

References

Key to genera

1a Fruit indehiscent; seeds without an aril:
   2a Fruit drupaceous; leaves alternate, opposite or fasciculate:
   3a Endocarp thick and woody (stone); leaves usually opposite or fasciculate, glabrous; sepals ± subcircular with entire margin .......... Elaeodendron
   3b Endocarp thin and crustaceous; leaves alternate, pubescent or glabrous; sepals ± deltoid with laciniate margin ................................... Mystroxylon
   2b Fruit baccate or small and nut-like; leaves opposite or subopposite, rarely alternate:
   4a Fruit small, nut-like and asymmetric with persistent lateral style or stylar scar; leaves opposite; ovules 2–4 per locule ................. Pleurostyla
   4b Fruit baccate:
   5a Fruit often large and globose, 1–20-seeded; seeds irregular, large; ovary with 2–8 ovules per locule ................................................. Salacia
   5b Fruit usually smaller, globose or ellipsoid, 1–3(–6)-seeded; ovary with 2 ovules per locale:
   6a Climbing or scrambling shrubs; sepals 5 with ciliolate margins; stamens 5 ................................................................. Allocassine
   6b Tall lianes; calyx tearing open into 2 or 3 irregular lobes; stamens 3(4) ......................................................................................... Salicigia

1b Fruit capsular or follicle-like, dehiscent when dry and mature; seeds with or without an aril:
   7a Plants with spines; leaves fasciculate on brachylasts, at least on older branches:
   8a Suffrutices, shrubs or small trees; flowers nearly always functionally unisexual with staminodes in female, and pistillode in male flowers; ovules 2(3) per locale; ovary (2)3(4)-locular; seeds completely or incompletely enveloped by a well or weakly developed aril, or aril only a basal rim ........................................................................................................... Gymnosporia
   8b Shrubs or woody climbers; flowers all bisexual; ovules 3–12 per locale; ovary always 3-locular; seeds completely enveloped by a well-developed aril ................................................................. Putterlickia
   7b Plants without spines; leaves opposite or alternate, never fasciculate:
   9a Leaves alternate; seeds ellipsoid, with or without a membranous aril:
   10a Capsules with wing-like emergences .................................................................................................................. Pterocelastrus
   10b Capsules smooth or verruculose, without wing-like emergences ...................................................................................... Maytenus
   9b Leaves opposite, at least on flowering shoots; seeds flattened or irregularly shaped, with wings; aril reduced or absent:
   11a Capsule elongated, narrow, dehiscing loculicidally in 3 valves; seeds winged, aril reduced or absent; stamens 5, outside the disc ....... Catha
   11b Capsule expanded laterally, forming 3 dehiscent mericarps, each dehiscing by a median suture into 2 caducous valves; seeds with or without wings; stamens (2)3(4), inside the disc or absent ........................................................................................................... Hippocratea
(Hallik (1990) divides the Hippocratea complex into a number of genera):
  12a Seeds densely pubescent around the embryo and with a wing with both a marginal vein and a marginal raphe; leaves with stellate hairs ...................................................................................................................... Helicotonea
  12b Seeds glabrous, winged, with a marginal vein and a submedian vein:
  13a Flowers without a disc; resin threads present (especially visible on breaking the petiole); stamens 3 or 5, curving inwards or ± erect:
  14a Stamens 3, subextrorse; petals unequal, very fleshy, convex-incurved ....................................................................................... Bequaertia
  14b Stamens 3 or 5, introrse; petals subequal, slightly fleshy, spreading:
  15a Stamens 3 ................................................................................................................................................. Tristemonanthes
  15b Stamens 5 ................................................................................................................................................. Campylolostemon

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13b Flowers with a disc; resin threads present or absent; stamens 3, curving outwards:

16a Ovules 2 per locale; stigma not lobed or lobes opposite the stamens:

17a Disc extended upwards into a columnar or cylindrical androgynophore:

18a Disc a broad ring, depressed in the centre, with a narrowly columnar androgynophore; leaves usually broadly ovate ...

18b Disc narrow, somewhat lobed at the base; leaves usually elliptic or ovate ........................................ Simicricata

17b Disc not extended upwards; androgynophore absent:

19a Style absent; stigmas 3, each curved downwards over an anther; disc divided into 3 crescent-shaped lobes .... Apodostigma

19b Style present; stigma punctiform or shortly 3-lobed; disc cup-shaped or a low circular pad, lobed or not:

20a Disc deeply cup-shaped ................................................................. Elachyptera

20b Disc a low pad, narrowly sinusous ................................................... Reissantia

16b More than 2 ovules per locale; stigmatic lobes opposite to or alternating with the stamens:

21a Resin threads visible on breaking petioles; inner face of petals pubescent ........................................ Hipppocratea

21b Resin threads absent; inner face of petals glabrous or minutely pubescent:

22a Buds conical; petals ± valvate in bud ................................................................................................................................................................................... Loeseneriella

22b Buds globose or cylindrical, rounded; petals imbricate in bud:

23a petals not unguiculate, elliptic to oblong; leaves without obvious reticulate venation ........................................ Pristimera

23b Petals unguiculate, lamina ovate to subcircular; leaves with prominent reticulate venation:

24a Style conical and subulate; stigma simple; disc circular to patelliform .................................................... Prinostemma

24b Style very short; stigma 3-lobed, almost sessile; disc lobed ................................................................. Cuervea

Allocassine N.Robson

Monotypic genus: Allocassine laurifolia (Harv.) N.Robson; sfn trop. Afr.; Zimbabwe, Mozambique, and sfn Af.

Apodostigma R.Wilczek
Wilczek: 402 (1956); Wilczek: 142 (1960); Hallé: 154 (1990); Robson et al.: 55 (1994); Phiri (Unpublished).


Tall, glabrous, unarmed lianes, latex absent. Leaves opposite to slightly opposite, simple, entire to faintly dentate, petiolate; stipules free, minute, inserted at nodes. Inflorescences of axillary, dichotomous cymes with a single terminal flower and two equal branches at each fork. Flowers small, somewhat irregular, pedicellate; young buds globose. Sepals 3, imbricate. Petals 5, not spreading but rather arcuate, 4 of them ± equally arched. Disc divided into 3 crescent-shaped submarginal lobes, each of which enfold a stamen. Stamens 3; filaments very short, broad; anthers extrorse, transversely dehiscent; pollen small, simple, tricolporate. Ovary with 3 locules, each with 2 ovules; stigmas 3, sessile, together forming a ± triangular organ which exceeds the stamens, each stigma curved down over an anther. Fruit of 3 flattened mericarps, each dehiscing by median sutures into 2 caducous valves. Seeds 2 in each mericarp, winged, wings with a marginal vein and a submarginal vein (raphe); cotyledons not united; radicle acute and prominent; germination epigal.


Bequaertia R.Wilczek
Wilczek: 399 (1956); Hallé: 218 (1990); Robson et al.: 70 (1994).

Hipppocratea as to H. mucronata Exell; Exell & Mendonça: 14 (1954/1956).

Glabrous lianes; older stems crenulate-dentate in cross section; latex present. Leaves opposite, petiolate; stipules extrapetiolar. Inflorescences of axillary dichotomous cymes, without accessory flowers or branches; bracts small, acute, opposite. Flowers small, ± 2–3 mm in diameter; buds shorter than wide. Sepals 5, small, with quinuncial aestivation. Petals very thick and fleshy, unequally imbricate. Disc absent. Stamens 3, with short filaments connate at base; anthers with extrorse, transverse dehiscence; pollen in tetrad, tricolporate. Ovary glabrous, 3-locular, half immersed; ovules 6–8 (~12) per locale, in 2 series; style absent; stigma 3-lobed. Fruit of 3 dehiscent mericarps, each with 2 caducous valves. Seeds winged, with a marginal and a submedian vein (raphe), inserted into pocket-like structures at point of attachment; embryo with a prominent radicle; cotyledons not fused, containing latex.


Campylostemon Welw.
Welwitshie: 998 (1867); Exell & Mendonça: 11 (1954/1956); Robson: 417 (1866); Hallé: 264 (1986); Robson et al.: 73 (1994).

Lianes or scandent glabrous shrubs, with latex. Leaves opposite, elliptic to oblong or ovate-lanceolate, shallowly to rather deeply crenulate-serrate, petiolate; stipules free, caducous. Inflorescence pedunculate, cymose, dichasial, simple, without axillary branches, axillary and sometimes terminal; bracts persistent. Flowers bisexual. Sepals 5, imbricate, free or ± united. Petals (4)5, imbricate in bud, entire, white to yellow. Disc absent. Stamens 3–5; filaments united at base, erect or incurved; anthers versatile, apical or intorse (?rarely extrorse), with thecae ± confluent, dehiscing transversely; pollen in tetrads. Ovary superior, 3-locular, with 5–16 axile ovules per locale, sessile; style absent; stigmas 3, free, divergent. Fruit of 3 capsular mericarps united at base; mericarps dorsiventrally flattened, dehiscing by median suture. Seeds with long, winged stalks as in Hippocratea. Germination epigal (1 species). Chromosome number: 2n = 56 (1 species).

Catharina Forsk., ex Scop.


Cueva Triana ex Miers

Tall-growing, unarmed lianes; latex present or absent. Leaves opposite, rarely subopposite, petiolate, large, ovate-elliptic, entire, coriaceous; stipules reduced. Inflorescences in axillary dichotomous cymes, often arranged in terminal panicles; buds globose. Flowers large, opening wide, pedicellate. Sepals 5, suborbicular, denticulate. Petals 5, widely spaced, obovate-circular, concave. Disc with 5 rounded lobes. Stamens 3, arising on inner margin of disc; filaments flattened, very short, ± as long as wide; anthers transversely dehiscent. Ovary 3-locular, with (4-) 6–8 ovules per locule; stigma subsessile, 3-lobed. Fruit ± 150 mm in diameter, of 3 obovate-circular, flattened mericarps on a conical receptacle, each mericarp dehiscing by a median suture into 2 caducous valves. Seeds 4–6 per mericarp, weighing up to 15 g, not winged but with a prominent vein (raphé).

Species 5, 3 in tropical America, 2 in tropical W Africa; sthn trop. Afr: 1: Cueva macrophylla (Vahl) Wilczek ex Hallé, Angola.

Elachyptera A.C.Sm.
Smith: 383 (1940); Wilczek: 138 (1960); Robson et al.: 48 (1994); Phiri (Unpublished).


Glabrous lianes or scrambling shrubs; latex absent. Leaves opposite or sometimes subopposite; blade often shiny above (especially in dried state) and usually greyish, brownish, reddish or blackish, more rarely olive-green, when dry. Inflorescences of cymes or groups of cymes with quadrangular or 4-winged internodes, with accessory branches in axils. Flowers small, 1.9–3.3 mm in diameter at anthesis; aestivation quincuncial. Sepals 5, slightly unequal, obscurely and irregularly dentate. Corolla rotate or semi-urecoalate. Petals 5, orbicular or oblong, with 1–few veins, entire or weakly denticulate, imbricate to apex. Disc small, 0.6–0.9 mm in diameter, rather deeply cup-shaped, rim almost level with base of style, entire or with a split under each stamen. Stamens 3, with narrow flattened filaments free to base, inserted in a deep perigynous furrow; anthers transversely dehiscent, with an apical pore in bud stage, extrorse. Ovary with 3 locules, style subpyramidal with 3 reduced stigmatic lobes opposite stamens; ovules 2 per locule. Fruit with 3 mericarps, each with 2 caducous valves; seeds with or without a wing; if winged then wing with a submedian vein (raphé); cotyledons fused or merely adhering, with a cordate base, with radicle lying between lobes.


Elaeodendron Jacq.


Gymnosporia (Wigt. & Arn.) Hook.f.


Helictonea Pierre


Tall lianes with terete stems, conspicuously pubescent, particularly the younger growths; latex absent. Leaves opposite, petiolate; blade entire, with stellate hairs especially beneath; stipules small, obscured by hairs. Inflorescence of paired cymes, without accessory branches, cymes often combining to form large panicles; bracts caducous. Flowers large, pedicellate, 12–15 mm in diameter; buds subglobose, enclosed to apex by sepals. Petals 5, imbricate, pubescent, unguiculate, with conspicuously fimbriate margins. Disc spreading, manylobed, separated by a constriction from an expanded fleshy androgynophore which is crowned with hairs. Stamens 3; filaments bent outwards; anthers with extrorse transverse dehiscence; pollen simple, tricolporate, coarsely reticulate. Ovary with 3 locules, each with many ovules; stigma pustuliform. Fruit dry with 3 dehiscent mericarps, each with 2 non-caducous valves; valves densely lined with hairs. Seeds densely pubescent around embryo, with a well-developed wing which has both a marginal vein and marginal raphé (i.e. raphé is not submedian); no pocket-like structure at point of attachment (such as occurs in Simirestis and Pristimeria) but sometimes with the vestiges of arils.


Hippocratea L.

In the strict sense, Hippocratea comprises only 3 species of which 2 occur in Africa, with 1 in sthn trop. Afr: Hippocratea myriantha Oliv. in Angola. The other species assigned to this genus have been placed in various segre-
Loeseneriella A.C.Sm.
Smith: 438 (1941); Hallé: 190 (1990); Robson et al.: 65 (1994).


Tall lianes or scandent shrubs; old stems grooved with fairly deep furrows filled with parenchyma. Leaves mostly opposite, petiolate; blade entire or moderately crenulate; stipules free or borne on a transverse flange-like structure. Inflorescences of axillary cymes without accessory branches. Flowers usually with conical buds. Sepals 5, equal or unequal, rather small. Petals 5, valvate or with margins slightly overlapping, often rather long, glabrous or pubescent. Disc very variable in its degree of development, often complex with a collar-like base encircling a separate fleshy pad, sometimes cup-like with centre extended upwards into a thick fleshy column. Stamens 3; anthers with extrorse, transverse dehiscence; pollen in monads, tricolporate, finely reticulate. Ovary 3-locular, thin-walled, enclosed within base of filaments; ovules 4–15(–20) per locule; style conic-pyramidal with a punctiform stigma or ± trilobed. Fruit of 3 dehiscent mericarps, each with 2 caducous valves. Seeds winged, with a marginal and submedian vein (raphe), inserted into pocket-like structures at point of attachment; cotyledons fused; germination hypogaeal.

Species 16, Old World tropics; sthn trop. Afr. 6, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Maytenus Molina


Mystroxylon Eckl. & Zeyh.


Pleurostylia Wight & Arn.
White: 219 (1962); Robson: 381 (1966); Robson & Sousa: 30 (1969); Robson et al.: 27 (1994); White et al.: 188 (2001); Coates Palgrave: 626 (2002).


Prionostemma Miers


Tall, glabrous scandent shrubs; without latex. Leaves opposite, elliptic to oblong or subcircular, entire or shallowly obtusely dentate; stipules acicular, not united. Inflorescences of cymes arranged in open panicles or of simple axillary dichasia; bracts entire, persistent. Sepals subcircular, somewhat unequal, margin ciliolate-denticulate. Petals 5, ovate-cordate to subcircular, concave and with a short claw, margin minutely ciliolate. Disc extrastaminal, single, slightly cup-shaped, margin subentire to slightly 5-lobed. Stamens 3; filaments short, broad; anthers 1-theccous, subcircular, extrorse. Ovary 3-locular, partly sunk into disc to almost free; style narrowly conical; stigmas united; ovules ± 8–20 per locale. Fruit of 3 flattened, ± obovate mericarps, each dehiscing by a median suture into 2 valves. Seeds winged, with marginal and submedian veins.


Pristimera Miers

Tall unarmed lianes or scandent shrubs; older stems normally terete, with pale yellow wood; latex usually absent. Leaves opposite or subopposite, petiolate; blade toothed, sometimes dentate, inserted into pocket-like structures at point of attachment; cotyledons fused; germination hypogaeal.

Putterickia Endl.


Reissantia N.Hallé


Unarmed climbers or scandent shrubs; older stems ± terete, younger ones 4-angled or unequally grooved; latex absent. **Leaves** opposite or subopposite, entire or sometimes with a crenulate margin; stipules minute, free. **Inflorescences** consisting of axillary dichotomous cymes with small accessory branches, or flowers sometimes in small panicles; bracts small, opposite, acute. **Flowers** pedicellate, small; young buds globose. **Sepals** 5. **Petals** 5, imbricate in bud, suberect. **Disc** a small, narrow rim, slightly sinuous, surrounding base of ovary and filaments. **Stamens** 3, extrorse; filaments flattened; anthers circular in outline after dehiscence; pollen small, acute and prominent; germination epigeal.

Species 6, Old World tropics; sthn trop. Afr: 3, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Salacia L.


Salacighia Loes.

Tall lianes up 30 m long and up to 100 mm in diameter; latex absent; branches reddish, lenticelled. **Leaves** opposite or ± alternate, petiolate, elliptic, acuminate, entire. **Inflorescences**: flowers borne in few- to many-flowered fascicles on slender, often ± pendent, leafless branches arising on long leafless woody inflorescence branches borne between ground level and a height of 4 m on woody stems; buds ± globose. **Calyx** tearing open into 2 or 3 irregular lobes. **Petals** (4)5–(7), ± circular, with fimbriate margin. **Disc** thick, fleshy, subpentagonal. **Stamens** 3(4); filaments short, broad and flattened, arising in a perigynous groove; anthers extrorse, divided into slightly oblique thecae; pollen in tricolporate monads. **Ovary** with 3(4) locules; style short, pyramidal, ending in a punctiform stigma; ovules 2 per locule, superposed. **Fruit** a globose berry, sometimes with 3(4) longitudinal grooves.

**Seeds** 1–6, subglobose, without endosperm, slightly mucilaginous.


Simicratea N.Hallé

Unarmed lianes, entirely glabrous; older bark covered with a thin papery orange layer (as in some *Salacia* species); stems terete; latex absent. **Leaves** opposite, petiolate; stipules reduced. **Inflorescences** of paired cymes with no accessory branches. **Flowers** pedicellate, rather similar in appearance to those of *Salacia* species; aestivation quincuncial, petals overlapping to apex. **Disc** spreading, cushion-like (but thin in dried state) with a central depression carrying a narrowly columnar androgynophore. **Stamens** 3, with flattened filaments; anthers with transverse dehiscence; pollen in monads, tricolporate, reticulate. **Ovary** completely superior, with 3 locules; ovules 2 per locule; style tapering, with a subpunctiform stigma. **Fruit** of 3 flattened mericarps, each dehiscing into 2 caducous valves. **Seeds** 2 in each mericarp, winged, with a marginal vein and a submedian (rhaphe) vein, inserted on an elevated bilobed structure which surrounds the placental tube; cotyledons joined or free; radicle very reduced.


Simirestis N.Hallé

*Hippocratea* L. in part; Robson: 403 (1966); White et al.: 185 (2001); Mapaura & Timberlake: 165, 175 (2002) under Hippocrateaceae.

Tall, unarmed lianes; older stems normally terete, with pale yellow wood; latex absent. **Leaves** opposite or subopposite, petiolate, entire or dentate; stipules very reduced. **Inflorescences** axillary, pedunculate, sometimes forming a terminal panicle; cymes dichotomous, always without accessory branches, their internodes ± quadrangular; bracts small, acute, opposite. **Flowers** moderately sized, 5–10 mm in diameter, often green, sometimes yellow, ± pedicellate; buds globose, ovoid or oblong. **Sepals** 5, with quincuncial aestivation, ovate or nearly round, equal or unequal, entire or minutely fimbriolate. **Petals** 5, with quincuncial aestivation, elliptic, oblong or somewhat spatulate, sessile, overlapping markedly in bud. **Disc** slightly sinuous just above base of petals, then extended upwards into a fleshy, ± cylindrical or truncate-conical androgynophore. **Stamens** 3, each arising on an ovary locule at about 1/2 – or 1/3-way up locule; pollen simple, tricolporate. **Gynoecium** with 3 swellings between filaments and 3 small furrows hidden by filaments; ovary 3-locular; ovules 4–12 per locule, arranged ± in 2 ranks; style small, slender to subpyramidal, truncate or obscurely 3-lobed at apex. **Fruit** of 3 flattened mericarps, each dehiscing along a median suture into 2 deciduous valves. **Seeds** winged, wing with a marginal and a submedian (rhaphe) vein.

**Tristemonanthus** Loes.
Loesener: 226 (1940); Halle: 220 (1990).

Woody, glabrous lianes with latex; young branches reddish. **Leaves** opposite, petiolate; ± elliptic, entire to slightly undulate; stipules extrapetiolar. **Inflorescences** axillary dichotomous cymes, sometimes arranged in panicles; young buds globose; bracts small, deltoid, pointed, persistent. **Sepals** 5, short, semicircular, sparsely denticulate, with quincuncial aestivation. **Disc** absent. **Stamens** 3, united at base, longer than gynoecium; filaments clasping at base; anthers 2-thecous, 3-locular; stigma subsessile, 3-lobed; ovules 4–8 per locule, in 2 ranks. **Fruit** of 3 elliptic, flattened mericarps, each dehiscing along a median suture into 2 deciduous valves. **Seeds** winged.

Species 2, tropical W Africa; sthn trop. Afr. 1: **Tristemonanthus mildbraedii** Loes., Angola (Cabinda).

### References


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### Celtidaceae

**Dilleniidae-Urticales**

(Eurosids I-Rosales; included in Cannabaceae)


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Celtis L.

Chaetacme Planch.

Trema Lour.

Ceratophyllaceae
(Magnoliidae—Ceratophyllales)
(Ceratophyllales; position uncertain)
Sthn trop. Afr.: genus 1, species 3.

Ceratophyllum L.

Chenopodiaceae
(Core Eudicots—Caryophyllales; included in Amaranthaceae)
Jordaan, M. in Leistner: 221 (2000). See key to genera in that work.
Sthn trop. Afr.: genera 9, species ± 27.

Atriplex L.

Bassia All.

Chenopodium L.

References

Exomis Fenzl ex Moq.
Brummitt (Unpublished).
Sthn trop. Afr.: the genus may be represented in Angola by Exomis microphylla (Thunb.) Aellen. Genus also present in sthn Afr.

Halosarcia Paul G.Wilson
Arthrocnemum not of Moq., in part.
**Salicornia L.**


**Salsola L.**

Sthn trop. Afr. 1: *Salsola angolensis* Botsch., and 1 (insufficiently known), Angola, Mozambique, and sthn Afr.

**Sarcocornia A.J.Scott**


**Suaeda Forssk. ex J.F.Gmel.**

**Chrysobalanaceae**
*(Rosidae—Rosales)*
*(Eurosid I—Malpighiales)*


Sthn trop. Afr.: genera 6, species ± 18.

**Key to genera**

1a Ovary arising at or near base of receptacle; flowers ± regular; endocarp with 4–8 longitudinal ridges ........................................ Chrysobalanus

1b Ovary arising in upper half or at mouth of receptacle tube:

2a Epicarp closely verrucose, endocarp with 2 small basal ‘plugs’ or ‘stoppers’ which allow seedlings to escape; bracts and bracteoles completely concealing flower buds up to anthesis, both individually and in small groups; lower surface of leaves with small stomatal cavities filled with hairs ................................................................. Parinari

2b Epicarp not verrucose, endocarp without basal plugs but sometimes dehiscing at germination by means of 2 lateral plates; bracts and bracteoles not enclosing flowers in groups; lower surface of leaves without hair-filled stomatal cavities:

3a Endocarp with 2 lateral germination plates; carpels 2-locular; receptacle not ventricose; sepals acute, not concave .................. Maranthes

3b Endocarp without lateral germination plates; carpels 1-locular; receptacle often ventricose; sepals acute, not concave:

4a Filaments fused for most of their length into a long slender channel .......................................................... Dactyladenia

4b Filaments free or fused only towards base:

5a Flowers slightly irregular; receptacle tube not oblique at throat; sepals subequal; filaments far exserted; staminodes almost free; endocarp with 4–7 shallow longitudinal channels ................................................................. Hirtella

5b Flowers strongly irregular; receptacle tube usually markedly oblique at throat; sepals unequal; filaments included; staminodes largely or completely united; endocarp without longitudinal channels ................................................................. Magnistipula

**Chrysobalanus L.**

Evergreen shrubs or trees. Leaves suborbicular to lanceolate-elliptic, petiolate, lower leaf surface glabrous or with a few stiff appressed hairs. Inflorescence a short, few-flowered raceme of cymes or cymose throughout, or a false raceme or a subsessile fascicle; bracts small, eglandular. Flowers regular. Calyx: tube (receptacle) cupuliform, interior and exterior puberulous; lobes 5, acute, subequal. Petals 5, longer than sepals. Stamens 12–26, forming a complete circle; filaments hairy, ± twice as long as sepals, appearing slightly united at base. Ovary of 1 carpel, 1-locular, arising at base of receptacle, covered with a dense mass of hairs; styles puberulous; stigma slightly expanded, shallowly 3-lobed. Fruit a small, glabrous drupe; endocarp thin, hard, interior glabrous, exterior smooth, with 4–8 prominent longitudinal ridges corresponding to lines of fracture that allow seedling to escape.

Species 2, tropical America, tropical Africa; sthn trop. Afr.: *Chrysobalanus icaco* L., Angola, Zambia.

**Dactyladenia Welw.**
Acioa Aubl. in part, as to African species; Exell: 161 (1928); Mendes: 19 (1970); Letouzey & White: 6 (1978).

Shrubs or small trees, sometimes scendent. Leaves usually with 2 glands on lower surface near base; petiole eglandular; stipules usually present. Inflorescence a simple raceme or a raceme of zig-zag, usually lax, false racemes; bracts and bracteoles not enclosing flower buds. Flowers bisexual, very irregular; receptacle tube usually elongate and narrowly obconic-tubular, usually longer than upper pedicel, often slightly gibbous at base, glabrous inside except near throat. Sepals 5, rounded or acute, usually spreading or reflexed, often with stalked or sessile marginal glands, adaxial surface whitish-tomentellous. Petals 5, caducous. Stamens 10–75, coiled in bud; filaments ligulately connate for most of length; arising on posterior rim of falcate annulus, far exerted, much longer than combined length of calyx and receptacle tube; staminodes short, filiform or denticulate. Ovary 1-locular, with 2 ovules, of 1 carpel, arising in mouth of receptacle tube; style filiform, slightly longer than stamens, slightly 3-lobed at apex. Fruit a ± ovoid drupe, usually longer than 30 mm, usually markedly tapered towards pointed apex; epipart often ferruginous-tomentose and with longer hispid hairs, less often glabrous; mesocarp thin; endocarp thin but hard, with a roughish surface, hairy inside, with no special mechanism allowing seedlings to escape.

Species 27, trop. Africa; sthn trop. Afr. ± 5, Angola.

Hirtella L.

Evergreen trees, sometimes flowering as shrubs. Leaves lanceolate or lanceolate-elliptic, petiolate, lower surface glabrous or with a few strigose or strigulose hairs; stipules subulate, persistent. Inflorescence many-flowered, usually a lax raceme or an elongate thyrsus with patent flowers or lateral branches usually bearing several sterile bracts and ending in a single flower or a few cymosely arranged flowers. Flowers slightly irregular; bracts and bracteoles often with stalked or sessile glands. Calyx: tube (receptacle) subcampanulate to narrowly cylindric, slightly gibbous, usually shorter than sepals, usually glabrous inside except near throat, and hairy outside; lobes 5, subequal, usually spreading or reflexed. Petals 5, shorter than sepals. Stamens 3–9; filaments laxly undulate in bud with a single undulation inserted on abaxial surface of disc, far exerted, usually much longer than combined length of calyx lobes and tube; staminodes short, free. Ovary of 1 carpel, 1-locular, usually inserted at mouth of calyx tube; style filiform, far exerted. Fruit a drupe with scanty mesocarp and smooth, thin, hard, non-granular endocarp with 4–7 longitudinal shallow channels which represent lines of weakness that permit seedling to escape. Germination hypogaeal; first leaves alternate.

Species 90, of these 88 occur in Central and S America and 1 in E Africa, and Madagascar: Hirtella zanzibarica Oliv.; sthn trop. Afr.: Malawi, Mozambique.

Magnistipula Engl.
Engler: 226 (1905); Mendes: 17 (1970); White: 281 (1976); White: 45 (1978); Champluvier: 393 (1990).

Trees, shrubs or geoxylid suffrutices. Leaves ± oblong-elliptic-oblong; shortly petiolate, lower surface glabrous or with a few strigose hairs; stipules subulate, persistent or caducous. Inflorescence a many-flowered panicle, usually thyrsoid, sometimes extremely contracted and racemoid. Flowers markedly irregular. Calyx: tube (receptacle) always curved, obliquely campanulate, slightly to strongly gibbous, nearly always markedly oblique at mouth, always longer than sepals, glabrous inside only at base; lobes 5, acute, usually very unequal in size. Petals 5, longer than sepals, persistent. Stamens 5–9; filaments white, coiled in bud, arcuate at anthesis, scarcely longer than sepals, flattened at base and appearing united for at least 1/3 of length; staminodes appearing partly or completely united to form a short comb- or tongue-like structure. Ovary of 1 carpel, mostly 1-locular, arising at mouth of calyx tube; style arcuate, scarcely longer than sepals, glabrous or hairy only at base. Fruit a fleshy drupe; endocarp hairy inside, on germination breaking up in an irregular manner. Germination hypogaeal; first leaves opposite.


Maranthes Blume
Blume: 89 (1825); Mendes: 14 (1970); White: 294 (1976); White: 41 (1978); Coates Palgrave: 251 (2002).

Evergreen trees. Leaves ovate to elliptic-oblong, petiolate, lower surface glabrous or with dense arachnoid indumentum; stipules caducous. Inflorescence a many-flowered corymb or panicle; bracts and bracteoles eglandular, caducous, not concealing young flowers. Flowers slightly irregular. Calyx: tube (receptacle) often slightly curved, obconoidal or subcampanulate, always gradually narrowed into pedicel, nearly always almost solid and almost completely filled with nectariferous tissue, glabrous inside on one side, hairy on other, or completely glabrous; lobes suborbicular, deeply concave. Petals suborbicular to broadly lunate. Stamens 2–60; filaments white, arising in 2 rows on free margin of disc; tightly undulate in bud with 2 or more undulations, much longer than sepals, usually occurring in a tangled mass; staminodes few and vestigial or absent. Ovary of 1 or sometimes 2 or 3 bilocular carpels, arising at mouth of receptacle tube; style curved upwards, much longer than sepals, glabrous except at base. Fruit a fleshy drupe; endocarp very hard, fibrous with a rough exterior; glabrous inside, with 2 lateral plates which break away on germination and allow seedlings to escape. Germination epigeal; first leaves opposite.

Species ± 12, confined to Africa except for 1 species which is widespread in Malaysia, New Guinea and Australia and a second which is only known from Panama; sthn trop. Afr. 5, Angola, Zambia, Zimbabwe, Malawi, Mozambique.

Parinari Aubl.

**Key to genera**
(adapted from Bamps (1970) and Bamps et al. (1978))

1a Styles obsolete, the stigma sessile or subsessile, peltate or lobed and spreading; plants dioecious or polygamous, less often bisexual:

2a Styles 1–5, well-developed; flowers bisexual:

3a Style entire; flowers 5-merous; stamens fused into a staminal tube ........................................................................................................... Endodesmia

3b Style ending in a peltate stigma; flowers 4-merous; stamens in 4 antepetalous fascicles or ± free ................................................................................. Calophyllum

4b Stamens arranged in fascicles or sometimes free; styles free to ¼-fused; fruit a capsule, drupe or berry:

5a Ovary incompletely 5-locular, with 2–28 ovules per locule, or 4-locular with 1 ovule per locule; placentation basal; stamens fused into a ring at the base; filaments well-developed; calyx entire in bud, dividing into 2(3) segments during anthesis ................................................................. Harungana

5b Ovary 5–8–per locule; berry ± 25–40-seeded ............................................................................................................. Psorospermum

6b Petals white, velvety on their inner faces; cymes corymbiform or umbelliform or flowers in panicles; fruit a berry or a drupe:

7a Fruit drupaceous, with 5 pyrenes; ovules 2–4 per locule .............................................................................................................. Vismia

7b Fruit a berry:

8a Ovules 1 per locule; berry 5-seeded ............................................................................................................. Psorospermum

8b Ovules 5–8 per locule; berry ± 25–40-seeded ............................................................................................................. Vismia

1b Ovary obsolete, the stigma sessile or subsessile, peltate or lobed and spreading; plants dioecious or polygamous, less often bisexual:

9a Ovary incompletely 5-locular, with 2–28 ovules per locule; placentation parietal; stamens grouped in 5 fleshy bundles, the anthers subsessile and disposed in several rows superposed on the inner face or on both faces of the bundle .............................................................................. Allanblackia

9b Ovary completely 2–5-locular, ovules 1 or 2 per locule; placentation basal or apical:

10a Fruit a drupe; ovary 2-locular with 2 ovules per locule, or 4-locular with 1 ovule per locule; placentation basal; stamens fused into a ring at the base; filaments well-developed; calyx entire in bud, dividing into 2(3) segments during anthesis ........................................................................... Mammea

10b Fruit a berry; ovary 2–4-locular, with 1 ovule per locule; placentation apical; stamens free or inserted on a cylinder to capsular disc or grouped in 2–5 bundles with the anthers borne at the summit, either on distinct free or connate filaments or ± sessile; calyx with (3/4) or 5 distinct lobes in bud ........................................................................................................... Garcinia

**Allanblackia** Oliv. ex Benth.


Trees with hollow, longitudinally wrinkled branches. Leaves opposite, with secretory canals visible on lower surface. Inflorescences terminal racemes or panicles with much reduced secondary axes, sometimes solitary or paired in axils of upper leaves, or sometimes pseudoaxillary on short lateral branches. Flowers unisexual. Sepals 5, imbricate, unequal. Petals 5, imbricate. Male flowers: stamens many, grouped in 5 very

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**References**

BLUME, C.L. 1825. Bijdragen tot de flora van Nederlandsch Indië. Lands Drukkerij, Batavia.


fleshy bundles opposite petals; bundles consist of almost completely fused filaments with subsessile, longitudinally dehiscent anthers in several rows on inner face or on both faces of upper, somewhat flattened part of bundle; disc star-shaped with 5 rectangular or spoon-shaped rays alternating with staminal bundles. Female flowers with 5 rudimentary staminal bundles alternating with 5 free disc glands; ovary conical, with 5 incompletely separated locules and parietal placents; ovules 2–28 per locule, arranged in 2 rows; stigma peltate, sessile or subsessile. Fruit an ovoid or ellipsoid berry, often very large. Seeds 4–80, ovoid, arillate.


**Calophyllum L.**


Trees or rarely shrubs secreting a milky, yellow or clear latex. Leaves opposite, almost always petiolate, entire, often coriaceous, with many lateral nerves close together and parallel (usually nearly at right angles to midrib) alternating with ± translucent glandular canals. Flowers bisexual, terminal or axillary, in few- to many-flowered racemes or paniculate cymes or rarely reduced to 1–3. Sepals 4, deciduous, free, inner pair sometimes ± petaloid. Petals 4–8 (sometimes 0), white, imbricate, not always distinguishable from inner sepals. Androecium of 4 antepetalous stamen fascicles each of many stamens, or sometimes with stamens apparently free; filaments slender and sometimes flexuous; anthers ovate to linear-oblong; fascicles absent. Ovary 1-locular, with a single erect ovule; style simple, slender, often flexuous; stigma peltate. Fruit a 1-seeded drupe with crustaceous pericarp. Seed large.

Species ± 140, most abundant in tropical Asia and Australasia, but also occurring in Madagascar, the Mascarene islands, East Africa and tropical America; sthn trop. Afr. 1: Calophyllum inophyllum L., Mozambique.

**Endodesmia Bentham.**

Bentham: 166 (1862); Gossweiler & Mendonça: 54 (1939); Exell & Mendonça: 121 (1937/1951); Bamps: 40 (1970).

Tall trees; branches ± cylindrical, smooth and glabrous. Leaves opposite, petiolate, elliptic to obovate, obtuse to cuneate at base, ± long-acuminate at apex, with numerous parallel lateral veins and translucent glandular canals indistinct in mature leaves. Inflorescences terminal or axillary cymes. Flowers bisexual. Sepals 5, imbricate, caducous. Petals 5, contorted, caducous. Disc circular, surrounding base of ovary. Stamens fused into a tube; anthers many, stipitate and arising on inside of staminal tube along its entire height. Ovary 1-locular and ± ovate; style narrowly cylindrical, truncate. Fruit drupaceous, on a thick, fleshy pedicel. Seed 1, subglobose; cotyledons fleshy.


**Garcinia L.**


Seed of southern tropical Africa: families and genera

Species ± 50, tropics of Old and New World; sthn trop. Afr. 1: Mammea africana Sabine, Angola (Cabinda).
Pentadesma Sabine


Tall trees, usually with a long clean bole; bark dark brown to almost black. Leaves opposite, grouped towards tips of branches, petiolate, oblong to obovate, cuneate at base, obtuse or slightly acuminate at apex, coriaceous, glabrous; lateral veins parallel, not clearly visible on upper surface; glandular dots not visible on lower surface. Inflorescences terminal, racemose panicles or racemes. Flowers bisexual; large and showy; pedicel stout, articulated near base. Sepals 5, free, 2 exterior shorter than interior ones which equal petals, imbricate, concave, coriaceous, ± persistent. Petals 5, free, con- torted in bud, coriaceous, oblong or ovate, ± persistent. Stamens many, in 5 epipetalous fascicles alternating with 5 pyramidal bodies; filaments filiform, shortly connate at base; anthers filiform, with very short pointed tail at base. Ovary 5-locular, ovoid-ellipsoid, with 7–14 axile ovules in 2 rows per locule; style elongated, ending in 5 linear lobes. Fruit a large 5-locular, globose or ovoid berry with coriaceous exocarp and resin of economic importance.


Psorospermum Spach


Trees, shrubs or shrublets. Leaves opposite, less frequently subopposite or alternate, petiolate, entire, often furnished with opaque glandular dots and stellate indumentum. Inflorescence a terminal panicule, usually cymose. Flowers bisexual. Sepals 5, with longitudinal linear glands. Petals 5, villous within, furnished with longitudinal glandular lines and swollen nectariferous tissue at base. Androecium of 5 fascicles of stamens, with few to many stamens in each fascicle and filaments united for most of their length; fascicles 5, fleshy, scale-like, alternating with fascicles. Ovary 5-locular, with 1(2)-ovulate locules and ascending ovules; styles 5, free, ± persistent. Fruit a berry. Seeds large, with a fibrous aril.

Species 5, trop. Africa and Madagascar; s.thn trop. Afra: 4: Mammea africana. Distributiones plantarum africanarum 3: 60, all confined to Madagascar except Symphonia globulifera L.f.; found within s.thn trop. Afra. in Angola and Zambia. This species yields a resin of economic importance.

Symphonia L.f.


Medium to large trees, with a straight bole and a crown of short horizontal branches. Leaves opposite, petiolate, entire, ± coriaceous, glabrous, with ± prominent venation, opaque or rarely with translucent glands. Inflorescence a terminal, one- to many-flowered, corimbose or umbellate cyme. Flowers bisexual, pedicellate. Sepals 5. Petals 5, incurved at anthesis. Androecium of 5 fascicles of stamens united to form a tube around ovary, and 5 united fascicles forming an annulus outside stamen tube. Ovary 5-locular; loculi (1)few- to many-ovulate; styles 5, united below, spreading above; stigmas minute. Fruit a 1–3-seeded berry with tough epidermis. Seeds large, with a fibrous aril.

Species ± 16, all confined to Madagascar except Symphonia globulifera L.f.; found within s.thn trop. Afra. in Angola and Zambia. This species yields a resin of economic importance.

Vismia Vand.


Small trees, shrubs or lianes with orange latex. Leaves opposite, petiolate with an interpetiolar ridge, entire, ovate to elliptic, with opaque glandular dots. Inflorescences terminal or axillary cymes, cymose panicles or glomerules. Flowers bisexual, regular. Sepals 5, ± ovate, with longitudinal linear glands, persistent. Petals 5, narrowly obovate, villose within, with longitudinal linear glands or glanddots, caducous. Interstaminal glands 5, glabrous. Stamens in 5 bundles of few to many stamens opposite petals; upper part of filaments free; anthers longitudinally dehiscent. Ovary 5-locular; ovules 5 or more per locule, arranged in 2 rows; styles 5, free, ± persistent. Fruit a berry. Seeds many, dry; radicle very short.

Species 5, tropical America and Africa (7 spp.); s.thn trop. Afra: 4, Angola, Mozambique.

References

DICOTYLEDONS

CLUSIACEAE: References

LAMARCK, J.B.A.P.M. DE. 1796. Tableau encyclopédique et méthodique.


DICOTYLEDONS

Cochlospermaceae
(Dilleniidae—Malvales)
(Eurosids II—Malvales)

Small trees or shrubs; hairs simple; leaves, sepals and petals containing red juice. Leaves alternate, simple, (3–)5–7-palmatilobed, ± entire, petiolate; stipules linear. Inflorescence terminal racemes or panicles. Flowers bisexual, regular, hypogynous, showy. Sepals 5, imbricate or contorted. Petals 5, free, contorted in bud, alternating with sepals, usually with red markings at base. Stamens many, evenly distributed or appearing fascicled; anthers slightly curved, opening by an apical pore. Ovary superior, (3)4(5)-carpellate, 1- or incompletely 3-locular, with placentation appearing axile at base, and parietal in upper parts of ovary; ovules many, anatropous; style simple; stigma small. Fruit a (3)4(5)-valved capsule; valves of membranous endocarp separating from, and alternating with those of epicarp. Seeds many, reniform with shallow sinus, covered with white woolly hairs; endosperm copious, oil-rich; embryo large, conforming to shape of seed, cotyledons broad.

Genera 2, species 15, tropics of America, Africa, Asia and Australia; sthn trop. Afr.: genus 1, species 1.

Planchon: 305 (1847); Exell & Mendonça: 382 (1937/1951); Verdcourt: 1 (1975); Poppendieck: 213 (1980); Takhtajan: 225 (1997).

Cochlospermum Kunth
Kunth: 6 (1822); Oliver: 112 (1868); Exell: 20 (1926) under Bixaceae; Exell & Mendonça: 77, 360 (1937/1951); Verdcourt: 1 (1975); Poppendieck: 215 (1980).

Description as for family.

Species 15, tropics of America, Africa, Asia and Australia; sthn trop. Afr.: genus 1: Cochlospermum angolense Welw. ex Oliv., Angola.

References


Combretaceae
(Rosidae—Myrtales)
(Rosids—Myrtales)

Bredenkamp, C.L. in Leistner: 228 (2000).

Sthn trop. Afr.: genera 8, species ± 90.

Key to genera
[based on Exell & Garcia (1970); Wickens (1973) and Exell (1978)]

1a Leaves opposite, subopposite or whorled:

2a Lower receptacle with 2 adnate bracteoles; petals absent; mangroves ___________________________________________________________ Laguncularia

2b Lower receptacle without adnate bracteoles; petals present; inland woody plants:

3a Flowers male and bisexual in the same inflorescence; minute scales and stalked glands absent _______________________________________ Pteleopsis

3b Flowers all bisexual; minute scales and/or stalked glands are present:
**DICOTYLEDONS**

<table>
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<th><strong>DICOTYLEDONS</strong></th>
<th><strong>COMBRETACEAE: Key to genera</strong></th>
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<tr>
<td>4a</td>
<td>Style adnate to the upper receptacle for part of its length; stamens not exserted beyond the petals; scales absent; microscopic stalked glands present .................................................. <strong>Quisqualis</strong></td>
</tr>
<tr>
<td>4b</td>
<td>Style not adnate to the upper receptacle; scales or stalked glands always present:</td>
</tr>
<tr>
<td>5a</td>
<td>Stamens twice as many as petals; petals mostly arising near the apex of the upper receptacle .................................................. <strong>Combretum</strong></td>
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<tr>
<td>5b</td>
<td>Stamens 4; petals arising near the edge of the disc .................................................. <strong>Meiostemon</strong></td>
</tr>
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</table>

| 1b | Leaves alternate, often crowded at ends of branches; flowers usually bisexual and male in the same inflorescence: |
| 6a | Petals present; lower receptacle with 2 adnate bracteoles; mangroves .................................................. **Lumnitzera** |
| 6b | Petals absent; inland plants or mangroves: |
| 7a | Flowers in spikes and spike-like racemes, never aggregated into tight cones; inland trees .................................................. **Terminalia** |
| 7b | Flowers and small fruits aggregated into tight cones; mangroves .................................................. **Conocarpus** |

**Combretum Loefl.**


**Conocarpus L.**
Limnaeaus: 176 (1753); Lawson: 417 (1871); Howes: 323 (1952); Liben: 88 (1968); Exell & Garcia: 92 (1970); Jongkind: 89 (1999).

Shrubs or trees (mangroves); bark fissured; branches subangular to narrowly winged, pubescent when young. **Leaves** alternate, petiolate, coriaceous to fleshy, at first minutely pubescent, glabrescent. **Inflorescences** of axillary panicles. **Flowers** small, 4-merous, sessile. **Calyx**: tube shallowly campanulate, slightly oblique. **Petals** 4, arising near margin of disc. **Stamens** 4, 1-seriate, antepetalous, not exserted. **Style** scarcely exserted. **Disc** with pubescent, scarcely free margin. **Ovary** with 2 ovules. **Fruit** 4-winged. **Seeds**: cotyledons 2, unfolding spirally and arising above soil level (known only in *M. tetrandrus*). **Scales** ± 40–80 µ in diam., circular in outline, slightly convexly scalloped at each marginal cell; cells delimited by 8–10 radial walls alone; cells wall clear; cells transparent.

Species 2: SE trop. Africa 1, Madagascar 1; sthn trop. Afr. 1: **Meiostemon tetrandrus** (Exell) Exell & Stace (with 2 subspecies) in Zambia, Zimbabwe and Mozambique. This genus, being lepidote, is evidently related to *Combretum* subgen. *Combretum*. It differs conspicuously from *Combretum* in having only 4 stamens in one whorl.

**Laguncularia C.F.Gaertn.**

Polygamous shrubs or small trees (mangroves); branchlets glabrous. **Leaves** opposite, petiolate, coriaceous to fleshy, obovate or elliptic, glabrous; petiole with a pair of glands towards top. **Flowers** bisexual or unisexual, sessile, subpaniculate; bracts ovate; bracteoles adnate to calyx tube. **Calyx**: tube tubinate, not prolonged above ovary; limb urceolate, 5-(6)-lobed, deciduous. **Petals** absent. **Stamens** 5(6), in 2 whorls, exserted; filaments filiform, glabrous. **Disc** long-pubescent. **Ovary** inferior, 1-locular; ovules 2. **Fruit** a trapezoidal, samara-like, glabrous, brownish maroon achene with a corky pericarp. **Seeds** cylindrical, curved, whitish.

Species 2, seashores in tropical America and tropical W Africa; sthn trop. Afr. 1: **Conocarpus erectus** L., Angola.

**Lumnitzera Willd.**


**Meiostemon Exell & Stace**

Deciduous scendent shrubs or more rarely small trees. **Leaves** opposite, elliptic to broadly elliptic, petiolate, lepidote, at first minutely pubescent, glabrescent. **Inflorescences** of axillary panicles. **Flowers** small, 4-merous, sessile. **Calyx**: tube shallowly campanulate, slightly oblique. **Petals** 4, arising near margin of disc. **Stamens** 4, 1-seriate, antepetalous, not exserted. **Style** scarcely exserted. **Disc** with pubescent, scarcely free margin. **Ovary** with 2 ovules. **Fruit** 4-winged. **Seeds**: cotyledons 2, unfolding spirally and arising above soil level (known only in *M. tetrandrus*). **Scales** ± 40–80 µ in diam., circular in outline, slightly convexly scalloped at each marginal cell; cells delimited by 8–10 radial walls alone; cells wall clear; cells transparent.

Species 2: SE trop. Africa 1, Madagascar 1; sthn trop. Afr. 1: **Meiostemon tetrandrus** (Exell) Exell & Stace (with 2 subspecies) in Zambia, Zimbabwe and Mozambique. This genus, being lepidote, is evidently related to *Combretum* subgen. *Combretum*. It differs conspicuously from *Combretum* in having only 4 stamens in one whorl.

**Pteleopsis Engl.**


**Quisqualis L.**


**Terminalia L.**


**References**


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**CONVOLVULACEAE:** References


**Convolvaceae**

*(Rosidae—Rosales)*

*(Eurosid I—Oxalidales)*


**Key to genera**

[adapted from Breteler (1989)]

1a Flowers with 5 carpels:

2a Follicles (almost) glabrous; leaves mostly pinnate; seed ± without endosperm............................................................ *Rourea*

2b Follicles hairy (sometimes glandular):

3a Flowers with a distinct androgyphonerecess............................................................ *Manotes*

3b Flowers without a distinct androgyphonerecess:

4a Follicles hairy inside ........................................................................ *Caesalpinia*

4b Follicles glabrous inside:

5a Sepals strongly accrescent in fruit; leaves mostly with more than 3 leaflets ............................................................ *Rourea*

5b Sepals inconspicuous or caducous in fruit; leaves trifoliolate ............................ *Agelaea*

1b Flowers with 1 carpel:

6a Leaves unifoliolate; petals glabrous; follicles velutinous ............................................................ *Burttia*

6b Leaves with more than 1 leaflet:

7a Petals and filaments glabrous; follicles indehiscent, 1- or 2-seeded ............................................................ *Jolylia*

7b Petals and/or filaments with many (sometimes glandular) hairs; follicles dehiscent, 1-seeded ............................................................ *Connarus*

**Agelaea** Sol. ex Planch.

Planchon: 437 (1850); Hieron: 188 (1896); Exell: 95 (1928); Exell & Mendonça: 142 (1954/1956); Mendes: 616 (1966); Mendes: 3 (1969); Jongkind: 136 (1989a); White et al.: 208 (2001).

Woody lianes, scandent shrubs or small trees; usually with fascicled hairs. **Leaves** 3-foliolate. **Inflorescence** a large many-flowered panicle. **Flowers** 5-merous; androecium and gynoecium heteromorphic. **Sepals** imbricate, with a dense brown indumentum, usually fringed with glandular hairs. **Petals** longer than sepals, often slightly connate near base, glabrous. **Stamens**: filaments connate at base, terete, glabrous. **Gynoecium**: carpels plicate; stigma expanded and sometimes flattened; ovules basally inserted. **Fruit** 1–3-follicular, dehiscent by ventral suture; pericarp tomentose. **Seed** ± ovoid; testa dark and shining; aril basal, obliquely cupuliform; cotyledons planoconvex, radicle apical, endosperm absent.

Species 6, 4 in trop. Africa, 2 in Asia; sthn trop. Afr. 3, Angola, Zambia, Zimbabwe, Malawi, Mozambique.

**Burttia** Baker f. & Exell


Shrubs or small trees; branches greyish brown, pubescent when young, later pale grey with many lenticels. **Leaves** 1-foliolate, long-petioled, deciduous; petiole slender, articulated at apex,
DICOTYLEDONS

CONNARACEAE: Burttia

densely ferruginous-hairy when young, later glabrescent; lamina broadly ovate to elliptic. Inflorescence a simple, 1–3-flowered axillary raceme. Flowers (4)5-merous with androecium and gynoecium dimorphic; pedicel articulate. Sepals 5, imbricate in bud, very shortly connate at base. Petals 5, free, subequal, larger than sepals. Stamens 10, 5 antepetalous ones longer than 5 antepetalous ones. Gynoecium: ovary sessile, densely sericeous; style glabrous; stigma papillose; ovules (1)2(3), arising near apex of ventral suture. Follicle flattened, with persistent calyx (and stamens), 1-seeded, densely pubescent, dehiscing by ventral suture. Seed narrowly ovoid, attached near top of ventral suture; aril lobate, spread densely pubescent, dehiscing by ventral suture. Stamens 5, free, imbricate, unequal: outer 2 smaller. Petals 5, free or somewhat coherent, imbricate. Stamens 10, united at base into a ± conspicuous cup partly enclosing ovary; filaments glabrous. Carpel 1; ovary ellipsoid, pubescent; style ± glabrous; stigma usually slightly lobed. Fruit 1- or 2-seeded, obovoid-ellipsoid to subglobose, shortly stipitate; pericarp shiny, glabrous or glabrescent. Seeds 1 or 2 per fruit; testa almost completely fleshy; cotyledons thick and almost horny, radicle minute.


Manotes Sol. ex Planch.


Lianas or scandent shrubs; branches cylindrical or very slightly lobed, usually densely tomentose when young, glabrous and lenticellate later. Leaves imparipinnate; leaflets 7–13, opposite or subopposite, entire, ± symmetric. Inflorescences axillary, paniculate or racemose. Flowers hetero-tristyloous or hetero-distyloous, reddish to yellow; with short but distinct androgyne. Sepals 5, connate at base, valvate in bud. Petals 5, free, longer than sepals, imbricate in bud. Stamens free, in 2 whorls: 5 stamens opposite sepals longer than 5 opposite petals. Pistils 5, free, pubescent. Follicles 1–5 per flower, constricted at base, beaked or not, glabrous inside, dehiscing by a ventral suture to expose pendulous seed; inner pericarp separating from exocarp at maturity; calyx persistent and usually accrescent in fruit. Seed solitary, subovoidal, attached to ventral suture; testa (sarcotesta) shiny, red and ± fleshy, to partly thin and black.


Jollydora Pierre ex Gilg


Small, evergreen, usually unbranched treelets; young parts reddish to light brown woolly, silky or tomentose. Leaves usually imparipinnate, sometimes paripinnate, mostly crowded near top; leaflets 5–11, opposite to alternate, elliptic to obovate or oblanceolate, cuneate at base, long-acuminate, petiolate. Inflorescence 1–several, up to 7-flowered clustered racemes on old wood, rarely axillary; pedicel articulate, with 1 small bract and 2 opposite bracteoles, cauliflorous. Flowers heterostylos. Sepals 5, free, imbricate, unequal: outer 2 smaller. Petals 5, free or somewhat coherent, imbricate. Stamens 10, united at base into a ± conspicuous cup partly enclosing ovary; filaments glabrous. Carpel 1; ovary ovoid, pubescent; style ± glabrous; stigma usually slightly lobed. Fruit 1- or 2-seeded, obovoid-ellipsoid to subglobose, shortly stipitate; pericarp shiny, glabrous or glabrescent. Seeds 1 or 2 per fruit; testa almost completely fleshy; cotyledons thick and almost horny, radicle minute.


References


Seed plants of southern tropical Africa: families and genera


Cnestis Juss.


Connarus L.

Linnaeus: 675 (1753); Hiern: 189 (1896); Exell: 98 (1928); Exell & Mendonça: 152 (1954/1956); Lemmens: 239 (1989b).

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emphasis on Africa. Agricultural University Wageningen Papers 89, 6: 1–403. [Also published in Belomontia, new series 21 (1989)].


LINNAEUS, C. 1753. Species plantarum, edn 1, Salvius, Stockholm.


Sthn. trop. Afr.: genera 23 or 24, species ± 152.

Key to genera

1a Leaves minute, scale-like or absent; herbaceous, yellowish twining parasites; flowers small, usually in clusters, often many .............................................. Cuscuta

1b Leaves well-developed, green:

2a Ovary distinctly 2- or 4-lobed or -cleft; styles 2, arising between the lobes of the ovary; prostrate herbs with oblong or cordate to reniform leaves:

3a Ovary distinctly 2-cleft, with 2 ovules in each locule; fruit 2-lobed ................................................................................................................................. 4

3b Ovary distinctly 4-cleft, with 1 ovule in each locule; fruit 4-lobed ................................................................................................................................. 5

2b Ovary not deeply lobed; fruit not 2- or 4-lobed; styles 1 or 2, terminal; plants of various habits:

4a Bracteoles at base of calyx markedly enlarged in fruit; prostrate herbs or immense lianes: .............................................................. Neupeltis

4b Bracteoles not markedly enlarged in fruit; rarely climbing shrubs, never immense lianes:

5a Outer 2 sepals much enlarged in fruit:

6a Stigmas ellipsoid or globose ........................................................................................................................................................................... Calycolobus

6b Stigmas linear-oblong ...................................................................................................................................................................................... Dipteropeltis

5b Outer 2 sepals not much enlarged in fruit:

7a Styles 2, free to partly united:

8a Styles forked; stigmas 4, linear or subclavate ................................................................................................................................. Evolvulus

8b Styles not forked; stigmas 2, peltate or capitate:

9a Styles joined for 12 of their length; large climbing shrubs .............................................................. Bonamia

9b Styles free or almost so; small erect or prostrate subshrubs:

10a Stamens and styles included ................................................................................................................................. Seddera

10b Stamens and styles exerted ....................................................................................................................................................................... Cessa

7b Style 1; stigmas(s) globose to linear:

11a Stigmas long and linear, ± as thick as the styles .............................................................. Convulvulus

11b Stigma capitulate, entire, or style ending in 2 or 3 globular or oblong, rarely filiform stigmas:

12a Indumentum conspicuously stellate-hairy ........................................................................ Astripomoea

12b Indumentum not stellate-hairy (except in Merremia stellata and Ipomoea ephemera) but sometimes with a few scattered branched hairs:

13a Stigmas oblong or nearly so, rarely filiform:
14a Leaves rounded at the base; 3 outer sepals largest and deciduous onto the petiole; a marsh plant of the coast with
usually solitary flowers ........................................................................................................................................... Aniseia
14b Leaves cordate, hastate or canoeate at the base; sepals equal or unequal, not deciduous; plant of various habitats (not as
above), with few-flowered capitate inflorescences:
15a Stigmas subglobose to filiform, usually oblong or elliptic; corolla usually blue but sometimes white or pink,
±10 mm long ......................................................................................................................................................... Jacqueumontia
15b Stigmas ovoid-oblong, complanate; corolla yellow, rarely white, usually with maroon or claret centre, 20–35 mm
long ........................................................................................................................................................................... Hewittia
13b Stigmas globose or nearly so:
16a Corolla urceolate, constricted at the apex of the tube ....................................................................................... Lepistemum
16b Corolla not distinctly urceolate:
17a Pollen smooth; corolla nearly always yellow or white, with or without a red or purple eye:
18a Fruit a large capsule with circumscissile epicarp .................................................................................................. Operculina
18b Fruit a 4-valved capsule:
19a Anthers at anthesis helically twisted; pollen tricolpate; leaves usually palmately or pinnately compound ....
.............................................................................................................................................................................. Merremia
19b Anthers at anthesis straight; pollen pantoporate; leaves oblong to linear-lanceolate, much longer than broad,
with hastate, sagittate or truncate base ..................................................................................................................... Xenostegia
17b Pollen spinulose; corolla variously coloured, often purple:
20a Fruit completely enclosed by the much enlarged calyx; pericarp thin, opening irregularly; seeds 4; leaves with
dense black glandular dots on the lower surface .................................................................................................. Stictocardia
20b Fruit dehiscent or indehiscent, not as above; leaves without black glandular dots below:
21a Stamens arising on scales situated near the base of the corolla tube; style completely caducous in fruit ........
.............................................................................................................................................................................. Paralelepistemum
21b Stamens arising directly on the corolla tube; style not completely caducous in fruit:
22a Fruit a 3–10-valved capsule ................................................................................................................................... Ipomoea
22b Fruit indehiscent, ovoid-oblong or ellipsoid ....................................................................................................... Turbina

Aniseia Choisy

Twining perennial herbs; stems sometimes rooting below. Leaves alternate, petiolate, narrowly elliptic, often
mucronulate. Flowers solitary, axillary. Calyx of 5 unequal sepals, 3 outer ones much larger, ovate and ± deciduous on
peduncle. Corolla funnel-shaped, usually entire, with well-defined hairy midpetaline bands. Stamens 5, arising at base of
corolla tube, included; pollen smooth. Disc small or absent. Ovary 2-locular with 2 ovules in each locule; style simple,
included; stigmas 2, thick, oblong. Fruit a 4-valved, ovoid or globose capsule. Seeds 4, trigonous or globose, black.

Species ± 5, pantropical, in N sthn trop. Afr.: Aniseia martinicensis (Jacq.) Choisy, Angola, Mozambique.

Astripomoea A.Meeuse

Astrosclæna Hallier f. not of Corda.


Bonamia Thouars


Calycobolus Willd. ex Schult.
Heine: 387 (1963a); Heine: 337 (1963b); Lejoly & Lisowski: 27 (1985);


Prevostia Choisy; Baker & Rendle: 81 (1905); Good: 112 (1929).

Climbing shrubs. Leaves alternate, simple, entire, petiolate, large, ± elliptic, subcoriaceous. Inflorescences terminal or ax-
illary, cymose or fascicled. Flowers rather small; bracts not accrescent. Sepals 5, ovate to suborbicular, outer 2 strongly
accrescent in fruit forming large orbicular, membranous wings, one much larger than the other. Corolla urn- or bell-shaped,
usually white; lobes spreading. Stamens included; filaments glabrous or thinly pubescent, fused to corolla in lower part
and often flattened. Ovary 2-locular, glabrous or pubescent; ovules 2 per locule; style included, mostly unequally bifid,
sometimes almost to middle; stigmas globose, kidney-shaped or ellipsoid. Fruit indehiscent, 1-seeded.

Species 30, tropical America (4 spp.), trop. Africa (25 spp.), Madagascar (1 sp.); sthn trop. Afr. 5, Angola.

Convolvulus L.


Cressa L.

Much-branched, short-lived perennials; stems woody at base, with many spreading or ascending, hairy, densely leafy
branchlets. Leaves small, sessile, ovate-lanceolate to ovate,
CONVOLVULACEAE: Cressa

entire. **Flowers** small, subsessile, in bracteate clusters at tips of branchlets. **Calyx** with 5 subequal, obovate, coriaceous, imbricate sepals. **Corolla** 5-lobed; tube campanulate; lobes ovate, imbricate, spreading. **Stamens** 5, exerted; filaments filiform, glabrous; anthers oblong. **Ovary** 2-locular, with 2 ovules in each locale; styles 2, exerted; stigmas large, capitate. **Fruit** a 2-4-valved capsule, usually 1-seeded. **Seeds** ovoid, glabrous and shiny, dark brown.

Probably monotypic, pantropical: *Cressa cretica* L., Angola, Mozambique.

**Cuscuta L.**


**Dichondra J.R.Forst. & G.Forst.**


**Dipteropeltis Hallier f.**

Hallier: 3 (1899); Baker & Rendle: 84 (1905); Good: 111 (1929); Lejoly & Lisowski: 366 (1993); Breteler: 183 (1995).

Woody climbers. **Leaves** alternate, petiolate, ± elliptic-ovate, entire. **Inflorescences** narrow, terminal or axillary panicles; bearing remote, solitary or paired cincinnous cymes; bracts and bracteoles small, usually early caducous. **Flowers** small, pedicellate. **Sepals** 5, ± free, imbricate, unequal: outer 2 ovate, longer and broader than inner 3, strongly accrescent and finally orbicular-reniform, looking like wings of the capsule. **Corolla** funnel-shaped to campanulate, shallowly to deeply 5-lobed. **Stamens** arising low down in corolla tube; filaments filiform; anthers oblong. **Ovary** conical, 1-locular; ovules 2; style deeply bifid; stigmas linear-oblong to subcapitate. **Capsule** ovoid-conical, small, surrounded by accrescent calyx.


**Evolvulus L.**


**Falkia Thunb.**


**Hewittia Wight & Arn.**


**Ipomoea L.**


**Jacquemontia Choisy**


**Lepistemon Blume**


Climbing perennials; stems up to 3 m long, covered with long, adpressed, yellow-brown, bristly hairs. **Leaves** cordate-ovate, petiolate, entire to lobed to coarsely dentate. **Flores** in dense axillary, sessile or peduncled cymes; bracteoles minute. **Calyx** of 5 subequal sepals, herbaceous or subcoriaceous, acute or obtuse, hairy or glabrous. **Corolla** urceolate; tube narrowing upwards; limb shortly 5-lobed. **Stamens** 5, arising near base of corolla; filaments dilated in basal portion into large, concave scales arching over ovary; pollen spinulose. **Ovary** 2-locular, with 2 ovules in each locale; style 1, very short; stigmas 2, capitate, or 1, and then 2-lobed. **Fruit** a 4-valved or almost indehiscent capsule. **Seeds** ± globose, minutely shallowly pitted, glabrous, grey-black.


**Merremia Dennst. ex Endl.**


**Neuropeltis Wall.**

Wallich: 43 (1824); Baker & Rendle: 80 (1905); Good: 114 (1929); Heine: 338 (1963); Lejoly & Lisowski: 472 (1984).

Climbing shrubs to immense lianas up to 40 m high and a stem diameter up to 300 mm; young branches and axes of inflorescence often densely pubescent. **Leaves** alternate, petiolate, mucronate, entire. **Inflorescences** racemes or panicles,
terminal or in axils of upper leaves; bracts small, lanceolate, soon caducous. Flowers small, shortly pedicellate; bracteole solitary at base of calyx, strongly accrescent after anthesis. Sepals 5, subequal, almost free, imbricate. Corolla ± deeply 5-lobed, lobes with hyaline margin. Stamens arising on corolla tube; filaments filiform, widening towards base, ± as long as corolla; anthers oblong, medifixed; pollen grains smooth. Disc very small. Ovary imperfectly 2-locular; ovules 4; styles 2, free, equal or subequal; stigma peltate or 2-branched. Capsule coriaceous, orbicular to ovoid, 1(2)-seeded, surrounded at base by persistent calyx. Seed globose, glabrous; embryo plicate.


**Operculina Silva Manso**


Large perennial twiners; stems, peduncles and petioles often winged. Leaves very variable, orbicular to lanceolate, cordate, hastate or truncate at base, entire or rarely lobed or dentate. Flowers usually large, in 1- to few-flowered axillary cymes; bracts large, oblong or elliptic, caducous. Calyx of 5 large, perigammatous to coriaceous, mostly glabrous sepals, often enlarged in fruit and ultimately with an irregularly lacerate margin. Corolla broadly funnel-shaped or campanulate. Stamens 5, included; anthers large, often longitudinally twisted; pollen ellipsoid, smooth. Ovary 2-locular, each locule with 2 ovules; style simple; stigma biglobular. Fruit a large, depressed-globose capsule with circumscissile epipar, the upper part coming off as an operculum. Seeds up to 4 ± globose, pilose or glabrous, black.

Species ± 15, pantropical; sthn trop. Afr. 1: **Operculina turpethum** (L.) Silva Manso, Mozambique. Very close to *Merremia* but with a differently dehiscent capsule.

**Paralepistemon Lejoly & Lisowski**


**Seddera Hochst.**


**Stictocardia Hallier f.**


**Turbina Raf. (Occurrence of genus uncertain).**


Of the species cited in these references only *Turbina longiflora* Verde., only known from Mozambique, may possibly belong to *Turbina*; all other species mentioned have been returned to *Ipomoea*. *T. longiflora* is also referred to in Izidine & Bandeira: 50 (2002).

*Turbina* is similar to *Ipomoea* but has an indehiscent ovoid-oblong or ellipsoid fruit, mostly with a single puberulous seed. Seeing that the fruit of *T. longiflora* is not known, its generic placing is uncertain.

**Xenostegia D.F.Austin & Staples**


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**Cornaceae**

(Asteridæ—Cornales)

(Asteridæ—Cornales; Alangiaceae included in Cornaceae)


Sthn trop. Afr.: genera 2, species 2.

Additional family characters and identification of additional genus (Afrocrania): Dioecious trees. Inflorescences terminal, protected by 4 deciduous bracts.

**Afrocrania** (Harms) Hutch.

Hutchinson: 89 (1942); Bamps: 1 (1971); Cannon: 637 (1978); Coates Palgrave: 859 (2002).


Dioecious trees. Leaves narrowly elliptic to lanceolate, both surfaces with fine adpressed pubescence when young, later glabrescent, petiolate. Inflorescences at first enclosed within 4 deciduous herbaceous bracts which provide protection for developing flowers. Flowers unisexual. Male flowers arranged in cymules forming dense terminal clusters; petals 4, valvate; stamens 4, without filaments; pistillode with abortive, narrowly conical style. Female flowers in terminal umbels; petals 4, valvate; staminodes 4, alternating with petals; ovary 2-locular with 1 ovule in each locule. Fruit drupaceous with shrivelled remains of calyx and style at apex.


**Curtisia** Aiton

Cannon: 635 (1978); Coates Palgrave: 858 (2002).

Sthn trop. Afr.: 1: *Curtisia dentata* (Burm.f.) C.A.Sm., Zimbabwe, Mozambique, and sthn Afr.

**Crassulaceae**

(Rosidæ—Rosales)

(Core Eudicots—Saxifragales)


Sthn trop. Afr.: genera 4, species 57.
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* Bryophyllum Salisb.

Sthn trop. Afr. 4, Angola, Zimbabwe, Malawi, Mozambique; introduced, probably from Madagascar, and naturalised in some areas in Zimbabwe, Malawi, Mozambique, and sthn Afr.

Cotyledon L.


Crassula L.


Kalanchoe Adans.

References


HIERN, W.P. 1896. Catalogue of the African plants collected by Dr. Friedrich Welwitsch in 1853–61, 1(1), Trustees of the British Museum (Natural History), London.


Ctenolophonaceae
(Rosidae—Linales)
(Eurosids I—Malpighiales)

Trees with stellately tufted and simple hairs on young shoots and stipules, and on outside of sepals and petals. Leaves opposite, simple, petiolate, coriaceous, entire; stipules interpetiolar, fused in pairs, caducous. Inflorescence cymose to racemose. Flowers bisexual, regular. Sepals 5, slightly fused at base, imbricate, persistent. Petals 5, imbricate, thick, caducous. Stamens 10, free, adnate at base halfway up to inner surface of an extrastaminal nectary disc, epipetalous ones slightly shorter than episepalous ones; anthers bithecous, ovate, introrse, opening by longitudinal slits, connective apiculate. Ovary superior, 2-locular; ovules 2 per locule, pendent from apical-axile placenta on fairly long funicles, anatropous, bitegmic; style 1, apically bifurcate; stigmas 2, discoid. Fruit a longitudinally dehiscent capsule. Seed 1, persistent and pendulous on long funicle after falling of pericarp; embryo straight; endosperm copious.

Genus 1, species 3, trop. Africa and Malesia. The family is often placed under Linaceae.

Winkler: 122 (1931) as Ctenolophonoideae under Linaceae; with notes on their demarcation and relationships with Ixonanthaceae.

Crassulaceae: *Bryophyllum

References


Cucurbitaceae
(Dilleniidae—Violales)
(Eurosids I—Cucurbitales)

Key to genera

(adapted from Jeffrey (1978))

1a Tendrils distally 2-fid; styles 3:
   2a Stamens 1, central, with thecae ring-like; ovary compressed, containing 1 ovule
      ................................................................................................................. Cyclanthopsis
   2b Stamens 4 or 5, with thecae short, straight; ovary trigonous, containing several ovules
      ................................................................................................................. Gerrardanthus

1b Tendrils simple or proximally 2–5-fid:
   3a Tendrils represented by spines ................................................................................. Acanthosicyos
   3b Tendrils evident, coiling:
      4a Leaves compound:
         5a Petals purplish, fringed with filaments .................................................................. Telfairia
         5b Petals cream, yellow or orange, not fringed ......................................................... Momordica
      4b Leaves simple (though sometimes deeply lobed) or absent:
         6a Young stems spotted with darker green:
            7a Petals free, at least 1 with an incurved basal scale; ovary spiny
               ................................................................................................................. Momordica
            7b Petals shortly united, without basal scales; ovary smooth
               ................................................................................................................. Diplocyclos
         6b Young stems concolorous (though sometimes calloso-punctate):
            8a Base of leaf lamina or apex of petiole with a pair of lateral glands:
               9a Ovary and fruit with many horizontal ovules/seeds on 3 placentas
                  ................................................................................................................. Lagenaria
               9b Ovary and fruit with (1)2 or 3 erect ovules/seeds in each of 3 locules
                  ................................................................................................................. Cayaponia
            8b Base of leaf lamina and apex of petiole without a pair of glands:
               10a Leaves with subcircular, ciliate bracts at the base of some or all petioles:
                  11a Flowers very small; petals ± 1 mm long; seeds usually 2
                     ......................................................................................................... Ctenolepis
                  11b Flowers larger; petals 2 mm and much longer; seeds more than 2:
                     12a Anther thecae triplicate; petals often linear
                        and 10 mm long or longer; seeds rounded .............................................. Trochomeria
                     12b Anther thecae duplicate; petals never linear, ± 2 mm long; seeds angular
                        ......................................................................................................... Dactylændra
               10b Leaves without subcircular bracts:
                  13a Tendrils 3–5-fid:
                     14a Flowers small; receptacle lobes 1 mm long or shorter; petals in male flowers 2–3 mm long; female flowers mostly
                        clustered in heads ......................................................................................... *Sicyos
                     14b Flowers larger; receptacle lobes 2 mm or longer; petals in male flowers 6 mm or longer; female flowers mostly solitary;
                        15a Male flowers solitary; ovary villous; petals 7–19 mm long
                           ................................................................................................................. Citrullus
                        15b Male flowers racemose; ovary densely puberulous; petals 20–45 mm long
                           ................................................................................................................. Luffa
                  13b Tendrils simple or 2-fid:
                     16a Tendrils 2-fid:
                        17a Anther thecae curved like a bow; placents and stigmas 2
                           ......................................................................................................... Kedrostis
                        17b Anther thecae triplicate or contorted; placents and stigmas 3 or 5:
                           18a Stamens 5, all 1-thecus; placents and stigmas 5; female inflorescences racemose
                              ......................................................................................................... Bambekea
                           18b Stamens 3, all 2-thecus, or two 2-thecus and one 1-thecus; placents and stigmas 3:
                              19a Male and female flowers in axillary clusters, often co-axillary
                                  ......................................................................................................... Diplocyclus
                              19b Male and female flowers solitary or racemose, not co-axillary:
                                 20a Leaf lobes pinnately lobulate, often deeply so
                                     ......................................................................................................... Citrullus
                                 20b Leaf lobes not pinnately lobulate, broadly triangular to elliptic, not lobulate or shortly 3-lobulate:
                                    21a Receptacle tube obconic to campanulate, and 2–7(–15) mm long in male flowers, shortly cylindric and
                                        2–5 mm long in female flowers; anther thecae laxly triplicate; connectives broad; anther head
                                        ± spherical .................................................................................................. Coccinia
                                    21b Receptacle tube in male and female flowers narrowly funnel-shaped or ± cylindric, often with a somewhat inflated base or middle:
                                        22a Leaves pinnately lobed with scattered disc glands on the lower surface; stamens included; anthers
                                            connate into a narrow cylindric head ................................................................ Pepoonium
                                        22b Leaves ± entire, ovate-cordate to hastate, glabrous on both surfaces; stamens exerted; anthers free
                                            ......................................................................................................... Cogniauxia
                        16b Tendrils simple:
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CUCURBITACEAE: Key to genera

23a Corolla star-shaped, the lobes linear, spreading to reflexed, tapering from base to apex, 5–60 mm long, united only at the base, greenish yellow ................................................................. Trochomeria

23b Corolla not as above:

24a Disc obvious, free from the receptacle tube laterally, short ± cylindrical in male flowers, annular around base on female flowers:

25a Stamens 2 or 3, all 2-thecous; ovary smooth, glabrous or nearly so ............................................. Zeheria

25b Stamens 3, two 2-thecous, one 1-thecous; ovary tuberculate, papillose or spiny or, if smooth, then setulose, aculeate, hispid or tomentose:

26a Male and female flowers subsessile, in axillary clusters ........................................................................ Mukia

26b Male and female flowers distinctly pedicellate, the male solitary or fasciculate, the female solitary:

27a Ovary tuberculate, setulose, with the tubercles themselves both laterally and apically setulose; receptacle tube densely setulose; setulae often brownish; anther thecae straight ............................................. Oreosyce

27b Ovary smooth, aculeate, hispid or tomentose, or with numerous fleshy spines, papillate or tubercles each ending in a hyaline setula, but otherwise glabrous; anther thecae triplicate, or, if straight or merely apically replicate, then receptacle tube shortly hispid:

28a Anther thecae triplicate; ovary softly spiny, papillate or tuberculate, or if smooth, then stems and petioles coarsely spreading-setulose or stalk of ovary rapidly elongating after flowering and burying the developing fruit: 

28b Anther thecae straight or apically replicate; ovary smooth, finely hispid to aculeate-setose ... Cucumella

24b Disc obscure, indistinct from the base of the receptacle tube or absent:

29a Placentas and stigmas 2:

30a Male flowers in lax panicles or rather lax to rarely dense racemes; petals 2–5 mm long; female flowers with ovary not developing a cupuliform base ............................................................................ Kedrostis

30b Male flowers in congested, racemiform or subcapitate, pedunculate or rarely subsessile clusters; petals 0.7–2.0 mm long; female flowers with ovary developing a cupuliform base .......................... Corallocarpus

29b Placentas and stigmas 3:

31a Petals united 1/2-way up or further:

32a Ovary densely setose; plants monoeocious ................................................................................ Raphidiocystis

32b Ovary glabrous or almost so; plants dioecious ............................................................................... Coccinia

31b Petals free or only shortly united:

33a Stamens 5: 4 in 2 pairs, 1 single; petals free ............................................................................. Eureiandra

33b Stamens 3: two 2-thecous, one 1-thecous; petals united towards base:

34a Male inflorescence racemose or paniculate; stamens and staminodes arising in throat of receptacle tube; anther thecae straight, apically hooked ........................................................................ Cucumeropsis

34b Male flowers solitary; stamens and staminodes arising at base of receptacle tube; anther thecae bent

................................................................. Citrillus

Acanthosicyos Welw. ex Hook.f.

Bambekea Cogn.

Glabrous, dioecious annual climbing herbs; tendrils 2-fid. Leaves ovate-cordate, subentire to deeply palmati-5-lobed, petiolate. Male flowers ovate to 10–20-flowered racemes; pedicels spreading; receptacle saucer-shaped; sepals 5, tri-angular, reflexed; petals 5, free, obovate, entire; stamens 5, arising at bottom of receptacle; filaments free; anthers at first cohering in a globose head, later free, 1-thecate, thecae triplicate, linear, irregularly flexuose, connective slightly enlarged; pistillode absent. Female flowers similar to male flowers; staminodes 5, linear-subulate; ovary ovoid, glabrous; style elongate; stigmas 5. Fruit globose to obovate, glabrous, containing many horizontal, not margined seeds.


Cayaponia Silva Manso

Monoeccious, perennial, slender climbers up to 7 m; branches scabrid; tendrils mostly simple. Leaves triangular-ovate, shallowly 3-palmatifoliated, 3-nerved, with a sessile gland on each side of decurrent base, shortly dentate, acute, scabrid; petiole slender, twining, ± half as long as lamina. Male flowers axillary, solitary or fasciculate; receptacle campanulate to subcylinic; sepals 5, small, triangular; corolla campanulate, petals 5, fused at base, obovate; stamens 3: two 2-thecous, one 1-thecous; filaments free, linear; anthers extorse, thecae triplicate; pistillode absent. Female flowers solitary or fascicled; pedicel thin; perianth similar to male but corolla lobes longer and fused to a greater height; ovary ovoid, 3-locular with 1 erect ovule per locule; style straight or slightly curved, surrounded at base by 3 flattened nectary glands, stigmas cordate; staminodes 3, short, tongue-shaped, arising at base of receptacle. Fruit dry, shortly stalked, ellipsoidal, glabrous, finely reticulate with very thin, brittle pericarp, containing 3 erect seeds. Seeds erect, ovoid.

Species 46, tropical America, 2 in trop. Africa; sthn trop. Afr. 1: Cayaponia multiglandulosa R.Fern., Angola, but this is probably not specifically dis-
CUCURBITACEAE: Cayaponia

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tinct from the other African species: C. africana (Hook.f.) Exell [Jeffrey: 225 (1971)].

Citrullus Eckl. & Zeyh.


Coccinia Wight & Arn.

Physedra Hook.f.; Norman: 196 (1929).


Cogniauxia Baill.

Citrullus lanatus

Cucumopsis Naud
Naudin: 30 (1866); Hooker: 533 (1871); Keay: 214 (1954); Jeffrey: 117 (1967); Keraudren: 60 (1967); Fernandes & Fernandes: 238 (1970).

Monoecious herbaceous climbers with robust, branched, angular, sparsely crisp-hairy stems; branches terete; tendrils simple. Leaves ± entire or 3–5-angled to palmatifoliated, finely toothed, deeply cordate at base, large, petiolate. Male flowers in racemes or in panicles and subumbellate at apex of a long common peduncle; petals ± as long as flowers; receptacle tube campanulate, hairy inside above, lobes 5, lanceolate, reflexed; petals 5, united at base; stamens 3: 2 double, 2-theocious, 1 single, 1-theeous, sessile in upper part of receptacle, anthers subpeltate, thecae straight, apically hooked; pistilode of 3 short filaments or absent; disc cup-shaped, not distinct from base of receptacle tube. Female flowers solitary, on a hairy stalk; perianth similar to male; receptacle tube shortly cylindric, hairy inside above; ovary fusiform-cylindric, style short, stigmas 3, bilobed; ovaries many, horizontal; staminodes 3, very small or absent. Fruit rather large, cylindric-ellipsoid, rounded apically, rather firm-walled, fleshy, smooth, indehiscent, cream with green streaks. Seeds rather large, ovate in outline, compressed, smooth, pure white.


Cucumopus L.


Cyclantheropsis Harms


Dactyliandra (Hook.f.) Hook.f.


Diploccyclus (Endl.) Post & Kuntze

Bryonia L. sect. Diploccyclus Endl. Bryonopsis in sense of Hook.f.: 556 (1871) and in sense of many authors, not of Arn.

Monoecious, glabrous, scendent perennial herbs; young stems green-spotted. Leaves simple, palmately lobed, petiolate. Tendrils proximally 2-fid. Probracts present, small. Flowers unisexual, in sessile or shortly racemose few- to many-flowered axillary clusters, male and female often co-axillary. Male flowers on slender pedicles; receptacle tube short and broad; lobes small, remote; corolla whitish or pale yellow, gamopetalous, 5-lobed, lobes entire; stamens 3, two 2-theocious, one 1-theeous,
free; filaments arising on receptacle tube; connectives broad; thecae flexuous; disc ± undulate, adnate to receptacle tube. **Female flowers** subsessile; ovary terete; ovules rather few, horizontal; receptacle tube smaller and narrower than in male flowers, perianth otherwise similar; stigma 3-lobed. **Fruits** solitary or clustered, subsessile, baccate, fleshy, globose to ellipsoid, indehiscent, red with white longitudinal stripes or lines of markings. **Seeds** rather small, pyriform, with highly convex faces and thick 2-grooved, rugulose margins.

Species 4, trop. Africa with 1 extending to tropical Asia; sthn trop. Afr. 3, Angola, Zambia, Zimbabwe, Malawi, Mozambique; 1 species naturalised in sthn Afr.

**Eureiandra** Hook.f.

Monoecious, annual, prostrate or scandent herbs. **Leaves** simple, pinnately 3–5-lobed, petiolate; asperulose or scabrid; petiole. **Tendrils** simple. **Flowers** racemose; receptacle tube broadly campanulate, lobes large, enclosing petals in bud, entire; petals 5, free, entire, yellow or whitish; stamens 5, all 1-thecous, or 3–1-thecous, or two 2-thecous and one 1-thecous; filaments arising on receptacle tube, free; anthers free; connectives broad; thecae much convoluted. **Female flowers** solitary; ovary smooth, ribbed, tuberculate or spiny; ovules many, horizontal; stigma 3-lobed. **Fruit** globose to cylindric, rostrate, smooth, ribbed or spiny, dry, brownish, fibrous, dehiscent by an apical operculum. **Seeds** compressed, oblong-elliptic in outline.

Species 7, tropical, 4 in Old World; sthn trop. Afr. 2, Angola, Zambia, Malawi, Mozambique; frequently cultivated.

**Momordica** L.


**Mukia** Arn.

**Oreosyce** Hook.f.

**Pepionium** Engl.

**Raphidiocystis** Hook.f.

**Adenopus** Benth.; Norman: 196 (1929).

**Luffa** Mill.
Seed plants of southern tropical Africa: families and genera

CUCURBITACEAE: Raphidiocystis

*Dicotyledons*

coaxillary with them; perianth similar to that of male flower, receptacle lobes usually smaller and less divided; ovary densely setose; ovules many, horizontal; stigma 3-lobed. **Fruit** subglobose to ellipsoid-cylindric, fleshy, densely echinate with multilocular brownish setae, dehiscent by 10 apical valves and extruding seeds and placenta. **Seeds** asymmetrically broadly ovate in outline, compressed; testa smooth, bordered. Species 5, trop. Africa and Madagascar; sthn trop Afr. 2, Angola, Zimbabwe.

*Sicyos L.*


Monoecious, annual, climbing or trailing herbs; stems usually ± hairy; tendrils 3–5-fid. **Leaves** simple, palmately 5-lobed, broadly ovate or reniform-cordate in outline. **Male flowers** small, few to many in simple or branched racemes, often whorled or ± capitulate; receptacle tube shallowly campanulate, lobes 5, small, dentiform; petals 5, united at very base, entire; stamens 3, filaments arising at base of tube, united into a central column, anthers united into a head or sometimes ± free, thecae arcuate, flexuose or triplicate. **Female flowers** 3–20 subsessile in capitulum, pedunculate groups, smaller than and coaxillary with male flowers; receptacle tube campanulate, lobes 5, triangular-subulate; petals 5, ± triangular; ovary 1-locular, ovoid and beaked, beset with forward-curving, subapressed bristles; ovule solitary, pendulous. **Fruit** rather small, dry and coriaceous or woody, 1-seeded, eventually splitting, ovoid and beaked or fusiform, ± hairy and usually beset with bristles or spines, each arising on a small basal tubercle, 3–20 borne in subsessile clusters on a short to fairly long peduncle. **Seed** broadly ovate-oblong in outline, compressed, with slight apical thickening; testa smooth, brown. Species 50, tropical America, Australia, New Zealand; sthn trop. Afr. 1: *Sicyos polyacanthus* Cogn., naturalised in Angola.

*Telfaira* Hook.


 Dioecious lianes, up to 30 or more. **Leaves** pedately 3–7-foliolate. **Tendrils** proximally bifid. **Proambres** present. **Flowers** unisexual, large, purplish. **Male flowers** many, racemose; receptacle tube short, broad; lobes dentate; petals 5, free, fringed with filaments; stamens 5 or 3, if 5, then all 2-theecous, if 3, then two 4-theecous, one 2-theecous, free; filaments arising on receptacle tube; thecae straight or slightly arcuate. **Female flowers** solitary; perianth similar to that of male flower; ovary ribbed; ovules many, horizontal; stigma 3-lobed. **Fruit** very large, fleshy, ribbed, many-seeded, tardily dehiscent by 10 longitudinal valves. **Seeds** large, broadly ovate or suborbicular in outline, compressed, enclosed in a fibrous endocarpic sheath. Species 3, Africa; sthn trop. Afr. 2, Angola, Zambia and probably native in N Mozambique, often cultivated for its edible oily seeds.

*Trochomeria* Hook.f.


**Zehneria Endl.**


Melothria L.; Norman: 193 (1929).


References


DICOTYLEDONS

CUCURBITACEAE: References


Dichapetalaceae
(Chailletiaceae)
(Rosidae—Malpighiales)
(Eurosids I—Malpighiales)

DICOTYLEDONS

Dichapetalaceae
(Chailletiaceae)
(Rosidae—Malpighiales)
(Eurosids I—Malpighiales)


Sthn trop. Afr.: genera 2, species ± 41.

Dichapetalum Thouars


Chailletia DC.; Hiern: 136 (1896) as synonym.


Tapura Aubl.

Torre: 328 (1963); Breteler: 43 (1986); Breteler: 122 (2001); White et al.: 222 (2001); Coates Palgrave: 460 (2002); Phiri (Unpublished).


References


Dilleniaceae
(Dilleniidae—Dilleniales)
(Core Eudicots)

Shrubs or climbers, sometimes small trees, rarely perennial herbs. Leaves alternate, simple, entire or variously toothed, often scabrous, with prominent parallel lateral veins; stipules absent or represented by a narrow wing adnate to petiole. Flowers bisexual, regular, often relatively large and showy, in terminal or axillary cymes, racemes or panicles or solitary. Sepals 5, free, imbricate, persistent. Petals 5 or fewer, free, imbricate, often crumpled in bud, caducous. Stamens many, free or partially united at base into bundles, often persistent; anthers 2-theccous, opening by longitudinal slits or apical pores. Ovary of (1–)3–5(–20) ± free carpels; ovules 1 or more per carpel, anatropous, bitegmic, erect, from base on inner suture; styles free; stigma simple. Fruit: ripe carpels dehiscent or berry-like. Seeds with a crested or lacinate funicular aril; embryo minute; endosperm copious, fleshy.

Genera 12, species 300, tropical and warm regions, especially Australia, in Africa only members of the pantropical genus Tetracera; sthn trop. Afr.: genus 1, species 6.

Salisbury: t. 73 (1807); Exell & Mendonça: 354, 379 (1937/1951); Wild: 103 (1960); Lucas: 1 (1968); Mabberley: 229 (1997).

Tetracera L.

Linnaeus: 533 (1753); Exell & Mendonça: 7 (1937/1951); Wild: 103 (1960); Lucas: 1 (1968); Kubitzki: 1 (1970); Wild & Gonçalves: 1 (1973).

Description as for family.

Species 40, tropical; sthn trop. Afr. 6, Angola, Zambia, Mozambique.

References

Dilleniaceae: References


Dipsacaceae
(Asteridae—Dipsacales)
(Euasterids II—Dipsacales)


Key to genera
[after Cannon & Cannon (1983)]

1a Calyx without persistent bristles ................................................................................................................................................................................. Cephalaria
1b Calyx with persistent bristles:
   2a Calyx bristles plumose ................................................................................................................................................................................. Pterocephalus
   2b Calyx bristles not plumose ................................................................................................................................................................................. Scabiosa

Cephalaria Schrad. ex Roem. & Schult.


Pterocephalus Adans.

Woody subshrubs with erect leafy shoots bearing several capitula; stems hollow, branched, pubescent, in lower parts mixed with long, glandular-based hairs. Leaves opposite, connate, linear-lanceolate or lanceolate, toothed, with 1 or 2 pairs of linear-lanceolate or linear leaflets at base. Flowers aggregated into hemispherical or globular heads, with 1 or 2 rows of foliaceous receptacular bracts; receptacle scales hairy or 0; involucre ± sulcate, 8-furrowed, toothed or with a ± membranous corona. Calyx short, with 5–24 plumose setae of equal length. Corolla usually 5-fid or with 4–6-fid flowers in same head, rarely entirely 4-fid. Stamens 4. Ovary: stigma oblique, entire or slightly 2-lobed. Fruit: mature fruit unknown.

Species ± 25, found mainly in the Middle East, spreading to southern Europe, India, China and Thailand, a few species occurring in the Canary Isles and North and East Africa; sthn trop. Afr. 1: Pterocephalus centennii M.J.Cannon, Mozambique.

Scabiosa L.


References

Dipterocarpaceae
(Dilleniidae—Malvales)
(Eurosids II—Malvales)

Trees, often buttressed, or shrubs. Leaves alternate, simple, entire to sinuate at margin, petiolate, with an extrafloral nectary at base of midrib on upper surface, midrib and lateral nerves ± depressed above, prominent beneath with tertiary venation densely reticulate; indumentum of simple fasciculate or stellate hairs, minute spherical glands often present. Flowers bisexual, regular, in axillary or branched terminal inflorescences; bracts and bracteoles paired, soon falling; receptacle produced into a very short, thick androgyneophore (Marquesia) or hardly produced. Sepals 5, free or slightly fused at base, hairy, accrescent. Petals 5, free or slightly connate at base, contorted to right, hairy or glabrescent. Stamens many; filaments free to slightly connate at base; anthers 2-thecous, basi-versile, with apical appendage of connective scarcely to somewhat developed, introrse or laterally dehiscing by longitudinal slits. Ovary superior, 3–5-locular, sometimes 1-locular at apex (Marquesia); ovules 2 per locule, anatropous, parietal or axile. Fruit nut-like, 1-seeded, with very hard woody pericarp, surrounded by 5 wing-like, accrescent, prominently veined sepals. Seeds with thin brown testa, a thin mucilaginous layer representing rest of endosperm and a large embryo with 2 large, irregularly crumpled and rolled cotyledons.

Genera 16, species 680, tropical Old World, especially Malesian rainforests; sthn trop. Afr. genera 2, species ± 27. Both local genera are placed in subfamily Monoideae.

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DICOTYLEDONS

DIPTEROCARPACEAE


Key to genera

Tall trees with straight, buttressed trunks; branchlets densely longitudinally channelled; leaves acuminate; stamens and ovary borne on a short thick androgynophore; anthers not appendiculate at the apex; ovary 3-locular at base, 1-locular at apex. ....................................................... Marquesia

Trees or shrubs with irregular, unbuttressed trunks; branchlets ± smooth; leaves only rarely acuminate, often rounded or retuse; stamens and ovary borne on the scarcely produced receptacle; anthers frequently with triangular or ovate apical appendage; ovary completely 3–5-locular .... Monotes

Marquesia Gilg
Gilg: 485 (1908); Gilg: 268 (1925); Exell: 220 (1932); Bancroft: 142, 372 (1937/1951); Duvgneaud: 407 (1961); White: 258 (1962); Verdcourt: 2 (1989).

Tall or medium-sized, buttressed trees. Leaves evergreen, acuminate; midrib and lateral nerves prominent beneath with tertiary venation densely reticulate; indumentum of simple, iso-spherical glands sparse to dense on both surfaces, making blade ± silky-pilose or velvety outside, pilose at base inside. Receptacle produced into a thick, short androgynophore. Stamens many; anthers short, connectives without appendage. Ovary ovoid, pubescent, 1-locular above, with parietal placentation; ovules 6. Fruit ovoid, surrounded by 5 equal wings derived from accrescent sepals.


References
BLUME, C.L. 1825. Bijdragen tot de flora van Nederlandsch Indië. Landsdrukkerij, Batavia.

Monotes A.DC.
Candolle: 623 (1868); Gilg: 268 (1925); Bancroft: 132, 370 (1937/1951); Bancroft: 326 (1939); Duvgneaud: 410 (1961); White: 258 (1962); Verdcourt: 4 (1989); Coates Palgrave: 738 (2002).


Shrubs to medium-sized trees without buttresses. Leaves mostly rounded or renate at apex, only rarely acuminate with ± rounded extrafloral nectary at base of midrib above, and sometimes additional ones in lower nerve axils; midrib and lateral nerves ± impressed above, prominent beneath, venation almost always very densely reticulate beneath; indumentum very varied: hairs simple, fasciculate or stellate, short or rather long, straight, curved or coiled, with small, spherical glands sparse to dense on both surfaces, making blade viscid. Flowers in axillary, small or compound panicles. Sepals and petals densely silky-pilose or velvety outside, pilose at base inside. Receptacle slightly produced into a very short thick androgynophore. Stamens many; anthers short, connectives often produced into short, triangular or ovate appendages at apex. Ovary ovoid, hairy, completely 3–5-locular, with 2 ovules in each locule. Fruit subglobose, woody, surrounded by 5 subequal, minutely hairy wings derived from accrescent sepals.


Droseraceae
(Dilleniidae—Nepenthales)
(Core Eudicots—Caryophyllales)


Sthn trop. Afr.: genera 2, species 11.

Aldrovanda L.

Sthn trop. Afr.: genera 2, species 11.

Drosera L.
DROSERACEAE: Drosera

Seed plants of southern tropical Africa: families and genera

DROSERACEAE: Drosera


References


Diospyros L.


Sthn trop. Afr.: genera 2, species 52.

Euclea Murray


References


Elatinaceae

(Dilleniidae—Guttiferales)

(Eurosids—I—Malpighiales)

Bergia L.


Elatine L.


References

DICOTYLEDONS

Agarista D.Don ex G.Don


Small trees; branchlets glabrous or pubescent. Leaves subopposite to alternate, subsessile to petiolate, evergreen, lanceolate to oblong to ovate or obovate. Inflorescence consisting of axillary and terminal racemes; pedicels short, 1-flowered, subtended by caducous bracts, each bearing a pair of caducous bracteoles. Calyx hypogynous; segments 5, fused below, persistent in fruit. Corolla hypogynous, obconical; lobes 5, small, imbricate, not persistent in fruit. Stamens 10, included, adhering slightly to corolla at base and shed with it; filaments geniculate; anthers dehiscing by terminal pores. Ovary superior, 5-celled; ovules few, placentation basal; style 1, persistent until capsule dehisces. Capsule 5-valved, loculicidal, without a central column after dehiscence.


Erica L.


Vaccinium L.


References


ERICACEAE

(Dilleniidae—Ericales)

(Asterids—Ericales)

Key to genera

1a Leaves not wider than 5 mm, ericoid or cupressoid .............................................................. *Erica*

1b Leaves wider than 10 mm, flat:

2a Ovary superior; fruit a capsule .................................................................................................... *Agarista*

2b Ovary inferior; fruit a berry ........................................................................................................ *Vaccinium*
Key to genera

1a Leaves opposite; stipules extrapetiolar; fruit a narrowly pear-shaped capsule, usually with 1 seed in each of 3 fertile locules .......................... Aneulophus

1b Leaves alternate; stipules intra- or extrapetiolar; fruit fleshy, perhaps a capsule in Pinacopodium:

2a Styles 3, rarely 2, free or partially united; ovary (3)-locular ................................................................. Erythroxylum

2b Styles 2, completely united, sometimes very short; stigmas 2 or 1 and then 2-lobed:

3a Stipules intrapetiolar; style well-developed with 2 free, spreading to reflexed stigmas; fruit a drupe ................................. Nectaropetalum

3b Stipules extrapetiolar; style very short with the 2-lobed stigma almost sessile; fruit probably a capsule .......................... Pinacopodium

Aneulophus Benth.

Bentham: 244 (1862); Wilczek: 39 (1958) under Linaceae; Mendes: 9 (1961); Badré: 53 (1973).

Shrubs or small trees, glabrous. Leaves opposite, petiolate, simple, entire, pinnennerved; stipules 2, extrapetiolar, opposite, ± caducous. Inflorescences many-flowered axillary fascicles; bracts ciliolate, persistent. Flowers small, white, pedicels glabrous. Sepals 5, imbricate, slightly fused at base, glabrous. Petals 5, imbricate, longer than sepals, oblongo-elliptic, ± caducous. Stamens 10, all fertile, subequal; filaments fused at base into a short ovary. Ovary (3)-locular, 3-lobed at apex, sessile; ovules 2 per locule; styles 3(4), free or fused up to half-way; stigmas 3, terminal, capitate. Fruit a narrowly pear-shaped capsule, usually with 3 fertile locules. Seeds 1 per locule, oblong, with a yellowish apical arillus; embryo straight.


Erythroxylum P.Browne


Nectaropetalum Engl.


Pinacopodium Exell & Mendonça


Nectaropetalum Engl. in part; Exell: 50 (1927).

Tall, glabrous trees. Leaves alternate, simple, entire, petiolate; stipules interpetiolar, soon caducous. Flowers in subumbellate, pedunculate cymes. Calyx campanulate, with 5 valvate sepals. Petals (4)5, free, concave, unguiculate, with indistinct nectariferous areas near base on ventral face. Stamens 10–12(?15), all fertile; filaments fused at base into a very short tube; anthers basifixed, apiculate, dehiscing longitudinally. Ovary 2-locular, with 1 pendent, axile ovule per locule; style very short; stigma capitate, 2-lobed. Fruit probably a capsule.


References


Escalloniaceae

(Rosidae—Rosales)

(Euasterids II)

Euphorbiaceae
(Dilleniidae—Malpighiales)
(Eurosids I—Malpighiales)

References

Main sources of information: Webster (1994); Radcliffe-Smith (1996); Archer (2000); Carter & Leach (2001); Esser (2001); Radcliffe-Smith (2001); Carter (2002); Angiosperm Phylogeny Group (2003).

Key to subfamilies
1a Locules of ovary each with 2 ovules; milky latex and stinging hairs absent; indumentum simple:
   2b Leaves opposite, alternate or verticillate, compound; pollen grains spiny ................................................................. Oldfieldioideae
   1b Locules of ovary each with one ovule; milky latex present or absent; indumentum various:
      3a Male disc intrastaminal ...................................................................................................................................................... Tribe Phyllanthoideae
      3b Male disc extrastaminal or absent:
         4b Petals absent (except in *Breynia* ................................................................................................................................... Tribe Phyllanthoideae
         4a Male disc extrastaminal or absent:
            5a Stipules deciduous; pollen exine finely reticulate, not coarsely reticulate or spinose .................................................. Tribe Phyllanthoideae
            5b Stipules persistent; pollen exine coarsely and deeply reticulate; baculate or echinate .................................................. Tribe Phyllanthoideae

Subfamily Phyllanthoideae
Key to tribes of subfamily Phyllanthoideae
1a Separates valvate ...................................................................................................................................................................... Tribe Bridelieae (*Bridelia*, *Cleistanthus*)
1b Separates imbricate or open:
   2a Flowers fasciculate:
      3a Male disc intrastaminal ...................................................................................................................................................... Tribe Drypeteae (*Drypetes*)
      3b Male disc extrastaminal or absent:
         4a Petals present:
            5a Stipules deciduous; pollen exine finely reticulate, not coarsely reticulate or spinose .................................................. Tribe Phyllanthoideae
            5b Stipules persistent; pollen exine coarsely and deeply reticulate; baculate or echinate .................................................. Tribe Phyllanthoideae
   2b Flowers capitate, spicate or racemose:
      6a Fruits not winged ................................................................................................................................................................. Tribe Antidesmeae (*Antidesma*, *Maesobryta*, *Spondianthus*, *Thecacoris*, *Uapaca*)
      6b Fruits winged ................................................................................................................................................................. Tribe Hymenocardieae (*Hymenocardia*)

Subfamily Oldfieldioideae
Represented in the area only by the tribe *Picrodendraceae* (*Androstachys*, *Aristegitonia*, *Oldfieldia*)

Subfamily Acalyphoideae
Key to tribes of subfamily Acalyphoideae
1a Petals present, at least in the male flowers:
   2a Flowers fasciculate; seeds black, shiny:
      3a Mostly herbaceous perennials; fruits dehiscent .................................................................................................................. Tribe Clutieae (*Clatia*)
      3b Trees or shrubs; fruits drupaceous .................................................................................................................................. Tribe Galericieae (see Pandaceae: *Microdesmis*, *Panda*)
   2b Flowers spicate, racemose or subpaniculate; seeds not as above:
      4a Trees or shrubs ................................................................................................................................................................. Tribe Agrostistachydeae (*Cytaranthus*, *Pseudagrostistachys*)
      4b Herbs ................................................................................................................................................................. Tribe Chrozophoreae (*Caperonia*, *Chrozophora*)
   1b Petals absent:
      5a Plants often scandent or twining; styles unlobed, mostly connate ................................................................................ Tribe Plukenetieae (*Dalechampia*, *Plukenetia*, *Tragia*, *Tragiella*)
5b Plants rarely scandent; styles mostly free or basally connate:
6a Male disc present:
  7a Laminar glands present:
   8a Male disc tenuose or absent; stamens (2)20–60(90); anther connective usually not enlarged ......................................................... Tribe Bernardieae
      (Necepsia, Paranecepsia)
   8b Male disc massive, pubescent; stamens 4–15; anther connective enlarged .......................................................... Tribe Caryodendreae (Discochyperma)
  7b Laminar glands absent:
   9a Stamens 50 or more, free; pistillode absent ................................................................. Tribe Pycnooceae (Argomuellea, Pycnoocea)
   9b Stamens 5–20, connate at the base into a column; pistillode present .............................................. Tribe Chaetocarpeae (Chaetocarpus)
6b Male disc absent, or if present than anther cells free but not becoming flexuous-verniform:
10a Male flowers usually capitulate; pollen coarsely reticulate ........................................................................................................... Tribe Epiprineae (Cephalocroton)
10b Male inflorescences various; pollen finely perforate-tectate to rugulose:
  11a Pollen colpi operculate .................................................................................................................. Tribe Alchorneae (Alchornea)
  11b Pollen colpi inoperculate, often reduced ........................................................................................ Tribes Crotonae (Acalypha), Erythrococca, Leidiesia, Macaranga, Mallotus, Micrococa, *Ricinus*

Subfamily Crotonoideae

Key to tribes of subfamily Crotonoideae

1a Indumentum simple or none; petals absent:
  2a Plants monoeccious; laticiferous jointed:
   3a Pollen colporate; endosperm oily .......................................................................................... Tribe Micrandreae (Hevea; not dealt with in text)
   3b Pollen periporate; endosperm starchy ................................................................................... Tribe Micranthoideae (*Manihot*)
  2b Plants mostly dioecious; laticifers not jointed:
   4a Leaves not pellucid-punctate; inflorescences axillary or terminal ........................................ Tribe Adenoclineae (Adenocline, Tetrochridium)
   4b Leaves pellucid-punctate; inflorescences leaf-opposed ................................................................ Tribe Gelonieae (Suesgada)
1b Indumentum various; petals present, or if absent then indumentum stellate or lepidote:
  5a Male sepal fused in bud, splitting valvately into 2–5 lobes ........................................................ Tribe Auleuriteae
      (*Aulites, Cavacoa, Crotonogyne, Manniophyton, Neoboutonia, Neuhotista, Tannodia, *Vernicia*)
  5b Male sepal usually imbricate, free, or if connate then not completely covering the petals in bud:
   6a Indumentum simple:
     7a Inflorescences terminal, dichasial .......................................................................................... Tribe Jatrophaeae (Jatropha)
     7b Inflorescences mostly axillary, spicate, racemose or paniculate ........................................... Tribe Cordaeae (*Codiaeum*)
    6b Indumentum stellate or lepidote, at least in part:
      8a Petals free; fruit usually dehiscent; seeds carunculate ...................................................................... Tribe Crotonae (Croton, Mildbraedia)
      8b Petals coherent; fruit indehiscent; seeds ecarunculate ..................................................................... Tribe Ricinodendrea (Ricinodendron, Schinziohyton)

Subfamily Euphorbioideae

Key to tribes of subfamily Euphorbioideae

Inflorescences racemose or spicate, but if capitulate, then not resembling a single flower ............................................................ Tribe Hippomaneae
(Eccocarcia, Maprouneae, Microstachys, Scleroscrotum, Shrakiposis, Spirostachys)
Inflorescences cyathial, resembling a single flower .................................................................................................................. Tribe Euphorbiae (Anthostema, Elaeophorbia, Endadenium, Euphorbia, Monadenium, Synadenium)

Key to all genera in sthn trop. Afr.

1a Male and female flowers reduced and enclosed within a common cup-like involucre:
  2a Male calyx present; involucral of 4 partially or completely fused bracts ........................................... Anthostema
  2b Male calyx absent; involucral bracts usually 5, connate into a cup or tube:
   3a Involucral glands (1, 2, 4, 5(8), free, interbracteal, on the margin of calyx:
     4a Leaves opposite, inquinatal at base, veins surrounded by a chlorophyll sheath; stipules present; main axis aborting above cotyledons; seeds usually ecarunculate ......................................................... (=Chamaesyce) Euphorbia
     4b Leaves alternate, opposite or whorled, if opposite then not inquinatal at base; stipules present or absent; main axis not aborting; seeds carunculate or ecarunculate:
       5a Female perianth present; ovary not confluent with pedicel; fruit not or rarely slightly fleshy, dehiscent ..................................................... Euphorbia
      5b Female perianth absent; ovary confluent with pedicel; fruit thick, fleshy, indehiscent, drupaceous ........................................... Elaeophorbia
   3b Involucral glands not as above; cyathophylls often united into a cup:
     6a Cyathia somewhat bilaterally symmetrical; involucral glands connate into a ring open on one side ........................................ Monadenium
     6b Cyathia radially symmetrical, without a gap on one side:
       7a Involute glands connate, conspicuous; ovary without angular crests .................................................. Synadenium
       7b Involute glands distinct, inconspicuous; ovary with prominent double angular crests .......................................................... Endadenium
  1b Male and female flowers differently arranged:
    8a Leaves compound:
      9a At least some leaves opposite, subopposite or whorled:
### DICOTYLEDONS

**EUPHORBIACEAE: Key to genera**

| 10a Stipules present; leaves 1-foliolate or digitately 2- or 3-foliolate | Aristogeitonia |
| 10b Stipules absent; leaves digitately 3-8-foliolate | Oldfieldia |
| 9b All leaves alternate: |  |
| 11a Petals absent | Hevea (Pará rubber tree; not dealt with in text) |
| 11b Petals present: |  |
| 12a Petiolules absent; stipules persistent; endocarp smooth | Ricinodendron |
| 12b Petiolules distinct; stipules fugacious; endocarp deeply pitted | Schinziophyton |
| 8b Leaves simple although sometimes deeply lobed: |  |
| 13a Leaves opposite: |  |
| 14a Plant herbaceous | Adenocline |
| 14b Shrubs or trees: |  |
| 15a Stipules large, intrapetiolar, completely enclosing the terminal bud | Androstachys |
| 15b Stipules small, parapetiolar: |  |
| 16a Leaf apex acutely acuminate; stamens many | Croton |
| 16b Leaf apex obtuse or emarginate, mucronulate; stamens few | Manniophyton |
| 13b Leaves alternate: |  |
| 17a Petals present, at least in the male flowers: |  |
| 18a Indumentum stellate or lepidote: |  |
| 19a Anthers inflexed in bud | Croton |
| 19b Anthers erect in bud: |  |
| 20a Fruit massive, indehiscent | Chrozophora |
| 20b Fruits readily dehiscent: |  |
| 21a Monoecious herb | Bridelia |
| 21b Dioecious shrubs or trees: |  |
| 22a Male sepals 5(6), free to slightly connate at base, imbricate | Mildbraedia |
| 22b Male sepals (2)3(4), closed in bud, valvate: |  |
| 23a Leaves palminnerved, 3- or 4-glandular at the base | Manniophyton |
| 23b Leaves penninerved, 2-glandular at the base | Crotonogyne |
| 18b Indumentum simple or absent: |  |
| 24a Flowers in axillary fascicles: |  |
| 25a Fruit generally indehiscent: a berry or a drupe: |  |
| 26a Disc present; calyx segments valvate | Microdesmis (see Pandaceae) |
| 26b Disc absent; calyx segments slightly imbricate | Pandaceae |
| 25b Fruit dehiscent: |  |
| 27a Disc of male flowers cupular | Heywoodia |
| 27b Disc of male flowers lobate or of separate glands: |  |
| 28a Disc of male flowers lobate | Amanoa |
| 28b Disc of male flowers of separate glands: |  |
| 29a Disc glands in 1 or 2 series on the receptacle only | Andraccthya |
| 29b Disc glands in (1)2 or 3 series on sepals, petals and receptacle | Chutia |
| 24b Flowers in spicate, racemose, paniculate or cymose inflorescences: |  |
| 30a Male calyx lobes imbricate: |  |
| 31a Inflorescences cymose | Jatropha |
| 31b Inflorescences racemose: |  |
| 32a Stamens 15–100; ovules 1 per locule | *Codiaeum* |
| 32b Stamens 5; ovules 2 per locule: |  |
| 33a Styles connate, with 3 sessile, 2-fid stigmas; anthers basifixed | Amanoa |
| 33b Styles free or connate at base, stigmas 2-fid; anthers medi- or apicifixed: |  |
| 34a Anthers apicifixed; disc of male flowers pubescent | Thecacoris |
| 34b Anthers mediifixed; disc of male flowers glabrous | Spondianthus |
| 30b Male calyx lobes valvate, or calyx ± truncate: |  |
| 35a Fruit up to 50 mm in diameter, ± tardily dehiscent: |  |
| 36a Stamens 15–20, in 3 or 4 whorls; pistillode 0 | *Vernicia* |
| 36b Stamens 10, in 2 whorls of 5; pistillode narrowly columnar | Panda (see Pandaceae) |
| 35b Fruit not more than 30 mm in diameter, readily dehiscent: |  |
| 37a Stipules fused into an elongate sheath | Pseudagrostistachys |
| 37b Stipules small, free or obsolete: |  |
| 38a Inflorescences axillary; pistillode (non-functional ovary) present: |  |
| 39a Herbs | Caperonia |
| 39b Shrubs or trees: |  |
| 40a Male calyx lobes and petals (4)5(6) | Cleistanthus |
| 40b Male calyx lobes 2 or 3; petals 3 | Cyttaranthus |
EUPHORBIACEAE: Key to genera

DICOTYLEDONS

38b Inflorescences terminal; pistillode absent:

41a Female petals shorter than the calyx ................................................................. Neoholstia
41b Female petals longer than the calyx:

42a Leaves penninerved; stamens 15–30; fruit 3–5-lobed ........................................ Cavaeo
42b Leaves palminerved; stamens 7–12; fruit subglobose ........................................... Tannodia

17b Petals absent:

43a Male calyx open in bud; milky latex often present:

44a Male flowers in dense ovoid or globose heads ................................................. Maprounea
44b Male flowers in narrow elongate spikes:

45a Fruit large, inflated .......................................................................................... Excoecaria
45b Fruit small, not inflated:

46a Inflorescences dense at maturity ...................................................................... Spirostachys
46b Inflorescences lax at maturity:

47a Perennial herbs, glabrous ............................................................................. Microstachys
47b Shrubs to trees:

48a Plants glabrous .............................................................................................. Sclerocroton
48b Plants with unbranched, multicellular, usually coloured hairs ....................... Shirakiopsis

43b Male calyx closed in bud; milky latex usually absent:

49a Inflorescences involucrate:

50a Dioecious trees; involucral bracts 5–12 ......................................................... Uapaca
50b Monoecious twiners; involucral bracts paired ............................................ Dalechampia

49b Inflorescences not involucrate:

51a Fruit winged:

52a Climbers; leaves 3-lobed; fruit wings 4 ....................................................... Plukenetia
52b Trees or shrubs; leaves entire; fruit wings 2 or 6:

53a Fruit 2-winged; stamens (4)5(6) ..................................................................... Hymenocardia
53b Fruit 6-winged; stamens 50 or more ............................................................... Pycnocoma

51b Fruit smooth, pitted, wrinkled, warty or tubercled, but never winged:

54a Female calyx lobes pinnatifid:

55a Shrubs; indumentum stellate; male flowers capitulate ................................ Cephalocroton
55b Twiners; indumentum simple, usually urticating; male flowers racemose:

56a Styles united to form a tube or globose mass ............................................... Tragia
56b Styles free above ......................................................................................... Tragiella

54b Female calyx lobes entire:

57a Male sepals imbricate:

58a Leaves usually palmately lobed to palmatifid ................................................ *Manihot
58b Leaves simple, entire:

59a Fruits indehiscent, compressed; endocarp pitted ....................................... Antidesma
59b Fruits dehiscent, sometimes tardily so; endocarp usually smooth:

60a Inflorescences leaf-opposed ......................................................................... Suregada
60b Inflorescences axillary or cauliflorous:

61a Inflorescences spicate, racemose or paniculate:

62a Fruits ellipsoid, tardily dehiscent ................................................................. Maesobotrya
62b Fruits 3-lobed, readily dehiscent:

63a Disc glands 5, free ....................................................................................... Thecacoris
63b Disc glands absent ........................................................................................ Tetrorchidium

61b Inflorescences fasciculate or glomerulate, or flowers solitary:

64a Disc absent ................................................................................................... *Breynia
64b Disc present:

65a Male disc intrastaminal; fruit indehiscent ....................................................... Drypetes
65b Male disc extrastaminal; fruit dehiscent, sometimes tardily so:

66a Pistillode absent:

67a Male disc annular; sarcotesta present, bluish ................................................. Margaritaria
67b Male disc of separate glands (except *P. pinnatus); sarcotesta absent .......... *Phyllanthus
66b Pistillode present:

68a Male disc annular:

69a Fruit thick-walled; female sepals deciduous; seeds with smooth testa .............. Pseudolachnostylis
69b Fruit thin-walled; female sepals persistent; seeds with sculptured testa .......... Meineckia
68b Male disc of separate glands:

70a Stamens free; fruit smooth, glabrous ........................................................... Flueggea
70b Stamens connate; fruit tubercled, setose ....................................................... Chaetocarpus
EUPHORBIEACEAE: Key to genera

DICOTYLEDONS

57b Male sepals valvate:
71a Female flowers usually subtended by accrescent bracts; styles laciniate; anthers vermiform............. Acalypha
71b Female flowers not subtended by accrescent bracts; styles not laciniate but sometimes plumulose; anthers not vermiform:
72a Leaves palmatifoliated, palmatifid or palmatipartite:
73a Robust herbs ................................................................................................................................. *Ricinus
73b Trees or shrubs .......................................................................................................................... Macaranga
72b Leaves not deeply lobed or divided:
74a Plants often drying purplish; anther thecae erect, separate:
75a Bud scales present, crustaceous to subcoriaceous, persistent .................................................. Erythrocoeca
75b Bud scales absent ......................................................................................................................... Microcoeca
74b Plants not usually drying purplish; anther thecae pendulous, usually contiguous:
76a Herbs ............................................................................................................................................... Leidesia
76b Trees or shrubs:
77a Anthers 3- or 4-thecous ................................................................................................................ Macaranga
77b Anthers 2-thecous:
78a Disc absent; stamens 8 or fewer .................................................................................................. Alchornea
78b Disc present; stamens usually more than 8:
79a Leaves palminerved; indumentum stellate; inflorescences terminal .............................................. Neoboutonia
79b Leaves peninnerved; indumentum simple; inflorescences terminal or axillary:
80a Inflorescences terminal ................................................................................................................ Discoglypremna
80b Inflorescences axillary:
81a Leaves with linear-lanceolate stipules; female sepals accrescent ............................................ Paranecepsia
81b Leaves exstipellate or stipules small and very early caducous; female sepals not accrescent:
82a Anther thecae free, at apex of 2-branched connective; styles plumulose.......................... Mareya
82b Anther thecae at least partially adnate to the connective, longitudinally dehiscent; styles papillose:
83a Petioles often pulvinate and geniculate; styles bifid ............................................................. Necepsia
83b Petioles very short or absent, not as above; styles simple ........................................................ Argomuelleria

Acalypha L.
(Acalyphoideae—Acalyphaeae)


Adenocline Turcz.
(Crotonoideae—Adenoclineae)


Alchornea Sw.
(Crotonoideae—Alchorneae)

Lepidoturus Baill.; White: 200 (1962) as synonym.


*Aleurites J.R.Forst. & G.Forst.
(Crotonoideae—Aleuritideae)

Sthn trop. Afr.: 2 recorded as cultivated in Zimbabwe, Malawi, Mozambique and sthn Afr., and may occur as escapes.

Amanoa Aubl.
(Phyllanthoideae—Amanoeae)
Aublet: 256 (1775); Hutchinson: 630 (1912); Pax & Hoffmann: 195 (1922); Keay: 371 (1958); Webster: 38 (1994); Radcliffe-Smith: 16 (2001); Dombo et al.: 9 (2002).

Trees, glabrous in all parts. Leaves alternate, petiolate, oblanceolate to oblong-elliptic, shortly and obtusely acuminate, deltoid at base, entire, coriaceous; stipules adnate to base of petiole. Inflorescences either bisexual or male; flowers in solitary, subglobose, sessile, terminal and axillary heads surrounded by coriaceous bracts, outer bracts keeled and mucronate, inner ones doubly keeled; bracteoles lanceolate, membranous. Male flowers: sepals 5, imbricate; petals 5, short, scale-like; stamens 5, arising within short, glabrous disc; filaments free, thick, short, epipetalous; anthers ovoid, dehiscing introrsely by longitudinally slits; rudimentary ovary 3-lobed. Female flowers: sepals as in male flowers; petals sometimes obsolete; ovary subglobose, 3-locular; stigmas 3, sessile, discoïd, thick; ovules 2 per locule. Capsule separating into 2-valved cocci. Seeds solitary by abortion, shining, testa crustaceous; endosperm thin or absent.

Andrachne L.
(Phyllanthoideae—Phyllanthaceae)


**Androstachys Prain**
(Oldfieldioideae—Picrodendreae)

Monotypic genus: *Androstachys johnsonii* Prain, Zimbabwe, Mozambique, and sthn Afr.

**Anthostema A.Juss.**
(Euphorbioideae—Euphorbiaceae)
Jussieu: 56 (1824); Hutchinson: 609 (1912); Pax & Hoffmann: 207 (1931); Keay: 416 (1958); Webster: 126 (1994); Radcliffe-Smith: 400 (2001).

Trees with glabrous branches. Leaves alternate, petiolate, oblong, entire, apex obtusely acuminate, base rounded; thinly coriaceous, shiny above; stipules apparently very early deciduous. **Inflorescences**: flowers in cyathia arranged in small, subsessile, rather dense, much-branched axillary cymes; bracts opposite, small; caly whole of 4–6 involucral bracts surrounding an ovary (female flower) surrounded on one side by 4 involucres of ± 8 free bracts, each involucre surrounding 7–13 stamens (male flowers).

**Male flowers** each with a cup-like, 3–4-toothed perianth at its base, joined to the pedicel and soon falling off; anthers 2-thecous, subglobose, opening longitudinally. **Female flower** (ovary) 3-locular, ± 10, trop. Africa and Madagascar; sthn trop. Afr. 1: *Androstachys macrophylla* Pax, Angola, Zambia, Zimbabwe, Malawi, Mozambique.

**Aristogeitonia Prain**
(Oldfieldioideae—Picrodendreae)
Prain: 438 (1908); Hutchinson: 625 (1912); Radcliffe-Smith: 118 (1987); Webster: 61 (1994); Radcliffe-Smith: 106 (2001).

Monoeocious; young shoots puberulous with simple indumentum. **Leaves** alternate, often crowded at apex of shoot, 1-foliolate or digitately 2- or 3-foliolate, of unequal size, petiolar; leaflets sessile, ovate-lanceolate, entire, coriaceous; stipules subulate. **Inflorescences**: flowers in fascicles in axils of fallen leaves on old wood; bracts minute. **Male flowers**: tepals 6, imbricate, 2-seriate; disc absent; stamens 11–15, filaments free, anthers ovoid, 2-thecate, dorsiﬁxed, extrorse; pistillode 3–6-lobed. **Female flowers**: tepals ± in male flowers but early caducous; disc annular, crenately lobed; ovary 3-locular, ovules 2 per locule, styles 3, or short or obsolete, stigmas capitate, reniform. **Fruit** a 3-lobed capsule dehiscing septicidally into 3 bivalved cocci; endocarp crustaceous. **Seeds** ovoid, often only 1 per coccus by abortion; testa crustaceous, shiny.


**Breyenia J.R. Forst. & G. Forst.**
(Phyllanthoideae—Phyllanthaceae)

Monoeocious or apparently dioecious shrubs or small trees, with or without a simple indumentum, often blackening on drying. **Branching** phyllanthoid. **Leaves** alternate, shortly petiolate, stipulate, simple, entire, penninerved, borne on plagiotropic shoots (leafy or floriferous lateral shoots of limited growth). **Flowers** axillary, the male fasciculate or solitary, usually in the proximal axis, the female solitary, usually in the distal axis. **Male flowers**: pedicels often capillary; calyx obconic or turbinate, calyx lobes 6, imbricate, sharply inﬂexed; petals absent; disc absent; stamens 3, united into a short column, anthers elongate, thecae linear, extrorse, adnate to column, longitudinally dehiscent; pistillode absent. **Female flowers**: pedicels sometimes capillary; calyx lobes 6, imbricate, not inﬂexed, usually larger than in the male flowers, accrescent; disc absent; ovary 3-locular, ovules 2 per locule; styles 3, free, short, erect, simple or bifid. **Fruit** ± baccate, tardily and often incompletely loculicidally dehiscen;
exocarp sometimes somewhat fleshy; endocarp crustaceous. Seeds trigonous, ecarunculate; testa membranous; albumen fleshy; cotyledons broad; radicle long.

Species 10–15, Indo-Pacific tropics, some species are widely cultivated ornamentals, 1: *Breynia disticha* J.R.Forst. & G.Forst. is found as a garden escape in Zimbabwe and Mozambique.

**Bridelia Willd.**
(Phyllanthoideae—Bridelieae)
Hier: 953 (1900) as *Bridelia*; Warburg: 461 (1903); Hutchinson: 611 (1912); Radcliffe-Smith: 120 (1987); Webster: 39 (1994) as *Briedelia*; Dressler: 337 (1996); Radcliffe-Smith: 12 (1996); Radcliffe-Smith: 19 (2001); White et al.: 244 (2001); Coates Palgrave: 488 (2002); Mapaura & Timberlake: 164 (2002).


**Caperonia A.St.-Hil.**
(Acalyphoideae—Chrozophoreae)


**Cavacoa J.Léonard**
(Crotonoideae—Aleuritidae)


**Cephalocroton Hochst.**
(Acalyphoideae—Epiprinidae)


**Chaetocarpus Thwaites**
(Acalyphoideae—Chaetocarpaeae)

Monoecious or occasionally dioecious shrubs or small trees with a simple indumentum, or glabrous. Leaves alternate, petiolate, minutely stipulate or stipules absent, simple, entire or 3-lobed, occasionally the lamina contorted or interrupted along the midrib, penninerved, eglandular or ± so. Inflorescences axillary or subterminal, racemose, solitary or paired, usually unisexual, pedunculate; male bracts 1–6-flowered; female bracts 1-flowered. Male flowers: pedicels slender, jointed; sepalas (3)5(6), closely imbricate; petals (3)5(6), small, minute or 0; disc glands 5–15, free, alternipetalous; stamens 15–100, filaments free, anthers erect, dorsifixed, connective broad, theca apically confluent, longitudinally dehiscent; pistillode absent. Female flowers: pedicels shorter and stouter than in the male, not jointed; sepalas smaller than in the male, otherwise ± similar; petals absent; disc shallowly cupular, subentire or shallowly 5-lobed; ovary 3-locular, 1 ovule per locule; styles 3, shortly connate at the base, spreading or recurved, usually simple. Fruit globose or 3-lobed, dehiscing septicidally into 3 bivalved cocci; pericarp thin; endocarp thin; columnella persistent. Seeds ovoid to subglobose, carun-
culate; testa smooth, shiny, marmorate, crustaceous; albumen fleshy; cotyledons broad, flat.

Species 16, ranging from Malaysia to N Australia and Polynesia; *Codiaeum variegatum* (L.) A.Juss. is widely cultivated in the tropics, often becoming naturalised.

**Croton L.**
(Crotoneoideae—Crotoneae)


**Crotonogyne Müll.Arg.**
(Crotonoideae—Aleuriteae)

Shrubs or small trees, monoecious or dioecious; indumentum of young parts and inflorescence of simple or stellate hairs, or stellate to lepidote. Leaves alternate, scattered, shortly petiolate, oblong-oblong, entire; stipules ovate, acuminate, with 2 large glands on upper surface where petiole joins blade. Inflorescences long, axillary, interrupted, simple, spike-like racemes. **Male flowers** small; calyx globose, slightly apiculate and closed in bud, usually lepidote, splitting into 2 or 3 valvate lobes; petals 5 or 6, almost free, adhering or fused into a glabrous tube 5- or 6-lobed at apex; stamens ± 15–20, filaments short, free, glabrous, anthers of 2 parallel thecae, connective drawn out longitudinally, subtriplinerved and penninerved, with a pair of glands at base. **Female flowers** larger than male ones, on a rigid, elongated, acaceous pedicel; calyx (4)-5-lobed, often glandular at base or on margin; petals (4)-5(6), free, imbricate; disc cup-shaped, entire or lobed; ovary 3-locular and 3-locular; ovule 1 per locule; styles 3, free or slightly fused at base, each divided into 3–8 filiform lobes. **Capsule** 3-lobed, lepidote or pubescent, breaking into 3 2-valvate cocci; columella persistent. **Seeds** ± ellipsoid, without caruncle, brown overall with yellow or brownish blotches.


**Cytaranthus J.Léonard**
(Acalyphoideae—Agrostistachydeae)

Monoecious shrubs. Leaves alternate, petiolate, simple, subentire to dentate-glandular, 3-nergated at base and with a pair of elongated glands where petiole and blade meet; stipules very small, soon caducous. **Inflorescences**: unisexual, rarely bisexual racemes, axillary, cauline or rarely pseudoterminal, solitary or few-fascicled, lax; bracts fused to axis and forming a small cavity containing 2 slightly exerted bracteoles and an exerted flower, and in male flowers sometimes further bracteoles and 1 or 2 small flower buds. **Male flower** with pedicel articulated near base; calyx membranous, opening into 2 or 3 reflexed parts; petals 3, rarely 6–8, free, not imbricate; receptacle convex, covered with big glands; stamens 25–40, filaments free, arising between glands; anthers with almost free, pendent thecae, connective drawn out into a small point; without rudimentary ovule. **Female flower** on an accrescent pedicel jointed near base; sepals fused into a 3-dentate cup; petals absent; gynophore annular, hypogynous; ovary 3-loculate and 3-locular; styles 3, bident, shortly fused near base; ovule 1 per locule. **Capsule** lobed, splitting into (2)3 2-valvate cocci; columella persistent. **Seeds** subglobose, grey to brown, glabrous, without caruncle; cotyledons foliaceous; endosperm abundant.


**Dalechampia L.**
(Acalyphoideae—Pluckenietae)


**Discoglypremna Prain**
(Acalyphoideae—Caryodendreeae)
Prain: 317 (1911); Radcliffe-Smith: 222 (1987); Webster: 74 (1994); Léonard: 11 (1996b); Radcliffe-Smith: 155 (2001).

Diocious trees with simple indumentum. Leaves alternate to pseudoverticillate, petiolate, simple, subentire to slightly toothed, subtriangular and pinnerved, with a pair of glands toward base of lamina; stipules soon deciduous. **Inflorescences** terminal, paniculate, panicle branches pseudospicate or racemose; bracts small to minute, entire, those of male inflorescences many-flowered, those of female ones 1-flowered. **Male flowers** on short articulate pedicels; calyx ovoid-ellipsoid in buds, later splitting into 3 or 4 valvate lobes; petals 0; disc composed of ± 15 densely pubescent extra- and intrastaminal glands; stamens (6–)8–15, filaments free, fairly long, flexuose, anthers subapicifixed, intorse, thecae free at base, pendulous from a produced conical connective, each unequally bilocellate, with larger locellus on outside, ± longitudinally dehiscent; pistil 0. **Female flowers** on short articulate pedicels; calyx (4)-5-lobed, lobes valvate, later strongly reflexed; petals 0; disc composed of 6–8 thick scale-like glands truncate and pubescent at apex; ovary 3-locular, with 1 ovule per locule; styles 3, free, entire, recurved-spreading, fimbriate. **Fruit** 3-lobed, loculicidally dehiscent into 3 valves, or septicidally into 3 bivalved cocci; exocarp slightly fleshy; cotyledons broad, flat.

Drypetes Vahl
(Phyllanthoideae—Drypeteae)

Elaeophorbia Stapf
(Euphorbioideae—Euphorbeae)

Endadenium L.C.Leach
(Euphorbioideae—Euphorbeae)


Species 4, tropical W Africa; sthn trop. Afr. 1: Elaeophorbia hiernii Croizat (=Euphorbia grandifolia Hiern not of Haw.), Angola.

Euphorbia L.
(Euphorbioideae—Euphorbeae)


Excoecaria L.
(Euphorbioideae—Hippomaneae)

Flueggea Wild.
(Phyllanthoideae—Phyllantheae)
EUPHORBIACEAE: Flueggea

DICOTYLEDONS

Securinega of various authors, in part; White: 204 (1962); White et al.: 259 (2001).


Heywoodia Sim
(Phyllanthoideae—Wielandieae)


Hymenocardia Wall. ex Lindl.
(Phyllanthoideae—Hymenocardieae)


Jatropha L.
(Crotonoideae—Jatrophiaceae)


Leidesia Müll.Arg.
(Acalyphoideae—Acalypheae)


Macaranga Thouars
(Acalyphoideae—Acalypheae)


Maesobotrya Benth.
(Phyllanthoideae—Antidesmeae)

Dioecious trees or shrubs with a simple indumentum. Leaves alternate, often long-petiolate, stipulate, simple, entire or toothed, penninerved; petiololes bipulvinate; stipules minute and deciduous (or foliaceous and persistent elsewhere). Inflorescences axillary (or cauliflorous elsewhere), solitary (or fasciculate elsewhere), racemose (or subspicate elsewhere); bracts usually 1-flowered; flowers shortly pedicellate. Male flowers: calyx (4–5)-lobed, imbricate; petals absent; disc glands (4–5), alternating with the stamens, fleshy, contiguous; stamens (4–5), opposite the sepals; filaments free; anthers erect, dorsifixed, introrse, thecae parallel, longitudinally dehiscent; pistillode cylindric, not lobed. Female flowers: calyx as in the male; petals absent; disc hypogynous, cupular, entire; ovary (12)4 locular, with 2 ovules per locule; styles short; stigmas bifid, recurved. Fruit subglobose or ellipsoid, subdrupaceous, tardily loculicidally dehiscent; pericarp thin; endocarp 1-locular by suppression. Seeds solitary by abortion, ellipsoid, ecarunculate; testa thin; albumen copious; cotyledons broad, flat, green.

Species ± 20, all in W trop. Africa, except 1 in Uganda; sthn trop. Afr. 2 (but most probably further spp. in N Angola), Angola, Zambia.

Mallotus Lour.
(Acalyphoideae—Acalypheae)
Loureiro: 635 (1790); Hiern: 980 (1900); White: 201 (1962); Radcliffe-Smith: 235 (1987); Webster: 89 (1994); Radcliffe-Smith: 179 (1996); Radcliffe-Smith: 225 (2001); White et al.: 254 (2001); Coates Palgrave: 504 (2002); Mapaura & Timberlake: 164 (2002).

Dioecious, or rarely monoecious trees or shrubs often with a stellate, or sometimes simple or mixed, indumentum. Leaves opposite or alternate, sometimes anisophyllous, petiolate, stipulate, sometimes lobed, entire or toothed, with 2 or more basal glands on upper surface, and often pelticul gland-dotted on upper and lower surfaces, penni- or palmined. Inflorescences unisexual, spicate, racemose or paniculate, terminal, subterminal or axillary, few- to many-flowered; male flowers commonly in fascicles along the axis, female flowers 1 or 2 per bract. Male flowers: calyx usually globose in bud, later valvately (2)3–4(5)-partite; petals absent; disc glands absent or many, free, dispersed amongst stamens; stamens many, on a slightly elevated receptacle, filaments free, anthers subdorsifixed with a variable connective, longitudinally dehiscent; pistillode absent or rarely minute. Female flowers: calyx shallowly to deeply imbricately or valvately 3–5(–10)-lobed, persistent, or subspathaceous and caducous; petals absent; disc absent; ovary (2)3(4)-locular, with 1 ovule per locule; styles free or connate at base, simple, recurved, papillose or plumose. Fruits globose or (2)3(4)-lobed, smooth or echinate, dehiscing septicidally into bivalved cocci leaving a ± 3-winged persistent columella; endocarp crustaceous. Seeds globose or ovoid, ecarunculate, outer testa slightly fleshy or soft, inner testa crustaceous, smooth or rugulose, endosperm fleshy, cotyledons broad, flat.


*Manihot Mill.
(Crotonoideae—Manihotaceae)
White: 201 (1962); Webster: 99 (1994); Radcliffe-Smith: 244 (1996); Radcliffe-Smith: 273 (2001); Phiri (Unpublished).

Sthn trop. Afr. 4 recorded as widely cultivated throughout the region and may occur as escapes. Also present in sthn Afr.
**Manniophyton Müll.Arg.**
(Crotonoideae—Aleuritideae)
Müller Argoviensis: 530 (1864a); Hiern: 972 (1900); Burtt Davy et al.: 52 (1958); Keay: 400 (1958); Léonard: 171 (1962); Webster: 116 (1994); Radcliffe-Smith: 343 (2001).

 Shrubs or climbers, usually dioecious, scabrous with short stellate or simple hairs; exuding a red resin. Leaves alternate, petiolate, varying from simple and ovate to 3(5)-lobed, cordate and with 5 veins, and often with several ± bottle-shaped glands at base, tips acutely acuminate. Inflorescences: axillary, usually paired, elongate, usually sparsely branched panicles. Male flowers small, clustered in slender panicles; calyx valvate, opening irregularly into 2 or 3 entire or bi- to trifid parts; petals fused into a scarcely lobed tube; disc of 5 or 6 epispalous, hairy glands; stamens 10–20, arising on a convex receptacle, filaments free, erect, unequal, anthers cordate, 2-thecous, introrse, dehiscing longitudinally; rudimentary ovule absent. Female flowers in panicles much smaller than those of male flowers; sepal 5, fused in lower part to almost free; petals 5, free, imbricate, larger and longer than calyx, patent at flowering time; disc annular, hirsute; ovary 3-carpellate and 3-locular, sessile on disc, densely hispid; styles almost free, 2-partite, reflexed, glabrous. Capsule deeply 3-lobed, large, rusty-tomentose, splitting into 3 bivalved cocci; columella persistent. Seeds ellipsoid to subglobose, glabrous, without caruncle, grey to dark brown.


**Maprounea Aubl.**
(Euphorbioideae—Hippomaneae)


**Mareya Baill.**
(Acalyphoideae—Acalyphaeae)

Trees or shrubs, monoeious, without latex; indumentum of simple hairs. Leaves alternate, simple, shortly petiolate, entire to glandular-serrate, with 2 basal glands, penninerved, often with transluccid dots and often at base of upper surface with 2 short filiform or glanduliform appendages; stipitate. Inflorescences usually bisexual, spicate or racemose, axillary, with laxyiowered glomerules usually consisting of 1 female flower and 2 or more male flowers. Flowers very small, fragrant; pedicel long to 0, not jointed. Male flowers: calyx subglobose and apiculate, valvate splitting into 3 or 4 sepal; petals 0; disc glands many, free, minute; stamens 10–40, filaments free, filiform, anther connective divided into 2 branches, thecae free, at apex of branches, pendulous in bud, at length flexuous-divaricate, dehiscing distally; pistillode usually 0; receptacle convex. Female flowers: sepal 3–6, imbricate, ± free; petals 0; disc flattened, deeply 3–6-lobed with lobes opposite sepals; ovary 3-locular, with 1 ovule per locule; styles 3, ± free, acum-bent on ovary, laciniate-plumulose. Fruit deeply 3-lobed, dehiscing septicidally into 3 bivalved cocci leaving a persistent columnella; exocarp puberulous; endocarp woody. Seeds subglobose, smooth, ecarunculate; testa thinly cruss-taceous to chartaceous; endosperm fleshy; cotyledons broad, flat.


**Margaritaria L.f.**
(Phyllanthoideae—Phyllanthaeae)


**Meineckia Baill.**
(Phyllanthoideae—Phyllantheae)

Clauziandria Müll. Arg.; Hiern: 956 (1900); Hutchinson: 738 (1912).

Monoeious or dioecious, ± glabrous shrubs or subherbaceous undershrubs. Leaves alternate, distichous, at least shortly petiolate, simple, entire, peninnerved. Inflorescences: flowers axillary, in unisexual or bisexual fascicles; if unisexual, male flowers several per fascicle, female flowers usually solitary. Male flowers on long, very slender pedicels; sepals 5, imbricate; petals 0; disc annular or patelliform, slightly lobed, lobes opposite sepals; stamens 5; filaments partly to almost entirely fused into a stout column; anthers quadrilobate, extrorse, laterally dehiscent; pistillode cylindric, 3-lobed or ± entire, at apex of staminal column. Female flowers on very long, slender pedicels distinctly articulate near base; sepals and disc as in male flowers; ovary 3-locular, smooth, glabrous, with 2 ovules per locule; styles 3, slightly connate at base, bipartite or deeply bifid; stigmas usually capitulate. Fruits 3-lobed, dehiscing septicidally into 3 bivalved cocci, leaving a persistent columnella; endocarp thinly woody. Seeds often 1 per locule due to abortion, reniform, pitted, ecarunculate; endosperm copious; cotyledons broad, flat; radicle more than half as long as cotyledons, bent.

Species ± 20, tropics of Old and New World; sthn trop. Afr. 1: Meineckia phyllanthisoides Baill. subsp. trichopoda (Müll. Arg.) Webster, Angola.

**Micrococca Benth.**
(Acalyphoideae—Acalyphaeae)

Clauziandria in sense of Hiern: 975 (1900).


**Microstachys A.Juss.**
(Euphorbioideae—Hippomaneae)

Saprium Jacq. in part as to some African species; Léonard: 151 (1962);
Monocious perennial herbs with several short erect stems arising from a thick, much-branched woody rootstock; indumentum of multicellular, branched or unbranched, colourless hairs; latex white. Leaves alternate, shortly petiolate, blades simple, obovate, elliptic, lanceolate or linear, entire to minutely serrulate, often with 1 or 2 glands on the margin towards the base; stipules minute, soon deciduous. Inflorescences terminal on main axes, overlapped by lateral leafy shoots, spicate or racemiform, mostly male with 1–4 female flowers at base. Male flowers with short pedicels; calyx lobes 3(4), triangular, with reddish tinge; petals 0; stamens 3(4), free; male bracts with 2 fleshy stipitate glands, one on each side. Female flowers subsessile to shortly stalked in fruit; calyx lobes 3(4), larger than in male flowers, often alternating with minute glands; ovary 3-lobed, each lobe with 2 (or more) ± conical appendages, styles 3. Fruit 3-lobed, septicidally dehiscent into 3 bivalved cocci, each valve with a small appendage. Seeds subcylindric, smooth, slightly shiny, pale grey; with a fleshy caruncle.

Species ± 15, pantropical: 1 in Asia and Australia, 3 or 4 in Africa, the remainder in S America; sthn trop. Afr. 1: Microstachys acetosella (Milne-Redh.) Esser (= Sapium acetosella Milne-Redh.), Angola, Zambia.

**Mildbraedia Pax**
(Crotonoideae—Crotoneae)

Dioecious shrubs or small trees; indumentum stellate, sometimes also simple. Leaves alternate, stipulate, long-petiolate, simple, entire or sometimes (in west and central Africa) deeply 2–3-lobed, subentire to repand-dentate, palminerved; stipules subulate, deciduous. Inflorescences axillary or supra-axillary, solitary, pedunculate, simply racemose or with flowers in racemes of 1-flowered (female inflorescences) or many-flowered (male inflorescences) cymes; bracts resembling stipules. Male flowers: calyx deeply 5(6)-lobed, or sepals free, imbricate; petals 5(6), free, imbricate; disc glands 5, free, fleshy, opposite sepals; stamens 10–25, outer ones ± free, inner ones united into a column, anthers small, introrse, dorsifixed, longitudinally dehiscent; pistillode absent. Female flowers: sepals and petals resembling those of male flowers, but slightly larger; disc hypogynous, annular or cupuliform, entire or ± crenulate, thick, pubescent or sericeous; ovary 3-celled, with 1 ovule per cell; styles 3, ± free or connate at base, bident or bipartite, papillose. Fruit tricoccous, or dicoccous by abortion, dehiscing septicidally into 3 bivalved cocci leaving a columella; endocarp thinly woody. Seeds subglobose, ecarunculate.

Species 3, tropical Africa and Madagascar; sthn trop. Afr. 2, Angola, Zimbabwe.

**Neoboutonia Müll.Arg.**
(Crotonoideae—Aleuritideae)

Dioecious, or rarely monoecious trees or shrubs with a stellate and sometimes also simple indumentum. Leaves alternate, long-petiolate, stipulate, simple, large, ± entire, minutely gland-dotted, palminerved. Inflorescences paniculate, terminal; male inflorescences larger and more branched than the female. Male flowers: calyx closed in bud, later splitting into 2 or 3 valvate lobes; petals absent; disc glands extrastaminal, minute; stamens 15–40, filaments free, short, anthers basifixed, introrse, longitudinally dehiscent; pistillode absent. Female flowers: calyx 5- or 6-lobed, lobes imbricate; petals absent; disc annular; ovary usually 3-locular, with 1 ovule per locule; styles usually 3, connate at base, deeply bipartite, rigid, recurved-patent. Fruit usually 3-lobed, septicidally dehiscent into 3 bivalved cocci; endocarp woody. Seeds ovoid or ellipsoid, carunculate; testa crustaceeous; albumen fleshy; cotyledons broad or flat.

**Neoholstia Rauschert**
(Crotonoideae—Aleuritidae)
*Holstia* Pax; White: 199 (1962).

Dioecious, or rarely monoecious shrubs or small trees; indumentum simple; buds with protective scales. **Leaves** alternate, petiolar, stipulate, simple, subentire to dentate or lobed, palmnerverd. **Inflorescences** terminal, interruptedly racemose or subpaniculate; bracts small, 1–several-flowered. **Male flowers**: pedicels jointed; calyx closed in bud, later splitting into 2–5 valvate lobes; petals (4)5, short, free, imbricate; disc glands 5, free, alternating with petals; stamens 8–13, connate at base, anthers basifixied, intorse, thecae parallel, longitudinally dehiscent; pistillode absent. **Female flowers**: pedicels jointed; sepals 5, free, subequal, imbricate; petals 5, short, free, imbricate; disc shallowly cupular, lobulate; ovary 3-locular, with 1 ovule per locule; styles 3, ± free, binate. **Fruits** 3-lobed, dehiscing septically into 3 bivalved cocci; endocarp thinly woody; columella ± absent or not persistent. **Seeds** subecarunculate; testa crustaceous; albumen fleshy; embryo straight; cotyledons broad, flat.


**Oldfieldia Benth. & Hook.**
(Oldfieldioideae—Pterodendroeae)
Benth & Hooker: 184 (1850); Léonard: 338 (1956); Radcliffe-Smith: 114 (1987); Webster: 61 (1994); Radcliffe-Smith: 117 (1996); Radcliffe-Smith: 104 (2001).

*Dioecious pachycaul trees or shrubs with a simple indumentum.* **Leaves** alternate, opposite-decussate or verticillate in whorls of 3, long-petiolate, exstipulate, digitately 3–8-foliolate; leaflets subleafose or petiolulate, entire, penninerverd, brochidodromous. **Inflorescences** axillary, solitary or gernicate, cyme; male inflorescences subsessile or pedunculate, 1–3-flowered. **Male flowers**: pedicels jointed; sepals 5–8, unequal, united at base, imbricate; petals 5, short, free, imbricate; disc shallowly cupular, lobulate; ovary 3–5 valvate lobes which become reflexed; petals absent; disc glands free, interstaminal; stamens 25–40, filaments free, anthers dorsifixed, intorse, pendulous, longitudinally dehiscent; pistillode absent; receptacle subglabrous. **Female flowers**: pedicels elongate, jointed; sepals 5–7, imbricate, unequal, accrescent; petals absent; staminodes 8–10; disc annular; ovary 3-celled, with 1 ovule per cel; styles 3, connate at base, bifid, papilllose. **Fruit** 3-lobed, septically dehiscent into 3 bivalved cocci; endocarp thinly woody. **Seeds** globose, ecarunculate.


**Phyllanthus L.**
(Phyllanthoideae—Phyllantheae)

*Stipitata* Pax & Hoffmann: 96 (1912); Léonard: 183 (1962); Radcliffe-Smith: 166 (1987); Webster: 70 (1994); Radcliffe-Smith: 136 (1996); Radcliffe-Smith: 133 (2001).


**Plukenetia L.**
(Acalyphoideae—Acalypeae)
Prain: 949 (1912); Prain: 496 (1920); Webster: 93 (1994); Radcliffe-Smith: 247 (2001).

*Pterococcus Hassk.:* 42 (1842) not of Pallas, name conserved; Radcliffe-Smith: 210 (1996).

Species ± 15, mostly neotropical but with 3 in Africa; sthn trop. Afr. 2, Angola, and sthn Afr.

**Pseudagrostistachys Pax & K.Hoffm.**
(Acalyphoideae—Agrostistachydioeae)
Pax & Hoffmann: 96 (1912); Léonard: 183 (1962); Radcliffe-Smith: 166 (1987); Webster: 70 (1994); Radcliffe-Smith: 136 (1996); Radcliffe-Smith: 133 (2001).

Dioecious shrubs or small trees; indumentum simple; leaves ovate, palmate, sessile, or shortly pedicellate; stigmas ± connate annular scar. **Inflorescences** axillary or borne on old racemes bare, or with subordinate glands, alternating with petals; stamens 8–13, connate; pistillodes 8–13, connate, with seeds attached. **Seeds** 1 or 2 per locule, usually 3 per fruit, somewhat compressed; testa fleshy; endotesta crustaceous; funicle thickened, carunculoid; endosperm fleshy; embryo green, cotyledons broad, flat.


**Paranecepsia Radcl.-Sm.**
(Acalyphoideae—Bernardioidae)

Dioecious tree with a simple indumentum. **Leaves** alternate, crowded at ends of branchlets, shortly petiolar, stipulate, stipellate, simple, serrate, palmnerverd. **Inflorescences** racemose, axillary, solitary, lax; bracts 1–5-flowered. **Male flowers**: pedicels jointed; calyx closed in bud, later splitting into 3–5 valvate lobes which become reflexed; petals absent; disc glands free, interstaminal; stamens 25–40, filaments free, anthers dorsifixed, intorse, pendulous, longitudinally dehiscent; pistillode absent; receptacle subglabrous. **Female flowers**: pedicels elongate, jointed; sepals 5–7, imbricate, unequal, accrescent; petals absent; staminodes 8–10; disc annular; ovary 3-celled, with 1 ovule per cel; styles 3, connate at base, bifid, papilllose. **Fruit** 3-lobed, septically dehiscent into 3 bivalved cocci; endocarp thinly woody. **Seeds** globose, ecarunculate.
wood, racemose, solitary or fasciculate, shortly pedunculate or not, strobiliform at first, later laxly flowered; bracts broad, concave, ciliate, persistent; male inflorescences 1–more-flowered; female inflorescences usually 1-flowered; bracteoles 2. **Male flowers** pedicellate, pedicels jointed near base; calyx closed in bud, later splitting into 2–5 membranous valvate lobes; petals 5–8, free, imbricate; receptacle convex, covered in contiguous disc glands, pubescent; stamens 20–55, free, erect in bud, arising from pits in the glandular surface, anthers fixed at apex, extrorse, thecae almost free, pendulous from a thickened glandular apiculate connective, longitudinally dehiscents; pistillode reduced or absent. **Female flowers**: pedicels stouter than in male, jointed near base; calyx and petals resembling those of the male; disc hypogynous, annular, thickened, alveolate; staminodes often present, filiform, arising from alveoli; ovary 3-locular, with 1 ovule per locule; styles 3, almost free, bipartite, stigmas papillose. **Fruit** 3-locular, dehiscing into 3 bivalved cocci; endocarp thinly woody; columella persistent, apically tricornute. **Seeds** subglobose, ecarunculate; testa crustaceous, shiny; albumen thick, fleshy; embryo straight or slightly curved; cotyledons broad, flat.


**Pseudolachnostylis** Pax

(Phyllanthoideae—Phyllantheae)


**Pycnocoma** Bentham.

(Acalyphoideae—Pycnocomeae)

Bentham: 508 (1849); Hiern: 983 (1900); Prain: 955 (1912); Pax & Hoffmann: 52 (1914); Radcliffe-Smith: 228 (1987); Webster: 76 (1994); Léonard: 37 (1996c); Radcliffe-Smith: 166 (2001).

Monoecious shrubs or small trees, glabrous except tips and indumentum. **Leaves** alternate, long-petiolate, palmatifloriate or palmatisect; petioles sometimes glandular at apex; leaf segments sometimes pseudopetiolulate, glandular-denticulate, peninnerved; stipules persistent, large, foliaceous, sessile, palmatifid, glandular-dentate. **Inflorescences** terminal or subterminal, paniculate, male larger than female; bracts linear, setaceous. **Male flowers** shortly pedicellate; buds globose; calyx lobes 4 or 5, imbricate; petals 5, imbricate, laterally coherent; disc glands 4–6, free, extrastaminal, entire, fleshy; stamens 6–14, filaments united at base, anthers dorsifixed, introrse, longitudinally dehiscent; pistillode absent. **Female flowers** pedicellate; calyx lobes 5, imbricate; petals ± as in male flowers; hypocynous disc crenulate; ovary 2- or 3-lobed, usually wider than long; pericarp coriaceous; mesocarp fleshy; endocarps 2(3), rarely 1 by abortion, distinct, each subglobose, I-locular, I-seeded, thinly woody, smooth. **Seeds** ecarunculate, subglobose; endosperm fleshy; cotyledons broad, flat, palminerved.

Monoecious trop. African genus: *Ricinodendron heudelotti* (Baill.) Pierre ex Heckel; sthn trop. Afr.: Angola, Mozambique. (See also *Schinziophyton*).

**Ricinus L.**

(Acalyphoideae—Acalyphaeae)

Burt Davy et al.: 53 (1958); White: 203 (1962); Radcliffe-Smith: 322 (1987); Webster: 84 (1994); Radcliffe-Smith: 156 (1996); Radcliffe-Smith: 201 (2001); Coates Palgrave: 512 (2002); Phiri (Unpublished).

Monotypic genus: *Ricinus communis* L.; widely cultivated throughout sthn trop. Afr., and often naturalised. Also present in sthn Afr.

**Schinziophyton** Hutch. ex Radcl.-Sm.

(Crotonoideae—Ricinodendreae)


**Sclerocroton** Hochst.

(Euphorbioideae—Hippomaneae)

Hochstettler: 85 (1845); Esser: 378 (2001b).

**Sapium** Jacq. in part, as to some African species; Léonard: 151 (1962); Radcliffe-Smith: 324 (1996).

Monoecious subshrubs, shrubs or trees, glabrous; latex white. **Leaves** alternate; petiolate, eglandular; blades simple, shallowly serrate to entire, often with 1 or 2 marginal glands;
stipules linear, soon deciduous. **Inflorescences** terminal, leaf-opposed or sometimes axillary, solitary, spicate or racemiform, all male or with (1)2 female flowers at base; male bracts broad, 3–many-flowered, with 1 to several pairs of disc-to-cup-shaped glands. **Male flowers**: pedicel jointed; calyx lobes 3(4); petals 0; stamens 2 or 3; free, very short. **Female flowers**: pedicels long; calyx lobes 3(4); petals 0; ovary 3-lobed, each lobe with 2 appendages; styles 3. **Fruit**: 3-lobed, septicidally dehiscent into 3 bivalved cocci, each valve with an appendix. **Seeds** ovoid-ellipsoidal, smooth, pale grey, without caruncle.


**Shirakiopsis** Esser
(Euphorbioideae—Hippomaneae)
Esser: 184 (1999); Esser: 1017 (2001a); Esser 380 (2001b).

Monoecious trees or shrubs with multicellular, unbranched, usually coloured hairs; latex white. **Leaves** alternate; petioles short, eglandular; blades simple, shallowly serrate, penninerved, with a row of marginal glands below, lower surface paler than upper; stipules small, undivided, eglandular. **Inflorescences** terminal, solitary, spicate or racemiform; bracts with a pair of spheroidal glands, (0)1–3 basal ones with a pair of spheroidal glands, (0)1–3 basal ones with 1 fe-

**Sapium** Jacq. in part, as to some African species; Léonard: 151 (1962); Radcliffe-Smith: 324 (1996).

Species 6, 3 in Asia, 3 in Africa; sthn trop. Afr. 6, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

**Spirostachys** Sond.
(Euphorbioideae—Hippomaneae)


**Spondianthus** Engl.
(Phyllanthoideae—Antidesmeae)


**Suregada** Roxb. ex Rottler
(Crotonoideae—Gelonieae)


**Synadenium** Boiss.
(Euphorbioideae—Euphorbeae)


**Tannodia** Baill.
(Crotonoideae—Aleuritideae)
Baillou: 251 (1861); Radcliffe-Smith: 172 (1987); Webster: 115 (1994); Radcliffe-Smith: 306 (1996); Radcliffe-Smith: 338 (2001); Coates Palgrave: 499 (2002); Mapaura & Timberlake: 165 (2002).

Dioecious or polygamo-dioecious (with an occasional male flower on a female inflorescence) trees or shrubs; indumentum simple. **Leaves** alternate, petiolate, stipulate, simple, entire or subentire, palminerved. **Inflorescences** terminal, interruptedly racemose; bracts 1–several-flowered. **Male flowers**: pedicels jointed; calyx closed in bud, later splitting into 2–5 valvate lobes; petals 4 or 5, free, imbricate; disc glands 4 or 5, free, alternating with petals; stamens 6–14, connate at base into a short column, 2-serial with outer series short and opposite petals and inner longer and opposite sepals, anthers dorsifixed, outer ones introrse, inner ones extrorse, longitudinally dehiscent, connective broad; pistillode absent. **Female flowers**: pedicels jointed; sepals 4 or 5, ± free, ± equal, imbricate;
Species 4, 2 African and 2 from Madagascar and the Comoro Islands; sthn trop. Afr. 1: Tannodia swynnertoni (S.Moore) Prain, Zimbabwe, Mozambique.

_Tetrorchidium_ Poepp.
(Crotonoideae—Adenoclineae)

_Hasskarlia_ Baill.; Hiern: 974 (1900).

Dioecious, completely glabrous shrubs, lianes or trees, exuding a milky sap. **Leaves** alternate or sometimes opposite on main axes, simple; petioles canaliculate, eglandular; blade obovate to elliptic, entire to shallowly crenate-serrate, penninerved. **Inflorescences** leaf-opposed. **Male flowers** in simple, dense spikes; bracts eglandular; calyx lobes 3, hyaline, each with 4 unequal concavities within; petals 0; disc 0; stamens 3(4), opposite calyx lobes, free; filaments very short; anthers erect, basifixied, 4-locular, introrse, longitudinally dehiscient; pistillode minute, 2–5 mm long. **Female flowers** in 3–5–flowered umbels; bracts soon falling; sepals 3, triangular-ovate; petals 0; disc glands 3, petaloid, alternating with sepals and carpels; ovary (2)3–locular, subglobose, with 1 ovule per locule; styles (2)3 adpressed to top of ovary. **Fruit** (2)3-locular and -lobed, dehiscing loculically or septicidally; columella slender. **Seeds** compressed-ellipsoid, sarcotesta orange, red, endotesta foveolate, black.

**Species ± 20, mostly tropical America but 5 in trop. Africa; sthn trop. Afr. 1:** Tetrorchidium didymostemon (Baill.) Pax & K.Hoffm., Angola.

_Thecacoris_ A.Juss.
(Phyllanthoideae—Antidesmeae)


Dioecious, rarely monoeocious trees, shrubs or perennial herbs; indumentum simple. **Leaves** alternate or subfasciculate, shortly petiolate, simple, entire or subentire, penninerved. **Inflorescences** axillary, solitary, genimate or fasciculate, pedunculate, spicate, racemose or rarely paniculate, few- to many-flowered; flowers 1 per bract. **Male flowers**: sepals 5(6), imbricate; petals 5, small, or absent; disc glands 5, free, interstaminal, alternating with sepals, thick; stamens 5, opposite sepals, filaments free, anther thecae distinct, introrse, parallel and pendulous at first, later extrorse, divaricate and erect, longitudinally dehiscient; pistillode large, obconic, turbinate or cyathiform, truncate and entire or 3–5-lobed. **Female flowers**: pedicles patent, elongating and deflexing in fruit; sepals somewhat connate at base, otherwise ± as in male; petals smaller than in male, or absent; staminodes sometimes present; disc hypogynous, annular, sometimes crenulate; ovary 3-locular, ovules 2 per locale; styles 3, free or connate at base, recurved, bifid, stigmas ± smooth. **Fruit** 3-lobed, dehiscent into bivalved cocci; pericarp thin, separating from the thinly woody endocarp; columnella persistent. **Seeds** ovoid-subglobose to obovoid-pyriform, carunculate; testa thin, striate, shiny; endosperm copious, fleshy; cotyledons greenish.

**Species 25, trop. Africa and Madagascar; sthn trop. Afr. 3, Angola, Zambia, Mozambique.**

_Tragia_ L.
(Acalyphoideae—Plukenetieae)
Hiern: 984 (1900); Radcliffe-Smith: 291 (1987); Webster: 95 (1994); Radcliffe-Smith: 216 (1996); Radcliffe-Smith: 253 (2001); Bingham & Smith: 141 (2002).

_Sthn trop. Afr. 3, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr._

_Tragiella_ Pax & K.Hoffm.
(Acalyphoideae—Plukenetieae)

_Sthn trop. Afr. 3, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr._

_Uapaca_ Baill.
(Phyllanthoideae—Antidesmeae)
Baillou: 595 (1858); Hiern: 963 (1900); Hutchinson: 634 (1912); Radcliffe-Smith: 566 (1988); Webster: 49 (1994); Radcliffe-Smith: 93 (1996); Radcliffe-Smith: 57 (2001); White et al.: 263 (2001); Coates Palgrave: 484 (2002).

Dioecious trees or shrubs; indumentum simple and/or minutely pseudolepidote; trunks occasionally stilt-rooted; twigs stout, often with pronounced leaf scars, producing an exudate, when cut, which hardens and darkens on drying. **Leaves** alternate, usually crowded towards end of twigs, petiolate or subsessile, stipulate or not; blades simple, often obovate, entire, penninerved. **Inflorescences** axillary, or borne on older wood, solitary or fasciculate, pedunculate, with a whorl of 5–12 imbricate bracts surrounding flowers; male inflorescences many-flowered, flowers in dense globose capitula; female inflorescences 1-flowered. **Male flowers** sessile; calyx campanulate or turbinate, truncate, dentate or irregularly or regularly lobed, lobes imbricate; petals absent; disc absent; stamens (4)5(6), free, epipetalous, anthers erect, subbasifixed, introrse, thecae parallel, longitudinally dehiscient; pistillode cylindric-obconic, infundibuliform, hypocrateriform, peltiform or sometimes lobed. **Female flowers** sessile; calyx minute, truncate, sinuate or lobed, disciform; petals absent; disc absent; ovary (2)3–5-locular, with 2 or 3 ovules per locale; styles (2)3(5), free, thick, recurved, covering ovary, multipartite to laciniate. **Fruit** drupaceous, indehiscent; mesocarp spongy; pyrenes (2)3(4), dorsally carinate and bissulate, indurate, tardily bivalved. **Seeds** mostly 1 per pyrene, compressed, ecarunculate; endosperm fleshy; embryo straight; cotyledons broad, flat, green.

**Species 61, 49 restricted to trop. Africa, the rest endemic to Madagascar; sthn trop. Afr. 10, Angola, Zambia, Zimbabwe, Malawi, Mozambique.**
References


EUPHORBIACEAE: References

DICOTYLEDONS

STAPF, 0. 1912. Elaeophorbia. Hooker’s Icones Plantarum 23: t. 2823.
Key to subfamilies

1a Plant armed with prickles or spines:

2a Inflorescence 2-coloured, the upper part bisexual, yellow, the lower part neuter, mauve or pink and white; short lateral branches ending in spines, plant otherwise unarmed ................................................................. *Dichrostachys

2b Inflorescence 1-coloured; plant armed with recurved prickles or stipular spines, very rarely with short lateral branchlets ending in spines:

3a Plant without recurved prickles and stipular spines; spine-tipped lateral shoots are present; inflorescence globose; stamen filaments united basally into a tube ........................................... *Albizia

3b Plant armed with recurved prickles or stipular spines; spine-tipped branchlets absent:

4a Flowers in globose or subglobose heads, rarely the inflorescence reduced to only 2–4 flowers per “head”:

5a Stamens many (± 35–200); flowers white, yellowish white or pale to deep yellow ................................................. *Acacia

5b Stamens as many as or twice as many as the (3)4, 5(6) corolla lobes; flowers pink or mauve ........................................... *Mimosa

4b Flowers in spikes or spiciform racemes:

6a Stamens many (± 35–200):

7a Petioles glandular; stamen filaments free; pods mostly dehiscent, various ........................................................................ *Acacia

7b Petioles eglandular; stamens filaments shortly conate basally; pods indehiscent, falcate or spirally coiled ................................... *Faidherbia

6b Stamens 10:

8a Recurved prickles scattered along the stem; pods compressed, slightly curved to falcate, at maturity the valves splitting transversely into 1-seeded segments .................................................................................................................. *Adenopodia

8b Straight stipular paired spines present; pods slightly curved or coiled, indehiscent, not segmented .............................................. *Prosopis

1b Plant unarmed:

9a Inflorescence capitulate, globose or subglobose:

10a Aquatic herb with creeping, usually floating and swollen stems; flowers of 2 sorts: bisexual in upper part of head, sterile with elongate staminodes in lower part ........................................................................................................ *Neptunia

10b Tree, shrub or suffrutex, rarely herbaceous, but then not aquatic:

11a Leaves reduced to simple, entire phyllodes...................................................................................................................... *Acacia (exotic species)

11b Leaves 2-pinnate:

12a Stamens many (± 20–200):

13a Stamens filaments free; central flower of inflorescence not different from the rest .................................................................. *Acacia

13b Stamens filaments united basally into a tube, tube included or exerted beyond the corolla; central flower of inflorescence usually differing from and often larger than the rest ......................................................................................... *Albizia

12b Stamens less than 15:

14a Leaves with 1 pair of pinnae; leaflets large, 20–60 mm wide; tree up to 15 m high ....................................................................... *Xyli

14b Leaves with (2)3–10 pairs of pinnae; leaflets smaller than above; perennial herb, suffrutex, shrub or tree:

15a Anthers with conspicuous scattered hairs; flowers in heads up to 18 mm in diameter; shrub or small tree with densely grey-puberulous branchlets; leaflets 1.5–4.0 mm wide .............................................................................................................. *Leucaena

15b Anthers glabrous:
### Key to genera

1a Leaves simple, emarginate apically to deeply bilobed, or consisting of a single pair of leaflets:

2a Petals 0:

3a Stamens (8)10(12); inflorescence an axillary or terminal panicle; leaves with 3–6 conspicuous nerves arising from the base; pods pale yellowish brown, reniform, indehiscent; seeds with small reddish sticky resin glands ................................................. **Colophospermum**

3b Stamens 20–25; inflorescence a slender raceme or panicle; leaflets with 7–12 prominent nerves arising from the base; pods brown or reddish brown, obliquely semi-orbicular, ovate or ovate-oblong, dehiscent or indehiscent; seeds not as above ........................................ **Guibourtia**

2b Petals 5:

4a Leaves simple, entire, 3-veined from the base .................................................................................. **Griffonia**

4b Leaves emarginate apically to deeply bilobed, or with a single pair of leaflets:

5a Leaves emarginate apically to deeply bilobed:

6a Plant with trailing or climbing, mostly herbageous stems arising from a large underground tuber; tendrils usually present; fertile stamens 2, accompanied by staminodes; calyx with 2 upper sepals partly or completely fused, the rest free ................................................. **Tylosema**

6b Shrub or small tree, seldom scandent or climbing, but then woody and without tendrils:

7a Flowers normally unisexual and plant dioecious; female flowers with the stigma sessile on the ovary, capitate, flattened-globose; male flowers with 10 fertile stamens; calyx turbinate with 4 or 5 short broad lobes ......................................................... **Piliostigma**

7b Flowers bisexual; style elongate; fertile stamens 1–10; calyx spathaceous or campanulate with 5 short lobes or teeth:

8a Calyx spathaceous, splitting to the base down one side only, with the sepals fused or sometimes partly separated; fertile stamens 1–10, sometimes accompanied by staminodes; pods oblong or oblongaceolate-oblong, valves thinly woody .............................................. **Bauhinia**

8b Calyx campanulate, with 5 short teeth or lobes; fertile stamens 10; plant often conspicuously glandular; pods semi-orbicular, valves papery, with or without stalked glands .................................................................................. **Adenolobus**

5b Leaves unjugate: with a single pair of leaflets:

9a Sepals 4, imbricate; leaves with many pellucid dots; stamens all free; seeds hard ......................................................... **Hymenaea**

9b Sepals 5, slightly to considerably reduced; leaves without pellucid dots; 9 of the 10 stamens united at the base; seeds with a very thin membranous testa .................................................................................. **Tetrapleura**

1b Leaves pinnately or bipinnately compound; leaflets more than 2:

10a Leaves bipinnate:

11a Plant armed with prickles or spines:

12a Calyx lobes valvate; flowers small, greenish to white; spines usually branched ........................................................................ **Pterolobium**

12b Calyx lobes or teeth imbricate; flowers yellow, pale yellowish white, pink, red or magenta; spines not branched:

13a Petals 2–3 mm long; pods samaroid, with a basal seed-containing portion of which the upper suture is greatly extended beyond the seed-containing part and is broadly winged on its lower side ........................................................................ **Pterolobium**

13b Petals 6–25 mm long; pods not winged:

14a Leaf rachis up to ± 0.4 m long, flattened, bearing along its margin very small, rather sparse, mostly alternate leaflets ...................... .................................................................................. **Parkinsonia (aculeata)**

14b Leaves not as above; leaflets mostly opposite .................................................................................. **Caesalpinia**

11b Plant unarmed:

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**DICOTYLEDONS**

**FABACEAE: Subfamily Mimosoideae (Mimosaceae)**

### Subfamily Caesalpinioideae (Caesalpinioideae)

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### DICOTYLEDONS

#### FABACEAE: Subfamily Caesalpinioideae (Caesalpiniaceae)

| 15a | Leaflets alternate; flowers small (petals 2–5 mm long, white to cream-coloured or pale green); sepals open from a very early stage, leaving the petals covering the flower until anthesis: |
| 16a | Flowers pedicellate; petals narrow, ± densely pubescent, at least on the margins; anthers 0.5–0.75 mm long; stigma small, hollow, on a narrow conical style; stamen filaments pubescent or tomentose to near the apex; hairs (when present) on vegetative buds and young branchlets grey-brown to yellowish |
| 16b | Flowers sessile; petals glabrous or almost so; anthers 1.5–2.0 mm long; style very short, ending in a funnel-shaped stigma slit down one side; stamen filaments glabrous; hairs on vegetative buds, young branchlets and inflorescence axes rusty red |
| 15b | Leaves opposite; flowers usually medium to large (petals 7–32 mm long, seldom smaller, yellow, orange, red or magenta); sepals valvate or imbricate: |
| 17a | Leaves imparipinnate; herb or low shrub up to 0.5 m high; stems, leaves and calyces with many dark sessile glands; petals up to 9 mm long |
| 17b | Leaves paripinnate; tree or large shrub; petals 7–32 mm long: |
| 18a | Stigma not broadly peltate; inflorescence axis, calyx and ovary not rusty tomentose; petals yellow, pink, red or magenta; stipules not as below |
| 18b | Stigma broadly peltate; inflorescence axis, calyx and ovary rusty tomentose; petals yellow; stipules up to 14 mm long, linear-subulate with up to 7 linear, alternate appendages up to 6 mm long: |
| 19a | Leaflets mostly more than 10 pairs per pinna; pod indehiscent, flattened, winged along both sutures |
| 19b | Leaflets mostly fewer than 10 pairs per pinna; pod dehiscent, not winged, elastically dehiscing into 2 recurving, narrow woody valves |

#### Plant armed with spines:

| 20a | Plant armed with spines: |
| 21a | Leaves with 3 pairs of opposite leaflets; inflorescence a relatively few-flowered lateral or terminal raceme; petals yellow, 8–10 x 5–7 mm; ovary glandular |
| 21b | Leaves with (3–)5–10(–12) pairs of irregularly alternate leaflets; inflorescence a dense drooping raceme; petals white; ovary eglanular |

#### Plant unarmed:

| 22a | Bracteoles paired, valvate throughout, well-developed, completely enclosing the flower bud, usually persistent: |
| 23a | Leaflets alternate, mostly 2–6: |
| 24a | Perianth of 4 sepals and 5 subequal petals |
| 24b | Perianth of (1) or 2 minute tepals |
| 25a | Filaments of stamens and staminodes all fused ± halfway into a pubescent tube |
| 25b | Filaments of stamens and staminodes (if present) free or only some fused at base: |
| 26a | Stamens 10(–14), all fertile and subequal: |
| 27a | Perianth 0 or of (1)4–7(–11) parts, all sepaloid and of similar form, grading inwards from broader to narrower |
| 27b | Perianth clearly differentiated into sepals and petals: |
| 28a | Petals 5(6), subequal; stamens 10, all free or with filaments of 9 shortly connate at the base: |
| 28b | Petals 5 but 1 much larger than the others; stamens 10, with filaments of 9 connate at the base |
| 29a | Leaflets distinctly petiolulate; petiolules not twisted; stamens 10(–14) with all filaments free |
| 29b | Leaflets sessile to sessile; petiolules usually twisted; stamens 10, with filaments of 9 connate at the base |
| 30a | Leaflets distinctly petiolulate |
| 30b | Leaflets sessile or subsessile: |
| 31a | Sepals 0 or up to 5 but usually much reduced; leaflets with distal half much reduced to ± absent |
| 31b | Sepals 5; leaflets with both halves ± equal |
| 32a | Stamens 3–9, very unequal, usually not more than 3 fertile, the rest smaller and often staminodial: |
| 32b | Sepals minute or absent; bracteoles petaloid, white or pink |

#### Subfamily Caesalpinioideae

| 33a | Leaves paripinnate, tree or large shrub; petals 7–32 mm long: |
| 33b | Leaves opposite; flowers usually medium to large (petals 7–32 mm long, seldom smaller, yellow, orange, red or magenta); sepals valvate or imbricate: |
| 34a | Flowers large, in dense subcorymbose terminal panicles; bracteoles 25–37 mm; petals 5, of three different lengths; seeds areolate; petiolules twisted, short, the leaflets very unequal-sided at the base |
| 34b | Flowers more laxly arranged in racemes or extended panicles; bracteoles shorter; petals 2–6, equally long or some small; seeds not areolate; petiolules rarely twisted |
| 35a | Anthers opening by terminal or basal pores or short subapical subvertical slits, usually basifixid; petals mostly yellow; glands often present on petiole or leaf rachis: |

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**Dipteryx**

**Erythrophleum**

**Burkea**

**Hoffmannseggia**

**Haematoxyllum**

**Gleditsia**

**Librevilla**

**Tamarindus**

**Jubbernaria**

**Paramacrolobium**

**Aphanocalyx**

**Brachystegia**

**Cryptosepalum**

**Anthonotha**

**Duparquetia**
36b Leaves paripinnate; sepals 5; stamens not coherent to form a synandrium; petals mostly yellow:

37a Filaments of the 3 adaxial stamens sigmoidally incurved, many times longer than their small anther; filaments of other stamens straight, shorter; the anthers dehiscing by basal pores; pedicels 2-bracteolate at or just above their base; pod elongate, usually cylindric, indehiscent; seed coat smooth, without areoles ................................................................. Cassia

37b Filaments of all stamens straight, either shorter or not more than twice as long as their anthers; if longer, then the anthers dehiscing by apical pores; pods various, but if cylindric and indehiscent then the pedicels without bracts:

38a Bracteoles 0; pod either indesicent, or breaking elastically through one or both sutures; if through both, then the valves not coiling; androecium often irregular, the members tending to decrease in size from the abaxial to the adaxial side of the flower; anther thecae naked along the sutures; seed coat often with a closed areole on each face or margin; tree, shrub or herb ................................................................. Senna

38b Bracteoles 2; pod elastically dehiscent, the valves coiling at or after dehiscence; androecium ± regular, members of the two sides sometimes of different lengths but not decreasing regularly from the abaxial to the adaxial side of the flower; anther thecae ciliolate along the sutures; seed coat without areoles; usually a herb ......................................................... Chamaecrista

35b Anthers opening by longitudinal slits as long as the anther, usually dorsifixed; conspicuous glands not present on petiole or rachis:

39a Petals 0 or sometimes petals present but then petals shorter than sepals and arising from beneath the margin of a pronounced hypogynous disc, or petals reduced to minute, linear, inconspicuous filaments and apparently absent:

40a Petals 0, 1(–5), if present then no longer than ± 2 mm and arising from beneath the margin of a pronounced hypogynous disc; anthers basifixed; pod drupaceous, globose to discoid with 1 or 2 seeds ........................................................... Dialium

40b Petals 0, no reduced or modified petals present; anthers dorsifixed:

41a Sepals 1 or 0; stamens 6–8 with all filaments shortly connate at the base ......................................................... Icuria

41b Sepals 4–6; stamens various but not all filaments connate at the base:

42a Leaflets with translucent gland dots:

43a Sepals 5(6); leaflets mostly alternate, but first and last pair sometimes subopposite ........................................ Oxystigma

43b Sepals 4(5); leaflets alternate or opposite:

44a Leaves with 1 pair of opposite leaflets ........................................................................................................... Guibourtia

44b Leaves with more than 2 leaflets which are alternate to subopposite:

45a Ovule/seed 1 per ovary/fruit; anther filaments hairy towards base; fruit resembling a samara ......................... Gossweilerodendron

45b Ovules 2(–4) per ovary; seed 1, partly enclosed in a coloured arillus; fruit dehiscing into 2 valves . Copaifera

42b Leaflets without translucent gland dots:

46a Leaflets alternate, with twisted petiolules; flowers on long slender pedicels arranged in lax racemes; ovary densely tomentose ................................................................................................................................. Crudia

46b Leaflets mostly opposite, petiolules not twisted; flowers on short stout pedicels arranged in short panicles or racemes; ovary glabrous ........................................................................................................ Schotia

39b Petals 1–5, some of which may be much reduced:

47a Petals 5, ± equal:

48a Flowers arranged in 2 rows (distichously) along the inflorescence axes; leaflets mostly alternate:

49a Leaflets usually without any translucent gland dots but with a small ± marked swelling near the posterior margin of each leaflet close to the base; petals mostly longer than 50 mm ................................................................. Baikiaea

49b Leaflets with numerous translucent gland dots, but without any marginal swelling near the base; petals shorter than 30 mm:

50a Leaflets usually emarginate at the apex; stamens 10: 1 free, 9 with filaments connate at the base ............ Tessmannia

50b Leaflets not or only vaguely emarginate at the apex; stamens 10, all free ................................................. Gillettiodendron

48b Flowers arranged spirally in more than 2 rows along the inflorescence axes; leaflets opposite or alternate:

51a Stipe of ovary free, arising at bottom of receptacle; leaflets opposite ................................................................. Cynometra

51b Stipe of ovary fused to the wall of the receptacle; leaflets opposite or alternate:

52a Portion of stipe included in the receptacle and completely fused with the receptacle wall; ovules many (rarely 2); leaflets opposite, subsessile ........................................................................................................... Normandiodendron

52b Portion of stipe included in the receptacle only partially fused with the wall of the receptacle:

53a Leaflets mostly alternate, subsessile; receptacle elongate, narrowly obconical; tree emitting a strong garlic odour . ................................................................. Scordophlebus

53b Leaflets mostly opposite or subopposite with some gland dots underneath; receptacle very short, cup-shaped; tree without garlic odour ........................................................................................................ Brenanioidendron

47b Petals 1–5; if 5 then very different:

54a Petiolules twisted; fertile stamens 7 ........................................................................................................ Afzelia

54b Petiolules not twisted; fertile stamens 10 or more:

55a Leaflets usually with translucent gland dots; upper surface of leaf rachis with 2 very small glandular openings at the level of the petiolules; ovules many; seed with a small arillus ........................................................................ Daniellia

55b Leaflets without translucent gland dots; leaf rachis without glandular openings; ovules 2(3); seed without arillus ........... Hymenostegia
Subfamily Papilionoideae (Papilionaceae)

Key to tribes

1a Filaments all free from base upwards, occasionally shortly and ± equally connate at base only; anthers usually uniform in size and shape:

2a Calyx entire in bud; stamens 9–many; petals 0–9, not much differentiated ................................................................. Swartzieae (p. 179)

2b Calyx lobes apparent or corolla markedly papilionoid; stamens (5–)10(–30); petals generally 5; leaves pinnately foliolate or of only 1 leaflet ......... ...

................................................................. Sophoroeae (p. 179)

1b Filaments partly or almost wholly united to one another, either monadelphous in a closed tube, or diadelphous with the vexillary (adaxial) filament often free or partly so:

3a Anthers distinctly of 2 forms: alternately long and basifixed, and shorter and dorsifixed; leaves simple, 1-foliate or digitately (3–many)-foliate, if compound, leaves generally pulvinate or with a raised leaf base, rarely distichous, never glandular-punctate; fruit never jointed:

4a Filaments fused into a sheath open on upper side ................................................................. Crotalarieae (p. 177)

4b Filaments fused into a closed tube ................................................................................................................. Genistaeae (p. 178)

3b Anthers ± uniform, at least in size, some sometimes abortive, or if of 2 forms (in Aeschynomeneae, Psoraleeae and a few Phaseoleae, by abortion in *Teramnus*) then leaves pinnate or glandular-punctate:

5a Leaves without pulvinus (stipules often adnate to petiole base) or reduced, often with a stipular ridge forming an abaxial commissure, generally distichous or crowded; inflorescense axillary; herb or small softly woody shrub:

6a Leaflets ± toothed; nerves extending to the ± toothed margin of the leaflets; stipules adnate to petiole base ......................... Trifolieae (p. 179)

6b Leaves not toothed (except some Psoraleeae); nerves looped within the margin (except some Galegeae):

7a Leaves generally paripinnate, ending in a tendril or bristle, rarely imparipinnate; stipules free from petiole, generally foliaceous; fruit 2-valved; seeds lenticular to globose with ± linear hilum and no radicular lobes; herb ......................................................... Vicieae (p. 179)

7b Leaves generally ending in a leaflet or a spine, less often in a bristle; stipules generally small and/or adnate to the petiole; seeds with a small round hilum generally below a radicular lobe:

8a Filaments of all or alternate stamens dilated apically; flowers 1 or 2 from axils, in heads or more often umbellate, sometimes subtended by a foliar bract; compound leaves generally with at least 3 terminal leaflets conjugate, lowermost pair sometimes stipulate-like, sometimes with a glandular stipule:

9a Fruit not jointed, generally dehiscent if long-exserted ..................................................................................... Loteae (p. 178)

9b Fruit jointed or elongated with thickened margins and hooked tip ................................................................. Coronilleae (p. 177)

8b Filaments not dilated upwards:

10a Ovule 1; fruit 1-seeded, glandular; inflorescences compound, with more than 1 series of bracts; foliage ± glandular-punctate or pustulate ................................................................. Psoraleeae (p. 178)

10b Ovules 2–many; fruit not both 1-seeded and glandular; racemes or fascicles simple with flower bracts only ............. Galegeae (p. 178)

5b Leaves pulvinate, mostly free from stipules, if present:

11a Petals 5, all similar, ribbon-like or spatulate; fruit drupaceous or flat and curved, eglandular 1(2)-seeded, indehiscent ..........

................................................................................................................................. Dalbergieae (p. 178)

11b Petals differentiated, paripinnate: 12a Stamens 9; leaves paripinnate; flowers in pseudoracemes (pedicels several at a rachis node) or axillary fascicles; pods elastically dehiscent, with brown to brightly coloured seeds ................................................................................................................. Abreae (p. 177)

12b Not as above:

13a Anthers apiculate or appendaged; petals usually reddish and caducous, 2-branched hairs present (often among others); normally leafy ............................................................................................................. Indigoeaeae (p. 178)

13b Anthers not appendaged (if petals caducous):

14a Fruit 1-seeded, often nutlet-like, small, generally glandular, with marcescent calyx; foliages glandular-pustulate or -punctate; never twining or large tree; inflorescence axillary; leaves (1–)3(–5)-foliate ......................................................... Psoraleeae (p. 178)

14b Fruit more pod-like, eglandular or woody; glands, if present, generally on surface or small internal dots:

15a Fruit transversely jointed, sometimes of only 1 article, or less often opening down 1 suture (then tertiary venation of leaflets scalariform); seeds with radicular lobe longer than cotyledonary lobe; lower petals generally withering and caducous after explosive pollen release; inflorescence generally compound with more than 1 series of bracts; leaves pinnately 3–(11)-foliate, generally stipulate; stipules and bracts often strictly interlinked ........................ Desmoeaeae (p. 178)

15b Fruit not jointed, or if so (in Aeschynomeneae), seeds more symmetric; lower petals more retractorile or little interconnected and differentiated:

16a Style straight or curved away from standard; standard with a median gutter; leaves digitately 3-foliolate ................................................................. Crotalarieae (p. 177)

16b Style curved towards standard:

17a Hyparthrium 0; intrastomal disc generally present; vexillary filament often connate medially, but free, arched and thickened to form openings at base; flowers generally in pseudoracemes, sometimes in extensive panicles or clustered in axils; leaves generally imparipinnate, 3–many-foliate, leaflets generally strictly opposite and stipulate, occasionally alternate, sometimes 1-foliate or simple:

18a Leaves 1–many-foliate, if 3-foliate the lateral leaflets only slightly asymmetric; tree, shrub or liane with hard wood, less often a subshrub or herb (*Tephrosia* species generally have closely parallel nerves extending to leaflet margins, but easily confused with Phaseoleae subtribe Ophreistinae); inflorescences aggregated towards branch ends ......................................................................................................................... (=Tephrosieae) Millettieaeae (p. 179)

18b Leaves (1–)3-foliate, the laterals usually markedly asymmetric and regularly stipulate, occasionally 5–9-
foliolate; twining, prostrate or erect herb, sometimes a shrub, liane or tree; inflorescences often in many axils ... Phaseoleae (p. 180)

17b Hypanthium present, short to long, intrastaminal disc generally lacking; vexillary filament not flared at base of staminal tube; flowers almost always arising singly if inflorescence is extended; leaves variously paripinnate to imparipinnate; leaflets alternate to opposite, with or without stipules, sometimes 1–3-foliolate:
19a Fruit jointed or geocarpic ................................................................. Aeschynomenaceae (below)
19b Fruit neither jointed nor geocarpic:
   20a Ovules 1–4; fruit indehiscent, the seeds generally in separate seed chambers with hard endocarp; keel petals generally overlapping abaxially or, if margins adnate, flowers usually secund on the rachis, ± free from wings; stamens often shortly and/or irregularly joined ........................................ Dalbergiaceae (p. 178)
   20b Ovules generally more than 4; fruit generally more pod-like, even if flat and indehiscent:
       21a Flowers in axillary racemes (occasionally with 1 or 2 branches if on leafless shoots) or rarely strictly leaf-opposed or in axillary clusters; stamens three-quarters joined except some bird-flowers; keel petals axially joined (shortly in some bird-flowers); pods usually dehiscent, often sepalate internally ........... Robiniaceae (p. 179)
       21b Flowers in terminal panicles, sometimes with supplementary axillary racemes, rarely all axillary; stamens very rarely joined so high and keel petals usually overlapping abaxially; fruit generally indehiscent ....

.......................................................................................................................... Sophoreae and Milletticeae (=Tephrosieae) (p. 179)

Tribe Abreae
Only one genus in tribe .................................................................................. Abrus

Tribe Aeschynomenaceae

Key to genera
1a Leaflets digitately 2- or 4-foliolate (occasionally a few leaves with 3 leaflets), often glandular-punctate .............................................. Zornia
1b Leaflets 3–many (sometimes in Aeschynomene undeveloped at flowering time), pinnaate, the leaflets not all arising at the same point:
   2a Leaves paripinnately 4-foliolate; fruits developing underground; receptacle (extended hypanthium) long and filiform and easily mistaken for a pedicel but flowers are actually sessile; cultivated for seeds (peanuts) but sometimes found as an escape ........................................... Arachis
   2b Leaves not all 4-foliolate; fruits not developing underground (or if so, in Aeschynomene nematopoda, leaflets very narrow); receptacle not developed except in Stylosanthes:
      3a Leaves pinnately 3-foliolate; calyx extended basally as a pedicel-like receptacle; fruits with 1 or 2 articles, the apical article narrowed into a distinct hooked beak .......................................................... Stylosanthes
      3b Leaves paripinnate or imparipinnate with more than 3 leaflets; calyx not so extended; fruits rarely as above:
         4a Calyx subequally 5-toothed; shrub with hard woody stems; articles of the fruit elliptic or oblong, veined, often bristly or papillate; leaves imparipinnate, the leaflets usually ± alternate ............................................................ Ormocarpum
         4b Calyx 2-lipped or rarely 5-toothed but then tiny herbs; shrubs or herbs; articles rectangular or semicircular, less often elliptic; leaves usually paripinnate or rarely absent:
            5a Fruit curved into a ring, the articles dehiscent, leaving the persistent sutures; annual herb .............................................................................. Cyclocarpa
            5b Fruit not as above; if curved then plant not an annual:
               6a Inflorescence mostly lax; fruit straight, curved or rarely coiled, of 1–many articles, mostly well exerted from the calyx; bracts mostly small (except in sect. Rubrofarinateae), not scarious and not masking the flowers and fruits; bracteoles often deciduous ... Aeschynomene
               6b Inflorescence mostly dense and ± scorpioid, often strobilate; fruit not visible, enclosed within the calyx or bracts, folded like a concertina, of 1–9 articles:
                  7a Fruit not included in the calyx, of 1 or 2 articles; bracts membranous, larger than the flowers and hiding the fruit, persistent; bracteoles and calyx membranous .................................................................................. Humularia
                  7b Fruit included in the calyx, of 2–9 articles; bracts scarious, smaller than the flowers; bracteoles and calyx scarious:
                     8a Stipules not spurred; leaflets alternate, with 2–7 basal nerves; inflorescence distichous, usually dense and strobilate; bracts persistent; lateral appendages of keel petals short or lacking .................................................. Kotschya
                     8b Stipules spurred; leaflets opposite, with only one main nerve; inflorescence subumbellate; bracts deciduous; lateral appendages of keel petals nearly as long as the claws ........................................................................ Smithia

Tribe Coronilleae
Only one genus represented ................................................................................ Antopetitia

Tribe Crotalariaeae

Key to genera
1a Style straight, directed forwards or downwards; anthers subequal in length:
   2a Anthers elongate, 4 basifixated, 6 attached a little higher ......................................................... Pearsonia
   2b Anthers all small, rounded, 10, 9 or 5:
      3a Stamens 10, all fertile ............................................................................................................. Rothia
      3b Stamens 9, 4 lacking anthers ................................................................................................. Robynsiophytum
   1b Style curved upwards; anthers unequal in length:
DICOTYLEDONS

FABACEAE: Tribe Crotalarieae

4a Upper part of style glabrous, usually not differentiated from the lower part, never coiled; anthers normally 4 + 6 (carinal one intermediate); pods usually flat to only slightly inflated ............................................................... Lotononis
4b Upper part of style with 1 or 2 lines of hairs, rarely glabrous but then upper part clearly differentiated from the thicker lower part, or helically coiled; anthers 5 + 5; pods usually markedly inflated; keel beaked:
5a Beak of keel not helically coiled .............................................................. Crotalaria
5b Beak of keel helically coiled through several turns ........................................ Bolusia

Tribe Dalbergieae

Key to genera
1a Anthers basifixed, with apical dehiscence; stamens often fused in 2 groups of 5; some branches often modified as spines or climbing aids. Dalbergia
1b Anthers dorsifixed, with longitudinal dehiscence; stamens monadelphous or the vexillar one free; branches unarmed or stipules spinescent:
2a Leaflets opposite or subopposite; pod strongly falcate to curved ...................... Machaerium
2b Leaflets alternate; pod ± orbicular with a ± median seed ........................................ Pterocarpus

Tribe Desmodieae

Key to genera
1a Pod 2-valved, several-seeded, not breaking transversely into articles; leaflets, at least of upper leaves, 3 ........................................ Pseudarthria
1b Pod breaking transversely into articles:
2a Pod folded like an accordion, almost completely included in the calyx; leaflets (1–)3–9, up to 80 mm long or more ........................................... Uraria
2b Pod not as above; leaflets 1 or 3:
3a Pod on a long plumose stipe; petiole winged; leaflet 1 ................................................ Droogmansia
3b Pod not on a long stipe; petiole not winged:
4a Calyx ± glumaceous; leaflet 1; pod subcylindric or somewhat flattened .................................. Alysicarpus
4b Calyx not glumaceous; leaflets 1 or 3; pod flattened .............................................. Desmodium

Tribe Galegeae

Key to genera
Style bearded; pod membranous, often inflated, without a longitudinal septum ................................................................. Lessertia
Style glabrous; pod completely or incompletely divided longitudinally into 2 locules by the introflexion of the carinal suture .................. Astragalus

Tribe Genistaeae

Key to genera
Pods without glandular tubercles; lip formed by upper calyx lobes more than twice as long as the tube, as long as the lower lip .......... Argyrolobium
Pods with conspicuous glandular papillae; lip formed by the upper calyx lobes ± as long as the tube, shorter than the lower lip; leaves mostly crowded on short shoots ........................................................................................................ Adenocarpus

Tribe Indigoferae

Key to genera
1a Stamens free distally for ± 2 mm, sheath L-shaped, anthers without apiculate connective, tufted hairy above and below; style twisted, dilated medially or abruptly constricted at the base; keel prolonged-rostrate; endocarp without tannin deposits; leaves simple ................ Rhynchotropis
1b Stamens free distally for less than 1 mm, anthers with distinct apical connective; style tapering evenly to stigma:
2a Pods 3–5 mm wide, erect, stramineous, longitudinally ridged; leaflets often dentate; vexillar stamen lightly attached to the sheath; corolla darkly veined when dry; dorsal surface of standard glabrous; keel not prolonged-rostrate; endocarp without tannin deposits; leaves pinnate .......
................................................................................................................................................... Cyanopsis
2b Pods less than 3 mm wide, erect, patent or reflexed, not as above; leaflets never dentate; vexillar stamen free; corolla not darkly veined when dry:
3a Keel (and usually dorsal surface of standard) hairy; upper margin of the keel with a fringe of hairs; standard mostly broad at the base, tapering suddenly to a short claw; keel with lateral spurs, not prolonged-rostrate at the apex; endocarp tannins usually present ................ Indigofera
3b Keel (and usually dorsal surface of standard) glabrous; standard narrow at the base, tapering gradually to the claw; keel with lateral pockets (spurs absent), often prolonged-rostrate at the apex; endocarp without tannin deposits:
4a Style short, thick; stigma discoid; fruiting pedicels mostly over 2 mm long, ± patent; pods often held at ± a right angle; anthers, at least those of the 4 shorter stamens, with hyaline scales at the base; bracts persistent; inflorescences lax in bud .................................. Microcharis
4b Style narrow, tapering to an oblique or capitulate stigma; fruiting pedicels rarely over 2 mm long, reflexed (as are the pods); anthers of the shorter stamens mostly with scales reduced or absent; bracts caducous; inflorescences dense in bud .................................. Indigastrum

Tribe Loteae

Only one genus represented ................................................................. Lotus

Tribe Psoraleae

Key to genera
1a Flower pedicel subtended by a cupulum (a cup-shaped structure some distance below the flower); calyx lobes covered with black stubby hairs on inner face ........................................................................................................ Psoralea
1b Flower pedicel not subtended by a cupulum:
FABACEAE: Tribe Psoraleae

DICOTYLEDONS

2a Fruit ovoid, with conspicuous black glandular warts when mature ................................................................. Cullen
2b Fruit never with black glandular warts ................................................................................................................ Otholobium

Tribe Robinieae

Only one genus represented ................................................................................................................................. Seseania

Tribe Sophoreae

Key to genera
1a Flowers ± regular; the adaxial petal sometimes a little broader .......................................................... Amphimas
1b Flowers irregular:
  2a Lower petals ± similar, pinnately nerved (fine subsidiary basal nerves in Camoensia), or absent:
    3a Leaves digitately 3-foliolate, stipellate; stamens joined; upper 2 calyx lobes ± joined; fruit a woody pod, lianes or climbing shrubs . Camoensia
    3b Leaves pinnate; stamens free; calyx lobes equal or very short:
      4a Fruit turulous; testa thin (often attached to endocarp); standard abruptly expanded above claw, markedly unlike other petals .... Angylocalyx
      4b Fruit drupaceous; testa very hard; standard small, gradually broadened from claw, not so markedly unlike other petals, hairy ... Xanthocercis
  2b Lower petals present, pinnately nerved, generally differentiated into wings and keel but sometimes reduced in ornithophilous flowers:
    5a Petals 1 or 6; leaves 1-foliolate or with less than 15 leaflets, without pellucid glands; stamen filaments free or almost so:
      6a Petals 0; leaflets 10–30 per leaf, with many pellucid glands; stamen filaments confluent basally with the hypanthium (calyx tube) ................................................................. Calycina
      6b Petals compound:
        10a Pod moniliform, stalked; flowers white, yellow or rarely blue-violet, in racemes or leafy panicles ........................................... Pericopsis
        10b Pod not moniliform:
          11a Pod broadly linear, ± winged or margined; flowers yellow ................................................................. Cullen
          11b Pod not winged; flowers mainly blue and pink ....................................................................................... Swartzia
    5b Calyx lobes valvate to very slightly imbricate; stigma terminal; seeds various:
      6a Leaves simple or 1-foliolate (with 1 or 2 pulvini):
        7a Calyx cup- to bell-shaped with 5 short teeth:
          8a Bracteoles large, enveloping the bud; seeds discoidal ........................................................... Dalhausia
          8b Bracteoles small; seeds transversely oblong-ellipsoid, red, with cup-shaped aril ................................... Bowringia
        7b Calyx splitting to base on one or both sides:
          9a Anthers longer than filaments; flowers in 2 rows on 1 side of rachis; seed 1 with a white, spongy cup-shaped aril .... Leuccephalos
          9b Anthers shorter than filaments; racemes not secund; seeds 1–several, with a small rim-aril ........................................... Baphia
      6b Leaves compound:
        10a Pod moniliform, stalked; flowers white, yellow or rarely blue-violet, in racemes or leafy panicles ........................................... Calypria
        10b Pod not moniliform:
          11a Pod broadly linear, ± winged or margined; flowers yellow ................................................................. Swartzia
          11b Pod not winged; flowers mainly blue and pink ....................................................................................... Pericopsis

Tribe Swartziae

Key to genera
1a Petals 0; leaflets 10–30 per leaf, with many pellucid glands; stamen filaments confluent basally with the hypanthium (calyx tube) .......... Cordyla
1b Petals 1 or 6; leaves 1-foliolate or with less than 15 leaflets, without pellucid glands; stamen filaments free or almost so:
  2a Petals 6, almost equal; leaves 1-foliolate ................................................................. Baphiopsis
  2b Petal 1, crinkled; leaves imparipinnate with less than 15 leaflets ................................................................. Swartzia

Tribe Trifolieae

Key to genera
1a Petals becoming dry and persistent after flowering; filaments mostly dilated upwards; fruit indehiscent ........................................... Trifolium
1b Petals falling after flowering; filaments not dilated:
  2a Flowers in slender racemes; ovules few; fruit indehiscent or tardily 2-valved ..................................................... *Melilotus
  2b Flowers in heads, umbels or short racemes or rarely solitary:
    3a Fruit mostly spirally coiled, scarcely dehiscent, mostly prickly ........................................................... *Medicago
    3b Fruit straight or curved, mostly linear, not prickly:
      4a Herbs, prostrate, rooting at nodes; stipules free from petioles, their base forming a ring around the stem .......... Parochetus
      4b Herbs, mostly erect to suberect, not rooting at nodes; stipules adnate to petioles ........................................... *Trigonella

Tribe Vicieae

Only one genus represented ................................................................................................................................. Vicia

Tribe Millettieae (=Tephrosieae)

Key to genera
1a Vegetative leaves (far) below the inflorescence, with 1 or 3 leaflets:
  2a Fruits 1-seeded, globose or ellipsoid; leaves all 1-foliolate; flowers in axillary clusters all along the stems .......... Requienia
  2b Fruits several-seeded:
    3a Fruits contorted, thin-walled, indehiscent; leaves digitately 3-foliolate to 1-foliolate; flowers all axillary .................. Psycholobium
    3b Fruits not folded ............................................ Tephrosia
  1b Vegetative leaves with 5 or more leaflets:
    4a Leaflets distinctly alternate:
5a Undersurface of leaflets with hyaline pearl-glands; inflorescence consisting of a group of 2–4 axillary racemes; pod thick, woody ................................................................. Schefflerodendron

5b Undersurface of leaflets without such glands; inflorescence a terminal or, less often, axillary raceme or a terminal panicle; pod thinly woody, indehiscent ........................................................................................................................................

4b Leaflets opposite or sub-opposite:

6a Lateral nerves many (more than 30 pairs) and very close to each other; stipels and bracteoles generally absent; calyx lobes subequal; pseudoracemes terminal or leaf-opposed ............................................................................................................ Tephrosia

6b Lateral nerves less than 15 pairs, or if more than 15 pairs, the leaflets very large and lateral nerves distant; stipels present or absent:

7a Flowers in usually wide panicles (with the flowers singly in the axil of a bract), sometimes in terminal racemes, but then combined with axillary racemes (“leafy panicle”):

8a Vexillary stamen at least halfway connate with the other 9; calyx cupular; flowers small and unattractive; pod usually falcate, indehiscent or opening only at the apex, without wings or with one or both sutures narrowly keeled; trees or shrubs ................. Philenoptera

8b Vexillary stamen entirely free from the other 9:

9a Standard with 2 distinct basal inflexed appendages; calyx 2-lipped ................................................................................................................................. Dewevrea

9b Standard with or without very indistinct basal appendages or only the margin thickened at the base; calyx not 2-lipped:

10a Stipules spinose; axillary panicles at the apex of branches, the apical part of which continues vegetatively after a flowering period; pod thin with a wing on the dorsal and on the ventral suture ........................................................................................................... Xeroderris

10b Stipules herboceous or chartaceous; panicles terminal, sometimes combined with axillary racemes in the upper leaves or on leafless branches; pod thinly coriaceous, only woody around the seeds, with a wing on the dorsal and on the ventral suture ... Aganope

7b Flowers in pseudoracemes or in pseudopanicles:

11a Pseudoracemes single, axillary, sometimes on leafless branches below the leaves:

12a Standard with 2 distinct basal inflexed auricles; vexillar stamens connate with the other 9, at base with 2 translucent areas; pod thick, woody, flat, (1)2-5-seeded; seeds lens-shaped ....................................................................................... Millettia subgen. Otosema

12b Standard without distinct basal appendages, sometimes the basal margin thickened:

13a Vexillary stamen free; trees or lianes; leaflets many, more than 11 per leaf; pod oblong, with many plumose appendages along the dorsal suture .......................................................................... Dalbergiella

13b Vexillary stamen connate with the other 9, usually with 2 translucent areas at the base:

14a Fascicles 3- or more-flowered ....................................................................................................................... Millettia subgen. Millettia

14b Fascicles 2-flowered, often mixed with single flowers in the same pseudoraceme; trees or lianes; vexillar stamen connate with the other 9 .......................................................................................... Philenoptera subgen. Lonchocarpus

11b Pseudoracemes terminal or arranged in a (terminal) pseudopanicle, or 2 or 3 (rarely more) pseudoracemes together in a leaf axil:

15a Vexillary stamen entirely free; pseudoracemes exclusively terminal:

16a Shrubs; stipels absent; calyx with subequal lobes; pod thin, woody, indehiscent .................................................................................................................... Mundulea

16b Liane; stipels present; dorsal 2 calyx lobes enlarged, covering the standard completely; pod thick, woody, dehiscent or indehiscent ........................................................................................................ Plateysepalum

15b Vexillary stamen at least halfway connate:

17a Standard with 2 basal, inflexed auricles:

18a Stipels always present; pseudoracemes in pseudopanicles; pod thin, indehiscent, with or without a dorsal wing . Leptoderris

18b Stipels present or absent; pseudoracemes terminal; pod thick, woody, without wings; trees or lianes . Millettia subgen. Otosema

17b Standard without basal appendages:

19a Pod thick, woody, without wings; stipels present or absent; trees or lianes .................................................................................. Millettia subgen. Millettia

19b Pod thin, with 1 or 2 wings; stipels aways absent .......................................................................................... Derris sect. Derris

Tribe Phaseoleae

Key to genera

1a Undersides of leaflets, calyces, sometimes the petals and other organs covered with gland dots (sometimes difficult to see if indumentum dense):

2a Ovary 3–8-ovuled; pod grooved between the seeds, linear-oblong, inflated, 45–100 mm long; cultivated shrub ................................................................. *Cajanus

2b Ovary 2-ovuled; pod not grooved, sometimes smaller or more tapered to the base:

3a Shrubs with fasciculate, dense, axillary inflorescences; pods oblong-ovoid, somewhat inflated, 9–12 x 6 mm, densely but irregularly covered with dark red globular secretion which stain yellow .................................................................................. Flemingia

3b Herbs or shrubs, mostly with pedunculate inflorescences, if sessile not dense, axillary and fasciculate; pods mostly (but not always) rather flattened, not bearing red globules of secretion:

4a Bracteoles present at the base of the calyx, caducous; style stiff, thickened below, bearded above; standard white, mauve or crimson-purple; pod oblong-falcate, much narrowed to the base .......................................................................................... Adenodolichos

4b Bracteoles absent; style thinner, glabrous on upper part; standard usually yellowish, often with extensive reddish purple veining; pod not narrowed so conspicuously to the base:

5a Funicle inserted at middle of the circular hilum; flowers spreading; pod broadened upwards, 3–4 times as long as broad, pubescent, sometimes with longer hairs interspersed .................................................................................. Rhynchosia

5b Funicle attached at one end of the linear hilum; flowers deflexed; pod ovate or elliptic-oblong, abruptly contracted to the stipe, up to twice as long as broad, covered with long hairs (or in one section of the genus velutina) ........................................................................... Eriosema

1b Undersides of leaflets, etc. without conspicuous gland dots:

6a Pods covered with bristly irritant hairs; standard much shorter than the other petals; keel petals mostly homy at the apex; 5 larger sub-basifixed
anthers alternating with 5 shorter versatile or basifixed anthers; seeds large, either globose or oblong, with short hilum and conspicuous rim aril, or discoid with hilum occupying over half the circumference and no rim aril ................................................................. Mucuna

6b Pods not covered with bristly irritant hairs and without other characters combined (note: many species have bristly hairs on their pods):

7a Mostly trees armed with strong prickles, stems sometimes annual from a woody rootstock; corolla mostly large, orange, scarlet or crimson, the standard usually larger than the other petals; pod often constricted between the seeds; seeds mostly red, orange or yellow, with a white or black hilum ......................................................................................................................................................... Erythrina

7b Herbs, subshrubs or herbaceous to woody climbers, without prickles:

6a Calyx lobes, bracts and bracteoles with clavate gland-tipped apices; erect or climbing herbs or subshrubs; pod 15–30 x 8–9 mm, compressed, densely and coarsely appressed hairy ......................................................................................................................................................... Eminia

6b Calyx lobes, bracts and bracteoles not gland-tipped:

9a Calyx obliquely truncate with no trace of teeth or scarcely any; seeds subglobose, black, remaining attached to the placenta after the pod dehisces ........................................................................................................................................................................ Dumasia

9b Calyx teeth developed; pods and seeds not as above:

10a Standard hairy outside (sometimes only finely so, but then standard much larger than the other petals); upper calyx lobes not completely joined:

11a Standard with a small spur 1–2 mm long on the outside above the claw; stipules and bracteoles with close parallel raised nerves; pods with longitudinal raised ribs on either side of the margins ........................................................................................................................................ *Centrosema

11b Standard without such a spur and without the other characters combined:

12a Standard much larger than the other petals, 30–50 mm long, very finely puberulous; pod 60–120 x 7–12 mm; commonest species with 5–7-foliolate leaves, others 3-foliolate ......................................................................................................................................................... Clitoria

12b Standard not much larger than the other petals and often shorter than 30 mm; pods mostly shorter or narrower:

13a Corolla ± 10–20 mm long; inflorescences with long peduncles; style long, with tenuous basal part and curved bearded thickened upper part beaked along the lateral stigma; pods linear-cylindric ........................................................................................................................................ Vigna (in small part) 13b Corolla 4–11 mm long, if over 10 mm then inflorescences in sessile clusters; style short, not as above; pods linear-oblong to oblong:

14a Flowers in elongated lax inflorescences or if subsessile, then in axillary clusters; stamens monadelphous; pods over 20 mm long; ovules 2–8 and pods mostly more than 2-seeded; pods 17–65 x 4.5–8.0 mm ........................................................................................................................................ Ophrestia

14b Flowers in sessile or mostly stalked condensed inflorescences; stamens diadelphous; ovules 2 and pods 1- or 2-seeded; pods 12–20 x 6–8 mm ........................................................................................................................................ Pseudocriosema

10b Standard glabrous outside, or if with a few marginal hairs then upper calyx lobes completely joined:

15a Alternate stamens sterile, lacking anthers; pods elongate, linear, distinctly upturned at the apex ................................................................................................. Teramnus

15b All stamens with anthers (except very rarely in cleistogamous flowers, or in Dioclea where alternate anthers may be sterile); pods without a distinct upturned beak or if beaked then very short and never linear:

16a Pods longitudinally 4-winged; vexillary stamen connate above, free below; stigma terminal or internal, penicillate, or style with a conspicuous ring of hairs beneath it; bracteoles large; corolla blue or purplish (rarely yellow) ........................................................................ Psophocarpus

16b Pods not longitudinally 4-winged and without the other characters combined:

17a Style with a reflexed appendage beyond the stigma curved through 360–450º; keel curved inwards through 250–280º; basal corner of keel produced into a long erect spur ........................................................................................................................................ Physostigma

17b Style sometimes produced beyond the stigma as a beak but never reflexed back as an appendage; keel, if coiled without such a prominent spur:

18a Pods large, linear-oblong to oblong, usually with longitudinal ribs close to or on the upper margin, 100–400 x 25–50 mm; standard large, reflexed, 25–35 mm long; seeds 14–35 mm long; vexillary filament free below but connate above with the rest; calyx lobes unequal, the upper 2 rounded and larger than the lower 3; woody climbers or lianes:

19a Racemes terminal; bracts much smaller than flowers; anthers uniform ........................................................................................................................................ Canavalia

19b Racemes terminal; bracts much longer than flowers; anthers often alternately fertile and sterile ........................................................................ Dioclea

18b Pods and seeds never so large or if nearly so, then pods without ribs; if vexillary stamen connate then corolla smaller:

20a Vexillary stamen and other short stamens with a pair of fused glands below the anthers; division of style into tenuously thickened portions obscure but upper part densely barbate; pollen grains without evident sculpture ................................................................. Vigna (subgen. Haydonia)

20b Vexillary and other short stamens without a pair of glands below the anthers:

21a Style distinctly flattened and spatulate at the apex:

22a Bracteoles shorter than the calyx tube; upper calyx lobes completely or not completely connate; standard without appendages; filaments less dilated above, the vexillary one basally dilated but without a tooth at the base; seeds not arillate ........................................................................................................................................ Sphenostylis

22b Bracteoles as long as the calyx tube and sometimes broader; upper calyx lobes completely joined to form a truncate lip; standard with appendages; filaments dilated at the apex, the vexillary one with a tooth at the base; seeds arillate ........................................................................................................................................ Nesphostylis

21b Style various but not apically flattened and spatulate (somewhat so at the very tip in Dolichos junodii from southern Mozambique, but then covered with long hairs):

23a Style with a distinct bulging eccentric callus at its junction with the ovary; style half the length of the ovary; bracteoles absent; usually an extensive climber but sometimes erect and flowering when leafless or almost so ........................................................................................................................................ Neorautenania
23b Style without a callus at its junction with the ovary:

24a Style divided into a thin basal part and a thick hardened upper part:

25a Style with thickened part (together with the keel) twisted through more than 360°, with the stigma terminal but not penicillate; stipules not produced below point of attachment; standard mostly without appendages; pods oblong to linear-lanceolate, 45–200 x 7–25 mm; pollen grains with or no very fine sculpture ........................................... *Phaseolus

25b Style with thickened part twisted through no more than 360°, usually up to 180°:

26a Thickened part of the style characteristically abruptly curved through 90° just above its junction with the tenuose part and narrowed and slightly curved towards the apex, resembling a squarish hook; stipules not produced below the point of attachment; wings round, large, longer than the standard and keel; claws of wings and keel long, partly adnate to the staminal tube; pods long, cylindrical; pollen grains finely reticulate ........................................................................................................................................... *Macroptilium

26b Thickened part of the style not of this characteristic hook-like shape and without the other characters combined:

27a Thickened part of the style curved through 180–360°; stigma terminal, penicillate with a ring of simple or branched hairs but rest of thick part of the style glabrous; thin part of the style extremely slender, filiform; stipules not produced below the point of insertion; pod long, linear; pollen grains strongly but not widely reticulate; twiner with usually precocious flowers in axillary fascicles .................. Decorsea

27b Thickened part of the style curved through 90–360°; stigma lateral or nearly so, not penicillate and style often produced as a beak beyond it; thick part of style usually densely bearded; thin part often ribbon-like; stipules often but not always produced below the point of insertion; pollen grains, except in a few species, with a very open raised reticulation ...................................................... Vigna

24b Style either uniformly thick or uniformly thin or tapering upwards or downwards, but not distinctly of two parts:

28a Style distinctly thickened; standard mostly purple and with distinct appendages inside near the base:

29a Style conspicuously flattened laterally, straight and blade-like throughout its length, forming an angle of just less than 90° with the ovary ............................................................... Lablab

29b Style subterete at least in the upper part (sometimes expanded apically):

30a Style expanded at the tip into a horizontal spoon-like cover, from which is suspended the spherical stigma, glabrous; upper wing spurs greatly developed ......................................................... Otoptera

30b Style tapered, with a terminal generally penicillate stigma; wings not markedly auriculate ............ Dolichos

28b Style not distinctly thickened, often short and inconspicuous; standard mostly without appendages (not to be confused with auricles where claw and blade meet):

31a Pods rather distinctly transversely grooved, the grooves corresponding to strong internal septa, densely covered with spreading somewhat ferruginous hairs as on the stems; climbers with blue flowers in sessile or stalked clusters; standard 7–10 mm long .............................................. *Calopogonium

31b Pods not distinctly transversely grooved or if slightly so not so conspicuously septate and inflorescences lax and elongate:

32a Pods oblong, 6–10 mm wide, densely covered with stiff spreading bristly hairs; leaflets usually lobed and sericeous beneath with long appressed hairs; standard purple, violet or white, 13–26 mm long, without appendages; seeds with a reticulate coating:

33a Stigma not penicillate; style filiform and hairy on the basal part, upper third virtually glabrous; inflorescence long, and long-stalked ......................................................... Pseudemania

33b Stigma penicillate; style tenuous and glabrous, the upper part more cylindrical but not really thickened; inflorescence short, subsessile .............................................. Pseudovigna

32b Pods glabrous to densely hairy but if covered with spreading hairs then pods longer, linear and usually under 6 mm wide (except the cultivated soya bean, Glycine max) or inflated:

34a Bracteoles absent; inflorescence slender and lax, the many flowers in groups of 2 or 3; standard mauve or violet, 8–16 mm long; pods glabrous except sometimes for densely ciliate margins; bracts conspicuous, seriate, persistent; calyx tubular, the standard thus reflexing only towards the apex; pods flattened; seeds not arillate ............................................................. Amphicarpae

34b Bracteoles present; other features not combined:

35a Corolla greenish yellow, cream-coloured or yellow, sometimes with a pink or purple mark; standard 6–26 mm long, provided inside with 2 long, linear, lamelliform appendages; stigma terminal, usually ± distinctly penicillate; pollen grains covered with short blunt tubercles ......... ................................................................................................................. *Macrotyloma

35b Corolla blue, mauve, violet or white; standard 3–14 mm long, devoid of appendages:

36a Leaflets elliptic-oblong, obtuse or emarginate; pods (15–)30–60(–80) x 5–10 mm; upper calyx lobes united to form an entire lip; vexillary filament free .............................................. Galactia

36b Leaflets elliptic or ovate, acute or acuminate; pods (7–)15–36 x 2.5–5.0 mm; upper calyx lobes almost completely united but lip narrowly bifid at the apex; vexillary filament joined to the others, at least initially; flowers in clusters along the extended rachis; climbing or trailing ......... .................................................................................................................................. Neonotonia
Abras Adans.
(Papilionoideae—Abraeae)
Torre: 3 (1966); White: 138 (1962); Lock: 100 (1989).


Acacia Mill.
(Mimosoideae—Acacieae)


Adenocarpus DC.
(Papilionoideae—Genistaeae—Genistinae)

Much-branched shrubs, with silky or villous indumentum. Leaves digitately 3-foliolate; stipules small and caducous or absent. Inflorescence terminal, racemose. Calyx 2-lipped, upper lip deeply bifid, lower one tridentate or 3-lobed. Corolla: standard suborbicular, slightly longer than the obovate or oblong wings; keel much incurved or shortly beaked. Stamens all joined into a closed tube; anthers alternately long and short. Ovary ellipsoidal, 2-ovuled; style incurved, laterally flattened, swollen at base, barbate above on inner side; stigma terminal, oblique, ± folded. Pods oblong-falcate, compressed, beaked with persistent curved style base, narrowed below, ± glandular. Seeds 1 or 2, usually rounded and compressed; hilum grooved; rim aril developed or absent.

Species ± 15, confined to trop. Africa; sthn Afr. 8, Angola, Zambia, Zimbabwe, Malawi, Mozambique. The genus has very much the facies of Rhynchosia but differs in style characters. The species are very difficult to define and the taxonomy of the genus is poorly understood.

Adenolobus (Harv. ex Benth.) Torre & Hillc.
(Caesalpinioideae—Cercideae)
Torre & Hillcoat: 194 (1956); Brunnett & Ross: 399 (1976); Lock: 40 (1989); Coates Palgrave: 337 (2002).


Adenopodia C.Presl
(Mimosoideae—Mimosae)
Brenan: 73 (1986); Lock: 87 (1989); Coates Palgrave: 312 (2002).

Entada Adans. in part; Torre: 257 (1956).


Aeschynomene L.
(Papilionoideae—Aeschynomeneae—Aeschynomenae)


Afzelia Sm.
(Caesalpinioideae—Detarieae)
Torre & Hillcoat: 214 (1956); Lock: 45 (1989); Bingham & Smith: 141 (2002); Coates Palgrave: 331 (2002).

Intsia Thouars; Hiern: 299 (1896).


Aganope Miq.
(Papilionoideae—Millettieae)
Miquel: 151 (1855); Polhill: 266 (1971a); Lock: 349 (1989).


Climbing, evergreen shrubs. Leaves alternate, imparipinnate; lateral leaflets in ±3–5 pairs, opposite or subopposite, somewhat coriaceous, glossy above. Inflorescence: a thyrsoid panicle, terminal or in axils of upper leaves; bracts linear to ovate, often caducous. Calyx brous; wings with long spur at base of lamina. Stamens: vexillary stamen free; 5 basifixied anthers alternating with 5 shorter medifixed ones. Ovary ellipsoidal, 2-ovuled; style incurved, laterally flattened, swollen at base, barbate above on inner side; stigma terminal, oblique, ± folded. Pods oblong-falcate, compressed, beaked with persistent curved style base, narrowed below, ± glandular. Seeds 1 or 2, usually rounded and compressed; hilum grooved; rim aril developed or absent.

Species ± 15, confined to trop. Africa; sthn Afr. 8, Angola, Zambia, Zimbabwe, Malawi, Mozambique. The genus has very much the facies of Rhynchosia but differs in style characters. The species are very difficult to define and the taxonomy of the genus is poorly understood.
campanulate, minutely 5-toothed. **Corolla** creamy white; standard occasionally greenish, sometimes marked with pink, ± glabrous, shortly clawed; wings generally free from keel, sometimes lightly coherent; keel petals ± as long as wings, partially coherent along lower margin. ** Stamens** diadelphous, vexillary one free; anthers all similar, dorsifixed. **Ovary** sessile or shortly stipitate; style tapering, terminating in a minute stigma; ovules ± 10. **Fruit** indehiscent, flattened, elongate, margined with a wing on one or both sides, venose; valves coherent between seeds. **Seeds** ± oblong-ovoid; radicle short, spreading in mature seeds.


**Albizia Durazz.**
(Mimosoideae—Ingeae)


**Alysicarpus Desv.**
(Papilionoideae—Desmodieae—Desmodiinae)


**Amblygonocarpus Harms**
(Mimosoideae—Mimoseae)
Torre: 264 (1956); White: 90 (1962); Brenan & Brummitt: 35 (1970); Lock: 87 (1989); Coates Palgrave: 305 (2002).


**Amphicarpaea Elliott ex Nutt.**
(Papilionoideae—Phaseoleae—Glycininae)

Climbing herbs. **Leaves** pinnately 3-foliolate; stipels present. **Flowers** in lax racemes, sometimes dimorphic with cleistogamous flowers; bracts conspicuous, striate, but bracteoles absent. **Calyx** 5-lobed, but with the two upper lobes connate. **Corolla** small; standard obovate, glabrous. ** Stamens** vexillar stamen free, rest fused into a sheath; anthers uniform, or, in cleistogamous flowers, up to 5 fertile. **Ovary** shortly stipitate, many-ovuled; style geniculate, filiform, bearded; stigma capitate, terminal, or, in cleistogamous flowers, style short with stigma angled such that it is in contact with anthers. **Pod** linear or falcate, compressed. **Seeds** variously coloured, subglobose or ovoid, with a short lateral hilum.

Species ± 3, N and tropical America, extending to Asia, with 1 species: *Amphicarpaea africana* (Hook.f.) Harms in trop. Africa; sthnl trop. Afr.: Zambia, Malawi. The generic name was originally spelt Amphicarpa, but it has been conserved with the spelling used here.

**Amphimas Pierre ex Harms**
(Papilionoideae—Sophoreae)
Harms: 157 (1906); Wilczek: 546 (1952); Torre & Hilleco: 169 (1956); Aubréville: 28 (1968b); Lock: 465 (1989).

Trees. **Leaves** pinnate; leaflets 11–19, alternate or opposite, oblong-ovate, rounded to cordate at base; each with a persistent filiform stipel at base. **Inflorescences** terminal panicles with many dense, many-flowered spike-like branches. **Flowers** bisexual or unisexual by abortion; pedicels articulated at apex; bracts lanceolate, caducous. **Calyx** campanulate, with 5 short, equal, deltoid lobes valvate in bud. **Petals** 5, divided up to middle into 2 linear lobes, recurved and crumpled in bud. **Stamens** 10, united at base into a cup, slightly exerted, opposite petals. **Ovary** long-stipitate, hirsute; ovules 2. **Pod** narrowly elliptic, flattened, central part very narrowly elliptic, reticulate, entirely surrounded by a broad longitudinally striate part. **Seeds** 1(2), kidney-shaped, brown.

Species 2–4, trop. Africa (Guineo-Congolian); sthnl trop. Afr. 1 or 2, Angola.

**Anglylocalyx Taub.**
(Papilionoideae—Sophoreae)

Trees or shrubs. **Leaves** imparipinnate; stipules small; stipels lacking; lateral leaflets few, alternate to subopposite, often acuminate. **Flowers** in racemes, generally clustered on old wood, sometimes amongst leaves; bracts and bracteoles small; pedicels jointed. **Hynpanthium** conical, at least half as long as calyx, with ovary arising near base on upper side, sometimes slightly gibbous; calyx continuing or at an angle to line of hynpanthium, tubular, very shortly and broadly lobed to subtruncate, usually torn to some extent as corolla opens, bearing petals and stamens on a rim at base. **Petals** subequal in length, glabrous except sometimes on standard outside; standard elliptic to orbicular with a well-developed claw; wings asymetrically lanceolate, not or scarcely auriculate at base of blade, free or slightly adnate to keel; keel-petals similar but narrower, free or lightly adnate. **Stamens** free; anthers subsessifixed. **Ovary** stipitate, ± 8–20-ovulate; style relatively short, bent upwards, glabrous on upper part, with a small terminal stigma. **Pod** torulose, beaked, indehiscent. **Seeds**: testa adhering to fruit wall; embryo detached and lying free within, oblong-ellipsoid or shallow cylindrical, with a very short straight radicle near one end.


**Anthonotha P.Beauv.**
(Caesalpinioideae—Detarieae)
Beauvois: 70 (1806); Exell & Hilleco: 200 (1956); Brenan: 153 (1967); Lock: 1 (1989).
Macrollobium partly in sense of some African authors; Baker: 139 (1928); Léonard: 409 (1952b) in part.

Unarmed evergreen trees. Leaves paripinnate; stipules free, or connate into an infrapetiolar scale; petiolules not twisted; leaflets opposite, in (1)–7 pairs, petiolate, equal-sided or nearly so at base, without translucent gland dots. Flowers in lateral or terminal panicles, or sometimes racemes; bracteoles 2, well-developed, valvate, completely enclosing flower buds, persistent. Hypynanthium ± shortly tubular or cupuliform. Sepals 4 or 5, equal, or with 1 larger than others. Petals 2–6, equal, or with 1–3 larger than others. Stamens (6–)9(10), free; usually 3(–5) of them large and 1–7 ± reduced, small and staminaloid. Ovary with 2–5 ovules. Pods dehiscing into 2 flattened woody valves with transverse nerves. Seeds large, ± compressed, non-areolate, with thin testa and short funicule.


Antopotitia A.Rich. (Papilionoideae—Coronillaeoneae)

Spreading to erect, pubescent annuals. Leaves imparipinnate; petiole absent or very short; leaflets 5–11, alternate or subopposite, narrowly elliptic to linear-oblongate, rounded to acute at apex, cuneate at base; stipels absent or very short; stipules reduced to glands. Inflorescences axillary, pedunculate, 2–8-flowered umbels; bracts and bracteates minute, caducous. Flowers small. Calyx pubescent; receptacle obconic; teeth subequal, narrowly triangular. Corolla glabrous; petals with claws ± as long as blades. Stamens 10, diadelphous; vexillary one completely free; free parts of filaments flattened; anthers uniform. Ovary stipitate, glabrous, arising laterally on receptacle; ovules many; style very short, curved; stigma enlarged. Pod curved, made up of 2–5 spherical, 1-seeded articles, each of which splits into 2 valves; dorsal suture persistent. Seeds spherical, minutely warted; hilum circular, minute. Monotypic genus: Antopotitia abyssinica A.Rich., trop. African mountains; sthn trop. Afr.: Zambia, Zimbabwe, Malawi, Mozambique.

Aphanocalyx Oliv. (Caesalpinioideae—Detarieae)
Oliver: t. 1066 (1870); Baker: 733 (1930); Léonard: 438 (1952b); Aubréville: 274 (1968b); Wieringa: 115 (1999); Bingham & Smith: 141 (2002); Gervais & Bruneau: 30 (2002); Brummitt (Unpublished).

Monopetaltanthus Harms in part: 195 (1897); Exell & Hillocat: 203 (1956); White: 126 (1962); Brennan: 196 (1967); Lock: 16 (1989).

Shrubs or small to large trees. Leaves paripinnate, 1–57-jugate; rachis ± terete, sometimes with a poorly developed (grooved) rib on upper side; leaflets opposite, distal half usually completely absent, resulting in distal margin being formed by the midrib, both halves (as far as present) with glands; stipules completely fused, with many closely spaced veins. Inflorescence a compound raceme, in most species reduced to a single raceme; bracts densely parallel-veined, glabrous inside; bracteoles fused with sepals, petals and stamens into a short hypynanthium. Sepals up to 5, but some or all usually absent; adaxial sepals free to fused. Petals: adaxial petal fully developed; lateral and abaxial ones reduced and often absent. Stamens usually 10, all fertile; adaxial stamen free, 9 united at base; filaments filiform, glabrous; anthers small, broadly eliptic, often with small to large dorsal teeth, longitudinally dehiscent. Ovary on a short stipe, hairy; ovaries 1–6; style insertion not hooked, angle 0–90º. Pod compressed, dehiscing with 2 woody valves, lateral nerve usually distinct, running fairly high and sometimes fused to dorsal wings, dorsal suture sometimes distinctly winged. Seeds disc-shaped; testa thin.


*Arachis L.*
(Papilionoideae—Aeschynomeneae—Stylosanthesinae)
Linnaeus: 741 (1753); Hiern: 239 (1896); Verdcourt: 169 (2000).

Annual, erect or straggling herbs. Leaves paripinnately 4-foliolate; leaflets obovate or elliptic, mucronate at apex; stipules partly adnate to petiole, linear-lanceolate, very acute, ciliate, veined, persistent; stipels absent. Flowers axillary, apparently solitary and stalked; primary bracts ovate-lanceolate, biapiculate; secondary bracts similar but 2-fid; receptacle long and filiform, pedicel-like. Calyx membranous, filiform, 5-lobed: 4 upper lobes joined, lower one ± free. Corolla yellow, usually with red nerves; standard rounded, usually 20, S Africa; sthn trop. Afr. 1: *Arachis hypogaea* L. the ground-nut, is widely cultivated; sthn trop. Afr., and is occasionally found as an escape.

Argyrolobium Eckl. & Zeyh. (Papilionoideae—Geniseteae—Genistinae)
Torre: 77 (1962); Polhill: 1000 (1971b); Lock: 267 (1989).


Astragalus L. (Papilionoideae—Galegeae—Astragalinae)


Baikiea Benth. (Caesalpinioideae—Detarieae)
Léonard: 296 (1952b); Torre & Hillcoat: 217 (1956); Lock: 45 (1989); Bingham & Smith: 141 (2002); Coates Palgrave: 329 (2002).
Baphia Afzel. ex Lodd.
(Papilionoideae—Sophoraceae)

Baphiopsis Benth. ex Baker
(Papilionoideae—Swartzicaceae)

Bauhinia L.
(Caesalpinioideae—Cercidaceae)

Bowringia Champ. ex Benth.
(Papilionoideae—Sophoraceae)
Bentham: 75 (1852); Harms: 432 (1913); Toussaint: 6 (1953); Hillcoat: 380 (1966); Lock 473 (1989).

Brenaniodendron et al.
(Caesalpinioideae—Amherstieae)
Baker: 145 (1928); Hoyle: 221 (1956); White: 101 (1962); Hoyle: 157 (1967); et al.: 305 (2001); Bingham & Smith: 151 (2002); Coates Palgrave: 320 (2002).

Brenaniodendron J. Léonard
(Caesalpinioideae—Detarieae)
Léonard: 9 (1999a); Coates Palgrave: 346 (2002).

Unarmed evergreen trees or shrubs. Leaves alternate, unifoliolate; stipules very small and soon falling off; blade without pelticul dots. Flowers bisexual, in short racemes or almost fasciculate, each flower subtended by 2 small nervose caducous bracteoles. Calyx ellipsoid and entire before dehiscence, opening by a single slit and reflexing, or becoming divided into 2 or 3 lobes; no disc or cupular hypanthium. Petals 6, almost equal, imbricate, upper one with its margins overlapped. Stamens 13–41, arranged around base of ovary, free or almost so; anthers basifixed, dehiscing by longitudinal slits; connective not glandular. Ovary sessile or nearly so, 2–5-ovuled, tapering upwards into a subulate style which is bent in its upper part and bears a minute capitiate stigma. Pods thick, beaked 1(2)-seeded. Seeds large, thin-walled, apparently not arillate, without endosperm; embryo curved.


Unarmed trees. Leaves paripinnate; stipules intrapetiolar, connate into a scale (at least on mature shoots); leaflets opposite or subopposite, in (1)2–5 pairs, petiolulate, equal or ± unequal-sided at base, with or without translucent dots. Flowers in racemes or panicles of racemes; bracteoles 2, well-developed, valvate, completely enclosing flower buds, persistent. Hypanthium tubular, 7–20 mm long. Sepals 5, subequal. Petals 5; upper one relatively very large and long-clawed, 4 others much reduced. Stamens 10; filaments exerted, 9 of them shortly connate at base, the other one free. Ovary shortly stipitate, arising on tube of hypanthium; ovules 2–8. Pod dehiscing elastically into 2 flattened woody valves which are obliquely transversely nerv ed when mature; upper suture narrowly winged on each side. Seeds compressed, ± obovate-elliptic to elliptic or quadrate, with thin testa and short funicle.

Species 15, trop. Africa; sthn trop. 11, Angola, Zambia, Mozambique.

Bolusanthus Harms
(Papilionoideae—Sophoraceae)


Bolusia Benth.
(Papilionoideae—Sophoraceae)
Harms: 432 (1913); Toussaint: 6 (1953); Hillcoat: 380 (1966); Lock 473 (1989).

Scandent, glabrous shrubs or small lianes. Leaves unifoliolate, petiole long, articulate at apex; oblong to lanceolate-oblong; stipules falcate, soon caducous. Inflorescences racemes or subsessile panicles; bracts ovate; bracteoles 2, ovate, soon caducous. Calyx broadly cup-shaped, with 5 very short teeth, margin minutely fimbriate. Petals: vexillum suborbicular, very shortly clawed, apex emarginated; wings oblique-oblong; keel of lightly cohering petals resembling wings. Stamens 10, free; filaments glabrous. Ovary long-elliptic, stipitate, glabrous; ovules ± 9; style falcate; stigma capitulate, minute. Pod stipitate, ovoid to suborbicular, membranous, inflated bladder-like, dehiscent. Seeds ellipsoid with a cup-shaped arillus.

Species 4: 1 in Madagascar, 1 in N China, 2 in W trop. Africa; sthn trop. Afr.

Bowringia mildbraedii Harms, Angola.

Brachystegia Benth.
(Caesalpinioideae—Amherstieae)
Baker: 145 (1928); Hoyle: 221 (1956); White: 101 (1962); Hoyle: 157 (1967); et al.: 305 (2001); Bingham & Smith: 151 (2002); Coates Palgrave: 320 (2002).

Unarmed evergreen trees. Leaves always paripinnate; leaflets 3–20, always opposite, with some gland-dots underneath. Inflorescence racemose. Flowers bisexual, spirally arranged along inflorescence axis; receptacle cupuliform, very short, much shorter than sepals; pedicels not jointed; bracteoles very narrow.
small, not enclosing flower buds. **Sepals** 4, imbricate, ± glabrous inside. **Petals** 5, subequal. **Stamens** 10; filaments free, equal, glabrous, 2–2 1/2–times as long as anthers; anthers narrowly elliptic, dehiscing by longitudinal slits. **Ovary** stipitate, pubescent near margins; stipe of ovary adnate to wall at bottom of receptacle; ovules 2; style elongate; stipe, ovary and style together clearly longer than stamens; stigma capititate. **Pods** flattened, woody, dehiscing elastically into 2 valves, with low-wing-shaped ridges to both sides of ventral suture. **Seeds** large, compressed, with thin wall, exarateale.

Monotypic genus: *Brenaniodendron carvalhoi* (Harms) J.Léonard (= *Cynometra carvalhoi* Harms), Mozambique.

**Burkea** Benth.
(Caesalpinioideae—Caesalpinieae)
Torre & Hillcoat: 250 (1956); Brenan: 21 (1967); Lock: 20 (1989); Coates Palgrave: 316 (2002).


**Bussea** Harms
(Caesalpinioideae—Caesalpinieae)
Harms: 159 (1902); Torre & Hillcoat: 173 (1956); Brenan 25 (1967); Lock: 20 (1989); Bingham & Smith: 141 (2002); Coates Palgrave: 345 (2002).

Shrubs or more usually trees, unarmed and always with brown or rusty indumentum on young shoots and also inflorescences. **Leaves** usually opposite or subopposite, but varying sometimes to alternate, bipinate; stipules small, subulate; specialized glands restricted to petiole and rhachis or absent; leaflets usually opposite, eglandular. **Inflorescences** of terminal panicles with flowers densely and racemosely arranged along branches; rarely and casually (in *B. massaiensis*) inflorescence reduced to a simple raceme; bracts small, falling as, or before flowers open. **Flowers** bisexual. **Sepals** 5, imbricate, inner ones with hyaline erose margins. **Petals** 5, upper one smaller than rest, all with rusty indumentum in middle and on claw. **Stamens** 10; filaments rusty-tomentose at base, eglandular; anthers dorsifixed, dehiscing by longitudinal slits. **Ovary** free, subsessile, densely brown-tomentose; ovules 2 or 3; style ± clothed like ovary; stigma enlarged and peltate. **Pods** erect, linear-oblongate, ± compressed, not winged, elastically dehiscing into 2 recurving woody valves each of which has a conspicuous longitudinal groove down middle. **Seeds** 1–3, longitudinal; funicle short; endosperm absent.


**Caesalpinia** L.
(Caesalpinioideae—Caesalpinieae)

**Mezoneuron** Desf. (as Mezoneuron); Torre & Hillcoat: 170 (1956); White: 125 (1962).

Sthn trop. Afr. 9, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr. *Caesalpinia decapetala* (Roth) Alston from Asia is a serious weed in moister parts of Zimbabwe.

**Calpogonium** Desv.
(Papilionoideae—Phaseoleae—Cajaninae)

Herbaceous or woody climbers or trailers. **Leaves** pinnately 3-foliolate; stipels present. **Flowers** blue or violet, small, in fascicles arranged in short to long axillary nodose pseudoracemes, or in axillary subsessile fascicles; bracts and bracteoles small, deciduous. **Calyx** campanulate or shortly tubular, 5-lobed, upper pair free or ± connate to form a 2-toothed lip. **Petals** standard ovate, auriculate at base, auricles inflaxed; wings narrow, adhering to obtuse keel. **Stamens**: vexillary stamen free; anthers mostly 8 or 9, all similar. **Ovary** sessile, many-ovuled; style filiform or subulate, usually ± incurved, glabrous or pubescent; stigma terminal, capitate. **Pods** linear or linear-oblong, ± compressed, 2-valved, dehiscing, mostly separte between seeds, outer surface transversely furrowed, giving the appearance that pod might break into segments. **Seeds** compressed-globose or oblong.

Species 6–8, confined to the warmer parts of America; 1 species: *Calpogonium mucunoides* Desv., now widely cultivated as a cover crop and often found as an escape in the Old World tropics; in sthn trop. Afr. reported as an escape in Malawi.

**Calpocalyx** Harms
(Mimosoideae—Mimosaeae)

Shrubs or small trees; trunk much branched; branchlets glabrous. **Leaves** bipinnate, consisting of a single pair of pinnate each bearing 3–7 pairs of opposite leaflets with basal leaflet often single; leaflets elliptic-oblongate with asymmetric base. **Inflorescences** with flowers crowded in dense, narrowly cylindrical spikes on long peduncles arranged in ample terminal, or sometimes axillary panicles. **Flowers** bisexual or unisexual by abortion. **Calyx** campanulate, 5-lobed. **Petals** 5, cohering in lower half. **Stamens** 10; filaments filiform, arising at base of petals, free or slightly coherent at base; anther connective ending in a caducous gland. **Ovary** ± stipitate, oblong, pubescent, arising in bottom of receptacle; ovules 4 or 5; style slender, ending in a tapering stigma. **Pod** dehiscing with 2 glabrous, triangular, woody valves.

Species 11, tropical W Africa; sthn trop. Afr. 1: *Calpocalyx dincklagei* Harms (= *C. crawfordianus* Mendes), Angola.

**Calpurnia** E.Mey.
(Papilionoideae—Sophoreae)
Climbing shrubs or lianes. Leaves digitately trifoliolate; leaflets petiolate, often stipellate. Inflorescences axillary racemes; bracts and bracteoles short, caducous. Flowers showy, articulated below pedicel. Calyx turbinate; lobes 5, deltoid or lanceolate, upper 2 ± connate. Petals all free; vexillum orbicular; wings and carina ovate. Stamens 10 or 11; filaments fused at least towards base into a tube with free portions recurved in bud; anthers uniform, linear, dorsifixed. Ovary sericeous, stipitate; stipe laterally fused to receptacle in lower part; ovules many; style filiform, involute in bud; stigma terminal, capitate, small. Pod broadly linear to oblong, flattened, few-seeded, dehiscent in 2 valves; base of style persistent. Seeds ± rhombic, flattened.


Climbing herbs or subshrubs. Leaves pinnately 3-foliolate; stipules small, striate; stipels present. Inflorescences (1)few—many-flowered, falsely racemose; bracts paired, striate; bracteoles appressed to calyx, striate. Calyx 5-lobed, upper pair largely joined into a bifid lip. Corolla showy; standard broad, with a conspicuous spur on back above claw, often pubescent outside. Stamens: vexillary filament free or joined to others at base. Ovary linear, many-ovuled; style curved, flattened and slightly widened towards terminal stigma, pubescent or bearded at apex. Pod linear, with 4 raised nerves or wings, dehiscent. Seeds variously coloured, oblong or elliptoid, with an elliptic to linear hilum.

Species ± 45, neotropics and subtropics, a few of which are widely cultivated in the Old World as cover crops; sthn trop. Afr. 45, neotropics and subtropics, a few of which are widely cultivated in the Old World as cover crops; sthn trop. Afr.
FABACEAE: Crabia

Dehiscence

Crotalaria L.  
(Papilionoideae—Crotalarioideae)  
Torre: 6 (1962); Lock: 163 (1989); Polhill: 1 (1982); White et al.: 324 (2001);  
Bingham & Smith: 141 (2002); Coates Palgrave: 365 (2002).  

Cryptosepalum Bentham  
(Caesalpinioideae—Determinateae)  
Bentham: 584 (1865); Léonard: 485 (1952b); Duvigneaud: 236 (1956);  
Unarmed subshrubs, shrubs or trees. Leaves paripinnate; leaflets ± 7–10, alternate, entire; petiolules twisted. Inflorescences terminal or lateral, lax but many-flowered racemes. Flowers bisexual, small, arranged in 2 rows on long, slender pedicels. Calyx: sepal 4(5), joined at base into a short cup-shaped receptacle, imbricate, reflexed in open flower. Petals absent. Stamens 10, free, equally long, soon caducous, glabrous, exserted; filaments filiform; anthers versatile, elliptic, dehiscing longitudinally. Ovary on a short stipe arising on wall of receptacle, free, slightly compressed, tomentose; ovules 2–6; style filiform; stigma small, terminal. Pod obliquely oblong, compressed, opening by 2 coriaceous to woody valves. Seeds usually 1 or 2, large, orbicular or kidney-shaped.

Species ± 55, Old and New World; sthn trop. Afr.: 1: Cryptosepalum Baker f., Angola (Cabaiba).

Cryptosepalum Bentham  
(Caesalpinioideae—Determinateae)  
Bentham: 584 (1865); Léonard: 485 (1952b); Duvigneaud: 236 (1956);  
Unarmed subshrubs, shrubs or trees. Leaves paripinnate; leaflets in 1 to many pairs; stipules linear, free, quickly falling off; leaflets sessile or subsessile, opposite, without transversal gland dots. Flowers arranged in more than 2 ranks in terminal or axillary many-flowered racemes; bracteoles 2, well-developed, petaloid (pink or white), opposite, valvate, completely enclosing flower buds, persistent. Hypanthium short, cup-shaped. Sepals usually small, 0–6. Petals (0)1–3, well-developed and elliptic when present. Stamens 3–6; staminodes sometimes present. Ovary stipitate; stipe adnate to side of hypanthium; ovules 1–5; stigma terminal, abruptly enlarged. Pods compressed, woody, dehiscent, glabrous; valves twisted after dehiscence, without longitudinal nerves, but upper suture with a longitudinal wing-like ridge on either side projecting in a plane at right angles to valve. Seeds compressed, elliptic, without areoles.


Cullen Medik.  
(Papilionoideae—Psoraleeae)  

Psoralea in sense of Torre in part: 83 (1962).

Cyclocarpa Afzel. ex Baker  
(Papilionoideae—Aeschynomeneae—Aeschynomeninae)  
Erect or spreading annual herbs, mostly branched and tufted. Leaves alternate, sensitive, paripinnate; stipules membranous, spurred; stipels absent. Inflorescences umbel-like racemes, 1–4-flowered; bracts and bracteoles small, thin. Flowers small, yellow. Calyx deciduous, 2-lipped, lips almost entire. Corolla: standard obovate, emarginate, shortly clawed; wings oblong, shortly clawed, finely denticate above, marked with a few small pockets; keel obtuse, spurred, finely denticate above. Stamens all joined, tube split completely unilaterally or for half its length to form 2 bundles of 5, or with vexillary filament free; anthers uniform. Ovary linear, falcate, subsessile, many-ovuled; style curved, inflexed; stigma small, terminal. Pods narrow, compressed, coiled into a ring or a spiral, minutely roughened on margins; articles 8–11, separating, nerve persistent after they have fallen. Seeds broadly irregularly reniform; hilum minute, excentric.


Cynometra L.  
(Caesalpinioideae—Determinateae)  
Linnaeus: 382 (1753); Baker: 150 (1871); Léonard: 379 (1951); Léonard: 309 (1952b); Torre & Hillcoat: 244 (1956); Aubréville: 66 (1968b); Lock: 48 (1989); Lewis: 595 (1996).  
Trees, rarely shrubs. Leaves paripinnate; leaflets 2–30, opposite, very rarely alternate, asymmetric, entire or emarginate, without transversal dots but sometimes with a large black gland on lower surface close to petirole, secondary veins anastomosing before reaching margin. Inflorescences many-flowered racemes or panicles, axillary or sometimes terminal, rarely on old wood, solitary or in fascicles; bracts large or small, usually caducous. Flowers small, arranged in more than 2 rows, sometimes articulated at apex of pedicel; bracteoles 2, caducous. Calyx: receptacle short, turbinate or sometimes campanulate; sepals 4 or 5, free, imbricate, often reflexed. Petals 5, free, ± equal. Stamens (8–)10–12, free to slightly fused at base; anthers dorsifixed, opening longitudinally. Ovary on a stipe arising at bottom of receptacle; ovules 1 or 2(–4); style elongated; stigma terminal. Pod indehiscent or dehiscent, sometimes swollen, tuberculate, sometimes compressed, smooth. Seeds 1 or 2 (–4), with a very short funicle, thin-walled, exarate.
Dalbergia L.f.
(Papilionoideae—Dalbergieae)
Cronquist: 52 (1954b); White: 147 (1962); De Sousa: 344 (1966); Polhill: 95 (1971b); Lock: 235 (1989); White et al.: 325 (2001); Bingham & Smith: 141 (2002); Coates Palgrave: 384 (2002).

Inflorescences axillary or terminal cymes, unequally di- lated at hilum; anthers linear-oblong, dorsifixed, longitudinally dehiscent. Ovary on a long accrescent stipe, ellipsoid, compressed, glabrous; ovules many, elongate, situated in upper half of ovary; style slender, exserted; stigma capitate, terminal. Pod stipitate, asymmetric at base, flat, 2-valved, smooth, glabrous; endocarp coriaceous, rolling up and separating from exocarp when mature. Seed usually solitary, compressed, suspended by a funicle dilated at hilum; testa hard, glabrous, smooth; endosperm absent; cotyledons flat.


Decorsea R.Vig.
(Papilionoideae—Phaseoleae—Phaseolinae)


Derris Lour.
(Papilionoideae—Millettieae)


*Desmanthus Willd.
(Mimosoideae—Mimoseae)


Desmodium Desv.
(Papilionoideae—Desmodieae—Desmodiinae)
Species ± 30, tropical America, a few in Old World; sthn trop. Afr. 1: *Dioclea reflexa* Hook.f., Angola.

**Dolichos L.**
(Papilionoideae—Phaseoleae—Phaseolinae)

Subshrubs or small shrubs with well-developed rootstocks. **Leaves** unifoliolate, frequently developing after flowers have appeared; petioles nearly always conspicuously winged, often so much so as to appear like a second lower leaf blade, rarely not winged; stipules striate, ciliate; stipels present. **Inflorescences** on leafy or leafless shoots, terminal or axillary, falsely racemose or paniculate; primary and secondary bracts present; bracteoles absent; flowers readily disarticulating with their pedicels. **Calyx** 5-lobed, 2-lipped; upper lip ± bifid, composed of 2 teeth connate for most of their length; lower lip prominently trident, central lobe the longest. **Corolla** mostly medium-sized, white to purple; standard rounded, produced into a claw at base, sometimes puberulous outside when young; wings clawed, transversely rugose inside, usually shorter than other petals; keel usually as long as the standard. **Stamens**: vexillary filament free at base and apex but connate with main tube for one-third to half of its length; free parts of filaments diadelphous; vexillar stamen free; anthers drooping. **Ovary** almost sessile, 3- or 4-ovulate, surrounded at base by a 10-lobed disc; style short; stigma small. **Pod** narrowly oblong, tapering gradually towards base, narrowing abruptly at tip, woody at maturity and with many small, ± transverse grooves. **Seeds** 1–5, large, flattened, dark red.


**Dialium L.**
(Caesalpinioideae—Caesieae)
Torre & Hillocat: 186 (1956); Brenan: 103 (1967); Lock: 33 (1989); Coates (Mimosoideae—Mimoseae)
Dialium

**Dichrostachys (A.DC.) Wight & Arn.**
(Mimosoideae—Mimosae)
Torre: 265 (1956); Brenan & Brummitt: 37 (1970); Lock: 89 (1989); Coates Palgrave: 338 (2002).

Species 30, tropical America, a few in Old World; sthn trop. Afr. 1: *Dioclea reflexa* Hook.f., Angola.

Subshrubs or small shrubs with well-developed rootstocks. **Leaves** unifoliolate, frequently developing after flowers have appeared; petioles nearly always conspicuously winged, often so much so as to appear like a second lower leaf blade, rarely not winged; stipules striate, ciliate; stipels present. **Inflorescences** on leafy or leafless shoots, terminal or axillary, falsely racemose or paniculate; primary and secondary bracts present; bracteoles absent; flowers readily disarticulating with their pedicels. **Calyx** 5-lobed, 2-lipped; upper lip ± bifid, composed of 2 teeth connate for most of their length; lower lip prominently trident, central lobe the longest. **Corolla** mostly medium-sized, white to purple; standard rounded, produced into a claw at base, sometimes puberulous outside when young; wings clawed, transversely rugose inside, usually shorter than other petals; keel usually as long as the standard. **Stamens**: vexillary filament free at base and apex but connate with main tube for one-third to half of its length; free parts of filaments diadelphous; vexillar stamen free; anthers drooping. **Ovary** almost sessile, 3- or 4-ovulate; style short; stigma small. **Pod** narrowly oblong, tapering gradually towards base, narrowing abruptly at tip, woody at maturity and with many small, ± transverse grooves. **Seeds** 1–5, large, flattened, dark red.


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Torre: 265 (1956); Brenan & Brummitt: 37 (1970); Lock: 89 (1989); Coates Palgrave: 338 (2002).

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(Mimosoideae—Mimosae)
Torre: 265 (1956); Brenan & Brummitt: 37 (1970); Lock: 89 (1989); Coates Palgrave: 338 (2002).


**Dialium L.**
(Caesalpinioideae—Caesieae)
Torre & Hillocat: 186 (1956); Brenan: 103 (1967); Lock: 33 (1989); Coates Palgrave: 338 (2002).

Baillon: 189 (1865); Torre & Hillcoat: 174 (1956); Aubréville: 48 (1968b); Lock: 36 (1989).

Oligostemon pictus Benth.; Baker: 135 (1928).

Lianes. *Leaves* imparipinnate; leaflets opposite, in (2)3(4) pairs, petiolulate, ovate or elliptic to oblancoate, velvety with maroon hairs, glabrescent below. *Inflorescences* erect, densely flowered, tomentose racemes; pedicels persistent. *Flowers* bisexual, irregular and resembling certain orchids. *Sepals* 4; anterior one coriaceous, partly enveloping others, of which 2 are joined. *Petals* 5; posterior 3 lanceolate, anterior 2 rudimentary. *Stamens* 4; filaments very short; anthers long, incurved, posterior 2 joined in lower half; all opening by apical pores. *Ovary* with 4 longitudinal ribs; ovules 2–4. *Pod* lanceolate-linear, flattened, acuminate, with 4 narrow wings, inside with woolly tomentum; valves recurving spirally after dehiscence.


**Elephantorrhiza** Benth. (Mimosoideae—Mimosae)

Torre: 263 (1956); Brenan & Brummitt: 23 (1970); Lock: 90 (1989); Coates Palgrave: 308 (2002).


**Eminia** Taub. (Papilionoideae—Phaseoleae—Glycininae)


Erect or climbing herbs or subshrubs. *Leaves* pinnately 3-foliolate; stipules and stipels present. *Inflorescences* an axillary or terminal pseudoraceme; bracts and bracteoles glandular. *Calyx* 4–5-lobed, upper lobes often connate, pubescent; lobes up to 5-toothed, each tooth gland-tipped or not. *Corolla* small; standard obovate, clawed. *Stamens*: vexillary stamen free, rest fused into a sheath. *Ovary* spindle-shaped, hirsute; style geniculate, filiform, bearded proximally, widening slightly towards bend, with a minute terminal stigma. *Pod* oblong, compressed, dehiscent, (1)2(3)-seeded. *Seeds* deep red to very dark brown, suborbicular or rectangular, with a small hilum bearing a small persistent cartilaginous funicle remnant.

Species 4, African; sthn trop. Afr. 4, Angola, Zambia, Zimbabwe, Malawi, Mozambique. The roots of several species contain an active amylase used by local people in the brewing of beer (Pauwels 1983: 153).

**Entada** Adans. (Mimosoideae—Mimosae)

Torre: 257 (1956); White: 91 (1962); Brenan: 13 (1970); Lock: 91 (1989); White et al.: 316 (2001); Coates Palgrave: 310 (2002).

*Entadopsis* Britton; White: 92 (1962).


**Eriosema (DC.) G.Don** (Papilionoideae—Phaseoleae—Cajaninae)


**Erythrina L.** (Papilionoideae—Phaseoleae—Erythrinae)


**Erythrophleum** Afzel. ex G.Don (Caesalpinioideae—Caesalpinieae)


**Faidherbia** A.Chev. (Mimosoideae—Acacieae)


*Acacia* Mill. in part; White: 92 (1962); Ross: 83 (1979).


**Fillaeopsis** Harms (Mimosoideae—Mimosae)

Harms: 258 (1899); Baker: 796 (1930); Gilbert & Boutique: 216 (1952); Torre: 262 (1956); Keay: 490 (1958); Lock: 93 (1989); Villiers: 38 (1989).

Tall trees, ± glabrous; branches glabrous, reddish brown with lenticels in longitudinal lines. *Leaves* bipinnate, pinnae opposite, 1 or 2 pairs; leaflets mostly alternate, 4–8 to each pinna, ovate-elliptic, rounded at base, shortly obtusely acuminate, glabrous. *Inflorescence* very dense, many very-flowered, slender spikes panically arranged at ends of shoots; bracts glabrous, narrowly triangular; floral buds globose. *Flowers* bisexual, white. *Calyx* small, 5-toothed; teeth ovate, obtuse. *Petals* 5, free, ovate, acute, valvate. *Stamens* 10, free; filaments filiform, slightly enlarged towards base; anthers ellipsoid, 2-thescate with connective prolonged into a deciduous, globose apical gland. *Disc* large, cup-shaped, glandular, surrounding lower half of ovary. *Ovary* sessile, glabrous, oblong-ellipsoid; ovules 8–10; style filiform, somewhat excentric; stigma truncate to slightly cup-shaped. *Pod* dehiscent, large, oblong-elliptic, flat, sessile, base and apex round or obtuse, glabrous, densely reticulate, margins slightly thickened. *Seeds* transverse, flat, oblong, winged; funicle very long, attached at side.

**Flemingia** Roxb. ex W.T.Aiton (Papilionoideae—Phaseoleae—Cajaninae)


**Galactia** P.Browne (Papilionoideae—Phasoleae—Diocleinae)


**Gilbertiodendron** J.Léonard (Caesalpinioideae—Detarieae)

Trees or shrubs. Leaves paripinnate, 2- to 8-jugate, lowest pair of leaflets smaller than others, arising very close to base of leaf; leaflets opposite, very rarely alternate, elliptic-oblong, very shortly petiolulate; stipules large or small, sometimes leaf-like, caducous or persistent, often with leaf-like, kidney-shaped appendages at base. Inflorescences axillary or terminal panicle, or sometimes racemes, or sometimes in fascicles or solitary on old wood; bracteoles 2, valvate, enveloping floral bud. Sepals 5 and subequal, or 4 and posterior one broader and 2-dentate or -fid. Petals 5, very unequal, posterior one much larger, showy, ± 2-lobed, borne on a channelled claw; other petals small, linear, resembling sepals. Stamens 7–9, free, glabrous, 3 fertile, long-exserted, 4–6 much smaller; anthers dorsifixed, opening by longitudinal slits. Ovary subsessile or very shortly stipitate, oblong, densely tomentose, arising at bottom of, and adnate on one side to, a very shortly cup-shaped receptacle; ovules 4 or 5. Pod woody, flattened, dehiscent, ± oblong with a thick suture and marked with 1–3 prominent longitudinal nerves and ± conspicuous transverse nerves. Seeds flattened.

Species 26, tropical W Africa; sthn trop. Afr. 3, Angola.

**Gilletiodendron** Vermoesen (Caesalpinioideae—Detarieae)
Vermoesen: 85 (1923); Léonard: 400 (1951); Léonard: 283 (1952b); Torre & Hillcoat: 220 (1956); Aubréville: 71 (1970); Lock: 52 (1989).

Trees. Leaves impari- or paripinnate; rachis channelled; leaflets many, alternate or sometimes some opposite, asymmetric, with translucent dots; stipules linear, soon caducous Inflorescences many-flowered axillary or terminal panicles. Flowers distichous, small; receptacle very small, cup-shaped; bracteoles 2, subsessile. Sepals 4, free, subvalvate, unequal: 1 broader, glandular. Petals 5, free, equal, pubescent on inner face. Stamens 10, free, alternately long and short in bud; filaments arising on outer wall of a fleshy disc, forming a sleeve around stipe; anthers dorsifixed, dehiscing longitudinally. Ovary compressed, glabrous, on a short free stipe arising at bottom of receptacle; ovules 2–5; style filiform; stigma terminal. Pod dehiscent, compressed, oblique, apiculate, stipitate, dehiscing with 2 finely warty valves. Seeds compressed, smooth.


**Gleditsia** L. (Caesalpinioideae—Caesalpinieae)


**Gossweilerodendron** Harms (Caesalpinioideae—Detarieae)
Harms: 459 (1925); Torre & Hillcoat: 248 (1956); Aubréville: 147 (1968b); Lock: 53 (1989); Dombo et al.: 10 (2002).

Large trees exuding greenish brown resin. Leaves imparipinnate; leaflets 6–10, alternate, oblong-elliptic, obtuse to obtuse-acuminate, with transluce gland dots; petiolules sometimes slightly twisted. Inflorescences densely flowered spike racemes arranged in panicles. Flowers bisexual, very small, on short pedicels; bracteoles reduced, not enveloping flower bud, caducous. Receptacle cup-shaped, very short. Sepals 4, imbricate, suborbicular, with transluce gland dots, margin ciliolate. Petals absent. Stamens (8–)10; filaments free, hairy in lower parts; anthers small, dorsifixed, oval. Ovary stitite, hairy; ovule 1. Pod resembling a samara with seed inside inflated end of a long papery wing with an irregular open network of veins, and a very short peduncle at other end. Seed 20–30 mm long.


**Griffonia** Baill. (Caesalpinioideae—Cercideae)
Baill: 188 (1865); Torre & Hillcoat: 200 (1956); Aubréville: 19 (1970); Lock: 43 (1989).

*Bandeiraea* Welw. ex Benth.; Baker: 139 (1928).

Lianes; branches puberulent, blackish. Leaves simple, 3-veined from base, ovate to ovate-elliptic, glabrous; petiole glabrous to puberulent. Inflorescences many-flowered racemes arranged in panicles. Flowers bisexual, regular, tomentellose to glabrescent. Receptacle narrowly cylindric, widening towards top. Calyx: tube short, ending in 5 broadly triangular lobes. Petals 5, equal, ob lanceolate, glabrous outside, puberulent inside. Stamens 10, free, in 2 whorls; filaments filiform, white, puberulent; anthers black, dehiscing longitudinally. Ovary on long glabrous stipe, arising high in receptacle tube, glabrous; ovules ?1 or 2. Pod oblong-elliptic, swollen, borne on a much lengthened pedicle exserted from persistent, narrowly funnel-shaped receptacle and calyx. Seeds 1 or 2, subglobose.


**Guibourtia** Benn. (Caesalpinioideae—Detarieae)
Léonard: 400 (1949); Torre & Hillcoat: 240 (1956); Brenan: 136 (1967); Coates Palgrave: 318 (2002).
Copaifera L. in part; Baker: 149 (1928).


Haematoxylum L. (Caesalpinioideae—Caesalpinieae)


Hoffmannseggia Cav. (Caesalpinioideae—Caesalpinieae)

Hymenostegia (Benth.) Harms (Caesalpinioideae—Detarieae)
Harms: 193 (1897); Léonard: 433 (1951); Torre & Hillcoat: 245 (1956); Aubréville: 97 (1968b); Lock: 55 (1989).

Trees or shrubs; buds in cones of imbricate scales which remain some time at base of shoot or inflorescence. Leaves paripinnate; leaflets opposite, in few to many pairs, usually sessile, sometimes subsessile, usually asymmetric, especially at base. Inflorescences axillary racemes, rarely panicles; 1 bract at base of pedicel persistent or not; bracteoles membranous, petaloid, often coloured, persistent, arising at base of calyx, sometimes enveloping bud, not valvate. Flowers bisexual, with a short cup-shaped or tubular receptacle. Sepals 4, imbricate, arising on rim of receptacle. Petals unequal, usually 3 large ones, sometimes fewer, often with 1 or 2 minute additional ones or absent. Stamens usually 10; filaments filiform. Ovary stipitate, arising on receptacle wall; ovules 2(3). Pod stipitate, apiculate, flat, dehiscent with 2 woody valves coiling up.

Species 16, tropical America and Africa; sthn trop. Afr: 1; Hymenaea verrucosa Gaertn., Mozambique.

Hymenostegia (Benth.) Harms (Caesalpinioideae—Detarieae)
Harms: 193 (1897); Léonard: 433 (1951); Torre & Hillcoat: 245 (1956); Aubréville: 97 (1968b); Lock: 55 (1989).

Trees or shrubs; buds in cones of imbricate scales which remain some time at base of shoot or inflorescence. Leaves paripinnate; leaflets opposite, in few to many pairs, usually sessile, sometimes subsessile, usually asymmetric, especially at base. Inflorescences axillary racemes, rarely panicles; 1 bract at base of pedicel persistent or not; bracteoles membranous, petaloid, often coloured, persistent, arising at base of calyx, sometimes enveloping bud, not valvate. Flowers bisexual, with a short cup-shaped or tubular receptacle. Sepals 4, imbricate, arising on rim of receptacle. Petals unequal, usually 3 large ones, sometimes fewer, often with 1 or 2 minute additional ones or absent. Stamens usually 10; filaments filiform. Ovary stipitate, arising on receptacle wall; ovules 2(3). Pod stipitate, apiculate, flat, dehiscent with 2 woody valves coiling up.

Species 16, tropical America and Africa; sthn trop. Afr: 1; Hymenaea verrucosa Gaertn., Mozambique.

Icuria Wieringa (Caesalpinioideae—Detarieae; Macrolobieae fide Wieringa (1999))

Tall trees; trunk straight, cylindrical, without buttresses; bark pale grey. Leaves paripinnate, 1- or 2-jugate; leaflets opposite, never emarginate; basal leaflet with glands only in proximal half; stipules free, valvate in bud. Inflorescences compound racemes, axillary on terminal node, 1 per node; bracts early caducous, pubescent outside, glabrous inside. Flowers sometimes unisexual by reduction. Sepals 1 or absent, only abaxial sepal sometimes present and then fused to the bracteoles. Petals usually absent, rarely a vestigial lateral petal present. Stamens 6–8, all shortly fused at base; anthers relatively large, purple-pink, without dorsal teeth, dorsifixed. Ovary shortly stalked, velvety; ovules 1–3; style insertion excentric, style usually geniculate at base and near apex; stigma mushroom-shaped. Pod laterally flattened, distinctly beaked, puberulous to velvety; lateral nerve running above middle of pod; wings of upper suture narrow. Seeds with a very thin membranous testa.

Species 16, tropical America and Africa; sthn trop. Afr: 1; Hymenaea verrucosa Gaertn., Mozambique.
Monotypic genus: *Icuria dunensis* Wieringa, known only from coastal dunes in Mozambique.

**Indigastrum** Jaub. & Spach  
(Papilionoideae—Indigoferae)  


**Indigofera L.**  
(Papilionoideae—Indigoferae)  


**Isoberrinia** Craib & Stapf ex Holland  
(Caesalpinioideae—Detarieae)  
Holland: 266 (1911); Hauman: 376 (1952b); Torre & Hillcoat: 204 (1956); Brenan: 138 (1967); Lock: 14 (1989).

Unarmed trees. *Leaves* paripinnate; stipules intrapetiolar, connate, or free in their upper part; leaflets opposite or subopposite, in 2–5 pairs, petiolulate, connate, or free in their upper part; leaflets opposite or

**Lablab Adans.**  
(Papilionoideae—Phaseoleae—Phaseolinae)  

*Sthn trop. Afr.* 1: *Lablab pupureus* (L.) Sweet, with 3 subspecies which are widely cultivated, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

**Leptoderris Dunn**  
(Papilionoideae—Milletiae)  
Dunn: 387 (1910); Baker: 130 (1928); Hauman: 32 (1954b); De Sousa: 368 (1966); Polhill: 76 (1971b); Lock: 351 (1989); White et al.: 328 (2001).

*?Deguelia sensu Hiern* 282 (1896).

Woody climbers, less commonly erect to scendent shrubs or trees with slender liane-like branches. *Leaves* imparipinnate; stipules present, usually caducous; stipels usually present, sometimes lacking; leaflets opposite. *Flowers* fairly small, crowded on very short ultimate branches of the mostly large terminal and axillary panicles (terminal panicles at least usually well branched); bracts subtending panicle branches mostly similar to stipules; floral bracts small; pedicels short with small mostly caducous bracteoles at top. *Calyx* narrowly campanulate, small, shortly 5-toothed with the 2 upper teeth united practically to the tips, hairy on both surfaces. *Corolla* usually white, cream or pale yellowish, often marked red, pink or violet; petals narrow, subequal in length or wings a little shorter, often auriculate at base of blade, glabrous to sparsely hairy or ciliolate at tips; standard narrowly oblong or ob lanceolate, with incurved margins, with or without thickening at base of blade; wings adhering to keel-petals and often with a distinct lateral fold or pocket; keel-petals oblong-elliptic, a little more curved and lightly coherent towards tips on lower side. *Stamens* united into a tube generally closed above but with openings at base either side of vexillar stamen (the latter may be free in young bud and is often adnate to claw of standard); anthers dorsifixed. *Ovary* sessile to shortly stipitate, and arising on tube of hypanthium; ovules 4–8. *Pod* dehiscent elastically or explosively into 2 flattened, smooth or sometimes obliquely-nerved woody valves; upper suture not at all winged. *Seeds* compressed, ± obovate-elliptic, with thin testa and short funicle.


**Jubbernardia Pellegr.**  
(Caesalpinioideae—Amherstieae)  
Torre & Hillcoat: 210 (1956); Brenan: 145 (1967); Lock: 15 (1989); Coates Palgrave: 331 (2002).


**Kotschyia Endl.**  
(Papilionoideae—Aeschynomeneae—Aeschynomerneniae)  

*Damapana* Adans.; Hiern: 236 (1896); Smithia Aiton in large part; Baker: 302 (1929).
Shrubs or small trees. **Leaves** 1-foliolate, ovate-elliptic, rounded at base, obtusely acuminate, papery, glabrous, closely reticulate on both surfaces, with ± 6 pairs of lateral nerves; petiole long, suberect; stipules inconspicuous. **Inflorescences** short axillary racemes towards ends of branches; axis of inflorescence pubescent; pedicels puberulous; buds ovoid, glabrous; bracts and bracteoles small. **Calyx** ovoid, shortly toothed, membranous, slitting down to base on one side as flower expands. **Petals** subequal; vexillum subsessile, broadly ovate; wings linear-oblong. **Stamens** free; anthers longer, longer than filaments. **Ovary** long-stalked; ovules few; style subulate; stigma small, terminal. **Pod** long-stalked, dehiscent, obliquely elliptic, beaked, coriaceous, turgid, 2-valved, 1(2)-seeded. **Seed** with a spongy aril.


**Librevillea** Hoyle
(Caesalpinioideae—Detarieae)
Hoyle: 17 (1955); Torre & Hillocoat: 234 (1956); Hoyle: 149 (1958); Aubréville: 283 (1968b); Lock: 57 (1989).

Trees. **Leaves** pinnate; leaflets 3–6, alternate, ovate-oblong or lanceolate with attenuate, acuminate apex, obtuse to rounded base, slightly falcate, glabrous, coriaceous; stipules intrapetiolar. **Inflorescences** fairly open terminal panicles; pedicels puberulous; bracteoles sepaloïd, suborbicular, puberulous. **Receptacle** short, cupular. **Perianth** rudimentary with (1)2 minute tepals. **Stamens** 10; filaments filiform, fused at base. **Ovary** shortly stipitate, hairy; ovules 2(3). **Pod** dehiscing with 2 woody valves.

Monotypic genus: **Librevillea** *klainei* (Harms) Hoyle, Gabon; Angola.

**Lotononis** (DC.) Eckl. & Zeyh.
(Papilionoideae—Sophoreae)

**Species** ± 20, tropical America; 1: **Machaerium lunatum** (L.f.) Ducke, extending to W African coast, including Angola.

**Macroptilium** (Benth.) Urb.
(Papilionoideae—Phaseoleae—Phaseolinae)

Herbs, prostrate or twining. **Leaves** pinnately 3-foliolate; stipules subsistent, not prolonged below point of insertion, striate; stipels present. **Inflorescences** axillary, falsely racemose, long-pedunculated, flowers in fascicles along rachis which is swollen at insertion of pedicels; bracts and bracteoles present, deciduous or ± persistent. **Flowers** usually fairly small, white or red to blackish purple. **Calyx** 5-lobed; upper lobes joined higher. **Petals** standard broad, reflexed, without appendages; wings broadly rounded; keel with a long claw adnate to staminal sheath, blade rather narrow, elongated, apex beaked and forming a spiral of 270°, shorter than wings. **Stamens** vixillarily stamen free; anthers uniform. **Ovary** linear, with many ovules; style tenuous below, filiform and flexible, apical part cartilaginous and thickened, abruptly curved through 90° just above its junction with the tenuous part, narrowed and slightly curved towards apex, resembling a squarish hook, hairy inside towards the terminal stigma. **Pods** long and narrow, many-seeded. **Seeds** small, with a short hilum.


**Macrotyloma** (Wigt. & Am.) Verdc.
(Papilionoideae—Phaseoleae—Phaseolinae)

**Species** 120, tropical America; 1: **M. lunatum** (L.f.) Ducke, extending to W African coast, including Angola.

**Medicago** L.
(Papilionoideae—Trifolieae)
Drummond: 224 (1972).

**Species** 120, widely cultivated and often naturalised; also in sthn Afr.
Seed plants of southern tropical Africa: families and genera

**Melilotus** Mill.  
(Papilionoideae—Trifolieae)  
Drummond: 224 (1972).

Sthn trop. Afr. 2, widely cultivated and often naturalised; also in sthn Afr.

**Microcharis** Benth.  
(Papilionoideae—Indigofereae)  

**Millestia** Wight & Arn.  
(Papilionoideae—Millettieae)  

**Mimosa** L.  
(Mimosoideae—Mimoseae)  

**Mucuna** Adans.  
(Papilionoideae—Phaseoleae—Erythrinae)  

**Mundulea** (DC.) Benth.  
(Papilionoideae—Millestieae)  

**Neonotonia** J.A.Lackey  
(Papilionoideae—Phaseoleae—Glycininae)  

**Neorautanenia** Schinz  
(Papilionoideae—Phaseoleae—Phaseolinae)  

**Newtonia** Baill.  
(Mimosoideae—Mimoseae)  

**Normandiodendron** J.Léonard  
(Caesalpinioideae—Detarieae)  

**Oddoniodendron** De Wild.  
(Caesalpinioideae—Detarieae)  
De Wildeman: 22 (1925); Mendes: 161 (1963); Aubréville: 260 (1968b); Lock: 18 (1989).

**Neptunia** Lour.  
(Mimosoideae—Mimoseae)  
Torre: 267 (1956); Brenan & Brummitt: 45 (1970); Lock: 94 (1989).

**Nesphostylis** Verdc.  
(Papilionoideae—Phaseoleae—Phaseolinae)  
Verdcourt: 296, fig. 3 (1970a); Lock: 419 (1989); Mackinder: 74 (2001).

Perennial climbing herbs. Leaves pinnately 3-foliolate; stipules small, striate; stipels present. Inflorescences axillary; flowers solitary. Calyx 5-lobed, but upper lobes connate. Corolla large, blue or pale purple; standard glabrous, auriculate and with appendages at base. Stamens: vexillary stamen free, with a tooth-like appendage at base; filaments dilated at apex; anthers similar in size, but 5 basifixed and 5 subdorsifixed. Ovary linear, many-ovuled; tomentose; style slightly twisted, flattening into a wedge shape at apex, with a ring of hairs directly below terminal stigma. Pods linear, compressed, many-seeded. Seeds oblong, with a well-developed aril.


**Newtonia** Baill.  
(Mimosoideae—Mimoseae)  

**Normandiodendron** J.Léonard  
(Caesalpinioideae—Detarieae)  

**Oddoniodendron** De Wild.  
(Caesalpinioideae—Detarieae)  
De Wildeman: 22 (1925); Mendes: 161 (1963); Aubréville: 260 (1968b); Lock: 18 (1989).
Trees, ± 20 m high; branches and leaves glabrous. Leaves alternate, imparipinnate, (1)2, (3–4)-foliolate; leaflets alternate, narrowly elliptic-lanceolate to subfalcate, gradually acuminate; base asymmetric, rounded to broadly cuneate; stipules fused to form a persistent callus bidentate at apex. Inflorescences: panicles or rarely racemes, usually axillary and fascicled or sometimes solitary; bracteoles densely reddish pubescent outside. Flowers with a short receptacle. Sepals 4, pilose inside. Petals 5, subequal. Stamens (8)10, long-exserted; filaments glabrous. Ovary shortly stipticate, hirsute; stipe and style glabrous. Pods dehiscent with 2 woody valves coiling after dehiscence.

Species 2, tropical W Africa; sthn trop. Afr. 1: Oddoniodendron romeroid Mendes, Angola.

**Ophrestia H.M.L. Forbes**
(Papilionoideae—Psoraleeae—Ophrestiinae)


**Ormocarpum P.Beaup.**
(Papilionoideae—Aeschynomeneae—Ormocarpinae)


**Otholobium C.H.Stirt.**
(Papilionoideae—Psoraleeae—Otholobiinae)


**Otoptera DC.**
(Papilionoideae—Phaseoleae—Phaseolinaceae)


**Oxystigma Harms**
(Caesalpinioideae—Detarieae)
Harms: 195 (1897); Léonard: 369 (1952b); Torre & Hillcoat: 246 (1956); Aubréville: 128 (1966b); Lock: 57 (1989).

**Pterygodium Harms; Baker: 152 (1928).**

Trees with resinous wood. Leaves pari- or imparipinnate; leaflets (2–)4–6–9, alternate or opposite, petiolulate, elliptic to lanceolate, entire, coriaceous, with translucent dots. Inflorescence with flowers crowded into dense, narrowly cylindric spikes arranged in open, axillary or terminal open panicles, or spikes sometimes solitary or fascicled. Flowers small, shortly pedicelled; bracts and bracteoles very small, caducous. Sepals 5(6), imbricate, ± free, orbicular. Petals absent. Stamens (8–)10, exserted; filaments free; equally long, accrescent, pubescent in lower half; anthers dorsifixed, small. Ovary sessile; ovule 1(?2). Pod suborbicular, asymmetric, flattened, woody, smooth. Seed 1, ruminate or pitted, resinous.


**Paramacrolobium J.Léonard**
(Caesalpinioideae—Detarieae)

Unarmed evergreen trees. Leaves paripinnate; stipules connate into a ± elongate, persistent, intrapetral scale which is biapiculate to rounded at apex; petiolules twisted; leaflets opposite, in 2–5 pairs, petiolulate, unequal-sided at base, without translucent gland dots. Flowers in compact terminal corymbose panicles; bracteoles 2, well-developed, valvate, completely enclosing flower buds, persistent. Hypanthium shortly cup-shaped. Sepals 4, unequal, posterior one larger than others and 2-toothed at apex. Petals 5, bluish-mauve; upper one relatively very large, 2 lateral ones much smaller, 2 lower ones minute. Stamens 9, their filaments unequally connate at base; normally 3 anterior ones large, well-developed, fertile, and 6 posterior ones reduced, staminodial. Ovary long-stipitate, tomentellous; ovules ± 6–8; style elongate, glabrous above; stigma abruptly enlarged, reniform-peltate. Pod dehiscing (initially at least along upper suture only) into 2 flattened woody valves without obvious transverse nerves; upper suture with a narrow wing-like ridge along each side. Seeds large, hard, ± compressed, on short funicles; each side marked with a large areole whose continuous margin is a small but abrupt change in level of surface of seed (areole being slightly sunk in relation to adjacent surface).


**Parkia R.Br.**
(Mimosoideae—Parkieae)

Trees without spines or prickles. Leaves 2-pinnate; petiole usually glandular on its upper side; pinnae (3)4–11(–14); leaflets in 10–18(–28) pairs. Inflorescence capitulate, shortly claviform (with a globose apical part abruptly narrowed into a ± short cylindric neck), solitary or paniculate. Flowers in upper part of heads bisexual, in lower part male or neuter. Calyx infundibuliform or long-tubular, gamosepalous, with 4 or 5 imbricate segments, 2 larger and 2 or 3 smaller, mouth of calyx therefore irregular. Corolla with 5 petals, free or ± united, not much longer than calyx. Stamens 10, all fertile; filaments connate below into a tube, to which petals are shortly adnate; anthers eglandular. Ovary usually stiptitate. Pods oblong to linear, straight or curved, dehiscent or not, usually ± thick and often woody, or somewhat fleshy when living. Seeds ellipsoid to ellipsoid-oblong, ± compressed or flattened.

Species ± 40, widely distributed through the tropics; ± 7 species in Africa
and Madagascar; the others in Asia and America; sthn Afr. 2, Angola, Zambia, Malawi, Mozambique.

**Parkinsonia** L.
(Caesalpinioideae—Caesalpiniae)
Torre & Hillcoat: 174 (1956); Lock: 25 (1989); Coates Palgrave: 342 (2002).


**Parochetus** Buch.-Ham. ex D.Don
(Papilionoideae—Trifolieae)

Prostrate herbs, rooting at nodes; stems glabrous or sparsely pilose. Leaves digitately 3-foliolate, with petioles up to ± 8 times as long as leaflets; leaflets cuneate-obovate, emarginate, entire or crenate or coarsely toothed distally, with ± 4 major secondary nerves on each side; stipules scarious, oval, acute, almost free from petiole, their bases forming a ring around stem. Inflorescence axillary, long-pedunculate, (1)2(–4)-flowered umbels; bracts present; bracteoles absent. Stamens: 9 united, upper one free; filaments abruptly bent upwards through 90°, not attached to corolla; anthers uniform. Ovary glabrous; style bent abruptly upwards; ovules many. Pod linear, acute, 3–4 times as long as calyx, somewhat inflated when ripe, glabrous, not septate, tardily dehiscent, many-seeded. Seeds 10–15, dark, obscurely mottled, not conspicuously arillate; hilum small, circular, lateral.


**Pearsonia** Dummer
(Papilionoideae—Crotalarieae)


**Peltophorum** (Vogel) Benth.
(Caesalpinioideae—Caesalpiniae)
Torre & Hillcoat: 169 (1956); Lock: 26 (1989); Coates Palgrave: 345 (2002).


**Pentaclethra** Benth.
(Mimosoideae—Parkieae)
Bentham: 127 (1840); Oliver: 322 (1871); Gilbert & Boutique: 138 (1952); Torre: 255 (1956); Lock: 99 (1989); Villiers: 18 (1989).

Unarmed trees. Leaves bipinnate, without glands; pinnae in many pairs; leaflets multijugate, shiny; stipules small, subulate, deciduous. Inflorescences dense, many-flowered spikes often arranged in panicles towards ends of branches. Flowers bisexual or unisexual, or sometimes sterile, sessile. Calyx campanulate with 5 short broad lobes. Petals 5, connate below, elliptic or oblong, valvate. Stamens 5, alternipetalous, far exerted, anthers and staminodes with a minute apical gland; staminodes 5, epipetalous, filiform; stamens, staminodes and inner, crenate-margined disc adnate to base of united petals. Ovary subessible, densely pubescent, at least in upper half; style slender; stigma obliquely capitate, terminal; ovules ± 6 or more. Pod 2-valved, elongate, compressed, narrowing towards base; valves woody, elastically revolute when mature. Seeds compressed; without endosperm.

Species 2, tropical America, trop. Africa; sthn troph. Afr. 2, Angola (Cabinia).

**Pericopsis** Thwaites
(Papilionoideae—Sopherae)
Thwaites: 413 (1864); Hillcoat: 381 (1966); Polhill: 41 (1971b); Gonçalves: 100 (1981); Lock: 475 (1989); Coates Palgrave: 353 (2002).


Trees or less commonly large shrubs. Leaves (5)7–12(13)-folioliolate; leaflets mostly exceeding 30 x 15 mm, usually appearing alternate but occasionally in opposite pairs; stipels generally present, single at base of lateral leaflets, paired and unequal at base of terminal one, inconspicuous and caducous. Flowers in terminal panicles or rarely simple racemes; bracts and bracteoles ± linear-oblong, to 3 mm long, caducous. Calyx campanulate below, with 5 teeth 2–4 times as long as tube, upper 2 remaining connate for most of their length, whole calyx eventually falling as one piece. Petals subequal in length, 10–22 mm long; standard suborbicular with a short claw, limb usually reflexed; wings with a short claw up to 3 mm long and a well-developed auricle at base of limb; keel-petals with a claw up to 5 mm long and a well-developed auricle, free or lightly coherent along lower margin. Stamens free; anthers dorsifixed. Intrastaminal disc present. Ovary stipitate, sometimes shortly so, ± 2–8-ovulate; style incurved, hooked at apex, glabrous, with a small terminal stigma. Fruit ± flat, oblong to linear-oblong, ± winged along upper margin and generally also along lower margin, proximal part often constricted to form a false stipe, larger pods often also constricted about middle, slightly woody, indesiccant. Seeds flat, oblong to suborbicular, reddish; hilum small; radicle short, straight.


**Phaseolus** L.
(Papilionoideae—Phaseoleae—Phaseolinae)


**Philenoptera** Fenzl ex A.Rich.
(Papilionoideae—Millettieae)

Trees or shrubs; slash usually producing a blood-red, resinous exudate. **Leaves** imparipinnate; leaflets 5–15, (sub)opposite, upper ones generally larger, sometimes leaves pinnately 3–1-foliolate; leaflets with reticulate venation often prominent beneath; stipellae present. **Flowers** 7–18 mm long, scattered singly on rachis in well-developed, irregular panicles, usually borne terminally and/or in axils of fallen or current leaves; bracts shorter than corresponding buds, usually caducous; bracteoles present; hypanthium indistinct. **Calyx** campanulate or cupulate, shortly 5-toothed with upper 2 almost completely united or subtruncate. **Corolla** much longer than calyx, white, pink or purplish, sometimes with yellow markings on standard, glabrous or with scattered hairs; standard ovate, obovate or suborbicular, reflexed, auriculate and/or with indistinct to distinct calliostyly at base; wings adhering to keel and of subequal length, both usually obtuse; keel petals partially connate towards tip, keel sometimes slightly falcate. **Stamens** united into a tube with vexillary filament adnate to the others; basal filamentae distinct; anthers dorsifixed. **Disc** present. **Ovary** usually shortly stipitate, few-ovulate; style curved, tapering to a very small terminal stigma, glabrous or with scattered hairs. **Pod** flattened, reticulately veined, indehiscent, broadly ovate to linear-oblong, with upper suture thin, thickened or slightly winged, usually stipitate, papery to coriaceous. **Seeds** 1–4(–8), laterally flattened, oblong-reniform, usually small; slightly winged, usually stipitate, papery to coriaceous. **Petals** ovate to linear-oblong, with upper suture thin, thickened or to a very small terminal stigma, glabrous or with scattered hairs. **Stamens** 10, free, glabrous outside, separated from base of ovary by a short perigynous zone composed of stamens and disc consolidated with an apparent corolla tube. **Stamens** 10, fertile; anthers each with a caducous apical gland. **Ovary** glabrous outside. **Pods** oblong-linear, straight or somewhat curved, dehiscing along one of the sutures with valves remaining attached lengthwise, neither splitting transversely nor into layers. **Seeds** flattened, ± oblong, elongate in direction of length of pod, surrounded by a broad membranous wing; cotyledons elongate transversely to radicle; funicle attached at or near middle of seed.


Herbs or subshrubs, erect or climbing. **Leaves** pinnately 3-foliolate; stipules persistent, not spurred, ribbed; stipels persistent. **Inflorescences** either axillary on leafy stems or appearing terminal on leafless shoots, pseudoracemose, many-flowered; rachis sometimes swollen at insertion of pedicels. **Flowers** mostly showy, white to purple. **Calyx** 5-lobed, 2-lipped, lower 3 lobes ovate-triangular, upper pair of lobes united to form an entire or bifid lip. **Petals**: standard auriculate but without appendages, glabrous, keel with marked basal spur, apex beaked, spirally twisted. **Stamens**: vexillary stamen free; 5 anthers dorsifixed, alternating with 5 basifixed ones. **Ovary** linear, 2–12-ovuled; style long, incurved for over 360°, narrowed below, thickened above, longitudinally barbate near apex, furnished at apex above oblique stigma with a dorsal appendage. **Pods** linear or linear-oblong, often curved, valves sometimes twisting after dehiscence. **Seeds** large or small, ellipsoid or subcylindrical; hilum linear or elliptic to ovate; aril absent.

Species 4 or 5, several ill-defined, confined to trop. Africa; sfn trop. Afr. 2 or 3, Angola, Zambia, Malawi, Mozambique. The genus is well known for its poisonous properties.

**Piliostigma** Hochst. (Caesalpinioidae—Cercidieae) Torre & Hilcoat: 199 (1956); White: 126 (1962); Lock: 44 (1989); Coates Palgrave: 337 (2002).


**Piptadenia africana** Hook.f.; Baker: 154 (1928).

Trees, tall, unarmed. **Leaves** bipinnate; pinnae 10–19(23) pairs, opposite or sometimes alternate, each pinna with 30–58(–61) pairs of linear leaflets; rachis of leaf without glands. **Flowers** bisexual, small, in often aggregated, spiciform racemes. **Calyx** gamosepalous, 5-toothed, glabrous outside except at base. **Petals** 5, free, glabrous outside, separated from base of ovary by a short perigynous zone composed of stamens and disc consolidated with an apparent corolla tube. **Stamens** 10, fertile; anthers each with a caducous apical gland. **Ovary** glabrous outside. **Pods** oblong-linear, straight or somewhat curved, dehiscing along one of the sutures with valves remaining attached lengthwise, neither splitting transversely nor into layers. **Seeds** flattened, ± oblong, elongate in direction of length of pod, surrounded by a broad membranous wing; cotyledons elongate transversely to radicle; funicle attached at or near middle of seed.


Trees, shrubs or lianas. **Leaves** imparipinnate, (2)–3- or 4-jugate; leaflets opposite, petiolulate, obovate to elliptic; stipules triangular, caducous. **Inflorescences** terminal and/or axillary panicles. **Flowers** pedicellate. **Calyx** with a short campanulate tube within 2 ± persistent bracteoles; 2 upper teeth greatly enlarged and connate into a broad, emarginate, cucullate lip ± as long as corolla and almost completely hiding it; 3 lower teeth free, linear-lanceolate, shorter than upper lip, but longer than tube. **Petals**: vexillum obcordate or obovate, emarginate, shortly unguiculate; wings and carina nearly as long as vexillum. **Stamens** diadelphous with upper stamen free from base or partly joined; anthers uniform, linear-lanceolate, oblong, versatile. **Ovary** linear, pilose; ovules 5 or 6; on a short gynophore surrounded by a short, 10-toothed nectary; style filiform, incurved, ± glabrous; stigma minute, terminal. **Pod** linear-lanceolate to oblong-ovate, compressed, marginate, woody, 2-valved, softly tomentose, ultimately dehiscent. **Seeds** 2–5, suborbicular, black.


**FABACEAE: *Prosopis***


**Pseudarthria** Wight & Arn.  
(Papilionoideae—Desmodieae—Desmodiinae)  


**Pseudeminia** Verdc.  
(Papilionoideae—Phaseoleae—Glycininae)  


**Pseudoeriosema** Hauman  
(Papilionoideae—Phaseoleae—Ophrestiinae)  

Species ± 5, restricted to trop. Africa; sthn trop. Afr. 4, Angola, Zambia, Malawi.

**Pseudoprosopis** Harms  
(Mimosoideae—Mimosaceae)  

Species 10, Old World; sthn trop. Afr. 3 indigenous, Angola, Zambia, Zimbabwe, Malawi, Mozambique. **Psophocarpus** DC.  
(Papilionoideae—Phaseoleae—Phaseolinae)  
Candolle: 403 (1825); Torre: 278 (1966); Lock: 423 (1989); Mackinder: 63 (2001).

is widely cultivated, though unknown in the wild. It is thought to be Asian, Maccarene or Madagascan in origin. Winged Bean is cultivated mainly for its immature edible pods, but many parts of the plant including its tuberous roots are eaten. *P. tetragonolobus* is distinguished from the native species by its larger flowers (25–40 mm long) and pod up to 200 mm long. This account is based on Verdcourt and Halliday’s revision of the genus in *Kew Bulletin* 33: 191–227 (1978).

**Psoralea L.**
(Papilionoideae—Psoraleaceae)

**Pterocarpus Jacq.**
(Papilionoideae—Dalbergiaceae)

**Pterolobium R.Br. ex Wight & Arn.**
(Caesalpinioideae—Caesalpinieae)

**Ptycholobium Harms**
(Papilionoideae—Millettiaceae)
*Syitra* E.Mey.; Torre: 141 (1962).

**Requienia DC.**
(Papilionoideae—Millettiaceae)
*Tephreria* Pers. in part.

**Rhynchosia Lour.**
(Papilionoideae—Phaseoleae—Cajaninae)

**Rhynchotropis Harms**
(Papilionoideae—Indigofereae)
Erect perennial herbs with medifixed hairs; rhizome branched, woody. *Leaves* alternate, unifoliolate, sessile or subsessile, linear or lanceolate, straight; stipules subulate to lanceolate-triangular, small. *Inflorescences* axillary, 7–15-flowered racemes. *Calyx* 5-lobed; lobes narrowly triangular, ± as long as, to longer than tube. *Corolla* with keel abruptly bent towards middle, rostrate. *Stamens* diadelphous: filaments of 9 fused, vexillar one free or fused to others at base; anthers with well-developed lacerate-fimbriate appendices at both ends, or apical one reduced to a few stiff hairs. *Ovary* linear, 3–6-ovulate; style twisted, cymbiform-dilated in lower half and abruptly contracted at base where it is eventually bent through a right angle; stigma oblique, discoid. *Pod* linear to sublinear, subsessile to shortly stipitate, dehiscent, finely striigose, spreading. *Seeds* separated by thin transverse partitions.


**Robynsiophyton R.Wilczek**
(Papilionoideae—Crotalarieae)
Wilczek: 126 (1953a); Wilczek: 286 (1953b); Torre: 6 (1962); White: 164 (1962); Lock: 232 (1989).
Annual or suffrutescent herbs, prostrate-ascending or erect. *Leaves* digitately 3-foliolate or sometimes simple in upper parts of branches; stipules 2, free; stipels absent. *Inflorescences* axillary or sometimes terminal subcapitate racemes; bracts linear-lanceolate. *Flowers* subsessile, bracteoles absent. *Calyx* 2-lipped, upper lip 2-lobed, lower lip 3-lobed; calyx ± as long as corolla, valvate in bud; tube cup-shaped; limb of 5 equal, narrowly lanceolate lobes longer than tube. *Corolla*: petals clawed; standard without callossites, longer than wings and keel; wings narrow; keel of petals similar to wings, cohering towards tip. *Stamens* monadelphous with 5 fertile stamens alternating with antherless staminodes; fertile stamens with filaments longer than those of staminodes and with globose to ellipsoid, subbasified anthers. *Ovary* sessile, tomentose; style erect, ± as long as ovary, glabrous; stigma terminal, capitate; ovules 6–10. *Pod* ± compressed, acute with ± persistent style, dehiscent. *Seeds* subreniform, with rudimentary arillus.


**Rothia Pers.**
(Papilionoideae—Crotalarieae)

**Schefflerodendron Harms**
(Papilionoideae—Millettiaceae)
Forest trees. *Leaves* imparipinnate; leaflets alternate; stipels small or shortly stalked, globular glands (flat when dry)
copious on inflorescence, calyx, corolla and ovary, where they are more or less hidden by a dark rusty brown crisped indumentum, and on the undersurface of the leaflets, where they are readily seen. **Calyx:** lobes short, broadly triangular. **Stamens:** vexillar stamens free, not bent or widened at base. **Ovary** stipitate. **Pod** inflated, woody, dehiscent, with very thick walls. **Seeds** 1 or 2.

Species 3 or 4, trop. Africa; sthn trop. Afr. 1: *Schefflerodendron adenopetalum* (Taub.) Harms, Angola.

**Schotia Jacq.**

(Caesalpinioideae—Detarieae)

Lock: 59 (1989); Léonard: 433 (1993); Coates Palgrave: 325 (2002); Mapaura & Timberlake: 165 (2002).


**Scorodophloeus Harms**

(Caesalpinioideae—Detarieae)

Harms: 77 (1901); Baker: 151 (1928); Léonard: 418 (1951); Torre & Hillcoat: 244 (1956); Brenan: 122 (1967); Liben: 48 (1970); Lock: 59 (1989).

Unarmed evergreen trees. **Leaves** once-pinnate; leaflets alternate, or some of them subopposite to opposite, 3–20, without gland dots. **Inflorescence** racemose. **Flowers** bisexual, spirally arranged along inflorescence axis; pedicels not jointed; bracteoles very small, not enclosing flower buds. **Sepals** 4, imbricate, glabrous inside or with a few short hairs near central part and at apex. **Petals** 5, subequal. **Stamens** 10; filaments free, glabrous; anthers dehiscing by longitudinal slits. **Ovary** stipitate, pubescent near margins; stipe of ovary adnate, woody, dehiscing elastically into 2 valves which are very thick walls.

**Pods** flattened, woody, dehiscing elastically into 2 valves which are smooth or nearly so outside. **Seeds** large, compressed, with very thick walls. **Calyx** 1 or 2. **Stipitate.**


**Senna Mill.**

(Caesalpinioideae—Cassieae)


*Cassia* L. in part; Mendonça & Torre: 174 (1956) in part.


**Sesbania Scop.**

(Papilionoideae—Robinieae)


**Smithia Aiton**

(Papilionoideae—Aeschynomeneae—Aeschynomeninae)


**Sophora L.**

(Papilionoideae—Sophoreae)


Sthn trop. Afr. 4: 3 indigenous in Zimbabwe and Mozambique, and 1 introduced in Zimbabwe; also in sthn Afr.

**Spheroistylis E.Mey.**

(Papilionoideae—Phaseolae—Phaseolinae)


**Stylosanthes Sw.**

(Papilionoideae—Aeschynomeneae—Stylosanthisae)


Sthn trop. Afr.: at least 1 endemic: *Stylosanthes fruticosa* (Retz.) Alston; several others cultivated and reported as escapes, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

**Swartzia Schreb.**

(Papilionoideae—Swartzieae)

Torre & Hillcoat: 167 (1956); Brenan: 218 (1967); Lock: 477 (1989); Coates Palgrave: 351 (2002); Dombo et al.: 10 (2002).


**Tamarindus L.**

(Caesalpinioideae—Amherstieae)

Torre & Hillcoat: 217 (1956); Brenan: 151 (1967); Lock: 19 (1989); Coates Palgrave: 330 (2002).


**Tephrosia Pers.**

(Papilionoideae—Millettieae)


**Terannus P.Browne**

(Papilionoideae—Phaseolae—Glycininae)


**Tessmannia** Harms
(Caesalpinioideae—Detarieae)

Harms: 295 (1910); Léonard: 384 (1949); Torre & Hillcoat: 220 (1956); White: 128 (1962); Brenan: 106 (1967); Lock: 60 (1989).

Unarmed evergreen trees. Leaves once-pinnate; leaflets alternate, rarely opposite, usually emarginate at apex, marked with numerous pellucid gland dots (visible at least before leaflets have thickened with maturity), without any marginal swelling near base. Inflorescences of terminal or axillary racemes or panicles. Flowers bisexual, distichously arranged along inflorescence axes; bracteoles small, not enclosing flower buds, soon falling off. Sepals 4, very narrowly imbricate, almost valvate, fulvous-tomentose inside. Petals 5, subequal or one somewhat narrower than rest, imbricate, clawed, with a crinkled lamina. Stamens 10; filaments tomentose below, one of them free, rest connate below into a short sulcate tube; anthers dorsifixed, dehiscing by longitudinal slits. Ovary stipitate, usually tomentose but sometimes only so on the stipe; ovules several to numerous; style elongate, coiled when young, with a capitate stigma. Pods flattened, woody, apparently indehiscent, short, warty or smooth outside. Seeds 1–4, black or brown, exarateolate, with a small basilar aril.


**Tetrapleura** Benth.
(Mimosoideae—Mimosae)

Bentham: 345 (1841); Gilbert & Boutique: 218 (1952); Torre: 264 (1956); White: 128 (1962); Brenan: 106 (1967); Lock: 60 (1989).

Unarmed. Leaves bipinnate, eglandular; pinnae 5–7(–10) pairs, opposite to alternate; leaflets 6–11(–13) on each side of pinna, oblong-elliptic to elliptic, with rounded to emarginated apex. Inflorescences axillary, solitary or rarely paired racemes. Flowers bisexual, yellowish to pinkish. Calyx gamosepalous, with 5 teeth. Petals 5, free, very narrowly obovate. Stamens 10, fertile, exerted; anthers with a caducous apical gland. Pods narrowly oblong, straight or slightly curved, woody, indehiscent; valves with a wing-like projection running longitudinally for whole length of valve, pod in section thus ± cruciform, internally septicidal between seeds. Seeds hard, dark brown, not winged.

Species 20, Old World tropics; sthn trop. Afra. 3, of which 1 is introduced, Angola, Zambia, Zimbabwe, Mozambique.
Malawi, and sthn Afr.

**Vigna Savi**
(Papilionoideae—Phaseoleae—Phaseolinae)


Sthn trop. Afr. 42, of which 3 are introduced, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

**Xanthocercis Baill.**
(Papilionoideae—Sophoreae)


**Xeroderris Roberty**
(Papilionoideae—Millietteae)


**Xylica Benth.**
(Mimosoideae—Mimosae)
Brenan & Brummitt: 33 (1970); Lock: 98 (1989); Coates Palgrave: 307 (2002); Izidine & Bandeira: 51 (2002); Bingham (Unpublished).


**Zornia J.F.Gmel.**
(Papilionoideae—Aeschynomeneae—Poiretiinae)


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PLANCHON, J. É. 1848. Leucanophalos. Hooker’s Index Plantarum t. 1066.


SCHRIRE, B.D. 1992. New combinations and resurrected names in...


VERDCOURT, B. 2001. See MACKINDER, B. et al.


Flacourtiaeae
(in broad sense, including Achariaceae, Aphloiaeae, Salicaceae (in broad sense) and Samydaceae) (Dilleniidae—Violales)
(Eurosids I—Malpighiales; divided into Achariaceae, Aphloiaeae and Salicaceae)

Chase et al. (2002) found the Flacourtiaeae to be composed of two clades that are more closely related to other families in the Malpighiales than to each other. In the clade containing the type genus Flacourtiaceae the Malpighiales are embedded. The other clade includes the members of the Achariaceae, a conserved family name. Therefore they propose to recognize two families: (1) Salicaceae (in broad sense), and (2) Achariaceae (in broad sense). They further propose to place Aphloia in the monotypic family Aphloiaeae, which they consider to fall outside the Malpighiales. The families and tribes to which they assign the genera of Flacourtiaeae from sthn trop. Afr. are shown in brackets for all genera in the text below, and families are also given in the following key below. Achariaceae, Aphloiaeae and Salicaceae are treated more fully in their position in the alphabetic arrangement of this work. Herewith a few observations on the more obvious differences between these families:

Achariaceae: All members of this family have petals and they are often larger and more numerous than the sepalas; petals often have an adnate adaxial scale; sepalas are often only 3; stamens are mostly many, rarely 5 or 8–10, anthers are mostly 2 mm or longer (except in Kiggelaria) and often linear; a disc or glands on the receptacle are usually absent; flowers are uni- or bisexual;
fruits are baccate or capsular, sometimes slightly woody.

**Aphloioaceae:** a family with only one genus and one highly variable species, *Aphloia theiformis* (Vahl) Benn., occurring in eastern trop. Africa, Madagascar and the Mascareignes. It differs from all other members of Flacourtiaceae (in broad sense) by a single parietal placenta, and from some members in its bisexual flowers without petals, many stamens with anthers shorter than 1 mm; without a disc or glands on the receptacle; a very short style with a peltate stigma with a median furrow; and a fleshy berry with 6–7 seeds.

**Salicaceae:** Petals are absent or present, and then usually as many and ± as large as the sepals; sepal and petals are often similar; filaments vary from 5–many with small anthers shorter than 1 mm and not much longer than broad (except in *Onocboa* where they are ± 2 mm long and linear); a disc or disc glands are usually present; flowers uni- or bisexual; fruits are capsular or baccate and seeds are often arillate.


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### Key to Achariaceae, Aphloioaceae and Salicaceae

[as defined by Chase et al. (2002)]

| Option | Description | Genus
|--------|-------------|--------|
| 1a | Perianth absent | Salix (Salicaceae)
| 1b | Perianth present, either as sepals or of both sepals and petals: | |
| 2a | Petals absent; anthers mostly shorter than 1 mm and not much longer than broad: |
| 3a | Leaves with linear or circular pellucid glands; stamens connate at the base with the alternating disc glands | Casearia (Salicaceae)
| 3b | Leaves generally without pellucid glands (very fine glands are very rarely present in *Doryalis*); stamens free: |
| 4a | Stamens in bundles of ± 10 alternating with the sepals; fruit a capsule | Bivinia (Salicaceae)
| 4b | Stamens irregularly arranged; fruit a berry or a berry-like drupe: |
| 5a | Ovary 1-locular; flowers bisexual; spines usually absent: |
| 6a | Disc glands present; style 2–4-fid in its upper part; berry reddish yellow | Ludia (Salicaceae)
| 6b | Disc glands absent; style very short; stigma subsessile, almost discoid; berry white | Aphloia (Aphloioaceae)
| 5b | Ovary falsely 3–8-locular; flowers unisexual, rarely bisexual; spines generally present: |
| 7a | Stamens surrounded by a ring of disc glands; ovary with 2 ovules per locule, one above the other; fruit a berry-like drupe with 1-seeded pyrenes in pairs | Flacourtia (Salicaceae)
| 7b | Stamens intermingled with disc glands and alternating with them; ovules 1–6 per placenta; fruit a berry with 1 or 2 seeds | Doyyalis (Salicaceae)
| 2b | Petals present, sometimes similar to sepals; anthers of varying size: |
| 8a | Petals ± as many as sepals; anthers of genera placed in Salicaceae mostly shorter than 1 mm, not much longer than broad, if ± 2 mm long and linear, then flowers up to 90 mm in diameter with a conspicuous central golden mass of stamens (*Onocboa*); anthers of genera included in Achariaceae mostly longer than 2 mm; sepals mostly more than 3: |
| 9a | Inflorescence epiphyllous (on petiole or on midrib of leaf lamina): |
| 10a | Sepals, petals and stamens all 5; style entire; flowers always bisexual | Mocquerysia (Salicaceae)
| 10b | Sepals and petals 3 or 4(5); stamens 20–40; flowers unisexual or bisexual (plants polygamous) | Phyllobotryon (Salicaceae)
| 9b | Inflorescence axillary, terminal or cauline: |
| 11a | Petals without a basal internal gland or scale: |
| 12a | Stamens many, not collected in bundles opposite petals; fruit a berry | Scoltipia (Salicaceae)
| 12b | Stamens equal in number to petals or in bundles opposite petals; fruit usually a capsule: |
| 13a | Leaves with 5–9 nerves from base; flowers unisexual; seeds with a red aril | Trimeria (Salicaceae)
| 13b | Leaves penninerved; flowers bisexual; seeds without an aril: |
| 14a | Style simple with a capitate or minutely bilobed stigma; flowers in pedunculate cymes; stipules deltoid | Gerrardia (Salicaceae)
| 14b | Styles 2–6 or 2–6-cleft; flowers in racemes or panicles; stipules absent or large and orbicular or reniform | Homalium (Salicaceae)
| 11b | Petals with a basal fleshy or hairy gland on the inner face: |
| 15a | Petals whorled (cyclically arranged); stamens 8–12 | Kiggelaria (Achariaceae)
| 15b | Petals spirally arranged; stamens either 5 or 16 or more: |
| 16a | Stamens 5 | Scottellia (Achariaceae)
| 16b | Stamens 16 or more: |
| 17a | Sepals free, ± half as large as petals; racemes subspicate, rather short | Rawsonia (Achariaceae)
| 17b | Sepals connate in lower third, ± as large as petals; racemes slender, elongate | Dasylepis (Achariaceae)
| 8b | Petals more than sepals; anthers mostly longer than 2 mm; sepals mostly 3: |
| 18a | Fruit with 4–6 crenate membranous wings: |
| 19a | Petals 5–7; style short, with (2)3(4) horizontally diverging stigmas as long as or longer than style | Grandidiera (Achariaceae)
| 19b | Petals 10–12; style simple, entire | Poggea (Achariaceae)
| 18b | Fruit a capsule, often woody, indehiscent, smooth or with spines or soft bristles: |
Aphloia (DC.) Benn.
(Aphloiaceae)


Bivinia Jaub. ex Tul.
(Salicaceae—Homalieae)

Jaubert & Tulasne: 78 (1857); Wild: 294 (1960); Wild & Vidigal: 37 (1973); Sleumer: 51 (1975); Coates Palgrave: 758 (2002); Mapaura & Timberlake: 165 (2002).


Buchnerodendron Gürke
(Achariaceae—Lindackerieae)


Caloncoba Gilg
(Achariaceae—Lindackerieae)


Small shrubs or small to medium trees with unarmed branches. Leaves on long petioles or almost sessile; lamina glabrous, scaly or hairy, sometimes glandular-punctate; stipules caducous. Flowers often large, in axillary fascicles or solitary, bisexual and male, often appearing before leaves. Sepals 3, imbricate, concave. Petals 8–12, larger than sepals. Stamens many, with linear or sagittate-linear anthers dehiscing by slits or pores. Ovary 1-locular with 5–8 multi-ovulate placentas; style simple with 5–8 distinct stigmas, or stigmatic apex only slightly lobed and somewhat peltate. Fruit an echinate or smooth, dehiscent, globose or ellipsoid capsule splitting into 5–8 valves, many-seeded and sometimes with a fleshy or gelatinous pulp.


Casearia Jacq.
(Salicaceae—Samydeae)


Dasylepis Oliv.
(Achariaceae—Erythrophereae)

Oliver: 170 (1865); Burtt Davy & Hoyle: 54 (1958); Wild: 263 (1960); Sleumer: 6 (1975).

Trees with glabrous vegetative parts; branches slender, dark brown, striate. Leaves entire or serrulate, often somewhat undulate, petiolar with caducous stipules. Flowers bisexual or male by abortion, in lax racemes or crowded and ± spicate. Sepals 4 or 5, almost free, outer ones scarcely smaller, usually orbicular. Petals 4–7, imbricate like inner sepals but larger, with thick hairy scales adnate at base within. Stamens indefinite, free; anthers linear to narrowly lanceolate, dehiscing longitudinally. Ovary free, glabrous or hairy, 1-locular with 2–4 multi-ovulate placentas; style short or long, simple or divided in upper half into 2–4 branches; stigmas 2–4, short. Fruit a globose capsule with hard leathery pericarp; style persistent, splitting into 2–4 longitudinal sections. Seeds few.
Species 6, trop. Africa; sthn trop. Afr. 1: Dasylepis burt-davyi Edlin, endemic, so far as is known, to Mt Mlanje, Malawi.

**Dovyalis** E.Mey. ex Arn.  
(Salicaceae—Flacourtieae)

Sleumer: 85, 361 (1937/1951); Wild: 281 (1960); Sleumer: 64 (1972a); Wild & Vidigal: 22 (1973), Sleumer: 59 (1975); Langenegger: 84 (1976); White et al.: 268 (2001); Coates Palgrave: 761 (2002); Msekandiana & Mlangeni: 36 (2002).

**Flacourtia** L’Hér.  
(Salicaceae—Flacourtieae)


**Gerrardina** Oliv.  
(Salicaceae—Homalieae)

Wild: 287 (1960); Wild & Vidigal: 30 (1973); Sleumer: 37 (1975); Killick: 72 (1976); White et al.: 272 (2001); Mapaura (Unpublished).

**Grandidiera** Jaub.  
(Achariaceae—Lindackerieae)

Jaubert: 467 (1866); Wild & Vidigal: 8 (1973); Sleumer: 11 (1975).

**Homalium** Jacq.  
(Salicaceae—Homalieae)


**Kiggelaria** L.  
(Achariaceae—Pangieae)

Wild: 265 (1960); Wild & Midigal: 5 (1973); Sleumer: 31 (1975); White et al.: 273 (2001); Coates Palgrave: 751 (2002); Phiri (Unpublished).

Lindackeria** C.Presl  
(Achariaceae—Lindackerieae)


Unarmed shrubs or trees. Leaves simple; lamina usually rather large, glabrous or hairy, hairs stellate or simple, margins usually toothed; petioles sometimes elongate; stipules present. Flowers bisexual or male by abortion, in racemes or solitary in axils. Sepals 3, imbricate, concave. Petals 6–12, imbricate, not much longer than sepals. Stamens many; filaments slender, free or rarely connate in a tube; anthers linear. Ovary shortly stalked, smooth, tuberculate or shortly echinate, usually hairy, 1-locular with 3 parietal placentas; placentas multi-ovulate or with relatively few ovules; style simple with inconspicuous stigmas. Fruit a globose, woody, echinate or warted capsule dehiscing tardily into 3 longitudinal valves. Seeds 1–3, with copious endosperm and a large embryo with flat, coriaceous cotyledons.

**Ludia** Comm. ex Juss.  
(Salicaceae—Flacourtieae)


Unarmed small trees or shrubs. Leaves alternate, petiolate, persistent, entire, oblong, oblanceolate, obovate or elliptic, apex usually shortly attenuate, base cuneate, nerves in 6–8 pairs, steeply ascending; stipules 0. Flowers bisexual, small, solitary or rarely 2 or 3 together from same axil, subsessile, subtended by several minute suborbicular bracts. Sepals 5 or 6, in one whorl, imbricate, densely pubescent outside and in upper part of inside, reflexed at anthesis. Petals 0. Stamens 40–60, arising on a flat receptacle with several small glands, among many hairs; filaments filiform; anthers small, connective generally rather obscure. Ovary globose, 1-locular, with 2–4 parietal placentas bearing few to many ovules; style columnar, 2–4-lobed or -partite at apex. Fruit baccate, with persistent style, 1-locular, hardly or tardily and irregularly dehiscent; pericarp coriaceous. Seeds few; testa hard.

**Mocqueriasia** Hua  
(Salicaceae—Scolopieae)

Unarmed, single-stemmed shrubs. **Leaves** alternate, simple, petiolate, narrowly obovate, cuneate at base, long-acuminate at apex, dentate to denticulate, glabrous; stipules linear-acuminate, glabrous. **Inflorescences** epiphyllous, usually in 1-flowered cymes in 2–6 groups per leaf on petiole or on midrib in lower 1/3 of lamina. **Flowers** bisexual; pedicel pubescent; ± as long as flower; bracts narrowly ovate. **Sepals** 5, imbricate, very narrowly ovate to linear-ovate, pubescent, persistent. **Petals** 5, imbricate, narrowly ovate to linear-ovate, pubescent, persistent. **Stamens** 5; filaments filiform, glabrous; anthers longitudinally dehiscent. **Ovary** superior, 1-locular, with 3 multi-ovulate parietal placentas, style simple, persistent in fruit, glabrescent. **Capsules** ovoid, with 4–6 broad coriaceous wings, tardily dehiscent. **Seeds** many, ovoid, angular, finely pubescent.


**Rawsonia** Harv. & Sond.
(Achariaceae—Erythrospermeae)


**Scolopia** Schreb.
(Salicaceae—Scolopieae)
Sleumer: 84 (1937/1951); Wild: 276 (1960); Wild & Vidigal: 17 (1973); Dowsett-Lemaire & White: 78 (1990); White et al.: 278 (2001); Coates Palgrave: 752 (2002); Mapaura & Timberlake: 165 (2002).


**Scottellia** Oliv.
(Achariaceae—Erythrospermeae)
Oliver: t. 2265 (1893); Sleumer: 79 (1937/1951); Bamps: 9 (1968); Sleumer: 275 (1972b); Hal: 32 (1995).

**Dacypetalum** Pierre ex A.Chev.

Trees up to 30 m high; trunk straight, slightly fluted; branchlets glabrous. **Leaves** alternate, persistent, simple, entire to crenulate, petiolate, cuneate at base, acuminate at apex, coriaceous, glabrous, with 5–8 pairs of secondary nerves; petiole thickened at both ends; stipules 0. **Inflorescences** racemes grouped in pseudopanicles, axillary; rachis slender to subfiliform; bracts minute, caducous. **Flowers** bisexual. **Sepals** 5, elliptic-ovate, ciliate. **Petals** 5, elliptic-ovate, ciliate. **Stamens** 5, alternately filaments subulate, ± twice as long as anthers; anthers acutely triangular in outline, deeply bifid up to basal attachment of filament, longitudinally dehiscent. **Ovary** superior, glabrous, 1-locular, with 2–4 multi-ovulate parietal placentas; style simple, shortly 2–4-fid. **Capsule** opening with 2 or 3 valves; pericarp woody. **Seeds** weakly arillate; with endosperm.

Trimeria Harv.
(Salicaceae—Homaleoideae)


Xylotheca Hochst.
(Achaeiaceae—Lindackerieae)
Sleumer: 81 (1937); Wild: 272 (1960); Wild & Vidigal: 11 (1973); Sleumer: (Achariaceae—Lindackerieae)

Wild: 296 (1960); Wild & Vidigal: 38 (1973); Sleumer: 302 (1974e); Sleumer: (Salicaceae—Homalieae)

References


**Fumariaceae**
(Magnoliidae—Papaverales)
(Eudicots—Ranunculales)


Sthn trop. Afr.: genus 1, species 1.

*Fumaria* L.
Exell & Mendonça: 49, 381 (1937/1951); Exell: 181 (1960); Lidén: 42 (1986); Lidén: 316 (1993).


References

Gelsemiaceae
(Loganiaceae in part)
(Asteridae—Gentianales)
(Euasterids I—Gentianales)

Shrubs, undershrubs, or sometimes lianas, with simple hairs or nearly glabrous; stems much branched; twigs usually thin. **Leaves** opposite, those of a pair equal or subequal, shortly petiolate; lamina mostly papyraceous when dry, ovate to very narrowly elliptic, on lateral branches often smaller, entire or obscurely sinuate-dentate, pinnately veined; veins conspicuous; stipules membranaceous, usually triangular, entire, those of a pair united, or all fused into a short ochra. **Inflorescence** axillary or terminal, usually on short lateral branches mostly obliquely and incompletely dichasial, 1–many-flowered; bracts mostly small and sepal-like. **Flowers** dimorphic. **Sepals** 5, green, connate at base up to half their length, equal or unequal, ovate to very narrowly elliptic, obtuse to subulate at apex, entire or sometimes obscurely sinuate-dentate. **Corolla** infundibuliform; lobes 5, imbricate in bud, spreading, orbicular or nearly so, white, sometimes pale yellow, orange or red, much longer than calyx; tube ± 3–5 times as long as lobes. **Stamens** 5, arising on corolla tube, alternating with corolla lobes, equal or unequal, included or, in long-staminate flowers, exserted; filaments pubescent or sometimes glabrous, arising 1/4 to 1/3 from base of corolla tube; anthers orbicular or oblong, thecae 2, discrete, divergent at base, opening by longitudinal slit. **Ovary** superior, 2-locular; ovules 2 per locule, arising at base of septum; style simple; stigma twice dichotomously branched, lobes narrow, pubescent. **Fruit** capsular, loculicidal, 4-valved, valves hinging on septum, locules with 1 or 2 seeds. **Seeds** obliquely ovate to orbicular, pale brown, dull and densely adpressed-pilose.

Genera 2, species 10, N to tropical America, Africa and E Asia; sthn trop. Afr. genus 1, species 2.


Mostuea Didr.
Didrichsen: 86 (1854); Good: 100 (1929); Bruce: 159 (1956); Burtt Davy *et al.*: 60 (1958) as Mostuea; Leeuwenberg: 1 (1961); White: 339 (1962); Leeuwenberg: 344 (1983); White *et al.*: 338 (2001) (in all preceding references under Loganiaceae); Mapaura (Unpublished), under Spigeliaceae.

Description as for family.


References
Gentianaceae
(Asteridae—Gentianales)
(Euasterids I—Gentianales)

Sthn trop. Afr.: genera 12, species 77.

Key to genera
[after Sileshi Nemomissa (2002)]

1a Trees or shrubs .................................................................................................................. Anthocleista
1b Herbs or suffrutices:
   2a Calyx winged at the keel; capsule 2-locular with axile placentation:
      3a Flowers usually blue, rarely white or pink; corolla tube shorter than 1 mm; anthers without apical and basal glands ............... Exacum
      3b Flowers usually yellow, rarely cream or white; corolla tube ± 3mm long; anthers usually with 1 apical and 2 basal glands ............ Sebaca
   2b Calyx not winged; capsule 1-locular with parietal placentation:
      4a Flowers 3-merous ........................................................................................................ Pycnosphaera
      4b Flowers (3)4, (5–7)-merous:
         5a Anthers twisting spirally on dehiscing .................................................................................. Chironia
         5b Anthers not twisting spirally:
            6a Corolla lobes with 1 or 2 fringed nectaries at the base, these 0.5–3 mm across .......................................................... Swertia
            6b Corolla lobes without nectaries:
               7a Flowers usually 5-merous; filaments with 2 hood-like scales at the base ......................................................... Enicostema
               7b Flowers usually 4-merous; filaments without scales at the base:
                  8a Fertile stamens usually 1 or 2, sterile stamens conspicuously shorter than fertile ones:
                     9a Inflorescences terminal head-like cymes; flowers usually regular; upper leaves reduced and scale-like .............. Schinziella
                     9b Inflorescences lax cymes; flowers slightly irregular; leaves not reduced and scale-like ...................................... Canscora
                  8b All stamens fertile:
                     10a Corolla tube with fimbriate-papillose scales or scabrid-denticulate; stamens arising in the sinuses of the corolla lobes .... Faraa
                     10b Corolla tube smooth; stamens arising on the corolla tube:
                        11a Calyx leathery; lobes 3-nerved .................................................................................. Neurotheca
                        11b Calyx papyraceous; lobes 1-nerved .................................................................................. Congolanthus

Anthocleista A.fzel. ex R.Br.


Canscora Lam.

Annual herbs. Stems erect, much branched, 4-ringed or narrowly 4-winged, glabrous. Leaves sessile, sometimes connate and decurrent on a ridge or narrowly winged; lamina lanceolate, elliptic, ovate to ovate-lanceolate, 3–5-nerved. Flowers 4-merous, in terminal or axillary, lax cymes, sometimes solitary. Calyx tuber terete or winged; lobes much shorter than tube. Corolla regular or rarely irregular; tube cylindrical, with 4 equal or unequal (2 large and 2 small) lobes, much shorter than tube. Stamens 4, inserted at different levels in corolla tube, often some sterile; filaments short; anthers ovoid or ellipsoid not twisted. Ovary ellipsoid or cylindrical, unilocular; ovules many; style filiform; stigma bilobed. Capsule cylindrical, bivalved. Seeds many; testa minutely reticulate-pitted.

Species 12, tropics of Indonesia, Malaysia, Australia and Africa; sthn trop. Afr. 3, Zambia, Zimbabwe, Malawi, Mozambique.

Chironia L.


Congolanthus A.Raynal
Raynal: 56 (1968); Boutique: 17 (1972); Paiva & Nogueira: 6 (1990); Sileshi Nemomissa: 30 (2002).

Annual herbs. Stems erect, slender, often branched, 4-angled. Leaves ovate to elliptic or obovate, linear at apex of branches, entire. Flowers 4-merous, axillary, solitary or 2- or 3-nate. Calyx tube cylindrical, with 4 ribs and 8 delicate veins, papyraceous; lobes 1-nerved. Corolla tube cylindrical, with 4-lobes. Filaments included in corolla tube or exserted; anthers narrowly ellipsoid, not twisted. Ovary narrowly ellipsoid, unilocular; ovules many; style oblong-cylindrical; stigma bilobed. Capsule narrowly cylindrical, bivalved.
**DICOTYLEDONS**

**GENTIANACEAE: Congolanthus**


**Enicostema** Blume


*Hippion* in sense of Hiern: 711 (1898).


**Exacum** L.


**Faroa** Welv.

Welwitsch: 45 (1869); Taylor: 69 (1973a); Taylor: 190 (1973b); Paiva & Nogueira: 41 (1990); Bingham & Smith: 142 (2002).

Annual or perennial herbs, sometimes somewhat succulent. **Stems** erect to prostrate, simple or ± branched, terete to 4-angled, usually ± narrowly winged. **Leaves** linear to ovate, often connate, sometimes dilated and scarious at base. **Flowers** 4-merous, usually pedicellate, in axillary, few- to many-flowered fascicles. **Calyx** a campanulate tube with 4 erect lobes. **Corolla** tube equaling or shorter than calyx, with 4 ± semilunate, fimbriate-papillose scales subtending filaments; lobes 4, spreading, ovate-lanceolate, as long as or shorter than tube. **Stamens** arising in sinuses of corolla lobes; filaments filiform; anthers ovoid. **Ovary** ± obovate, unicocular; ovules many; style filiform; stigma simple, subcapitate, or bilobed, or obsolete, or divided in 2 filiform lobes. **Capsule** obovate, bivalved. **Seeds** many, subglobose, minutely scrobiculate.


**Neurotheca** Salisb. ex Benth.


**Pycnosphaera** Gilg


**Schinziella** Gilg


Erect perennial herbs. **Stems** not or sparsely branched from base. **Leaves** sessile, upper ones much reduced and scale-like. **Flowers** 4-merous, in compact, pedunculate, terminal heads. **Calyx** tube as long as lobes. **Corolla** regular with a cylindrical tube and with 4 lobes ± as long as tube, without nectaries. **Stamens** 4, unequal, 3 sterile, 1 larger, fertile. **Ovary** cylin-dric-ovoid, unicocular; ovules many; style filiform; stigma bilobed. **Capsule** narrowly obovate, bivalved. **Seeds** many, subglobose.


**Sebaea** Sol. ex R.Br.


**Swertia** L.

Hiern: 711 (1898); Gilg: 335 (1903) as *Sweertia*; Boutique: 4 (1972); Paiva & Nogueira: 26 (1990); Sileshi Nemomissa: 145 (1997); Sileshi Nemomissa: 419 (1998); Sileshi Nemomissa: 46 (2002).


**References**


GENTIANACEAE: References


DICOTYLEDONS

References


References


Gisekiaceae  
(Caryophyllidae—Caryophyllales)  
(Core Eudicots—Caryophyllales)


Sthn trop. Afr.: genus 1, species 2.

**Gisekia L.**


**References**


Goodeniaceae  
(Asteridae—Campanulales)  
(Euasterids II—Asterales)


Sthn trop. Afr.: genus 1, species 1.

**Scaevola L.**


**References**


Gunneraceae  
(sometimes placed under Haloragaceae)  
(Rosidae—Haloragidales)  
(Core Eudicots—Gunnerales)


Sthn trop. Afr.: genus 1, species 1.

**Gunnera L.**


**References**


**Haloragaceae**
(Rosidae—Haloragidales)
(Core Eudicots—Saxifragales)


Sthn trop. Afr.: genera 2, species 3.

**Laurembergia P.J.Bergius**
Exell: 231 (1933); Mendes: 31 (1970); Mendes: 74 (1978).

*Serpícula* L.; Hiern: 332 (1896).


**Myriophyllum L.**

**Hamamelidaceae**
(Hamamelidaceae—Hamamelidae)
(Core Eudicots—Saxifragales)


Sthn trop. Afr.: genus 1, species 2.

**Trichocladius Pers.**


**Gyrocarpus Jacq.**


**Illigera Blume**

**References**


**Hernandiaceae**
(Magnoliidae—Magnoliidae)
(Magnoliids—Lauridae)


Sthn trop. Afr.: genera 2, species 3.

Additional family characters distinguishing *Illigera* from *Gyrocarpus*: lianes; leaves digitately 5-foliolate; fruit with 2 broad lateral wings.

**Gyrocarpus Jacq.**


**Illigera Blume**
Lianas climbing by means of twisting petioles. **Leaves** 5-foliolate; leaflets ovate to ovate-lanceolate. **Inflorescences** cincinnate, terminal and axillary. **Flowers** bisexual, 5-merous; buds ellipsoid. **Teips** 5 + 5, valvate. **Stamens** 5, opposite outer tepals, alternating with minute glands; filaments with 2 appendages at base. **Ovary**: tube accrescent to form 2 broad lateral wings. **Seeds**: cotonoid planoconvex to unequal, one surrounding the other.

Species ± 20, Old World tropics; sthn trop. Afr. 2, Angola.

### References

BLUME, C.L. 1827. Bijdragen tot de flora van Nederlandsch Indié. Lands Drukkerij, Batavia.


## Heteropyxidaceae

(Rosidae—Myrtales)

(Rosids—Myrtales)


Sthn trop. Afr.: genus 1, species 2.

**Heteropyxis** Harv.


### References


## Humiriaceae

(Rosidae—Linales)

(Eurosids I—Malpighiales)

Large trees; terminal branches glabrous, often with aromatic juice. **Leaves** alternate, simple, petiolate, slightly toothed or crenate, glabrous; stipules minute, extra-axillary, caducous. **Inflorescence** cyemose-paniculate, dichotomous, axillary or terminal; peduncle robust, branches and pedicels minutely pubescent; bracts amplexicaul, persistent. **Flowers** bisexual, regular. **Sepals** 5, ± united at base, imbricate, broadly orbicular, puberulous, especially in basal portion, ciliate. **Petals** 5, free, imbricate, linear, clawed, pubescent. **Disc** intrastaminal, membranous, laciniate, appressed to ovary. **Stamens** 10, 5 opposite sepals longer than 5 opposite petals; filaments united at base, thick, flattened; anthers dorsally attached near base, versatile; thecae 2, disjunct, ellipsoid, each containing only 1 pollen sac, attached to lower portion of a thick, fleshy, ovate-acuminate connective; dehiscing by detachment. **Ovary** superior, 5-locular, glabrous; ovule 1 per locule, pendulous, anatropous, bitegmic, on apical-axile placenta; style simple, 5-grooved, stout; stigma capitate, 5-lobed. **Fruit** ± subglobose drupe; exocarp fibrose-carnose, hard when dry; endocarp woody, slightly 10-sulcate and bullate, with resinous cavities. **Seeds** usually only 1 or 2; embryo ± straight; endosperm fleshy and oily.

Genera 8, species 50, tropical S America north to Costa Rica, and in W Africa; sthn trop. Afr.: genus 1, species 1.

Jussieu: 87 (1829); Winkler: 126 (1931); Exell & Mendonça: 392 (1951); Keay: 354 (1958); Cuatrecasas: 44 (1961); Badré: 47 (1972).

**Sacoglottis** Mart.

Martius: 146 (1827); Exell: 50 (1927) as Sacoglottis; Winkler: 128 (1931); Exell & Mendonça: 249 (1951); Cuatrecasas: 161 (1961); Liben: 80 (1971); Badré: 47 (1972).

### Description as for family.

Species 9, tropical America and W Africa; sthn trop. Afr. 1: **Sacoglottis gabonensis** (Baill.) Urb., Angola. The only African species, also found in Liberia, Côte d’Ivoire, Nigeria, Cameroon, Gabon and the DRC.

### References


HUMIRIACEAE: References


Hydnoraceae

*(Magnoliidae—Aristolochiales)*

*(Magnoliids—Piperales)*


Sthn trop. Afr.: genus 1, species 1.

**Hydnora** Thunb.


Sthn trop. Afr.: 1; *Hydnora ahysinica* A.Braun in Schweinf., Angola, Zimbabwe, and sthn Aftr.

Hydrophyllaceae

*(Asteridae—Solanales)*

*(Euasterids I; included in Boraginaceae)*


Sthn trop. Afr.: genus 1, species 2.

**Hydrolea** L.

Linnaeus: 328 (1762); Exell: 106 (1929); Verdcourt: 2 (1989); Verdcourt: 57 (1990).

Annual or perennial herbs, decumbent below and sometimes rooting at nodes. *Leaves* alternate, entire; stipules absent. *Flowers* bisexual, regular, in pedunculate, terminal, few- to many-flowered cymes. *Calyx* deeply divided into 5 lobes, imbricate at base. *Corolla* 5-lobed, rotate-campanulate, deep blue, white at base. *Stamens* 5, arising at sinuses of corolla; filaments filiform, usually dilated at base; anthers sagittate, apiculate. *Ovary* 2(3)-locular, with fleshy placentas adnate to septa; ovules many per locule; styles 2, subulate, distinct from base; stigmas capitate. *Fruit* a ± ellipsoid, usually septically bivalved capsule. *Seeds* many, minute.

Species ± 20, tropics and subtropics of Old and New World, 7 in Africa; sthn trop. Aftr. 2, Angola, Zambia.

**Hydrostachyaceae**

*(Asteridae—Callitrichales)*

*(Asterids—Cornales)*


Sthn trop. Afr.: genus 1, species 3.

**Hydrostachys** Thouars

Hess: 375 (1953); Cusset: 76 (1973); Stannard: 11 (1997).


References


ICACINACEAE

Icacinaceae
(Rosidae—Icacinales)
(Euasterids I)

Key to genera
[adapted from Villiers (1973)]

1a Leaves opposite:
   2a Shrubs or trees, often spinescent; flowers bisexual ................................................................. Cassinopsis
   2b Lianes with tendrils, not armed; flowers unisexual ................................................................. Iodes

1b Leaves alternate:
   3a Shrubs or trees:
      4a Inflorescence umbelliform or of corymbiform panicles:
         5a Inflorescences leaf-opposed, consisting of several umbellate heads; disc present; calyx small, shortly 5-toothed; anthers densely villous ....
            .............................................................................................................................. Lasianthera
         5b Inflorescences axillary, of corymbiform or umbelliform panicles; disc absent; calyx with sepals ± free; anthers glabrous ............ Alsodeiopsis
      4b Inflorescence a spike, raceme, cyme, or glomerate:
         6a Flowers unisexual; inflorescences corymbose: loose spikes or racemes arranged in fascicles on cushions at nodes of older branches .... Stachyanthus
         6b Flowers bisexual; inflorescences axillary, extra-axillary or terminal:
            7a Petals united into a cylindric tube; sepals ± free; stamens with filaments adnate to the petals .................................................. Leptaulus
            7b Petals free at the base; calyx 5-toothed; stamens with filaments free to slightly cohering at the base:
               8a Flowers in terminal panicles; anthers linear; up to half as long as filaments; fruit with a fleshy red (drying black) lateral appendage ...
                  ...................................................................................................................... Apodytes
               8b Flowers in axillary or supra-axillary fascicles, spikes or racemes, or flowers solitary; anthers elliptoid to ovoid, much shorter than filaments; fruit without a fleshy lateral appendage:
                  9a Flowers in simple, many-flowered supra-axillary fascicles; filaments broadened below; petals not bearded on inner face . Rhaphistyli
                  9b Flowers in axillary spikes or racemes or solitary; filaments filiform throughout; petals bearded on inner face ....................... Icacina

3b Lianes or climbing shrubs:
   10a Inflorescences corymbose: loose spikes or racemes arranged in fascicles on cushions at nodes of older branches ................. Stachyanthus
   10b Inflorescences ± axillary:
      11a Flowers in simple, ± axillary fascicles on pedicels ± as long as the flowers or longer; filaments markedly broadening below .... Rhaphistyli
      11b Flowers in spikes or racemes; filaments not markedly broadening below:
         12a Drupe completely enveloped by the strongly accrescent corolla terminating in a long slender cone or tube; the secondary nerves on leaves often prolonged beyond the margin as hydathodes:
            13a Leaves penninerved, elliptic, ± entire; flowers 4-merous; female flowers with staminodes; male flowers in dense spikes ........
                .......................................................................................................................... Chlamydocarya
            13b Leaves palmati- to penninerved, often lobed; flowers 3-merous; female flowers without staminodes; male flowers in small dense heads arranged in panicles ................................................................. Polyccephalum
         12b Drupe not surrounded by the accrescent corolla; leaves without hydathodes:
            14a Calyx absent; flowers usually unisexual; stigma sessile, consisting of several radiating tubes; endocarp spiny on inner surface ....
               ...................................................................................................................... Pyrenacantha
            14b Calyx and petals present; flowers bisexual; style terete, often excentric; stigma capitellate; endocarp not spiny on inner surface ..... Icacina

Alsodeiopsis Oliv.
Oliver: 996 (1867); Exell: 224 (1932); Sleumer: 359 (1942); Exell & Mendonça: 341 (1951b); Keay: 637 (1958); Lucas: 8 (1968); Villiers: 18 (1973).

Shrubs or sometimes small trees, with usually stiff hairs on young branches and leaves. Leaves alternate, entire, pinninerved. Flowers bisexual, regular, small, on slender pedicels, axillary in cymes or racemes. Sepals 5, free or partially united at base. Petals 5, free or united up to half their length, valvate. Stamens 5, free, alternate, or partly united at base; filaments short; anthers ovate-oblong or sagittate, apiculate. Ovary 1-locular, hisporate; style filiform; stigma small, capitellate; ovules 2, pendulous. Fruit an oblong-ellipsoid drupe. Seed large, woody.

Cassinopsis Sond.

Shrubs or Afr. 2, Zimbabwe, Mozambique, and sthn Afr.
Chlamydocarya Baill.

Baillon: 276 (1872); Exell & Mendonça: 346 (1951b); Boutique: 247 (1960); Villiers: 88 (1973).

Tall dioecious lianes with irritating hairs, especially those on fruit. Leaves alternate, entire or subdenticate, pinnerved with secondary nerves often prolonged beyond leaf margin by projecting hydathodes. Inflorescences: spikes of glomerules. Male flowers in cauline or axillary spikes; calyx absent; petals 4; stamens 4, with distinct filaments; anthers ellipsoid; gynoecium rudimentary. Female flowers in glomerules or spikes; sepals 4, ± fused at base; petals 4, fused into a tube ending in a crown of hairs and strongly accrescent in fruit; staminodes 4, alternisepalous; ovary 1-locular; style short, tubular; stigma divided. Fruit globose drupes, lower part fused with corolla; upper part surrounded by the strongly accrescent corolla narrowing into a long tube; endocard crusteous to subwoody with prickles on inner surface. Seeds with numerous small pits corresponding to prickles on inside of endocarp; embryo as long as seed.

Species 6, trop. Africa; sthn trop. Afr. 1(2), Angola.

Icacina A.Juss.

Jussieu: 174 (1823); Oliver: 356 (1868); Exell & Mendonça: 342 (1951); Keay: 639 (1958); Villiers: 50 (1973).

Shrubs, trees or lianes, often with thick underground tubers. Leaves alternate, entire, pinnerved. Inflorescences axillary, extra-axillary or terminal panicles, spikes of fascicles. Flowers bisexual. Calyx small, ± deeply 5-toothed. Petals 5, free, valvate, pubescent on inner face. Stamens 5; filaments free; anthers ovoid-oblong. Disc hypogynous, ± well-developed. Ovary 1-locular, often asymmetric, ovoid-oblong, narrowing towards apex; ovules 2; style often excentric, and bifid; stigma capitate, small. Fruit a 1-seeded, ellipsoid, often asymmetric drupe; endocard crusteous. Seed with small embryo situated at summit of endosperm.


Iodes Blume

Blume: 29 (1825); Exell & Mendonça: 347 (1951b); Boutique: 239 (1960); Lucas: 15 (1968); Villiers: 5 (1973).

Dioecious lianes with tendrils ± as long as leaves, arising at leaf nodes. Leaves opposite, entire, pinnerved. Inflorescences: flowers borne in axillary cymose panicles, rarely terminal umbels. Flowers unisexual, pedicellate, articulated below calyx. Calyx deeply 4- or 5-toothed, sometimes absent. Petals 3–5, ± united at base. Male flowers with 3–5 stamens alternating with petals; filaments very short, ± flattened. Female flowers: ovary subsessile, 1-locular, stigma sessile, discoid, sometimes slightly excentric; ovules 2, pendulous. Fruit a drupe, ellipsoid; endocard woody. Seeds large.

Species 28, Old World tropics; sthn trop. Afr. 2, Angola.

Lasianthera P.Beauv.

Palisot de Beauvois: 85 (1806); Oliver: 353 (1868); Exell & Mendonça: 342 (1951b); Boutique: 263 (1960); Villiers: 14 (1973).

Glabrous shrubs or small trees. Leaves alternate, entire, pinnerved. Inflorescences umbels of small heads opposite leaves. Flowers bisexual. Calyx small, shortly 5-toothed. Petals 5, valvate, cohering in a tube but easily separated to base. Stamens alternating with petals, free or adnate at base to petals, with a tuft of long hairs on inside near base of anthers; anthers with a tuft of hairs on back. Disc unilaterial, pressed against one side of ovary. Ovary 1-locular, ± oval in outline but beaked and dorsiventrally flattened and thus narrowly oval in cross section; style short, glabrous; stigma small. Fruit a dorsiventrally flattened drupe with remains of disc attached to base. Seed: embryo small, apical on endosperm.


Leptaulus Benth.

Bentham: 351 (1862); Exell & Mendonça: 341 (1951b); Boutique: 260 (1960); Mendes: 343 (1963); Lucas: 1 (1968); Villiers: 57 (1973).

Evergreen shrubs or small trees; bark pale grey-brown. Leaves alternate, elliptic to narrowly elliptic, entire, rather coriaceous, petiolate. Flowers bisexual, in subumbellate cymes or solitary, white, drying chrome-yellow. Calyx deeply 5-lobed; lobes slightly imbricate. Petals 5, united nearly to apex, valvate with inflexed tips. Stamens 5, alternating with petals and adnate to them for most of their length. Ovary with a somewhat excentric style as long as corolla tube; stigma funnel-shaped. Fruit an oblong-ellipsoid drupe. Seed oblong-ellipsoid.


Polycephyllum Engl.

Engler: 227 (1897); Exell & Mendonça: 346 (1951b); Boutique: 246 (1960); Villiers: 96 (1973).

Dioecious lianes; branches ferruginous-tomentose. Leaves alternate, 3- to 5-lobed or entire, palmati- or pinnerved, nerves prolonged beyond lamina by projecting hydathodes; densely tomentose underneath. Male flowers very small, in dense, many-flowered glomerules arranged in panicles; calyx absent; corolla campanulate, petals 3, united; stamens 3, with filiform filaments, anthers oblong; ovary absent or rudimentary. Female flowers in dense, solitary, axillary globose heads; calyx campanulate, truncate or shortly 3-lobed; corolla campanulate, shorter than calyx, fused at base with ovary; ovary ellipsoid, style pubescent, ending in a peltate, multifid stigma. Fruit a drupe, globose to ellipsoid, tomentose, completely surrounded by accrescent corolla terminating in a cone; endocard woody, verrucose on inner surface. Seed with small embryo situated at apex of oily endosperm.


Pyrenacanthia Wight

Exell & Mendonça: 344 (1951b); Mendes: 347 (1963); Lucas: 10 (1968); Villiers: 69 (1973); Eggli: 287 (2002); Mapaura & Timberlake: 165 (2002).

Rhaphiostylis Planch. ex Benth.

Bentham: 259 (1849); Exell & Mendonça: 343 (1951b); Mendes: 345 (1963); Lucas: 6 (1968); Villiers: 31 (1973).

Glabrous, evergreen, straggling shrubs or woody lianes; bark smooth, dark grey; young branches dark purple. Leaves alternate, narrowly lanceolate to elliptic, entire, glossy dark green, petiolate. Flowers bisexual, in 4- to many-flowered supra-axillary fascicles; pedicels glabrous, ± equaling flowers. Calyx small, 5-fid. Petals 5, valvate, free, white. Stamens 5; filaments compressed below, filiform above, alternipetalous. Ovary 1-locular with a filiform, persistent excentric style. Fruit an obliquely dorso-ventrally compressed, reticulately wrinkled drupe with a persistent style.


Stachyanthus Engler

Engler: 227 (1897) name conserved; Exell: 224 (1932); Boutique: 257 (1960); Lucas: 6 (1968); Villiers: 31 (1973).

Neostachyanthus Exell & Mendonça: 111 (1951a); Exell & Mendonça: 344 (1951b).

 Dioecious climbing shrubs; branches hirsute. Leaves alternate, entire, shortly petiolate, penninerved. Inflorescences: male and female in loose spikes or racemes arranged in fascicles on cushions at nodes of older branches; bracts small. Male flowers: 5- or 6-merous; calyx cup-shaped, shortly toothed; petals valvate, coiled outwards before anthesis; stamens with filiform filaments ± as long as linear anthers; disc present or absent. Female flowers similar to male ones but disc always absent; ovary 1-locular, oblong-ovate, stigma sessile, discoid. Fruit an ellipsoid, ± flattened drupe; endocarp crustaceous, verrucose to smooth inside. Seed often pitted; endosperm markedly mottled.


References


Irvingiaceae (Rosidae— Sapindales)
(Eurosids I— Malpighiales)

Trees, usually tall, glabrous; stems with mucilage cavities. Leaves alternate, simple, entire, pinnately veined, coriaceous, petiolate, not gland-dotted; stipules intrapetiolar, large, very long, folded around terminal bud, early caducous and leaving a very distinct scar around stem. Inflorescences a panicule, terminal, axillary or on twigs below leaves. Flowers usually bisexual, regular, small, in terminal or axillary racemes or panicles. Sepals (4)5, free to slightly united at base, imbricate. Petals (4)5, free, equal, longer than sepals, imbricate. Disc intrastaminal, thick, fleshy, cushion-shaped. Stamens (8)10 (twice as many as petals), arising at base of disc, free or fused at base; anthers 2-thecous, circular-ovate, intorse with longitudinal slit; pollen spherical, tricolporate. Ovary superior but partly to deeply immersed in disc, 2- or 5-locular, locules 1-ovulate; ovules pendulous from apical-axile placenta; style simple; stigma truncate or capitate. Fruit drupaceous, with 1(2) or (4)5 nutlets, and fleshy, edible mesocarp. Seeds compressed; testa shiny; endosperm sparse to absent; cotyledons plano-convex.


Exell & Mendonça: 279, 395 (1951); Gilbert: 109 (1958); Keay: 692 (1958); Aubréville: 12 (1962); Exell: 220 (1963); Harris: 143 (1996); Mabberley: 365
IRVINGIACEAE

Key to genera
Stipules covering terminal buds usually longer than 50 mm; ovary globular, (4)5-locular; drupe depressed-subglobular, containing (4)5 nuts .... **Klainedoxa**
Stipules covering terminal buds usually shorter than 50 mm; ovary slightly flattened, 2-locular; drupe ± ellipsoid, containing 1 nut .............. **Irvingia**

**Irvingia Hook.f.**
Hooker: 167 (1860); Engler: 398 (1931); Gilbert: 112 (1958); Keay: 693 (1958); Aubréville: 21 (1962); Harris: 166 (1996); Harris: 8 (1999); Dombo et al.: 10 (2002).

Trees, sometimes very tall. **Leaves** papyraceous to coriaceous; stipules mostly shorter than 40 mm. **Flowers** bisexual or sometimes unisexual by abortion. **Sepals** small, free or slightly united at base. **Petals** spreading, much longer than sepals. **Stamens** with free filaments. **Ovary** 2-locular, slightly sunk into disc, ± globular. **Fruit** ± ellipsoid drupe, containing 1(2) woody pyrene(s) by abortion; pyrene ellipsoidal, 1-seeded; endosperm almost absent to copious.

Species 7, 6 in humid W and C Africa, 1 in SE Asia; sthn trop. Afir. 5, Angola.

**Klainedoxa Pierre ex Engl.**
Engler: 227 (1896); Engler: 396 (1931); Exell & Mendonça: 279 (1951); Gilbert: 109 (1958); Keay: 693 (1958); Aubréville: 21 (1962); White: 171 (1962) as Klainedoxa; Exell: 220 (1963); Keay: 166 (1984); Harris: 152 (1996); Harris: 5 (1999); Phiri (Unpublished) as Clainedoxa.

Trees, often very tall; young trees armed with spines up to 100 mm long. **Leaves** coriaceous; stipules usually longer than 50 mm, falcate. **Flowers** bisexual. **Sepals** free, ovate. **Petals** elliptic, 2 or 3 times as long as calyx. **Stamens** (9)10, antepetalous ones shorter than antesepalous ones; pollen with polar triangle. **Ovary** (4)5-locular, slightly sunk into fleshy disc. **Fruit** a depressed, hard, ± distinctly (4)5-lobed drupe containing (4)5 hard, 1-seeded pyrenes, irregularly shaped with processes, free or centripetally fused. **Seeds**: endosperm copious.


**Ixornanthaceae**
(Rosidae—Linales)
(Eurosids I—Malpighiales)

Trees, shrubs or rarely suffrutescent, glabrous or with an indumentum of simple hairs. **Leaves** alternate, simple, entire or toothed, pinnernerved; stipules small or 0. **Flowers** bisexual, ± regular, ± hypogynous, small, in axillary cymes or racemes. **Sepals** 5, free or united at base, imbricate. **Petals** 5, free, contorted in bud, persistent, often becoming indurated. **Stamens** 5 or 5 + 5, all fertile; filaments arising on outer side of ring- or cup-like disc, either free or basally attached to disc; anthers 2-theceous, dorsifixed, dehiscing longitudinally; filaments and style folded in bud. **Ovary** superior, 5-locular, each locule with (1)2 ovules and often ± divided by a false septum; ovules, if 2, collateral, pendulous from an apical-axile placenta, anatropous, bitegmic; style terminal, completely united; stigmas 5, free and radiating or united to form a globose mass. **Fruit** a coriaceous to woody, septicidal capsule, each valve frequently splitting at apex along false septum. **Seeds** 1–3(5), ellipsoid, smooth, surrounded by a yellowish or reddish aril; endosperm fleshy; embryo often oblique or lateral.


References
The American genus differs from Phyllocosmus in its elongate pointed capsule with dry walls and particularly in its flattened, winged seeds (Verdcourt: 3; 1984).

Bentham: 242, 245 (1862) as tribe Ixonantheae under Lineae; Exell & Mendonça: 105 (1951a); Robson: 100 (1963); Robson & Gonçalves: 1 (1969); Verdcourt: 1 (1984); Takhtajan: 321 (1997).

Phyllocosmus Klotzsch

Ochthocosmus Bentham in part, as to African species; Winkler: 123 (1931); Exell & Mendonça: 105 (1951a); Exell & Mendonça: 246 (1951b); Keay: 355 (1958); White: 167 (1962); Robson: 100 (1963); Phiri (Unpublished) under Irvingiaceae.

Description as for family.


References

Kirkia Oliv.
Exell & Mendonça: 276 (1951); White: 172 (1962); Wild & Phipps: 214 (1963); Wild et al.: 3 (1969); Stannard: 829 (1981); Takhtajan: 312 (1997); Stannard: 3 (2000); (in all preceding references Kirkia is placed in Simaroubaceae); Coates Palgrave: 423 (2002); Angiosperm Phylogeny Group: 420 (2003).

Sthn trop. Afr.: genus 1, species 1.

References

Kirkia (Simaroubaceae in part)
(Rosidae—Sapindales)
(Eurosids II—Sapindales)

Lamiaceae (Labiatae)
(Asteridae—Lamiales)
(Euasterids I—Lamiales)
Key to genera


1a Fruit dry and hard, turbinate, flat above, with 4 small horns in a cross, at length dividing into 4 pyrenes; calyx accrescent to form a plate-like structure in fruit .......................................................... Karomia

1b Fruit a drupe or composed of nutlets; calyx sometimes accrescent in fruit but not as above:

2a Fruit a drupe, remaining undivided or dividing very late in development; style terminal or subterminal:

3a Leaves palmately compound with (1–)3–5 leaflets ........................................................................................................................................ Vitex

3b Leaves simple:

4a Fruit an entire drupe containing a single, 4-locular pyrene ................................................................................................................................ Premeia

4b Fruit a 4-lobed or furrowed drupe with 4 pyrenes:

5a Flower bud symmetric or, if asymmetric, usually expanding abruptly on upper side due to resupination; anterior corolla lobe only slightly (if at all) larger than the others; anthers dorsifixed; stigma lobes equal ........................................................................................................ Clerodendrum

5b Flower bud markedly asymmetric, corolla expanding on lower side only; anterior corolla lobe frequently much larger than the other 4; anthers usually basifixed (occasionally approaching dorsifixed); stigma lobes frequently unequal .......................... Rotheea

2b Fruit composed of 4 (or by abortion fewer) nutlets; style gynobasic:

6a Stamens directed upwards or in different directions, never all directed downwards upon the lower side of the tube or the lower lip of the corolla (stamens absent in female flowers of Tetradenia):

7a Stamens exerted; filaments with dense moniliform hairs in upper part; anthers 1-theca .......................................................... Pogostemon

7b Stamens included to exerted; filaments ± glabrous; anthers 2-thecous or ± 1-thecous by confluence, or pollen sacs separated by prolongation of connective:

8a Fertile stamens 2; anther thecae separated by a long connective; calyx 2-lipped ................................................................................................................................ Salvia

8b Fertile stamens 4; anther thecae not widely separated; calyx 2-lipped or 5–many-toothed:

9a Stamens directed in different directions, filaments straight, 2 directed upwards and 2 downwards; corolla small, 2–5 mm long, subequally 4- or 5-lobed (stamens absent in female flowers of Tetradenia):

10a Perennial rhizomatous herbs; flowers bisexual ................................................................................................................ Mentha

10b Semisucculent or softly woody shrubs, usually flowering after the leaves are shed; plants dioecious ................................................. Tetradenia

9b Stamens all directed to upper side of tube or upper lip of corolla; corolla mostly longer than 5 mm (sometimes shorter in Scutellaria but then calyx 2-lipped with upper lip deciduous):

11a Calyx 2-lipped, pouch-shaped or becoming inflated and bladdery in fruit:

12a Corolla ± equally 2-lipped; calyx not much enlarging in fruit, with lips entire, equal in length, the upper one deciduous; nutlets not winged .......................................................... Scutellaria

12b Calyx very unequally 2-lipped, often liver-coloured, with upper lip short, broad, ascending; lower lip much larger, 3-lobed; nuts appearing winged due to stiff primary rays interlaced with fine transverse hairs .............................................................................. Tinnea

11b Calyx regularly or irregularly 5–many-toothed, mouth sometimes oblique but not distinctly 2-lipped (obscurely 2-lipped in some Leucas species, but then calyx 6–10-toothed):

13a Corolla usually orange or yellow, rarely cream; upper lobe 12–30 mm long; calyx 8–10-toothed .................................................... Leonotis

13b Corolla not orange or yellow; upper lobe shorter than 10 mm:

14a Stamens included in corolla tube; anthers and style held together by intermingling hairs; calyx glabrous within .......................................................... Acrotome

14b Stamens reaching mouth of corolla tube or exerted (stamens included in cleistogamous flowers of *Lamium amplexicaule but then bracts amplexicaul):

15a Calyx 6–many-toothed (teeth often very unequal in size) .................................................................................................................. Leucas

15b Calyx subequally 5-toothed:

16a Calyx 13(–15)-ribbed; stamens arising near corolla throat with very short upcurved filaments .................. Satureja

16b Calyx 5–10-ribbed; stamens arising within corolla and usually well exerted:

17a Bracts large, amplexicaul ........................................................................................................................................... *Lamium

17b Bracts leaf-like, or reduced or ovate, sessile and covering the axis between the verticils, not amplexicaul:

18a Bracts ovate, sessile, cuspidate, sparsely pubescent with ciliate margin covering the axis between the verticils ........................................................................................................... Achirospernum

18b Bracts leaf-like or reduced:

19a Bracts leaf-like; calyx often with additional smaller teeth (5–8–toothed); upper lip of corolla subequal to lower one and beset with stiff, brush-like hairs ....................................................................... Leucas

19b Bracts usually reduced, occasionally leaf-like; calyx always 5-toothed; upper lip of corolla glabrous or pubescent but not with stiff brush-like hairs, usually shorter than horizontal lower lip ........... Stachys

6b Stamens directed downwards upon the lower side of the corolla tube or the lower lip of the corolla:

20a Lower lip of the corolla thickened at the base and reflexing at anthesis to explosively release the stamens; calyx teeth linear-subulate; corolla small, ± equally 5-lobed, lower lip thickened at base .................................................................................. *Hyptis

20b Lower lip of the corolla not thickened at the base, very rarely reflexing at anthesis:

21a Calyx fleshy; only lower 2 stamens fertile, upper 2 minute .................................................................................. Hoslundia

21b Calyx not fleshy; all 4 stamens fertile, or if upper 2 sterile, then not minute:

22a Stamens arising close together near the throat of the corolla:

23a Calyx inflated and bladdery in fruit ........................................................................................................................................ Alvesia
LAMIACEAE: Key to genera

23b Calyx not much enlarged in fruit, neither fleshy nor inflated; all 4 stamens fertile:

24a Calyx falling away by a clean break above the base of the fruit. .................................................. Acollanthus
24b Calyx persistent in fruit, 3–5-toothed or 2-lipped:

25a Calyx with 5 equal, rigid, spine-like teeth; flowers in a dense, terminal, spike-like inflorescence. .......... Pycnostachys
25b Calyx not rigidly spinescent:

26a Calyx equally or subequally 5-toothed, uppermost tooth sometimes slightly larger than the other 4:

27a Bracts differentiated from and smaller than the leaves:

28a Style with entire stigma; inflorescence paniculate with slender branches somewhat zigzag towards ends and bearing solitary flowers. .......................................................... Holostylon
28b Style bilobed; inflorescence paniculate or subspicate with flowers in verticils of (1–)3–many-flowered cymes or dichasia. .................................................. Plectranthus sens. lat. (including Isodictyophorus and Lecopus)
27b Bracts leaf-like, becoming gradually smaller towards the apex of the inflorescence or towards the ends of flower-bearing stems:

29a Stems semiwoody, erect; inflorescence dense, paniculate or spicate; flowers in 6–8-flowered verticils arranged in short lateral and terminal spikes. ................................................. Neohyptis (best in Plectranthus)
29b Stems softly herbaceous, decumbent or erect; flowers in slender, lax, axillary racemes borne along almost entire length of stem. ................................................................. Englerstraum
26b Calyx ± clearly 2-lipped: upper lip of calyx consisting of a large, oblong to broadly oblong lobe often decurrent on the tube, distinctly larger than the remaining teeth/lobes. ................................................................. Plectranthus sens. lat. (including Solenostemon and Symphostemon)

22b Stamens separated by a clear gap at the point of origin in the corolla tube; the lower pair usually arises near the corolla throat, the upper one ± in the middle of the tube or nearer the base, or if near the throat, then on the upper rather than the lower side of the tube:

30a Calyx ureolate-campanulate or very obscurely 2-lipped with a 3-toothed upper and a 2-toothed lower lip; cymes pedunculate with pedicellate flowers; upper stamens arising ± in the middle of the corolla tube. .................................................. Isodon
30b Calyx with a single-lobed upper lip and a usually 4-lobed lower lip (rarely 3- or 7-lobed); if equally 5-lobed then cymes sessile, condensed and lacking bracteoles:

31a Corolla with 4 subequal or slightly unequal lobes, not distinctly 2-lipped; stamens included in the corolla tube. ................................................................. Endostemon
31b Corolla either distinctly 2-lipped or subequally 5-toothed; stamens exserted:

32a Lower pair of stamens united for most of their length, upper pair free. .............................................. Syncolostemon
32b Lower and upper pairs of stamens free or all shortly united at the base:

33a Calyx equally or subequally 5-toothed. .......... Benguella
33b Calyx 2-lipped:

34a Upper lip of calyx 3-toothed (teeth sometimes minute), lower lip 2-toothed or entire:

35a Inflorescence corymbose, flower heads capitate, 8–10 mm long and almost equally broad. .... Haumaniastrum
35b Inflorescence spike-like, 50–100 mm long; flowers in dense, many-flowered cymose clusters. ....... Platostoma
34b Upper lip of calyx consisting of a large, oblong to broadly oblong lobe often decurrent on the tube, distinctly larger than the remaining teeth/lobes:

36a Upper pair of filaments with a crested or hairy knee-bend near the base. ........................................ Ocimum
36b Upper pair of filaments glabrous or pubescent but without a crested and hairy knee-bend near the base:

37a Filaments of lower pair of stamens connate for part of their length; upper pair attached to the corolla tube and free. ................................................................. Hemizygia
37b Filaments all free or all connate at the base:

38a Corolla ± 2 mm long, obscurely 2-lipped, lower lip almost flat. ............................................................ Basilicum
38b Corolla 4 mm long or longer, 2-lipped; lower lip concave to boat-shaped:

39a All 4 stamens fertile. ...................................................... Orthosiphon
39b Upper pair of stamens sterile. ................................................................. Fuerstia

Achyrospermum Blume
Blume: 840 (1826); Baker: 463 (1900); Bruce: 47 (1936); Morton: 261 (1962); Chikuni: 605 (1995); White et al.: 293 (2001); Coates Palgrave: 995 (2002).

Perennial herbs or subshrubs; stems quadrangular to subterete. Leaves petiolate, thin, crenate. Inflorescences of small flowers in dense, terminal or lateral spike-like panicles; bracts ovate, sessile, membranous, ciliate, much smaller than leaves, persistent. Calyx: tube subcylindric to funnel-shaped, 10-nerved; teeth 5, subequal, herbaceous, not rigid. Corolla: tube funnel-shaped to cylindric; limb bilabiate, upper lip short, curved, lower lip longer, deflexed, 3-lobed. Stamens 4, didynamous, curved, lowest pair the longest; anther thecae distinct or confluent. Style bifid at apex. Nutlets obovoid, reticulate, scaly at apex.


Acrotome Benth.
Taylor: 1 (1935); Codd: 19 (1985); Mapaura (Unpublished).


Aeollanthus Mart. ex K.Spreng.
Good & Taylor: 165 (1931) as Aeollanthus; Codd: 121 (1985); Ryding: 52

_Icomum_ Hua; Binns: 57 (1968).

Species 43, tropical and southern Africa; sfln trop. Afr. 27, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sfln Afr.

Alvesia Welw.

Welwitch: 55 (1869); Baker: 378 (1900); Binns: 56 (1968); Mathew: 564 (1972).


Perennial pubescent herbs or subshrubs with woody base; stem and branches ± terete at base, faintly 4-angular towards apex. Leaves ± sessile or petiolate, oblong-lanceolate to broadly ovate, acute, ± entire or serrate. Inflorescences ± dense terminal racemes with pedicellate flowers in 3–6-flowered verticils; bracts ovate, orbicular, or with a campanulate tube and very small obtuse lobes; in fruit large, scarious, inflated and ± closed at mouth. Calyx densely pubescent, 2-lipped, 3-lobed; upper lobe ovate, lower lobes ± orbicular, or with a campanulate tube and very small obtuse lobes; in fruit large, scarious, inflated and ± closed at mouth. Corolla bilabiate, outside densely pubescent; tube short, widening abruptly into an oblique dilated throat; upper lip much shorter than lower, ovate, emarginate or 3-lobed; lower lip large, oblong, carinate, directed far forward. Stamens 4, didynamous, decline, exserted or included in lower lip; filaments free; anthers synsthecate. Disc entire or shortly lobed. Style shortly bifid. Nutlets subreniform to subglobose, granular.


_Basilicum_ Moench

Morton: 238 (1962); Morton: 454 (1963); Binns: 56 (1968); Codd: 217 (1985); Mapaura (2002); Phiri (Unpublished).

_Moschosoma_ Rechb. in part; Binns: 58 (1968).


_Benguellia_ G.Taylor

Taylor in Good & Taylor: 156 (1931); Paton: 262 (1997a).

_ORTHOSIPHON_ Gürke: 360 (1903).

Perennial marsh herbs with erect, simple to sparsely branched glabrous stems. Leaves opposite, narrowly lanceolate to linear, narrowing very gradually into a short petiole, ± entire but shallowly dentate towards tip, acute, glabrous on both sides but with glandular dots. Inflorescences terminal, with numerous 4–6-flowered verticils densely to loosely arranged on a simple straight rachis; bracts sessile, broadly ovate. Calyx tubular at flowering time, 10-nerved with 5 ± equal, short, triangular teeth; accrescent and narrowly campanulate in fruit. Corolla 2-lipped; tube much longer than calyx, widening slightly towards the mouth; posterior lobe 3-fid, anterior lobe entire, slightly concave. Stamens 4, decline, shortly exserted; anterior stamens arising at corolla throat; posterior ones at midpoint of corolla; filaments free. Style slightly exserted, ending in 2 short, flattened, rounded lobes.

Monotypic genus: _Benguellia lanceolata_ (Gürke) G.Taylor, known only from Angola.

_Clerodendrum_ L.


Kalaharia Baill.; Burtt Davy _et al._: 101 (1958); White: 368 (1962) as synonym.


_Endostemon_ N.E.Br.


_Englerastrum_ Briq.


Sfln trop. Afr. 7, Angola, Zambia, Zimbabwe, and sfln Afr. Generic limits in genera closely related to _Plectranthus_, such as _Englerastrum_, are not all clearly defined. Paton (pers. com.) suggests that _Englerastrum_ should be placed under _Plectranthus_.

_Fuerstia_ T.C.E.Fr.


Perennial herbs with a woody rootstock or subshrubs, glandular pubescent; stem erect to ascending, quadrangular at least in younger parts. Leaves opposite or 3- or 4-nate, sessile or shortly petiolate. Inflorescences simple, terminal or axillary racemes with flowers arranged in 2–4-flowered verticils; flowers pedicellate. Calyx 2-lipped, shortly tubular, small and semierect during flowering, accrescent and declinate in fruit; upper lip broad, ovate, shortly deflexed, slightly concave, ± as long as upper one; bracts subtending a single flower. Stamens 4, declinate, but posterior 2 sterile, arising near midpoint of corolla; anterior 2 fertile, arising near corolla throat; filaments free; anthers dorsiﬂexed, synsthecate, held within basal part of corolla lip. Ovary 4-lobed; style curved, 2-lobed at apex. Nutlets basiﬁxed, surrounded by a 4-lobed disc.


_Haumaniastrum_ P.A.Duvign. & Plancke


_Acrocephalus_ Benth. in part, as to African and Madagascan species; Codd: 213 (1985); Retief: 325 (2000).

**Hemizygia** (Benth.) Briq.


**Holostylon** Robyns & J.-P. Lebrun

Good & Taylor: 161 (1931); Binns: 57 (1968); Codd: 173 (1985); Mapaura (Unpublished).

Sthn trop. Afr. 3, Angola, Zambia, Zimbabwe, Malawi, and sthn Afr. Paton (pers. com.) suggests that *Holostylon* should be placed under *Plectranthus*.

**Holusndia** Vahl

Hiern: 860 (1900); Binns: 57 (1968); Codd: 183 (1985); Mapaura (unpublished).


*Hyptis* Jacq.


*Mesosphaerum* P.Browne; Hiern: 872 (1900).

Sthn trop. Afr. 3 or 4 species, native of tropical America, widespread weeds in trop. Africa, including Angola, Zambia, Zimbabwe, Malawi, and sthn Afr.

One of them, *Hyptis pectinata* (L.) Poit., is apparently indigenous in trop. Africa (Codd 1985: 117).

**Isodictyophorus** Briq.


Erect subshrubs; stems quadrangular, whitish-woolly when young. **Leaves** opposite, petiolate, lanceolate, crenulate, glabrous above, pubescent and glandular-punctate beneath. **Inflorescences** terminal panicles or racemes; pedicels slender, crowded at nodes, often branched. **Calyx** with all teeth ± equal, triangular and 3-nerved, ± as long as tube; mature calyx broadly campanulate, ± regular. **Corolla** 2-lipped; lower lip boat-shaped, very broad, with 2 small lateral lobes, upper lip usually 4-lobed, shorter than lower one. **Stamens** 4, declinate, arising at corolla mouth; anther syntrichate. **Style** with stamina in lower lip of corolla; stigma shortly 2-lobed. **Nutlets** ovoid or oblong, smooth.


**Isodon** (Schrad. ex Benth.) Schap.

Spach: 162 (1838); Codd: 7 (1984); Li: 289 (1988); Paton & Ryding: 723 (1998); Phiri (Unpublished).


Perennial herbs or subshrubs, much branched; stems and branches acutely quadrangular. **Leaves** shortly petiolate to subsessile, ovate to oblong-ovate, acute, rounded at base, dentate to crenulate. **Inflorescences** ample, dichotomously branched, axillary and terminal panicles; bracts not sharply differentiated from leaves; bracteoles linear, very small. **Calyx** urceolate-campanulate, sometimes obscurely separated into a 3-toothed upper lip and a 2-toothed lower lip; teeth subequal, triangular. **Corolla** 2-lipped; tube relatively straight, not markedly ventricose or saccate at base; upper lip reflexed, 4-fid at apex, lower lip broadly ovate, almost flat. **Stamens** 4, declinate; posterior one arising near base; anterior one arising at mouth of corolla tube, exserted; filaments all free to base; anthers syntrichate, ovate. **Style** far exserted; stigma minutely 2-lobed.

Species ± 100, tropical and subtropical Asia, and 1: *Isodon ramosissimum* (Hook. f.) Codd in tropical Afr.; sthn trop. Afr.: Malawi, Zimbabwe.

**Karomia** Dop


**Lamiastrum** Biedenharn & Lebrun; White: 372 (1962).

Sthn trop. Afr. 1: *Lamiastrum amplexicaule* (L.) Benth., a native of Europe, is now a widespread weed, also in sthn Afr.

**Leucus** A.Chev.


Perennial herbs with quadrangular, pubescent stems. **Leaves** lyrate-oblanceolate, ± auricled on stem. **Inflorescence** terminal, pseudospicate, dense; bracts small, early caducous. **Calyx** tube bulbous; teeth 5: 4 ± as long as tube, lanceolate, upper tooth larger, narrowly lanceolate, acuminate. **Corolla** 2-lipped, pubescent; lower lip carinate. **Stamens** 4, declinate, with filaments fused into a tube arising at corolla throat; anthers syntrichate. **Style** lying with stamens in lower lip of corolla; stigma shortly 2-lobed. **Nutlets** ovoid, smooth.

Species 5, trop. Africa; sthn trop. Afr. 1: *Leucus lyratus* A.Chev., Zambia, Zimbabwe. Paton (pers. com.) states that *Leucus lyratus* is so similar to *Plectranthus betonicifolius* that there appears to be no reason to keep *Leucus* separate from *Plectranthus*.

**Leonotis** (Pers.) R.Br.

Hiern: 879 (1900); Binns: 58 (1968); Iwarsson: 31 (1985); White et al.: 294 (2001).


**Leucas** R.Br.

Hiern: 876 (1900); Burtt Davy et al.: 58 (1958); White: 372 (1962); Binns:
Becium Lindl.; Buscalioni & Muschler: 483 (1913); Wild: 78 (1965).


Mentha L.

Hiern: 873 (1900); Gürke: 354 (1903); Codd: 107 (1985).


Neohyptis J.K.Morton


Annual herbs, sparingly branched; stems erect or decumbent, quad-rangular. Leaves sessile, ovate to ovate-lanceolate, apex subacute, base obtuse, margin obscurely crenate, glabrous above, hirsutulous on nerves beneath. Inflorescence of short, dense, spike-like racemes borne terminally and in axils of leaves in upper half of stem; bracts persistent. Calyx tubular-campanulate, slightly ventricose when mature, equally 5-toothed; teeth lanceolate, acute. Corolla 2-lipped; tube straight; upper lip erect, 4-lobed; lower lip concave, spreading. Stamens 4, didynamous, declinate, not exceeding lower corolla lip; filaments fused in pairs towards base, arising in throat. Nutlets small, glabrous.


Ocimum L.


Orthosiphon Benth.

Hiern: 858 (1900); Morton: 238 (1962); Binns: 59 (1968); Codd: 229 (1985); Paton: 147 (1995a).


Platostoma P.Beauv.


Annual or perennial herbs; stems arising from a tap root, a slender rhizome or a small woody rootstock. Leaves: upper ones and bracts basally pale or coloured. Inflorescence lax or condensed; verticils composed of opposite cymes; cymes usually more than 3-flowered. Calyx round in cross section; posterior lip 1- or 3-lobed with posterior lip decurrent or not, anterior lip 1–5-lobed. Corolla 2-lipped, curved, dorsally gibbous or spurred; posterior lip 3- or 4-lobed, ascending, anterior lobe horizontal. Stamens 4, declinate or spreading; posterior ones arising at midpoint of corolla; anterior ones arising near corolla throat; filaments basally swollen and often pubescent; anthers synnthetic. Style bifid. Nutlets minutely striate or reticulate, apically pubescent or not.

Species 45, Old World tropics, 11 in trop. Africa, of which 6 are found in sthn trop. Afr. in Angola, Zambia, Zimbabwe, Malawi, Mozambique, and in sthn Afr.

Plectranthus L'Hér.


Pogostemon Desf.

Desfontaines: 154 (1815); Good & Taylor: 166 (1931); Cantino et al.: 511 (1992); Bhatti & Ingrouille: 8 (1996); Bhatti & Ingrouille: 77 (1997); Ingrouille & Bhatti (1998).

Geniosporum Wall. ex Benth. in part; Hiern: 854 (1900).

Amphibious or aquatic perennial herbs with spreading rhizo-mes or polycyphal rootstock; stem weak, terete or angular; with 4-celled hairs. Leaves in opposite pairs, petiolate, ovate or elliptic, base cuneate, apex acute or obtuse, margin serrate or dentate; hairs 3- or 6-celled. Inflorescence a dense terminal spike, simple or branched, with 2- or 4-celled hairs. Calyx campanulate, 5- or 10-veined, densely hairy to glabrous outside; teeth 5, ciliate, hairy within. Corolla 4-lobed, 3 lobes forming upper lip, lower lip single-lobed. Stamens 4, all exserted; filaments bearded with dense moniliiform hairs towards middle, arising at different heights in corolla tube; anthers 1-theecous. Style exserted; stigma 2-lobed. Nutlets 4, ± ellipsoid, reticulate-foveate.

**Pycnostachys** Hook.


**Rotheca** Raf.


Shrubs, subshrubs, or pyrophytic herbs, sometimes scanty or decumbent, rarely small trees. Leaves usually verticillate, sessile or shortly petiolate, often distinctly crenate or coarsely serrate, sometimes entire. Inflorescence cymose, usually leafy, mostly lax, terminal and/or axillary. Calyx campanulate to subspherical, divided for half its length or often less, frequently red or purple; lobes 4–6, rounded to narrowly triangular, acute to rounded at apex. Corolla irregular, pale to deep blue or a mixture of both, occasionally partly white or yellow; tube 6–12 mm long; basally saccate in front, deeply divided behind at base of anterior lip; filaments widening at base and united in a short lamina arising in throat of corolla at base of anterior lip; anthers not furcate.


**Salvia** L.


Sthn trop. Afr. 2 indigenous, but several, such as *Salvia coccinea* Ellingr. and *S. refissa* Hornem., cultivated and naturalised, also in sthn Afr.

**Satureja** L.


Micromeria Benth.: t. 1282 (1829); Baker: 452 (1900); Binns: 58 (1968).


**Scutellaria** L.


**Solenostemon** Thonn.

Hiern: 863 (1900); Morton: 251 (1962); Codd: 437 (1975); Mathew: 174 (1976); Codd: 179 (1985); White et al.: 296 (2001); Mapaura (Unpublished).


**Stachys** L.


**Symphostemon** Hiern

Hiern: 867 (1900).

Plectranthus L’Hér. as to P. insolitus C.H. Wright; Baker: 419 (1900).

Minutely glandular herbs. Leaves opposite, subopposite, subternate and subalternate. Inflorescences terminal racemes; pedicels alternate, opposite and subternate, spreading; bracteate at or near base. Calyx subbilabiate, obliquely campanulate, gibbous at back of base, 5-cleft, somewhat accrescent in fruit and usually pendulous; teeth unequal, posterior one broadly ovate and obtuse or apiculate, other teeth narrower and acute. Corolla bilabiata; tube exserted, shortly cylindric to funnel-shaped, slightly curved and gibbous at back near base, throat wide, scarcely oblique; posterior lobe shortly 4-lobed, anterior one longer, boat-shaped, entire, enfolding stamens and style. Stamens 4, didynamous, declinate, all fertile, slightly shorter than anterior lobe; filaments widening at base and united in a short lamina arising in throat of corolla at base of anterior lip; anthers roundish. Disc fleshy, produced into 4 thick obvoid glands beside base of nutlets. Ovary 4-partite; style shortly exceeding corolla tube; stigma emarginate at apex. Nutlets obvoid, compressed.

Species 1 (2 fide Mabberley 1997: 693), Angola.

**Syncolostemon** E.Mey.


**Tetradenia** Benth.


Iboa N.E.Br.: 298 (1910); Burtt Davy et al.: 58 (1958); White: 374 (1962); Binns: 57 (1968); Moschosma Rich. in part; Binns: 58 (1968).


**Tinnea** Kotschy & Peyr.

Hiern: 879 (1900); White: 375 (1962); Binns: 60 (1968); Vollesen: 1 (1975); Codd: t. 1814 (1980); Codd: 13 (1985).


**Vitex** L.


Premna L. as to *P. colorata* Hiern: 833 (1900).

DICOTYLEDONS

LAMIACEAE: References


Lauraceae

(Magnoliidae—Magnoliaceae)

(Magnoliids—Laurales)


White et al.: 302 (2001) state that *Persea americana* Mill. is locally naturalised in Malawi.
Identification of additional genus using the key by Jordaan in Leistner: 334 (2000): Beilschmiedia runs to 2b, and then, as the fruit is naked, to 4a, but as it has alternate leaves it will not run to Dahlgrenodendron which has opposite leaves.

**Beilschmiedia Nees**


Trees or shrubs. Leaves alternate, occasionally subopposite towards ends of branches, subsessile or petiolate, papyraceous to coriaceous, pinnately nerved. Inflorescences terminal and axillary, panicles or racemes or paniculate cymes, few- to many-flowered; bracts ± pubescent, caducous. Flowers bisexual; receptacle shortly tubular or cup-shaped. Tepals 6(8) in 2 whorls on rim of receptacle, subequal, deciduous. Stamens in 4 whors, 2 outer whors each of 3(4) fertile stamens with anthers dehiscing introrsely; inner (third) whorl with anthers dehiscing extrorsely or laterally and with a gland on either side at base of filaments, or inner (third) whorl anthers sometimes sterile; innermost (fourth) whorl reduced to 3 staminodes. Ovary subglobose to narrowly ellipsoid, sessile, ± immersed in receptacle; narrowed above into a slender style with an obscure stigma. Fruit a 1-seeded drupe, subglobose to ovoid or ellipsoid, naked.

Species ± 200, pantropical, ± 80 species in Africa and Madagascar. Robyns & Wilczek (1950) recognise 77 species in tropical continental Africa. However, Verdcourt (1996) suggests that there are probably fewer than this, pointing out that only 2(3) species are recorded from East Africa; sthn trop. Afr. 5, Angola (Cabinda), Zambia.

**Cassytha L.**


**Cryptocarya R.Br.**


**Lecythidaceae**

(Dilleniidae—Lecythidales)
(Asterids—Ericales)


Additional family characters: Trees (mangroves) or evergreen shrubs with woody rootstock. Leaves sometimes with hairy pits in axils of lateral nerves. Flowers in racemes, panicles or solitary. Calyx 2–5-lobed. Petals 0 or 4, if 0, then outer series of staminodes sometimes considered to be a corolla. Stamens and staminodes many. Ovary 2–5-locular, sometimes 4-ridged to 4-winged; style short or longer than stamens; stigma truncate or peltate. Fruit sometimes resembling a pomegranate, or 4-winged, 1-, few-, or many-seeded.

Genera 20, species 280, pantropical, especially S American rain forest; segregated into 4 or 5 subfamilies which are sometimes regarded as closely related families (Takhtajan 1997). Two of these occur in the region: Planchonioideae (=Barringtoniaceae) with Barringtonia and Petersianthus, and Napoleonoeoideae with Napoleonaea. Sthn trop. Afr.: genera 3, species ± 5.

Key to genera

1a Petals 0, but outer series of staminodes forming a showy, pleated, corolla-like, membranous corona; style very short, expanded into a broad peltate stigma; fruit usually several-seeded

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**Ocotea Aubl.**


**References**


**Barringtonia** J.R.Forst. & G.Forst.


Shrubs or small trees; stems straight, sparsely branched, sometimes producing runners, soft-wooded, glabrous, with many lenticels; tendrils absent. **Leaves** alternate, 2-pinnate or occasionally 3-pinnate at base; petiole long, somewhat swollen, glabrous or pubescent; leaflets 3, 5(7), imparipinnate, opposite, elliptic, acuminate at apex, serrate-dentate; stipules petiolar, very soon caducous. **Flowers** bisexual, regular, small, globose in bud, in leaf-opposed, cymose, often umbelliform inflorescences. **Calyx** 5-lobed, cupular, usually glabrous or rarely pubescent. **Petals** 5, fused at base, becoming reflexed, glabrous. **Stamens** 5, opposite petals, filaments filiform; anthers 2-thecous, appearing 4-lobed due to divergence thecae, basifixed. **Ovary** 2-locular, 4-ridged to 4-winged; ovules many in 2 rows in each locule; style filiform. **Fruit** broadly 4-winged (as in *Combretum*), almost orbicular, emarginate. **Seeds** 1–4, fusiform.


**References**


**References**

**Napoleoniae** P.Beaup.


**References**

**Leareaceae**

**(Rosidae—Rhamnales)**

**(Rosids; included in Vitaceae)**

Shrubs or small trees; stems straight, sparsely branched, sometimes producing runners, soft-wooded, glabrous, with many lenticels; tendrils absent. **Leaves** alternate, 2-pinnate or occasionally 3-pinnate at base; petiole long, somewhat swollen, glabrous or pubescent; leaflets 3, 5(7), imparipinnate, opposite, elliptic, acuminate at apex, serrate-dentate; stipules petiolar, very soon caducous. **Flowers** bisexual, regular, small, globose in bud, in leaf-opposed, cymose, often umbelliform inflorescences. **Calyx** 5-lobed, cupular, usually glabrous or rarely pubescent. **Petals** 5, fused at base, becoming reflexed, glabrous. **Stamens** 5, opposite petals, filaments filiform; anthers 2-thecous, dorsifixid with ± longitudinal dehiscence. **Disc** apparently absent. **Ovary** superior, 4–6-locular, ovoid, glabrous; 1 anatropous, basal, erect, bitegmic ovule per locule; style cylindric,
short; stigma subcapitate. **Fruit** a depressed-subglobose, 4–6-lobed berry. **Seeds** 4–6, laterally compressed and triangular in transverse section; endosperm ruminate; embryo linear, small.

Genus 1, species 34, Old World tropics; sthn trop. Afr. species 1. Leeaceae is often placed under Vitaceae from which it differs mainly in the fused, not free, filaments, the absence of tendrils, and the 4–6-locular ovary with a single erect ovule per locule.

Dumortier: 21, 27 (1829), name conserved; Wild: 492 (1966); Descoings: 133 (1972); Ridsdale: 73 (1974).

**Leea** L.  

Description as for family.

Species 34, Old World tropics; sthn trop. Afr: 1: **Leea guineensis** G.Don, Angola, Zambia, Malawi.

**References**  

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**Lentibulariaceae**  
(Asteridae—Scrophulariales)  
(Euasterids I—Lamiales)


Sthn trop. Afr.: genera 2, species 36.

**Genlisea** A.St.-Hil.  


**Utricularia** L.  


**References**  


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**Linaceae**  
(includes Hugoniaceae)  
(Rosidae—Linales)  
(Eurosids I—Malpighiales)


**Key to genera**

1a Stamens 10, all fertile; woody plants ........................................................................................................................................................................... **Hugonia**

1b Stamens 4 or 5; annual or perennial herbs, rarely shrublets; fruit with 4 or more locules:

2a Sepals undivided; flowers 5-merous ........................................................................................................................................................................... **Linum**

2b Sepals 3(4)-fid; flowers 4-merous ........................................................................................................................................................................... **Radiola**

**Hugonia** L.  
Exell & Mendonça: 243 (1951) in Hugoniaceae; Robson: 91 (1963); Robson & Gonçalves: 2 (1969); White et al.: 335 (2001); Coates Palgrave: 401 (2002); Izidine & Bandeira: 51 (2002).

Linum L.

Exell & Mendonça: 242 (1951); Robson: 96 (1963); Robson & Gonçalves: 7 (1969); Exell: 145 (1970); Rogers: 711 (1981); Bingham (Unpublished).


Radiola Hill

Hill: 227 (1756); Robson: 99 (1963).

Herbs, annual, ± spreading, glabrous; stem often purplish red. Leaves opposite, sessile, elliptic or lower ones obovate, entire, 1-nerved; stipules absent. Flowers in terminal, regularly dichotomous dichasia, homostylic. Sepals (2)(3)(4)-fid, united at base, persistent. Petals 4, white, united with stamen filaments to form a very short tube, very shortly unguiculate. Stamens 4, with filaments united at base only; staminodes usually absent; nectaries obscure. Ovary 4-locular, each locule with 2 pendulous ovules and partially divided by a false septum; styles 4, free; stigmas capitate. Fruit a 4-locular, 8-valved capsule with 2-seeded locules; seeds in each locule partially separated by an enlarged false septum. Seeds small, with scanty endosperm; embryo straight.


References


Loranthaceae

(Rosidae—Santalales)
(Core Eudicots—Santalales)

This account is based very largely on Polhill & Wiens (1998) and Polhill & Wiens (1999).


Expanded family description: hairs, where present, simple or slightly branched to dendritic or stellate.

Key to genera

[after Polhill & Wiens (1998)]

1a Hairs simple, irregularly branched or absent:

2a Flowers in racemes or spikes, sometimes crowded at apex of peduncle; petals 4, separate, coherent below, radially spreading to reflexed from the middle where the short erect stamens generally arise .......................................................... Helixanthera

2b Flowers borne in heads, umbels, clusters or singly; petals not as above:

3a Corolla ± S-shaped, elongate, with marked folds on the inner surfaces of the lower part of the petals or corolla tube; secondary haustoria present on extensive surface runners .......................................................... Plicosepalus

3b Corolla gamopetalous with a short to long tube lacking folds inside; plants with a single haustorial attachment:

4a Corolla, when open, with radially arranged lobes spreading and later reflexed, tubular below:

5a Corolla 4-lobed; stamens remaining attached to the style tip by connective appendages .......................................................... Emelianthe

5b Corolla 5-lobed; stamens erect to spreading, separate:

6a Filaments curving gently outwards, essentially isodiametric, arising near base of corolla lobes .......................................................... Pedistylis

6b Filaments erect, upper part thickened and coiling at anthesis, arising nearly halfway up the corolla lobes .................................................. Actinantha

4b Corolla opening unilaterally, often with a marked V-slit, sometimes (Oncocalyx and Spragueanella) the lobes only slightly coherent to one side (at least when seen pressed), but then short tube deeply split:

7a Corolla lobes introlute at anthesis ......................................................................................................................... Oliverella

7b Corolla lobes erect, reflexed or rolled outwards at anthesis:

8a Corolla lobes 4; corolla lobes generally half as long as tube or longer .................................................................................. Englerina

8b Corolla lobes 5:

9a Corolla usually banded with 1–several contrasting colours, with vents opening below the corolla tip in mature buds, the lobes often remaining erect:

10a Corolla lobes much shorter than the tube ........................................................................................................ Agelanthus
**Actinantherella** Balle


**Agelanthus** Tiegh.


**Emelianthe** Danser

Danser: 53 (1933); Polhill & Wiens: 96 (1998); Phiri (Unpublished).

Aerial, hemiparasitic shrubs 0.5–2 m, with a single haustorial attachment, glabrous, fibrous at fractures. **Leaves** mostly alternate and also crowded on short shoots, penninerved. **Flowers** 2–4, umbellate on a short peduncle or clustered on short shoots of generally leafless branches, shortly pedicellate; bract ovate-triangular from a saucer-shaped base. **Calyx** cupular. **Corolla** joined halfway, 4-lobed, radially symmetrical, with fluted vents opening at top of tube, not or scarcely explosive, lobes recurving. **Stamens** arising above base of corolla lobes, remaining weakly attached to style tip by a conspicuous bifid connective appendage; anthers 4-theceous.


**Englerina** Tiegh.


Aerial, hemiparasitic shrubs, ± 0.5–2(–4) m high, usually with a single haustorial attachment, glabrous or shortly hairy with simple or slightly branched hairs. **Leaves** opposite or subopposite, sessile to generally petiolate; lamina usually thin but sometimes coriaceous, penninerved. **Inflorescence** a 2–20-flowered pedunculate umbel with flowers standing up like candles from horizontal branches; bract unilaterally developed from a generally shallow cupular base, not or scarcely exceeding calyx. **Calyx** annular or cup-shaped, sometimes 4-lobed or lacertate. **Corolla** 4-lobed, joined one-fifth to two-thirds, red, yellow, orange or pink and white; buds generally 4-angular, generally slightly swollen over anthers; tube split unilaterally with V-split extending halfway to almost to base. **Filaments** arising at or near base of corolla lobes, free part tapered upwards, involutely curved or coiled at anthesis, produced into a tooth in front of anther; anther 4-theceous. **Style** filiform, 4-angular; stigma obvoid to gloular. **Berry** obvoid to urceolate, with persistent calyx, usually red. **Seed** orange or yellow.


**Erianthemum** Tiegh.


**Globimetula** Tiegh.

Van Tieghem: 244, 264 (1895); Polhill & Wiens: 209 (1998).

Aerial, hemiparasitic shrubs, ± 0.5–2(–4) m high, usually with a single haustorial attachment, but sometimes scendent with many secondary haustoria; glabrous or sometimes with papilae on youngest parts and umbels. **Leaves** opposite, subopposite or ternate, penninerved. **Inflorescence** a 2–20-flowered pedunculate umbel; bracts at base of peduncle and pedicels small, triangular. **Flowers** 5-merous, gamopetalous, bilaterally symmetrical by presence of a unilateral V-shaped slit extending more than halfway to base. **Calyx** subentire, normally ciliolate. **Corolla** with conspicuous basal and apical (sometimes winged) swellings, pink or red, sometimes white to green on lower or upper part;
lobes revolute. **Filaments** involutely curved or coiled at anthesis; anthers 4-thecate with outer pair of thecae shorter and sometimes set lower, connective distint. **Style** skittle-shaped above; stigma turbinate to peltate. **Berry** depressed-globose to ellipsoid, red to yellow. **Seeds** brightly coloured.


**Helixanthera** Lour.


**Oedina** Tiegh.

Aerial, hemiparasitic shrubs, up to 2 m or more, from a single haustorial attachment; twigs slightly compressed to angular, soon terete; hairs stellate and dendritic. **Leaves** mostly opposite or subopposite, rarely clustered, shortly petiolate, pinninerved. **Inflorescence** few- to many-flowered racemes or spikes from axios and older nodes; bract small, unilateral. **Calyx** saucer-shaped to tubular, entire to shortly toothed. **Corolla** 5-lobed, regular to slightly irregular, joined up to half-way, yellow to red, puberulous to hirsute, weakly explosive at anthesis; tube with a slight to marked basal swelling, only rarely with a short V-split at anthesis; lobes usually erect, often partly cohering at tips, occasionally spreading to coiled. **Filaments** arising 6–10 mm above base of corolla lobes, ± articulate, upper part coiling; anthers 4-thecous, basifixed. **Style** filiform; stigma ovoid to fusiform. **Berry** , where known, blue-green, ovoid-ellipsoid to obovoid. **Seed** orange to red.


**Oliverella** Tiegh.


**Oncella** Tiegh.

Small, glabrous, aerial, hemiparasitic shrubs with a single haustorial connection. **Leaves** subopposite, shortly petiolate. **Inflorescence** 2–6-flowered, shortly pedunculate axillary umbels; bract shortly cupular with a small limb with a pouch-like swelling or a spur. **Calyx** cupular to shortly tubular, split by expanding corolla. **Corolla** 5-merous, with a short tube bent in bud, yellow to red, banded green to white, developing vents in mature buds; lobes linear to linear-lanceolate at tips, reflexing below middle at anthesis, sometimes slightly cohering above. **Filaments** arising at base of corolla lobes, erect and filiform below, upper part thickened and inrolled at anthesis; anthers 4-thecous, linear-lanceolate, fusiform. **Style** filiform; stigma capitate. **Berry** obovoid.

Species 2, E and SE trop. Africa; sthn trop. Afr. 1: **Spragueanella rhamnifolia** (Engl.) Balle, E Zimbabwe, Malawi, Mozambique. Closely related to **Oncocalyx** but with a very short corolla tube without a V-shaped slit on one side.

**Tapinanthus** (Blume) Rchb.


**Vanwykia** Wiens

**LORANTHACEAE: References**


**DICOTYLEDONS**

**Lythraceae**

(Rosidae—Myrtales)

(Rosids—Myrtales)


Sthn trop. Afr.: genera 8, species 60.

**Additional family characters:** Evergreen, glabrous trees or shrubs, growing in mangroves; pneumatophores present. **Flowers** sometimes in 3’s, terminal or axillary. **Ovary** multilocular, adnate to calyx tube at base. **Fruit** a multilocular, many-seeded berry surrounded at base by persistent calyx. **Seeds** curved, angular with a thick, coriaceous testa; endosperm 0; embryo with short, leafy cotyledons.

**Key to genera**

1a Trees or shrubs:

2a Ovary multilocular with many ovules per locule; fruit a multilocular berry with many seeds; growing in mangroves ........................................... Sonneratia

2a Ovary 2–6-locular with 2–many ovules; fruit a capsule or (in Lawsonia) indehiscent or irregularly disrupting:

3a Partitions of the ovary complete and then the placenta continuous with the style; flowers 4-merous; stamens (4)8(12); fruit indehiscent; seeds not winged ..................................................................................................................................................... Lawsonia

3b Partitions of the ovary interrupted above the placenta, the latter not continuous with the style; flowers 5- or 6-merous; fruit dehiscent; seeds winged:

4a Small trees; flowers 5- or 6-merous, homomorphic, arranged in panicles; calyx turbinate, membranous, with very short folded appendages; stamens 5 or 6; ovary 2-locular; capsule included; seeds thinly winged; leaves minutely pellucid-punctate, with a large gland on the underside of the rounded apex ............................................................................................................................................................... Galpinia

4b Shrubs, villous-tomentose; flowers 6-merous, sometimes dimorphic-heterostylous, axillary, solitary or rarely geminate; calyx campanulate, coriaceous, with short, not folded, appendages; stamens 12 or 18; ovary 1-locular; capsule slightly exserted; seeds with a thick wing; leaves not pellucid-punctate, subacute or obtuse at the apex and without a gland below ......................................................................................................................... Pemphis

1b Herbs or suffrutescences:

5a Partitions of the ovary complete and then placenta continuous with the style; flowers in axillary, ± pedunculate cymes or in contracted umbellate or capitate cymes enveloped by 2 large bracteoles; capsule dehiscing by a small apical operculum, the lower part persisting, subseptifragal or disrupting irregularly ....................................................................................................................................................... Nesaea

5b Partitions of the ovary incomplete and then placenta not continuous with the style; flowers axillary and solitary or in ± pedunculate cymes or in glomerules at the expanded base of the leaves; capsule dehiscing by valves or disrupting irregularly:

6a Capsule dehiscing by transversely striate valves (under the microscope); usually aquatic plants ................................................................................................................................. Rotala

6b Capsule disrupting irregularly with the walls not transversely striate; hygrophytous plants but usually not aquatic:

7a Ovules and seeds many, small; flowers 3–5-merous; anthers yellow; capsule with relatively thick walls ........................................................................................................ Ammannia

7b Ovules and seeds 2–5, larger than above; flowers (3)4(5)-merous; anthers violet; capsule with very thin walls ...................................................................................... Hianthera

**Ammannia L.**


**Galpinia N.E.Br.**


Monospecific: Galpinia transvaalica N.E.Br., Zimbabwe, Mozambique, and sfn Afr.

**Hianthera A.Fern. & Diniz**


Annual or perennial, aquatic or terrestrial, glabrous herbs. **Leaves** cussate, sessile, linear, widened at base, canalicate above. **Flowers** (3)4(5)-merous, in axillary, sessile, many-flowered dense dichasia surrounded by widened bases of leaves; outer bracteoles 2, ± as long as glomerules, inner ones many, subulate, membranous, whitish. **Calyx** campanulate, scarious, 8-nerved below, 4-nerved above point of origin of stamens, with short appendages in sinuses and a nectariferous ring at bottom. **Petals** persistent, corrugated. **Stamens** (3)4(5), opposite lobes; anthers dorsifixed, they and pollen violet. **Ovary** sessile or shortly stipitate, with partitions interrupted above column of placenta (placenta then not continuous with style) incompletely 2-locular, 2–5-ovulate; style ± long. Cap-
sule thinly membranous, dehiscing irregularly. Seeds few, concave-convex, relatively large, dark violet.


**Lawsonia L.**

Linnaeus: 349 (1753); Fernandes: 277 (1978a); Fernandes: 3 (1980a).

Evergreen, glabrous shrubs or small trees; young branches 4-angular, old ones terete, rigid and often spinescent. Leaves decussate, elliptic to oblanceolate, entire. Flowers bisexual, 4-merous, in lax leafy terminal panicles. Calyx tube, becoming almost 1-locular, dehiscing by a transverse slit at middle (circumscissile). Sepals broadly ovate, ovate-oblong, ± equal in length. Stamens exerted, 4, 8, or 16, staminal filaments filiform; anthers broadly elliptic. Ovary sessile, subglobose, 2–4-locular; style thick, continuous with placenta, persistent, a little longer than stamens; stigma capitulate. Fruit globose, indehiscent or disrupting irregularly. Seeds many, thick, 4-sided; cotyledons flat.

Monospecific genus: *Lawsonia inermis* L., native of western tropical Asia, N Africa and probably of the eastern coast of Africa, widespread by cultivation in tropical regions of the world; powdered leaves (henna) used for staining fingernails etc.; sthn trop. Afr.: Mozambique.

**Nesaea Kunth**


**Pemphis J.R.Forst. & G.Forst.**


Shrubs or small trees, silky-pilose, with young branches subangular, older ones terete, nodes rather thickened, with conspicuous scars after leaf fall. Leaves decussate, oblong-lanceolate, entire. Flowers 6-merous, regular, axillary, solitary, rarely geminate, pedicellate; pedicels 2-bracteolate at base, bracteoles very soon caducous. Calyx turbinate-campanulate, coriaceous, with lobes widely 3-angular and appendages ± short, horn-shaped. Petals 6, obovate, corrugated, shortly clavated. Stamens 12–18, 1- or 2-seriately arising a little below middle of calyx tube, subequal or unequally; filaments filiform; anthers broadly elliptic. Ovary globose, shortly stipitate, 3-locular; style short or elongate; stigma 2-lobed; ovules many, erect. Capsule subglobose, ± enclosed in calyx tube, becoming almost 1-locular, dehiscing by a transverse slit at middle (circumscissile). Seeds many, erect, imbricate, obcuneate, winged; wing thickened.

Monotypic or genus with 2 species, one littoral and widespread in Old World tropics, the other confined to the low mountains of SW Madagascar; sthn trop. Afr. 1: *Pemphis acidula* J.R.Forst. & G.Forst., Mozambique.

**Rotala L.**


**Sonneratia L.f.**


Trees or shrubs, evergreen, glabrous, growing in mangroves, with many thick, finger-like pneumatophores; young branches cylindric, swollen at nodes. Leaves opposite-decussate, entire, coriaceous, petiolate; stipules 0. Flowers bisexual, regular, solitary or in 3s, axillary or terminal. Calyx thick and leathery, 4–8-lobed; tube campanulate. Petals as many as and shorter than calyx lobes, strap-shaped, inconspicuous, white, resembling filaments, soon deciduous. Stamens many, showy, inflexed in bud, arising in several rows on a perigynous ring at mouth of calyx tube; filaments free, white; anthers kidney-shaped, medifixed, opening lengthwise. Ovary multilocular, adnate to calyx tube at base; ovules many, anatropous, bitegmic, on a thick axile placenta; style simple, long; stigma subcapitate. Fruit a multilocular, many-seeded berry free from calyx tube and eventually stipitate, surrounded at base by persistent calyx. Seeds curved, angular, with a thick coriaceous testa; endosperm 0; embryo with short leafy cotyledons.


**References**


Maesaceae
(previously under Myrsinaceae)
(Dilleniidae—Primulales)
(Asterids—Ericales)

Dioecious or possibly polygamous trees, shrubs or scramblers, sometimes with runners; pubescence of nonglandular, uniseriate trichomes and lepidote scales. **Leaves** alternate, petioled, simple, mostly shallowly to distinctly serrate, often gland-dotted. **Inflorescences** axillary or terminal racemes or panicles. **Flowers** bi- or unisexual, regular, 4- or 5-merous, small and inconspicuous, entomophilous. **Calyx** persistent, with 2 bracts at base; lobes imbricate, mostly broadly ovate. **Corolla** campanulate, longer than calyx, with a well demarcated tube; lobes broadly ovate to subrotund, spreading, quincuncial-imbricate in bud. **Stamens** arising in mouth of corolla tube; filaments usually long, very rarely short or 0, ± terete; anthers oblong-cordate, often emarginate, dorsifixed at or below the middle, dehiscing by longitudinal slits or aborted. **Ovary** inferior or semi-inferior, 1-locular; ovules usually many, arranged in several rows on the placenta; style short or almost obsolete; stigma often ± distinctly lobed. **Fruit** indehiscent, small, globose, ovoid or subturbinate, dry or fleshy, with a somewhat woody endocarp, crowned with persistent style and calyx, several-seeded. **Seeds** many, small, embedded in placenta, angular, dark brown; testa reticulate; endosperm abundant; embryo oblique to almost transverse.

Genus 1, species ± 200, Old World tropics; sthn trop. Afr.: genus 1, species 2.


Maesa Forssk.


References

Malpighiaceae
(Rosidae—Malpighiales)
(Eurosids I—Malpighiales)


Sthn trop. Afr.: genera 7, species 23.


Key to genera
1 a Leaves alternate:
   2 a Styles 2, curved inwards; wing surrounding each samara much broader than long ................................................................. Acridocarpus
   2 b Styles 3, erect; wing surrounding samara much broader than long .............................................................................................. Caucaanthus
1 b Leaves opposite or ternate:
   3 a Anthers linear, 3–4 mm long; samara with the lateral wing divided into 5–7 narrow, stellately arranged lobes ........................................... Tristellateia
   3 b Anthers ovate, oblong or ovate-oblong, 1.0–1.8(–2.5) mm long; wing(s) of the samara ± entire:
      4 a Calyx with 8–10 glands; sepals each with 2 glands, 1 sepal sometimes without glands; fruit of (1–)3 samaroid mericarps, each ± semicircular in outline with the flat dorsal wing ± as wide as the nut ........................................................................................................ Heteropterys
      4 b Calyx without glands, or glands inconspicuous; fruit a samara with lateral and dorsal wings, or if only with a dorsal wing then the samara obliquely ovate with the winged portion much wider than the nut:
         5 a Samara obliquely ovate in outline with only a dorsal wing longer than broad .............................................................................. Sphedamnocarpus
         5 b Samara with 1 or 2 lateral wings or with lateral and dorsal wings:
            6 a Styles shorter than, or ± as long as, ovary and shorter than to slightly longer than stamens .............................................................. Caucaanthus
            6 b Styles always longer than ovary and distinctly longer than stamens:
**Acridocarpus** Guill. & Perr.

Woody climbers; younger stems densely covered with short soft white sericeous hairs, older ones very finely pubescent or glabrescent. **Leaves** spirally arranged or opposite, ovate-cordate, pubescent or glabrescent above, grey-tomentose beneath and with 2 large glands near base (usually concealed by indumentum); petiole densely sericeous, usually with 2 small glands above middle; stipules very small, deciduous. **Inflorescences** racemose or corymbose-paniculate, axillary or terminal. **Flowers** regular, bisexual, evil-smelling; bracts ovate; bracteoles lanceolate or linear-subulate. **Sepals** broadly ovate with a narrowed base, sericeous outside; without glands. **Petals** shortly unguiculate, carinate, subhoastate at base, glabrous, margins wholly or partially fimbriate. **Stamens** glabrous, with dorsifixed, subversatile, oblong anthers; filaments somewhat fleshy. **Ovary** densely sericeous; styles fairly stout, truncate, shorter than, as long as or slightly exceeding stamens. **Fruit** with lateral wing completely surrounding nut, oblong-elliptic, entire; dorsal wing absent.

Species 3, E and NE Africa to Arabian Peninsula; sthn trop. Afr.; Angola, Zambia, Malawi, Mozambique, and sthn Afr.

**Caucaanthus** Forssk.
Forsskål: cxi, 91 (1775); Launert: 119 (1963); Launert: 24 (1968); Launert & Gonçalves: 12 (1969).

Woody climbers; younger stems densely covered with short soft white sericeous hairs, older ones very finely pubescent or glabrescent. **Leaves** spirally arranged or opposite, ovate-cordate, pubescent or glabrescent above, grey-tomentose beneath and with 2 large glands near base (usually concealed by indumentum); petiole densely sericeous, usually with 2 small glands above middle; stipules very small, deciduous. **Inflorescences** racemose or corymbose-paniculate, axillary or terminal. **Flowers** regular, bisexual, evil-smelling; bracts ovate; bracteoles lanceolate or linear-subulate. **Sepals** broadly ovate with a narrowed base, sericeous outside; without glands. **Petals** shortly unguiculate, carinate, subhoastate at base, glabrous, margins wholly or partially fimbriate. **Stamens** glabrous, with dorsifixed, subversatile, oblong anthers; filaments somewhat fleshy. **Ovary** densely sericeous; styles fairly stout, truncate, shorter than, as long as or slightly exceeding stamens. **Fruit** with lateral wing completely surrounding nut, oblong-elliptic, entire; dorsal wing absent.

Species 3, E and NE Africa to Arabian Peninsula; sthn trop. Afr.; Angola, Zambia, Malawi, Mozambique, and sthn Afr.

**Flabellaria** Cav.
Cavanilles: 436 (1790); Exell & Mendonça: 250 (1951); Launert: 21 (1968).

Woody climbers up to 15 m long. **Leaves** opposite, simple, petiolate, entire; stipules absent. **Flowers** regular, in many-flowered terminal or axillary panicked racemes, white or cream. **Sepals** 5, valvate, closed over petals in bud, eglandular. **Petals** 5, not clawed, entire, glabrous. **Stamens** 10, all bearing anthers; filaments free or somewhat connate at very base; anthers basifixied, elliptic or oblong. **Ovary** 3-locular, densely pilose; styles 3, much longer than stamens. **Fruit** a samara with 2 lateral wings connate at base and distinct at top.

Monotypic genus: **Flabellaria paniculata** Cav., trop. Africa; sthn trop. Afr.; Angola.

**Heteropterys** Kunth
Kunth: 163 (1822) name conserved; Exell: 50 (1927); Exell & Mendonça: 254 (1951) as *Heteropterus*; Badré: 20 (1972) as *Heteropterus*.

Shrubs or lianes. **Leaves** opposite, simple, petiolate, entire, base of lamina and/or petiole usually glandular; stipules indistinct. **Inflorescences** axillary or terminal, generally paniculate; bracts and bracteoles persistent. **Sepals** 5, each with 2 dorsal glands, or 1 without glands. **Petals** 5, unguiculate, usually entire and glabrous. **Stamens** 10, all fertile, glabrous; filaments fused at base; anthers basifixed. **Ovary** 3-locular; styles free; laterally compressed; stigmas terminal, in lateral, inside position. **Fruit** consisting of (1–3) samaroid mericarps, each with a dorsal suborbicular wing.


**Sphedamnocarpus** Planch. ex Benth. & Hook.f.

Woody climbers; younger stems densely covered with short soft white sericeous hairs, older ones very finely pubescent or glabrescent. **Leaves** spirally arranged or opposite, ovate-cordate, pubescent or glabrescent above, grey-tomentose beneath and with 2 large glands near base (usually concealed by indumentum); petiole densely sericeous, usually with 2 small glands above middle; stipules very small, deciduous. **Inflorescences** racemose or corymbose-paniculate, axillary or terminal. **Flowers** regular, bisexual, evil-smelling; bracts ovate; bracteoles lanceolate or linear-subulate. **Sepals** broadly ovate with a narrowed base, sericeous outside; without glands. **Petals** shortly unguiculate, carinate, subhoastate at base, glabrous, margins wholly or partially fimbriate. **Stamens** glabrous, with dorsifixed, subversatile, oblong anthers; filaments somewhat fleshy. **Ovary** densely sericeous; styles fairly stout, truncate, shorter than, as long as or slightly exceeding stamens. **Fruit** with lateral wing completely surrounding nut, oblong-elliptic, entire; dorsal wing absent.

Species 22, mainly in Madagascar, but with 1 species known from SE Asia and 1 from the African continent: **Tristellateia africana** S.Moore; in sthn trop. Afr. only in Mozambique.

**Triaspis** Burch.

Woody climbers, younger stems usually greyish-pubescent, older ones glabrous, densely lenticellate. **Leaves** opposite, ovate or broadly elliptic, entire, with two glands near apex of petiole; stipules very small. **Inflorescences** racemose, terminal; many-flowered; pedicels articulated, 2-bracteolate. **Flowers** regular, bisexual. **Sepals** oblong, sericeous outside, persistent. **Petals** oblong, shortly unguiculate, carinate, entire, bright yellow. **Stamens** with glabrous basifixed anthers; filaments of outer whorl longer and broader at base. **Ovary** globose; only 1 (very seldom 2) styles fully developed, terete. **Fruit** subglobose; with a short acumen formed by the radicle.

Species 22, mainly in Madagascar, but with 1 species known from SE Asia and 1 from the African continent: **Tristellateia africana** S.Moore; in sthn trop. Afr. only in Mozambique.

**Tristellateia** Thouars
Thouars: 47 (1806); Launert: 113 (1963); Launert: 12 (1968); Launert & Gonçalves: 6 (1969).

Woody climbers, younger stems usually greyish-pubescent, older ones glabrous, densely lenticellate. **Leaves** opposite, ovate or broadly elliptic, entire, with two glands near apex of petiole; stipules very small. **Inflorescences** racemose, terminal; many-flowered; pedicels articulated, 2-bracteolate. **Flowers** regular, bisexual. **Sepals** oblong, sericeous outside, persistent. **Petals** oblong, shortly unguiculate, carinate, entire, bright yellow. **Stamens** with glabrous basifixed anthers; filaments of outer whorl longer and broader at base. **Ovary** globose; only 1 (very seldom 2) styles fully developed, terete. **Fruit** subglobose; with a short acumen formed by the radicle.

Species 22, mainly in Madagascar, but with 1 species known from SE Asia and 1 from the African continent: **Tristellateia africana** S.Moore; in sthn trop. Afr. only in Mozambique.

**References**
Seed plants of southern tropical Africa: families and genera

**MALPIGHIACEAE**: References


**DICOTYLEDONS**

**Malvaceae**
(in broad sense, including Bombacaceae, Tiliaceae and Sterculiaceae)
(Dilleniidae—Malvales)
(Eurosids II—Malvales)


Herbs, shrubs or trees, sometimes with fibrous, fleshy trunks attaining a very large girth, sometimes monoeccious, dioecious or polygamous, usually with stellate hairs. **Leaves** alternate, simple, unlobed to digitately lobed or partite to 3–9-foliolate, petiolate, usually palmately veined, sometimes penniveined; stipules mostly present, free, usually narrow or setaceous, often deciduous. **Flowers** ± regular, bisexual or sometimes unisexual, at least functionally so, usually pedicelled, sometimes showy; arranged in axillary or terminal racemes, panicles, cymes, corymbs or fascicles, or solitary; bracts and bracteoles often present, with or without an epicalyx of 3–many free or connate segments. **Calyx** 3–5-lobed or sepals free, usually valvate. **Petals** (3, 4)5 or 0, free but often adnate to base of staminal tube, sometimes glandular at base inside. **Stamens** 5–many, free or with filaments partly to almost completely fused into a tube around the gynoecium, sometimes raised on an androgynophore; staminodes 0 or present; anthers 1- or 2-thecous, with longitudinal slits or apical pores; pollen spinulose or smooth. **Ovary** superior, of 1–many free to fused carpels with 1–many ovules in each carpel/locule, usually on axile placentas; style mostly simple with stigma from ± entire to variously branched, or with as many styles as carpels. **Fruit** a loculicidal capsule or schizocarp, or indehiscent, or a ± fleshy drupe. **Seeds** 1–many, glabrous or hairy; embryo straight or curved; endosperm copious to 0.

**Sthn trop. Afr.: genera 45, species ± 359.**

**Key to genera**

1a Petals present; flowers bisexual or sometimes unisexual (Sterculioideae):

1b Petals absent; flowers unisexual due to abortion, sometimes bisexual (Bombacoideae):

2a Carpels 3–15, in 1 row; calyx 3–6-lobed:

2b Carpels 3–5, in axillary or terminal racemes, panicles, cymes, corymbs or fascicles, or solitary; bracts and bracteoles often present, with or without an epicalyx of 3–many free or connate segments. **Calyx** 3–5-lobed or sepals free, usually valvate. **Petals** (3, 4)5 or 0, free but often adnate to base of staminal tube, sometimes glandular at base inside. **Stamens** 5–many, free or with filaments partly to almost completely fused into a tube around the gynoecium, sometimes raised on an androgynophore; staminodes 0 or present; anthers 1- or 2-thecous, with longitudinal slits or apical pores; pollen spinulose or smooth. **Ovary** superior, of 1–many free to fused carpels with 1–many ovules in each carpel/locule, usually on axile placentas; style mostly simple with stigma from ± entire to variously branched, or with as many styles as carpels. **Fruit** a loculicidal capsule or schizocarp, or indehiscent, or a ± fleshy drupe. **Seeds** 1–many, glabrous or hairy; embryo straight or curved; endosperm copious to 0.
13a Stamens many, indefinite:
   14a Style branches and stigmas twice as many as carpels (style branches mostly 10, carpels 5 (tribe Malvaceae)):
      15a Epicalyx of (3–)5–16 filiform to broadly ovate, mostly free segments; carpels without hooked spines ....................... Pavonia
      15b Epicalyx of 5 lobes fused in lower third; carpels with hooked spines .......................................................... *Urena
   14b Style branches and stigmas as many as carpels (5–many) or style and stigma ± entire:
      16a Fruit a capsule or indehiscent and woody to ± fleshy; staminal tube toothed at apex to truncate, bearing anthers on most or
         much of its surface (tribe Hibisceae):
         17a Style simple (rarely very slightly divided at the tip), apex 5-lobed or clavate with ± coherent stigmas:
            18a Calyx spathaceous, thin, splitting laterally and deciduous with the corolla.................................................... Abelmochus
            18b Calyx not splitting laterally, truncate or regularly lobed, persistent:
               19a Calyx distinctly 5-lobed, with rows of black oil glands along the nerves ...................................................... Cienfugosia
               19b Calyx truncate, entire or at most dentate or undulate:
                  20a Epicalyx of 3 large, leaf-like, persistent bracts .......................................................... Gossypium
                  20b Epicalyx of 3–8 small, narrow, deciduous bracts:
                     21a Fruit indehiscent, woody or somewhat fleshy ........................................................................... Thespesia
                     21b Fruit a loculicidally dehiscent capsule .................................................................................... Azanza
            17b Style divided apically into distinct branches; stigmas capitate to club-shaped:
               22a Style 3(4)-branched; epicalyx of 3 large, leaf-like, persistent bracts ......................................................... Gossypioides
               22b Style 5-branched; epicalyx of 5–20 variable bracts, occasionally absent:
                  23a Ovules and seeds solitary in each locule ........................................................................................ Kosteletzkya
                  23b Ovules and (mostly) seeds 2 or more in each locule ........................................................................ Hibiscus
      16b Fruit a schizocarp with mericarps eventually separating from a persistent axis; staminal tube split at apex into many
         filaments (tribe Malvaceae):
         24a Epicalyx absent:
            25a Ovule 1 per locule; seeds 1 per mericarp, lateral walls of mericarps not disintegrating before fruit breaks up .......... Sida
            25b Ovules 2 or more per locule; seeds mostly 2 or more per mericarp, or sometimes 1 by abortion:
               26a Mericarps 5–40, not divided ..................................................................................................................... Abutilon
               26b Mericarps 3–5, ± divided into 2 compartments by a transverse constriction ............................................... Wissadula
            24b Epicalyx present:
               27a Stigmas ± apical, usually with distinctly greater diameter than the rest of the style branches ................. *Malvastrum
               27b Stigmas decurrent on adaxial side of the filiform to narrowly clave style branches ..................................... *Malva
   13b Stamens 5, or in 5 small dense sessile clusters of 3 anthers each (Byttnerioideae):
      28a Petals hooded over the stamens; staminodes present:
         29a Petals with a long apical appendage; stamens 5; fruits spiny ................................................................. Byttneria
         29b Petals without a long apical appendage; stamens in 5 clusters of 3 anthers each ........................................ Scaphopetalum
      28b Petals not hooded; staminodes absent or inconspicuous:
         30a Ovary 5-locular; capsule loculicidally 5-valved .................................................................................. Melochia
         30b Ovary 1-locular; capsule 2-valved, 1-seeded ............................................................................ Waltheria
      12b Stamens filaments free or fused only partly:
       31a Stamens 5:
          32a Staminodes present; flowers with 3 persistent epicalyx bracts ........................................................... Melhania (Dombeyoideae)
          32b Staminodes absent; epicalyx absent
            33a Styles 5; stamens opposite the petals, not raised on an androgynophore ........................................... Hermannia
            33b Style 1; stamens raised on a short androgynophore ........................................................................... Triunfetta (Grewioideae)
       31b Stamens more than 5, mostly indeterminate, sometimes in fascicles of 3 or 4:
          34a Fruit of 5 samara-like 1-seeded carpels .......................................................................................... Triplochiton (Helicteroideae)
          34b Fruit various, not as above:
             35a Petals much shorter than sepals, pilose towards margins; seeds conspicuously arillate .......... Leptonychia (Byttnerioideae)
             35b Petals ± as long as or longer than the sepals; seeds without or with arillus:
                36a Staminodes 5; stamens 10–15, either basally fused into a short tube incorporating the staminodes, or in pairs opposite
                   the petals with the staminodes alternating with the stamen pairs (Dombeyoideae):
                   37a Staminal tube short, bearing staminodes and stamens; petals persistent, often becoming dry or scarious ........ Dombeya
                   37b Staminal tube absent; stamens arranged in pairs opposite sepals; petals soon deciduous ....................... Nesogordonia
                36b Staminodes absent or, if present, usually more than 5 and irregularly arranged; stamens usually many:
                   38a Fruits drupaceous, never dehiscent, with ± fleshy mesocarp, never with stiff or soft bristles:
                      39a Ovary 2–4-locular; fruit a 1–4-lobed drupe or berry with 1–4 pyrenes ........................................ Grewia (Grewioideae)
                      39b Ovary 5–10-locular:
                         40a Sepals 4; petals 4, without glandular area at the base; stipules and bracts entire ............................... Duboscia
                         40b Sepals 5; petals 5, with a glandular area at the base; stipules and involucral bracts palmatifid ........ Desplatsia
                   38b Fruits dry, often capsular and breaking up irregularly, often armed with stiff or soft bristles:
                      41a Fruits with stiff or soft bristles:
42a Seeds 1 or 2 per locule; petals glandular at base on inside; a short androgynophore is present; fruit pricky or spiny .................................................. Triumfetta
42b Seeds many, if only 2 then fruit smooth, not spiny; petals not glandular at the base; androgynophore absent or very short; fruit pricky or smooth:
43a Annual herbs with axillary capsules ± 8 mm in diameter with spines ± 3 mm long ............... Corchorus
43b Perennial herbs, shrubs or small trees; capsules larger with longer bristles:
44a Stamens all fertile, in 4 fascicles opposite the petals; leaves not lobed; petals shorter than sepals; capsule 3-valved ................................................................. Ancistrocarpus
44b Outer stamens sterile; stamens not grouped in fascicles; leaves often lobed; petals ± as long as sepals; capsule 4–8-valved:
45a Inflorescence umbellate; ovary ovoid; capsule ellipsoidal or subglobose; flowers mostly white or pink ...
45b Inflorescence paniculate; ovary oblong; capsule oblong; flowers pink to red ............... Clappertonia
41b Fruits without bristles:
46a Herbs or subshrubs; anthers all fertile, with free filaments, sometimes on a short androgynophore; fruit a 2–5-locular loculicidal capsule ................................................................. Corchorus
46b Trees or shrubs; staminodes present or absent; anthers basally fused; androgynophore always absent; fruit a capsule or indehiscent:
47a Fruits spindle-shaped, strongly longitudinally ribbed, ± indehiscent; seeds discoid, without aril, contained in pits in endocarp; ovary 6–10-locular; stamens many, all fertile; anthers dehiscing by apical pores .............. Glyphaea
47b Fruits globose, linear-cylindric or spindle-shaped, not or only slightly longitudinally ribbed; stamens all fertile with free filaments; androgynophore sometimes present; herbs or subshrubs ............... Corchorus

**Abelmoschus Medik.** (Malvoideae)

**Hibiscus** L. in part; Exell & Mendonça: 178 (1937/1951).
Species 15, Old World tropics; sthn trop. Afr. 2: *Abelmoschus ficulneus* (L.) Wight & Arn. often confused with *A. esculentus* (L.) Moench which is cultivated and may appear as an escape in Angola, Zambia, Zimbabwe, Mozambique, and sthn Afr.

**Abutilon Mill.** (Malvoideae)

**Adansonia L.** (Bombacoideae)
Exell & Mendonça: 143 (1937/1951); Wild: 512 (1961); Wild & Gonçalves: 2 (1979a); Beentje: 1 (1989); Baum & Oginuma: 11 (1994); Coates Palgrave: 705 (2002); Walker: 49 (2002).

**Ancistrocarpus Oliv.** (Grewioideae)
Oliver: 173 (1865) conserved name; Masters: 265 (1868b); Exell & Mendonça: 237 (1937/1951); Wilczek: 72 (1963).

Shrubs or small trees. Leaves 3- or 5-nerved at base, oblanceolate to obovate or elliptic, acuminate, denticulate, stellate-tomentose, especially along nerves; stipules lanceolate-linear, caducous. Inflorescences: lateral or terminal umbellate cymes.

**Flowers** bisexual, regular. Sepals 4, free, ± apiculate. Petals 4, shorter than sepals, without glands at base, glabrous. Stamens many, all fertile, arranged in 4 groups opposite petals and fused at base; anthers oblong-linear, basifixed, dehiscing longitudinally. Ovary ± 6-celled; ovules many, ± parietal, anatropous; style filiform; stigma obtuse. Fruit capsular, 3-valvate, dehiscient, globular to ellipsoid, coriaceous, densely covered with prickles ± half as long as fruit body. Seeds many, with endosperm.


**Azanza Alef.** (Malvoideae)

**Berxy Roxb.** (Brownlowioideae)

**Carpodiptera** Griseb. (see note below); Wild: 33 (1963); Wild & Gonçalves: 2 (1969); Verdcourt: 5 (2001); Coates Palgrave: 682 (2002).

Small trees; dioecious or more rarely monoecious; branchlets sparsely stellately hairy, soon glabrous. Leaves simple, oblong or ovate, with margins entire or reaped, petiolate; stipulate. Inflorescence of axillary pedunculate cymes. Flowers unisexual; pedicels stellate-pubescent; bracts stellate-pilose, caducous. Calyx campanulate, 2- or 3-lobed. Petals 5, narrowed to base, white, glandless. Androgynophore obsolete. Stamens many, united at base. Ovary 2-locular; 2-lobed, sessile, with (1/2) pendulous ovaries per locule; style obsolete or very short; stigma large and spreading, 2-lobed. Fruit a 2-valved capsule, usually
DICOTYLEDONS

MALVACEAE: Berrya

with 1 seed; each valve prolonged by 2 unequal, horizontally spreading, foliaceous wings in a vertical plane. Seed large, villous or hairy, at least at apex; testa coriaceous; endosperm fleshy.

Species 78, 76 in tropical America, 2 in trop. Africa; sthn trop. Afr. 1: Berrya africana (Mast.) Kosterm., Mozambique. Verdcourt (2001: 5) notes: “Koster-mans (1969) sank Carpodiptera into Berrya, and this may prove to be correct but ... I am not altogether convinced. A more exhaustive study is needed”.

Bombax L. (Bombacoideae)


Rhodognaphalon (Ulbr.) Roberty emend. A.Robyns; Wild & Gonçalves: 4 (1979a); Izidine & Bandeira: 49 (2002).

Trees. Leaves digitately (3)5–7–(9)-foliolate; leaflets entire, central one larger than outer ones. Flowers moderately large, solitary or cymose in leaf axils; pedicels with 3 soon deciduous bracteoles. Calyx closed in bud, truncate or subtruncate.

Petals 5, tomentellose outside. Stamens many, united in a tube below, adnate to petals at base, either in 2 whorls with outer whor of 5 epipetalous bundles and the inner whor of 5 alternipetalous pairs, or in 5 epipetalous bundles; anthers ob-long or reniform. Ovary 5-locular; ovules many; stigma 4- or 5-lobed or entire. Fruit a loculicidally 5-valved woody capsule with a persistent axis. Seeds many, irregularly globose or angular, covered in woolly endocarp indumentum; endosperm absent; cotyledons plicate.

Species 130, pantropical; sthn trop. Afr. 1: B. catalpifolia Jacq. subsp. africana (Mast.) Exell & Mendonça, Angola.

Ceiba Mill. (Bombacoideae)


Tall trees, with horizontally branched crown and a very straight trunk; bark pale grey, smooth, usually with scattered conical spines. Flowers moderately large, axillary or subterminal, solitary in axils or often 1–3-fasciculate. Calyx cupular, 5-lobed. Petals 5, imbricate, rose-coloured or white. Stamens (10)15, united in 5 phalanges, each bearing 2 or 3 coiled anther-thecae and united below in a tube. Ovary 5-locular, each locule with many ovules; stigma club-shaped, pentagonal. Capsule a woody or coriaceous 5-valved capsule. Seeds many, surrounded by endocarp wool; endosperm thin or absent; cotyledons much contorted.

Species 10: 9 confined to tropical and subtropical America; Ceiba pentandra (L.) Gaertn., the Silk Cotton or Kapok Tree, is native in tropical America and probably in trop. Africa. Most specimens in sthn trop. Afr. are cultivated but the species has been recorded as spontaneous at times in various parts of trop. Africa, including Angola, Zambia, Malawi and Mozambique.

Christiana DC. (Brownlowioidae)

Candolle: 516 (1824); Masters: 241 (1868b); Exell & Mendonça: 209 (1937/ 1951); Wilczek: 3 (1963); Kubitzki: 537 (1995); Verdcourt: 2 (2001).

Small to tall trees, often dioecious by abortion; young parts, including outside of calyx and carpels, with dense, yellowish stellate hairs. Leaves palmatinerved, ovate, acuminate with cordate base; stipules linear. Inflorescences terminal and axillary corymbiform cymes. Flowers usually unisexual by abortion. Calyx campanulate, irregularly 3–5-fid. Petals 5(6 or 7). Stamens many, all fertile in male flowers, sterile in female flowers, free, not arising on a raised torus; filaments filiform; anthers subglobose. Ovary of (1)2–5(6), free, 1-locular, 2-valved carpels; ovules 1 per carpel, ascending. Fruit apocarpous into follicles opening by 2 valves; endocarp light brown, shiny, crustaceous. Seeds 1 per follicle, large, vari-gated, at first with hairs along raphe.

Species 2, S America and trop. Africa; sthn trop. Afr. 1: C. africana DC., Angola.

Cienfuegosia Cav. (Malvoideae)


Clappertonia Meisn. (Grewioideae)


Small shrubs with stems and petioles covered with dense rus-
fous-stellate hairs. **Leaves** broadly ovate to oblong, 3–7-lobed, margins coarsely serrate; stipules linear-subulate to lanceo-
late. **Inflorescences** of small terminal or axillary cymes. **Se-
pals** 4 or 5, oblong, with an apical or subapical gland. **Petals**
4 or 5, clawed, glandless, pink, purplish or white. **Stamens**
many, up to ± 12 fertile and slightly longer than the rest; stami-
 nodes filamentous or lanceolate-linear and sterile, with-
out anther thecae. **Ovary** sessile, 4–8-locular, with many ovules
in each locule; stigma lobed or denticulate at apex. **Capsule**
ellipsoid or oblong-ovoid, loculicidally 4–8-valved; valves
transversely separte within, with many stiff pilose bristles out-
side. **Seeds** many, discoid or compressed-obovoid.


**Cola Schott & Endl.**
(Sterculioideae)


**Corchorus L.**
(Grewioideae)


**Desplatsia Bocq.**
(Grewioideae)

Bocquillon: 51 (1866); Masters: 266 (1868b) (as *Desplatzia*); Exell & Mendonça: 225 (1937/1951); Wilczek: 40 (1963).

Small trees or shrubs. **Leaves** ovate-oblong to obovate-ob-
long, cordate to subcordate and asymmetric at base, long-acu-
minate, obscurely dentate; domatia often present; stipules palmatifid, ± persistent. **Inflorescences** many-flowered, axil-
ary or terminal umbellate cymes; involucral bracts 3- or 4-
fid, not enveloping buds. **Flowers** bisexual. **Sepals** 5, oblong,
hooded. **Petals** 5, shorter than sepals, with a glandular area at
base inside. **Stamens** many, fused at base into a glabrous or
pubescent tube ciliate at top; anthers subglobose, dorsifixed,
 dehiscing longitudinally. **Ovary** 5–10-locular, tomentose; style
cylindric, glabrous; stigma ± fringed; ovules many, in 2 rows
in each locule, anatropous. **Fruit** drupaceous, indehiscent,
externally coriaceous, inside fibrous. **Seeds** many, oblong,
narrowly winged, embedded in fibrous tissue.

Species 7, tropical W Africa; sthn trop. Afr. 1: **Desplatsia subericarpa** Bocq., Angola (Cabinda).

**Dombeya Cav.**
(Dombeyoideae)


**Assonia Cav.**; Hiern: 85 (1896).


**Duboscia Bocq.**
(Grewioideae)

Bocquillon: 50 (1866); Masters: 265 (1868b); Exell & Mendonça: 209 (1937/1951); Wilczek: 38 (1963).

Trees. **Leaves** obovate-oblong to lanceolate, rounded to ±
cordate and 3-nerved at base, acuminate, denticulate; sti-
ules entire, ± caducous. **Inflorescences** axillary cymes;
bracts ± fimbriate, style shorter than ovary; stigma fimbriate;
 ovules many, in 2 rows in each locule, anatropous. **Fruit**
drupaceous, indehiscent, fibrous inside. **Seeds** many, flattened, embedded in fibrous tissue.


**Glyphaea Hook.f.**
(Grewioideae)


Small trees; young parts stellately tomentellous. **Leaves**
 oblong or obovate-oblong, irregularly crenate-dentate, strongly
3-nerved and sometimes asymmetrical at base, stellate-pubes-
cent on both surfaces; petiole slightly widened just below leaf
lamina; stipules caducous, very small, subulate. **Inflorescence**
 of leaf-opposed or extra-axillary, 1–several-flowered cymes;
bracts very small, caducous. **Sepals** 5, linear-oblong, ±
hairy outside. **Petals** 5, bright yellow, glandless, linear-ob-
long. **Androgynophore** obsolete. **Stamens** many, all fertile;
 anther thecae linear, adnate throughout their length, dehiscing
by terminal pores and with connective prolonged into a
small crest. **Ovary** sessile, 6–10-locular; style shorter than
ovary; stigma fimbriate; ovules many, in 2 rows in each
locule, anatropous. **Seeds** many, oblong, narrowly winged, embedded in fibrous tissue.


**Gossypioides Skovst. ex J.B.Hutch.**
(Malvoideae)


Sthn trop. Afr. 1: **Gossypioides kirkii** (Mast.) Skovst. ex J.B.Hutch., Moz-
ambique, and sthn Afr.
Gossypium L.  
(Malvoideae)  


Grewia L.  
(Grewioideae)  


Kosteletzyka C.Presl  
(Malvoideae)  


Leptonychia Turcz.  
(Byttnerioideae)  
Turczaninow: 222 (1858); Masters: 238 (1868a); Exell & Mendonça: 197 (1937/1951); Hallé: 129 (1961); Germain: 226 (1963); Dowsett-Lemaire & White: 84 (1990); White et al.: 562 (2001); Lebrun & Stork: 690 (2003).

Evergreen shrubs or trees. *Leaves* alternate, simple, entire, petiolate, oblong, acuminate, base rounded; small axillary domatia often present on lower surface. *Inflorescences* axillary or on old wood, cymose; bracts present; pedicels articulate. *Flowers* bisexual; buds oblong, sometimes constricted in the middle, acute. *Sepals* 5, ± free, oblong, acute, usually puberulous with stellate hairs on outer surface. *Petals* 5, very short, concave, somewhat fleshy, ciliate, cohering at margins. *Stamens* ± 25, in 5 fascicles opposite petals; filaments basally fused into a short collar; 1–5 staminodes present in each fascicle; anthers with 2 opposite thecae, oblong, dehiscing laterally. *Ovary* 3–5-locular with 5–10 ovules per locule in 2 vertical rows on a central placenta; style central, cylindric; stigma truncate, 3(5)-toothed. *Fruit* a subglobose, 3- to 5-locular, loculicidally dehiscent capsule opening with rugose and stellately tomentose valves. *Seeds* 1 in each locule, large; testa black, covered by a red spongy aril; endosperm horny; embryo straight, cotyledons foliaceous.

Species 30, Old World tropics, mainly Africa; sthn trop. Afr. 6, Angola, Malawi.

Malva L.  
(Malvoideae)  


Malvastrum A.Gray  
(Malvoideae)  
Meeuse: 503 (1961); Meeuse & Gonçalves: 110 (1979); Phiri (Unpublished).

Malvaceae: Melhania

**Melhania Forssk.**

(Dombeyoideae)


**Melochia L.**

(Byttnerioideae)


**Nesogordonia Baill.**

(Dombeyoideae)

Baillon: 555 (1886); Wild: 551 (1961); Wild & Gonçalves: 36 (1979b); Barnett & Dorr: 985 (2000).


Small or large trees, ± stellate-pubescent, at least on young parts. Leaves petiolate, simple, oblong to oblong-lanceolate or narrowly ovate; stipules caducous, small. Flowers bisexual, solitary or axillary, in pedunculate, few-flowered cymes; pedicels articulated. Sepals 5, valvate. Petals 5, often somewhat twisted. Stamens in an uninterrupted ring or in fascicles of 2–4 opposite sepals; filaments free or ± united within fascicles; and with an inner ring of 5 free fertile stamens or 5 free staminodes opposite petals. Ovary obconic or subglobose, pubescent or tomentose, 5-locular; locules 2-ovulate; styles 5, free or united into a single style; stigmas fleshy, papillose. Capsule obconic, truncate and excavated at apex, with 5 rather thick wings, dehiscent into 5 valves, with 1 or 2 seeds per locule. Seeds with a unilaterial wing.


**Octolobus Welw.**

(Sterculioideae)


Small monoeccious trees with straight trunk and pubescent young branches. Leaves alternate, mainly towards ends of branches, unifoliolate, entire, petiolate, ± elliptic, acuminate; stipules long-acicular. Flowers unisexual, fairly large, subsessile, solitary or sometimes in few-flowered fascicles on old wood; many short, scarios, broadly ovate, imbricate bracts forming a pseudoinvolucre; buds globose or obvoid. Calyx campanulate, stellate-pubescent outside, papillate inside, divided ± halfway into 6–8 coriaceous lobes with membranous, induplicate, corrugate margins. Petals absent. Male flowers with a sturdy androphore bearing a cupuliform crown of many anther thecae in a single row. Female flowers with 40–80 almost free, densely stellate-canescens, obliquely elongate-ovoid carpels arranged imbricately and tightly in 2–4 rows to form a globose head with a single row of staminodia at base and raised on a short androphore; carpels unilocular with many horizontally oriented ovules arranged in 2 rows; stigma obliquely sessile at apex of carpel, swollen, dark purple, papillate. Fruit consisting of 8 to many, free, obovoid to clavate, stipitate, tardily dehiscent, few-seeded follicles. Seeds subglobose, smooth, black.


**Pavonia Cav.**

(Malvoideae)


Shrubs; young branches puberulous, later glabrous. Male flowers alternate, simple, shortly petiolate, entire, elliptic, penninerved with one basal pair of nerves; stipules triangular to ensiform, subpersistent. Inflorescences few- to many-flowered axillary or sometimes cauleine fascicles surrounded at base by pointed bracts; pedicels slender, articulated at base of flower; pointed bracteoles present on pedicel; bud spherical. Calyx coriaceous with sepals ± completely fused, bursting irregularly into 2 or 3 valves. Petals 5, concave, hooded, striate outside with 7 longitudinal nerves. Stamens many, with a large wing; endosperm present.

Species 15, tropical, especially Old World; sthn trop. Afr. 2, Angola (Cabilia), Zambia.

**Scaphopetalum Mast.**

(Byttnerioideae)

Masters: 28 (1867); Masters: 236 (1868a); Exell & Mendonça: 198 (1937/51); Germain: 302 (1961); Germain: 212 (1963); Wild & Gonçalves: 53 (1979b); Lebrun & Stork: 702 (2003).

Shrubs; young branches puberulous, later glabrous. Leaves alternate, simple, shortly petiolate, entire, elliptic, penninerved with one basal pair of nerves; stipules triangular to ensiform, subpersistent. Inflorescences few- to many-flowered axillary or sometimes cauleine fascicles surrounded at base by pointed bracts; pedicels slender, articulated at base of flower; pointed bracteoles present on pedicel; bud spherical. Calyx coriaceous with sepals ± completely fused, bursting irregularly into 2 or 3 valves. Petals 5, concave, hooded, striate outside with 7 longitudinal nerves. Staminal tube membranous, bell-shaped, 5-angular, ± clearly divided at apex into 10 segments, 5 of which are sterile, reflexed and rounded, alternating with 5 fertile lobes opposite petals and each bearing 3 sessile, 2-locular anthers. Ovary subcylindric, obscurely 5-lobed, 5-locular, pubescent; ovules in 1 or 2 rows on central placenta; style simple; stigma minute. Fruit an elliptic to subconical loculicidal capsule crowned by persistent calyx and opening by 5 undulate valves. Seeds ± 2–4 per carpel, ± ovoid, pubescent, partly covered by an irregularly dentate aril.

**Sida L.**
(Malvoideae)


**Sparrmannia L.f.**
(Grewioideae)


**Sterculia L.**
(Sterculioideae)


**Thespesia Sol. ex Corrêa**
(Malvoideae)

Exell: 421 (1961); Fryxell: 301 (1968); Exell & Gonçalves: 3 (1979); Coates Palgrave: 703 (2002).


**Triplochiton K.Schum.**
(Helicteroideae)


Large trees with a straight bole and light grey, smooth flaking bark. Leaves palmately 5–9-lobed, cordate; lobes ovate to oblong; petiolate; stipules present. Flowers bisexual, in reduced axillary cymes or many-flowered panicles; bracts present and also 3 bracteoles forming a deciduous involucre beneath flowers. Calyx campanulate with 5 valvate lobes. Petals 5, with contorted aestivation, tomentose, with a basal claw. Androgynophore conspicuous. Stamens many; staminodes 5, ovate, with a contorted aestivation. Ovary of 5 coherent carpels and with 5 coherent styles; ovules ± 12 per carpel, 2-seriate. Fruit of 5 samara-like, single-seeded carpels each with a unilaterally produced wing.


**Triumfetta L.**
(Grewioideae)


**Urena L.**
(Malvoideae)


**Waltheria L.**
(Byttnerioideae)


**Wissadula Medik.**
(Malvoideae)


**References**


Following Jacques-Félix (1983), the prolongation of the connective below the anther thecae is referred to as a pedoconnective.

**Key to genera**

1a Ovary 1-locular or imperfectly 2-4-locular with only 1 locule developing; anthers short, longitudinally dehiscing; placental basal with 2–18 ovules; fruit a 1- or 2-seeded berry; seeds large; trees or shrubs with glabrous leaves ................................................... (MELASTOMACEAE):

2a Leaves with only 1(3) prominent longitudinal nerve; leaf surface uneven; calyx entire or with valvate lobes; petals often sessile; fruit spherical or ellipsoid ............................................. Memecylon

2b Leaves with 3 prominent longitudinal nerves; a polygonal network of veins is often visible; leaves rarely subcoriaceous:

3a Cymes pubescent in all parts, branched and often ample; leaf surface granular, especially below; fruits crowned by the truncate to wavy remnants of the calyx .................................................... Spathandra

3b Cymes glabrous, variously branched or glomerate:

4a Bracts persistent at all articulations of the inflorescence, including the bracts immediately below the sessile flowers; leaf surface mostly granular; ovary with 2 ovules; fruit spherical, without prominent remnants of calyx ................................................................. Lijdenia

4b Bracts usually caducous; flowers at least briefly pedicellate; leaf surface smooth; ovary with many ovules; fruits spherical or ellipsoid, crowned by the persistent calyx ......................................................... Warneckea

1b Ovary 3-5-locular with many ovules on axile placentas; anthers mostly fairly long, opening by an apical pore; fruit a capsule with many minute seeds; herbs, shrubs or sometimes small trees, usually with variously hairy leaves ..................................................... (DIOECIEAE):

5a Calyx entire to shallowly undulate; lobes ± absent; top of ovary convex, glabrous; fruit indehiscent, dry or baccate, not angular; seeds straight or slightly curved (DISSOCHAETEAE):

6a Leaves arising on the same node equal, elliptic; young branches rounded, covered with minute rusty hairs; stamens equal ................................................................. Ochtchocharis

6b Leaves arising on the same node unequal, lanceolate-cordate; young branches 4-angled, glabrous; stamens unequal ..................................................... Dinophora

5b Calyx distinctly lobed; top of ovary concave, convex or ± flat, variously hairy, scaly or glabrous; fruit a loculicidal capsule, 4- or 5-angular or rounded:

7a Ovary convex on top, usually with a crown of hairs, bristles or scales, usually adnate to the calyx tube by 8 or 10 longitudinal septa; calyx tube/receptacle ± ellipsoid; appendages between sepals often present; fruit not angular; seeds usually distinctly curved (cochleate), with a curved embryo (OSBECIEAE):

8a Creeping annual herbs rooting at the nodes ................................................................................................................. Guyonia

8b Perennial herbs, subshrubs, shrubs or trees:

9a Trees or large shrubs; flowers 4-merous, produced before the leaves; pedoconnectives of anthers with linear appendages; seeds obvoid or subpyramidal with hyaline papillae dorsally ................................................................. Dichaetanthera

9b Plants not possessing all the above characters:

10a Calyx provided with appendages between the sepals, if absent then the calyx tube/receptacle glabrous; sepals early or tardily caducous, rarely persistent:

11a Stamens usually very unequal, the longer ones with long pedoconnectives with a forked appendage, the shorter ones with a short pedoconnective with 2 tubercles (if stamens subequal than pedoconnectives conspicuous at least on the longer stamens); sepals not or tardily caducous ........................................................................................................... Dissotis

11b Stamens equal:

12a Shrubs; flowers 5-merous ................................................................................................................................. Pseudosbeckia

12b Erect, usually unbranched annuals; flowers 4-merous ................................................................................................. Antherotomia

10b Calyx without appendages between the sepals:

13a Stamens ± equal, with slightly attenuate, not rostrate anthers; bristles of calyx tube/receptacle in 1–several, complete or incomplete rings; fruit a berry-like capsule bursting irregularly ....................................................................... Tristemma

13b Stamens usually very unequal, with rather attenuate-rostrate anthers; bristles of calyx tube/receptacle, if present, not in rings; fruit a valved capsule ........................................................................................................... Melastomastrum

7b Ovary depressed: the upper side ± flat or concave, glabrous but often with a crown of scales, adnate to the calyx tube by longitudinal septa or wholly adnate; calyx tube/receptacle and fruit generally ± 4- or 5-angled, without appendages between sepals; seeds straight to slightly curved, with embryo ± straight (Sonerileae):

14a Plants stemless; usually only with a leaf and ± 1 long-peduncled cyne arising from a scaly tuber ........................................................................ Cincinnobotrys

14b Plants with stems; leaves ± numerous, arising on stems and branches; inflorescences axillary or terminal:

15a Flowers in terminal, simple to forked scorpioid cymes; stamens ± identical, with a small scale-like anterior appendage ................ Calvoa

15b Flowers in variously arranged cymes; stamens of outer and inner whorl usually clearly different:
DICOTYLEDONS

MELASTOMATACEAE: Key to genera

16a Anterior appendage of anthers, at least in anthers of the outer whorl, simple, club-shaped or linear .................... Amphilemma

16b Anterior appendage of anthers, at least in anthers of the outer whorl, 2-forked from the base, awl-shaped or linear ......... Dicellandra

Amphilemma Naudin
(Melastomatoideae—Sonerileae)

Perennial herbs, subshrubs or shrubs of medium height with sympodial growth; floral organs often with glandular hairs. Leaves long-petioled, membranous, longitudinally 3- to 5-nerved, ± ovate. Inflorescences simple or branched, terminal or axillary scorpioid cymes. Calyx: tube/receptacle turbinate to campanulate, produced beyond ovary; limb 5-toothed, dilated, deciduous. Petals 5, oblong or obovate, pink or white, often conspicuous. Stamens 10, in 2 unequal whorls; longer anthers linear-subulate with elongate, curved connective and an anterior appendage at base and sometimes in a spur behind; shorter anthers with connective rarely produced. Ovary 5-locular, 5-angled, with 5 facets that have membranous margins; ovules few to many; style linear, stigma punctiform. Capsule turbinate, 5-locular, 5-valved at top, with an entire to 5-lobed crown. Seeds minute, obvoid or globose; funicle ± fragile; raphe produced into a broad appendage.

Species 13, tropical W Africa; sthn trop. Afr. 3, Angola.

Antherotoma (Naudin) Hook.f.
(Melastomatoideae—Osbeckieae)


Calvoa Hook.f.
(Melastomatoideae—Sonerileae)

Perennial herbs, subshrubs or shrubs, often ± succulent; branches terete or 4-angled, often with thickened nodes. Leaves opposite, short- to long-petiolate, lanceolate to broadly ovate, longitudinally 3- to 5-nerved. Inflorescences scorpioid cymes, simple, bi- to several times furtate. Flowers sessile or shortly pedicellated; relatively small. Calyx: tube/hypanthium campanulate or obconic, produced beyond ovary; limb 5-toothed, deciduous. Petals 5, obovate or oblong, ± symmetric, often adhering at base. Stamens 10, equal or outer ones slightly longer, of similar shape or anterior appendix slightly different; anthers oblong, ± sausage-shaped, connective short, flattened, often strongly curved, anterior appendage usually scale-like, obtuse or truncate in outer whorl, larger, broader and dish-shaped and ± denticulate in inner whorl, spur situated towards middle of connective; filaments flattened, often adhering at point of origin on petals. Ovary 3–5-locular, adhering to calyx tube, with an entire to 3–5-lobed epigynous crown; style short, ± sigmoid; stigma capitate; ovules many. Capsule included in coriaceous, campanulate, ribbed calyx tube, and surmounted by accrescent crown. Seeds minute, oblong or obovoid.


Cincinnobotrys Gilg
(Melastomatoideae—Sonerileae)
Gilg: 265 (1897); Wickens: 66 (1975); Bingham & Smith: 153 (2002).


Acaulescent herbs with 1(2) leaves and inflorescences arising from a bulbil-bearing rhizome; bulbils densely covered with stellate bristles. Leaves broadly ovate-cordate, serrulate with teeth ending in a bristle, longitudinally 5–9-nerved, petiolate. Flowers 5(4)-merous, in scorpioid, single or branched cymes. Calyx: tube/receptacle turbinate, hispid; lobes triangular, persistent. Petals ovate, obovate or oblong, pale pink. Stamens 10(8), very unequal; anthers of long stamens dehiscing by a terminal, broad, oblique pore and with a long pedoconnective anticlinitically furnished with an upcurved, clavate, entire or bilobed appendage; anthers of short stamens abortive. Ovary 5(4)-locular, adherent to calyx tube/receptacle nearly to top; style columnar with a dilated subcapitate stigma. Capsule turbinate, crowned by 5 scales. Seeds very small, straight, straw-coloured with a lateral appendage at top.

Species 7; trop. Africa; sthn trop. Afr. 1: Cincinnobotrys acaulis (Cogn.) Gilg, Angola, and Zambia.

Dicellandra Hook.f.
(Melastomatoideae—Sonerileae)

Herbs or subshrubs, sometimes scindent or epiphytes; branches 4-angled, winged or with acute angles, capable of rooting along entire surface. Leaves large, long-petiolate, usually unequal on same node, ovate-lanceolate to elliptic, longitudinally 5- to 7-nerved; base rounded to cordate. Inflorescences a many-flowered, terminal, oblong to pyramidal pincle of cymes, with 5 or 6 flowering nodes, or cymes sessile and flowers fascicled. Calyx: tube/receptacle campanulate-turbinate, sometimes slightly angular; lobes (4)5, short, broadly triangular or rounded. Petals (4)5, lanceolate to oblong-lanceolate. Stamens (8–)10 in 2 whorls, stamens of outer one usually slightly longer, with 2 anterior appendages and a spur; stamens of inner whorl usually shorter with shorter appendages; anthers linear-subulate, larger ones sometimes curved and attenuate at base. Ovary (4)5-locular, partly adnate to calyx; apex truncate with a membranous or slightly thickened crown. Fruit a capsule within accrescent calyx; crown persisting or disappearing but not accrescent. Seeds semi-elliptic or obovoid, attenuate at base; raphe produced into a lateral spur near apex.

Dichanthera Endl.
(Melastomatoideae—Osbeckieae)


Trees or shrubs, strigillose with rigid bristles; branches ± distinctly 4-angled. Leaves opposite, subentire, with 5–7 longitudinal nerves. Flowers 4-merous, pedicellate, arranged in terminal panicles, produced before leaves; bracts 2, caducous. Sepals short, persistent; intersepalar segments absent. Petals obovate or oblong, pink or mauve to magenta. Stamens 8, unequal; filaments filiform; anthers linear, subulate, sigmoid, 1-porose, with undulate thecae; pedoconnective rather long with 2 linear anterior appendages at base. Ovary 4-locular, tube/receptacle by 8 sepal; style filiform, somewhat thickened distally; stigma punctiform. Capsule 4-valved. Seeds very many, obovoid or subpyramidal, with hyaline papillae on back; hilum basal.

Species 34, mainly Madagascar, 7 in trop. Africa; sthn Afr. 5, Angola, Zambia.

Dinophora Benth.
(Melastomatoideae—Dissochaeteae)

Glabrous shrubs, sparsely branched; branches slender, 4-angular. Leaves opposite, unequal at same node, petiolate, lanceolate-cordate, acutely acuminate, 5- or 7-nerved at base, serrate with mucronate teeth. Flowers in lax terminal dichotomous panicles; pedicels slender. Calyx: tube/receptacle smooth, short, entire or faintly dentate. Petals 5, ovate-lanceolate, pink. Stamens 10, in 2 subequal whorls; outer stamens with connective produced below and anterior appendage 2-lobed; inner ones with curved anther and connective not produced but with 2 anterior tubercles. Ovary adherent to calyx tube/receptacle by 5 ribs, glabrous, apex convex; style thick, sigmoid; stigma punctiform. Fruit broadly ellipsoid, with very thin walls, splitting irregularly. Seeds: hilum large; embryo curved.


Dissoitis Benth.
(Melastomatoideae—Osbeckieae)


Guyonia Naudin
(Melastomatoideae—Osbeckieae)

Annual herbs; stems creeping, rooting at nodes, branches erect, 4-angled. Leaves decussate, petiolate, ± ovate, membranous, crenulate, sparsely setose above and on nerves beneath; nerves 3–5, parallel-convergent. Flowers (4)5–(7)-merous, terminal or axillary, solitary or 2 or 3 together subtended, but not enveloped by a caducous dentate-ciliate bract. Calyx: tube/receptacle ovoid; lobes linear-triangular, persistent, without intersepalar appendages. Petals obovate, delicate, pale pink. Stamens equal to slightly unequal; anthers ovoid to oblong-ellipsoid; connective produced below anther, with 2 inconspicuous tubercular anterior protuberances at junction with filament. Ovary adherent to calyx tube in lower half, ovoid, glabrous; style sigmoid; stigma capitate. Fruit a valvate capsule within membranous calyx which tends to rupture irregularly. Seeds relatively large and few, attenuate towards funicular end, upper half rounded, tuberculate or papillose.


Lijndenia Zoll. & Moritzi
(Memecyloideae—Memecyleae)

Melastomastrum Naudin
(Melastomatoideae—Osbeckieae)


Memecylon L.
(Memecyloideae—Memecyleae)


Ochthocharis Blume
(Melastomatoideae—Dissochaeteae)

Perennial herbs, shrubs or undershrubs, young branches, petioles, peduncles and pedicels covered with minute rusty hairs.
Leaves opposite, usually ± equal at same node, ovate to broadly ovate, petiolate, with 5–7 longitudinal nerves. Inflorescences of terminal and axillary paniculate cymes. Flowers 5-merous. Calyx: tube/receptacle obovoid, shallowly undulate at margin, covered with very small brown hairs; lobes 0. Petals broadly ovate, ± oblique, violet or rose. Stamens 10, equal or subequal; anthers linear, straight, with pedoconnective produced into a posterior, thick ± square appendage and provided with 2 anterior subglobose tubercles. Ovary adnate by sepal to inferior half of calyx tube/receptacle, 5-locular, with multi-ovulate placentas; style longer than stamens. Fruit capsular, dehiscing irregularly. Seeds many, curved.


Pseudosbeckia A.Fern. & R.Fern. (Melastomatoideae—Osbeckieae)

Shrubs with young branches 4-angled, ± densely bristly. Leaves opposite, elliptic to ovate, longitudinally (3)5-nerved, subentire or crenulated, dark green above, yellowish green below. Flowers 5-merous, in terminal few-flowered cymes or solitary; bracts caducous. Sepals tardily deciduous; intersepal segments subulate. Petals obovate. Stamens 10, equal; filaments straight; anthers oblong-lanceolate, straight, yellow, with rather undulate thecae and 1 extorse pore; pedoconnective very short with 2 anterior, divergent, obtuse appendages and 2 posterior minute prominences at base. Ovary 5-locular, adnate to calyx tube/receptacle by 10 longitudinal septa; style filiform; stigma punctiform. Capsule 5-valved. Seeds cochliclate, covered with rather elongate tubercles arranged in curved parallel lines.


Spathandra Guill. & Perr. (Memecyloideae—Memecyleae)


Shrubs or trees; branches rounded. Leaves large, coriaceous, subsessile; lamina ovate-elliptic, entire, veins parallel-convergent, 3 strong, 2 marginal ones weak. Inflorescences many-flowered, stipitate, puberulous cymes with well-developed peduncles and pedicels, terminal, axillary or on old wood; prefloral branches and flowers often umbellate; bracteoles at base of pedicels, not immediately below calyx. Calyx: tube/receptacle deeply cup-shaped with broadly triangular lobes. Petals triangular, valvate in bud, blue, white or purple. Stamens: anthers erect, connective ± parallel, curved towards back, with a gland, divergent only at base. Ovary 1-locular, without any partitions or parietal projections; ovules 6–8 on a central placenta; style filiform; stigma capitulate. Fruit spherical, crowned with remains of calyx. Seeds 1(2); embryo curved, cotyledons foliciaeous, hemispheric. Species 5, trop. Africa and Madagascar; sthn trop. Afr. 1: Spathandra blakeoides (G.Don) Jacq.-Fél., Angola.

Tristemma Juss. (Memecyloideae—Osbeckieae)

Perennial herbs or shrubs, with sharply 4-angular or -winged stems and branches, hairy or bristly. Leaves opposite, longitudinally 5–7-nerved. Flowers 5-merous, sessile or subsessile, in terminal heads surrounded by leaves and leafy bracts; inner bracts coriaceous, chaffy or membranous. Calyx: tube/receptacle ovoid or ovoid-oblong, glabrous or densely setose in upper half or with 1–6 rings of bristles; lobes persistent, ± reflexed, ciliate at margin; intersepal segments 0. Petals mauve, pink or blue-violet rarely white. Stamens 10, subequal; anthers lanceolate, all similar, yellow, pedoconnective short with an anterior 2-lobed or 2-fid appendage at base. Ovary 5-locular, adnate to calyx tube/receptacle all around to above middle. Capsule 5-valved, with fleshy placentas, usually splitting irregularly. Seeds many, cochlleate.


Warneckea Gilg (Memecyloideae—Memecyleae)


Trees or shrubs; young branchlets 4-angled to subterete, usually thickened at nodes, later terete. Leaves subsessile to shortly petiolate, longitudinally 3-nerved, lateral nerves mostly not merging with middle nerve near apex; sphaeroïdal sclereids present and surface therefore often granular. Inflorescences (1)2- to many-flowered cymes, axillary or on old wood, sometimes arranged in axillary panicles; bracts minute. Flowers 4-merous, small. Calyx: tube/receptacle subhemispheric to broadly campanulate; limb 4-toothed or -lobed. Petals broadly ovate, whitish or bluish. Stamens 8, equal, sometimes 4 with abortive anthers. Ovary 1-locular, adherent to calyx tube/receptacle; style filiform; ovules 2–12, on a central placenta. Fruit a ± globose (2)-seeded berry crowned by persistent calyx. Seeds large; embryo straight, without hypocotyl, cotyledons unequal or 1 rudimentary.


References
BLUME, C.L. 1831. Ochthocharis. Bijdragen tot de natuurkundige
wetenskappen 6: 624.


Meliaceae (Rosidae— Sapindales) (Eurosids II—Sapindales)


Key to genera

[after Styles & White (1991)]

1a Leaves imparipinnate, pinnately 3-foliolate, simple or 2–3-pinnate; fruit a berry or a drupe or a small loculicidal capsule; seeds neither winged nor with a corky covering, often arillate: 

2a Leaves simple; style head expanded to form a receptaculum pollinis (pollen presenter); fruit a small capsule; seeds arillate ................. Turraea

2b Leaves compound:

3a Leaves 2–3-pinnate; staminal tube complete, with appendages; fruit a drupe ................................................................................................. *Melia

3b Leaves pinnate; if fruit drupaceous then staminal tube incomplete (Leptodorichila) or without appendages (Ekebergia):

4a Anthers arising within the throat of the staminal tube: 

5a Petals fused to the staminal tube for the greater part of its length; petals not grooved and winged at the base ......................... Turraeaanthus

1b Leaves imparipinnate, pinnately 3-foliolate, simple or 2–3-pinnate; fruit a berry or a drupe or a small loculicidal capsule; seeds neither winged nor with a corky covering, often arillate: 

*Melia
Leaves paripinnate; fruit a septicidal capsule; seeds winged or with a thick corky or woody outer covering:

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<td>Exell: 64 (1927) as Entandrophragma</td>
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*Toona*

Carapa Aubl.


Trees of very variable habit. Leaves usually paripinnate, and with an apical gland, mostly crowded at ends of stout branchlets. Flowers unisexual, 4- or 5(6)-merous, in large, much-branched panicles. Calyx small, lobed almost to base; lobes imbricate. Petals 4 or 5(6), slightly contorted, spreading in open flowers. Staminal tube urceolate, bearing 6–8 included anthers or antherodes towards apex and terminated by 8–10 suborbicular, emarginated or irregularly lobed, overlapping appendages alternating with anthers or antherodes.

Disc cushion-shaped, surrounding base of ovary and free from staminal tube. Ovary 4 or 5(6)-locular with 2–8 ovules in each locule; style-head discoid with a crenular margin. Fruit a large, pendulous, leathery, subglobose, septifragal capsule, breaking open on hitting ground; columella poorly developed. Seeds ± 12–20, large, subangular, with a woody but buoyant outer covering.

Species 2 or 3, tropical America and Africa; sthn trop. Afr. 1: *Carapa procera* DC., Angola.

Ekebergia Sparrm.


Entandrophragma C.D.C.


Guarea L.

Linnaeus: 150, 228 (1771); Staner & Gilbert: 201 (1958); Pennington & Styles: 494 (1975); Styles & White: 40 (1991); Brummitt (Unpublished).

Diocious trees or treelets; indumentum of simple hairs. Leaves pinnate, with a dormant terminal bud or more rarely a terminal leaflet; leaflets 8–15, oblong-elliptic, entire. Calyx irregularly lobed. Petals 5, free from staminal tube. Staminal tube cylindric; anthers 10, arising in throat of staminal tube and completely included. Disc annular at base of ovary. Ovary 3–5-locular; locules with 1 or 2 ovules; style head discoid with a small central depression. Fruit a cleistocarp, indehiscent or breaking up after falling. Seeds large, completely covered by a thin yellow aril.


Khaya A.Juss.


Lepidotrichilia (Harms) J.-F.Leroy

Leroy: 1025 (1958); White & Styles: 305 (1963); Pennington & Styles: 473 (1975); White et al.: 365 (2001); Phiri (Unpublished).

Small or medium-sized evergreen trees; bole fluted; bark smooth, grey. Leaves imparipinnate, densely stellate-pubescent; leaflets opposite or alternate, 3- or 4-jugate, entire, lower surface with minute red and black glands. Flowers bisexual, borne in large cymose panicles. Calyx cupuliform with 5 minute teeth. Petals 5, free, much longer than calyx in bud, induplicate-valvate, creamy white, becoming darker yellow with age. Filaments 10, fused in lower half to form a staminal tube; anthers arising between a pair of deltate-acuminate appendages which slightly exceed them in length. Disc absent but base of staminal tube apparently slightly modified for nectar secretion. Ovary 2(3)-locular, each locule with 1 ovule; style
head capitate, surmounted by 2 or 3 erect stigmatic lobes. Fruit drupaceous, indehiscent.


**Lovoa** Harms

Harms: 164 (1896); Exell & Mendonça: 311 (1951); Staner & Gilbert: 193 (1958); White: 293 (1963); Pennington & Styles: 523 (1975); White et al.: 45 (1979); Styles & White: 58 (1991); Coates Palgrave: 446 (2002); Dombo et al.: 10 (2002); Mapaura & Timberlake: 166 (2002).

Large, evergreen, monoeocious trees; bole fluted or slightly buttressed at base. Leaves paripinnate; leaflets opposite or alternate, 3–5(6)-jugate, entire. Flowers unisexual, borne in large panicles. Calyx lobed almost to base; lobes 2 + 2, imbricate, outer larger than inner ones. Petals 4, free, white, much longer than calyx in bud, imbricate. Staminal tube shortly cylindric or cup-shaped, margin entire or with very short, broad teeth or with paired deltate-acuminate appendages alternating with anthers; anthers 8. Disc short, broad, cushion-shaped, enveloping base of ovary, but free from staminal tube. Ovary 4-locular, each locule with 2 rows of 2 ovules; style short; style head capitate, obscurely 4-lobed. Fruit a pendulous, elongate, trilobate, woody, septifragal capsule, dehiscing from apex or from apex and base simultaneously; columella extending to apex of capsule, 4-ridged, softly woody, each face slightly indented with imprints of 1 or 2 seeds. Seeds 2(4) per locule, but only 1 or 2 fertile, attached to apex of columella by winged end of seed and leaving inconspicuous scars on falling.

Species 2 or 3, confined to evergreen forest in trop. Africa; s.tn trop. Afr.: Angola, Zimbabwe, Mozambique.

***Melia*** L.


**Pseudobersama** Verdc.


***Toona*** (Endl.) M. Roem.

Roemer: 131, 139 (1846); White & Styles: 35 (1979); Styles & White: 45 (1991); White et al.: 365 (2001); Coates Palgrave: 444 (2002).


**Trichilia** P. Browne


**Turraea** L.


**Turraeanthus** Baill.


Guarea L. in part; Hiern: 131 (1896).

Diococious trees or treelets; indumentum of simple hairs. Leaves pinnate; leaflets without pellucid lines or dots. Flowers unisexual, in axillary panicles or rambilflorous. Calyx almost entire or shallowly and irregularly lobed. Petals 4 or 5(6), valvate, fused in upper half to staminal tube. Staminal tube 10–30 mm long, cylindric, slightly expanded at mouth, margin crenate or shallowly lobed; anthers 8–12, glabrous, in a single irregular whorl arising within throat of staminal tube, completely included or partly exerted. Disc absent. Ovary 4- or 5-locular; locules with 2 supersoned or oblique axle ovules; style head discoid with a slight central depression. Fruit a somewhat fleshy, 3–5-valocul, loculodial capsule with 1-seeded locules. Seeds with a fleshy, non-vascularised sarcotesta; embryo with thick, plano-convex, superposed cotyledons, radicle included, usually near abaxial surface.


**Xylocarpus** J. König


Trees of mangrove swamps and coastal scrub, often with pneumatophores or ribbon-like buttresses, probably monoeocious. Leaves paripinnate; leaflets entire. Flowers probably unisexual, borne in compound cymes. Calyx lobed to or beyond middle, lobes 4, aestivation open. Petals 4, free, much longer than calyx in bud, contorted. Staminal tube urceolate, bearing 8 included anthers inside tube towards apex and terminated by 8 appendages alternating with anthers; appendages subcircular, retuse or shallowly and irregularly 2(3)-lobed. Disc large, red, cushion-shaped, situated beneath or engulfing and fused to ovary, free from staminal tube. Ovary 4-locular, each locule with 2–4 ovules; style short; style head discoid, almost completely blocking entrance to staminal tube, margin crenulate, upper surface with a minute central papilla with 4 radiating, (? focal) grooves. Fruit a large, almost spheroidal, leathery, septifragal capsule, dehiscing by 4 valves; septa...
thin, ultimately breaking down. **Seeds** 8–16, large, pyramidal or tetrahedral, with angular margins due to mutual compression, outer side somewhat rounded, attached by apex to placent and so forming a spherical mass; outer integument thick, corky.

Species 2, widespread in the mangrove swamps and coastal scrub of the Old World, sthn trop. Afr. 2, Mozambique.

**References**


**Archer, R.H. in Leistner:** 356 (2000).

Sthn trop. Afr.: genus 1, species 3.

**Bersama Fresen.**


**References**


**Meliaceae (Rosidae—Sapindales) (Rosids—Geraniales)**


Sthn trop. Afr.: genus 1, species 3.

**Menispermaceae**

(Magnoliidae—Ranunculales) (Eudicots—Ranunculales)


Sthn trop. Afr.: genera 19, species 42.
Key to tribes (and Tiliacora)

[after Kessler (1993)]

1a Endosperm absent ........................................................................................................................................................................ 1. PACHYONEAE

1b Endosperm present:

2a Endosperm not ruminate .................................................................................................................................................................... 4. MENISPERMEA

2a Endosperm ruminate:

3a Endosperm strongly ruminate; cotyledons not foliaceous, appressed .............................................................. 2. ANOMOSPERMEA (only Tiliacora)

3b Endosperm weakly ruminate; cotyledons foliaceous, divaricate .............................................................................................................. 3. TINOSPOREAE

Key to genera (male plants)

1a Small trees, shrubs or subshrubs, sometimes scandent:

2a Spiny subshrubs .................................................................................................................................................................................. Antizoma

2b Unarmed small trees or shrubs .......................................................................................................................................................... Penianthus

1b Lianas:

3a Leaves peltate or subpeltate:

4a Bracts conspicuous, enlarged in fruit; petals 1 or, if more, then united into a cup .............................................................. Cissampelos

4b Bracts not conspicuous, not enlarged in fruit; petals 2–6, free:

5a Sepals 9, inner 3 united into a pseudocorolla; stamens 2–6, arranged in a disc-shaped, stalked synandrium ....................... Stephania

5b Sepals 6; stamens 6: outer 3 free, inner 3 with connate filaments ............................................................................................. Rhigioscarya

3b Leaves not peltate:

6a Inner sepals connate:

7a Stamens 6–9, united only at the base ........................................................................................................................................ Synelisia

7b Stamens 20–30, united in an elongated synandrium ........................................................................................................... Albertisia

6b Inner sepals free:

8a Petals 0:

9a Stamens free; inflorescences not elongated ......................................................................................................................... Tricelisia

9b Stamens united into a subglobose synandrium; inflorescences elongated ........................................................................ Dioscoreophyllum

8b Petals 3–6, sometimes minute:

10a Stamens 9–18, united into a conical synandrium; inflorescences of corymbose panicles or cymes, densely flowered ........ Anisocylca

10b Stamens 6–9, free or united:

11a Petals ± united into a cup; stamens united into a flattened stipitate synandrium; anthers opening by a transverse slit ...... Cissampelos

11b Petals not united into a cup:

12a Inner sepals valvate:

13a Petals minute to absent; sepals hairy .......................................................................................................................... ...Tricelisia

13b Petals developed; sepals glabrous or hairy:

14a Sepals glabrous or nearly so; inflorescence a panicle of cymes; flowers oblong ............................................................... Tiliacora

14b Sepals hairy; inflorescence a fascicle of solitary flowers or of long-pedunculate, 2- or 3-flowered congested cymes; flowers subglobose ........................................................................................................................................ Syrrheonema

12b Inner sepals imbricate:

15a Anthers opening by a transverse or a semicircular slit:

16a Anthers opening by a semicircular slit; flowers in elongate, very slender panicles up to 0.6 m long ........... Kolobopetalum

16b Anthers opening by a transverse slit:

17a Stamens 3 with filaments fused almost to the apex, anther connectives triangular .............................................. Dialytheca

17b Stamens 6 or 9 with filaments free or partly fused:

18a Inflorescences in short cymes of axillary flowers; leaves short, generally entire, not strigose ............ Cocculus

18b Inflorescences in long panicles of sessile flowers:

19a Leaves deeply lobed, strigose ................................................................................................................................................... Jateorhiza

19b Leaves entire, glabrous ......................................................................................................................................................... Leptoterantha

15b Anthers opening by a longitudinal slit:

20a Leaves nearly rounded or subangular, densely hairy especially when young; petals with a rib on the inner side ........... Chasmanthera

20b Leaves entire, not angular, glabrous; petals without a rib .............................................................................................. Tinospora

Key to genera (female plants)

(Dialytheca not included; female plants unknown)

1a Small trees, shrubs or subshrubs, sometimes scandent:

2a Spiny subshrubs; carpel 1 .................................................................................................................................................................... Antizoma

2b Unarmed small trees or shrubs; carpels 3 .................................................................................................................................. Penianthus

1b Lianas:

3a Leaves peltate or subpeltate; carpel 1:

4a Bracts conspicuous, enlarged in fruit; petals 1, or if more, then united into a cup .............................................................. Cissampelos

4b Bracts minute, not enlarged in fruit; petals 2–6, free ................................................................................................................... Stephania
### Albertisia Becc.  

### Epinetrum Hiern.  
21 (1896); Exell & Mendonça: 37 (1937/1951); Troupin: 151 (1960); Troupin & Gonçalves: 3 (1973).

### Anisocycla Baill.  
Baillon: t. 49a (1887); Troupin: 153 (1960); Troupin & Gonçalves: 5 (1973); Kessler: 409 (1993).

Lianes with yellowish hairs. **Leaves** simple, elliptic or ovate-elliptic, discolorous. **Male inflorescences** of 4–6-flowered corymbs. **Male flowers** sessile or shortly pedicellate; sepals 9–24, pubescent to hairy on outside, 3–12 outer ones bract-like, sublinear to subovate, 3–6 median ones subspathulate or similar to outer ones, inner ones ovate-elliptic, much larger than others; petals 3–6, arising at base of androecium, small and glabrous; stamens 9–18 with filaments connate into a short style; stigma membranous, recurved, longitudinally dehiscent. **Female flowers** of false racemes of 3–5-flowered corymbs; bracts filiform, persistent. **Male flowers** with 6–9 sepals, 3 outer bract-like and hairy, 3–6 inner larger, membranous to papyraceous, concave, pubescent outside; petals 6, fleshy, ribbed inside; stamens 6, erect, with long connate filaments; anther thecae with longitudinal dehiscence. **Female flowers** of pendulous racemes. **Female flowers** with sepals and petals similar to those of male, sometimes larger; staminodes 6, small, elongate; carpels 3, subovoid, narrowed into a short style; stigma membranous, recurved, longitudinally cleft. **Druplets** 3, ellipsoid and unequal-sided, apiculate; exocarp coriaceous; endocarp with a dorsal, median, slightly tuberculate ridge, 3 apical teeth, and 2 ventral narrow marginal wings. **Seeds** with ruminate endosperm.


### Cissampelos L.  

Lianes with verrucose bark. **Leaves** simple, with long peti-oles, suborbicular, cordate at base, densely hairy; nerves palmate. **Male inflorescences** of false racemes of 3–5-flowered corymbs; bracts filiform, persistent. **Male flowers** with 6–9 sepals, 3 outer bract-like and hairy, 3–6 inner larger, membranous to papyraceous, concave, pubescent outside; petals 6, fleshy, ribbed inside; stamens 6, erect, with long connate filaments; anther thecae with longitudinal dehiscence. **Female flowers** of pendulous racemes. **Female flowers** with sepals and petals similar to those of male, sometimes larger; staminodes 6, small, elongate; carpels 3, subovoid, narrowed into a short style; stigma membranous, recurved, longitudinally cleft. **Druplets** 3, ellipsoid and unequal-sided, apiculate; exocarp coriaceous; endocarp with a dorsal, median, slightly tuberculate ridge, 3 apical teeth, and 2 ventral narrow marginal wings. **Seeds** with ruminate endosperm.


### Seed plants of southern tropical Africa: families and genera  
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Cocculus DC.


Dialytheca Exell & Mendonça

Climbs with simple leaves. Flowers in pseudomonads. Male flowers: sepal 6, inner 3 much longer than outer 3; stamens 6, filaments connate, anthers with transverse dehiscence. Female plants unknown.

Monotypic: *Dialytheca gossweileri* Exell & Mendonça, Angola.

Dioscoreophyllum Engl.

Herbaceous twiners; branchlets ± slender, sparsely pubescent or hirsute. Leaves simple, ovate-triangular with sagitate-cor- date base, entire or 3–7-lobed, with long petioles. Male inflorescences of axillary, long-pedunculate racemes. Male flowers with 6–8 sepals in 2 whorls; petals 0; stamens 3–6, fused into a cylindric or subglobular, sometimes flattened, sessile or stipitate synandrium; anther thecae oblanceolate, parallel, dehiscing longitudinally. Female inflorescences similar to male. Female flowers with 6 sepal; petals 0; carpels 3–6, with thickened, recurved stigmas. Drupelets subovoid, topped by remains of style and stigma; exocarp smooth and sometimes shining; endocarp crustaceous, verrucose or covered on upper side with short prickles much enlarged at base. Seeds with thick fleshy endosperm.


Jateorhiza Miers
Miers: 212 (1849); Exell: 14 (1926) as *Jatrorrhiza*; Exell & Mendonça: 40 (1937/1951); Troupin: 156 (1960); Troupin & Gonçalves: 10 (1973); Kessler: 413 (1993); White et al.: 376 (2001); Phiri (Unpublished).


Somewhat woody lianes with dense indumentum and tuber- ous rootstock. Leaves palmately 3–5(7)-lobed, strigose on both surfaces; petiole long. Male inflorescences of elongate axil- lary panicles, lateral axes bearing 3–7–flowered clusters. Male flowers with 6 sepal, 3 outer ones elongate to elliptic, 3 inner ones obovate; petals 6, somewhat concave, mostly abruptly bent inwards at apex and with margins incurved and envelop- ing androecium; stamens 6, free or connate; anthers introrse, globular; thecae with transverse dehiscence. Female inflorescences of axillary racemes. Female flowers with sepal and petals ± similar to those of male; staminodes 6, tong- ueshaped. Carpels 3, subovoid; styles small, recurved; stigma broad, produced into 2- or 3-cleft lamellae. Drupelets ovoid or subovoid; exocarp strigose-hispid or setulose; endocarp ovoid, flattened, ventral side ± smooth, dorsal side clothed with many fibrillose hairs. Seeds with fleshy, ruminulate endosperm.


Kolobopetalum Engl.

High-climbing shrubs with long internodes. Leaves simple, oblong, auriculate at base; petiole of older leaves often twining. Inflorescences ample panicles. Male flowers: sepals 6, outer 3 shorter than inner 3; petals 6; stamens (3–6), free or ± connate, anthers with a semicircular dehiscence. Female flowers: sepals and petals as in male; staminodes 3; carpels 3. Drupes ellipsoid; endocarp crustaceous, densely echinate; condyle scutelliform. Seeds: endosperm weakly ruminate at ventral side; embryo subreniform, cotyledons oblong-lanceo- late, divaricate.


Leptoterantha Louis ex Troupin

Climbing shrubs. Leaves simple, elliptic to oblong-elliptic, base cuneate, entire, petiolate. Inflorescence: axillary pani- cles. Male flowers: sepals 6, inner 3 longer than outer 3; pet- als 6, outer 3 longer than inner 3; stamens 6, filaments connate, anthers with transverse dehiscence. Female flowers: sepals and petals as in male; staminodes 6; carpels 3. Drupes ellipsoid; endocarp glabrous; condyle scutelliform. Seeds: endosperm weakly ruminate at ventral side; cotyledons folia- ceous.


Penianthus Miers

Shrubs or small trees, evergreen, usually 1-stemmed and sparsely branched, glabrous in all vegetative parts. Leaves simple, entire, usually coriaceous; petiole swollen at both ends. Inflorescence a few- to many-flowered globose head or um- bel. Male flowers: tepals 12–18, in whorls of 3; stamens (3–) 6–(8), free or sometimes 2 stamens completely connate length- wise, anthers with apical dehiscence. Female flowers: tepals 12(–14); staminodes 6 or 0; carpels 3. Drupe oblong to ellip- soid; endocarp glabrous; condyle scutelliform. Seeds: endosperm absent; embryo straight, cotyledons thick, adpressed. x = 13, 26.


Rhigiocarya Miers
Glabrous lianes; branchlets slender with long internodes. **Leaves** simple, broadly ovate, cordate at base, peltate. **Inflorescence** cymes. **Male flowers**: sepals 6, outer 3 shorter than inner 3; petals 6; stamens 6, outer 3 free, introrse, inner 3 with connate filaments, extrorse, anthers with longitudinal dehiscence. **Female flowers**: sepals and petals as in male; staminodes 0; carpels 3. **Drupes** ovoid to ellipsoid; endocarp bony, echinate; condyle forming a cavity. **Seeds**: endosperm ruminate; embryo subreniform, cotyledons folicaceous, divaricate. \( x = 12 \).


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**Stephania Lour.**


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**Synclisia Benth.**


Lianes with slender stems. **Leaves** simple, clothed with long, stiff, spreading hairs; petiole slender. **Inflorescence**: flowers axillary, solitary or paired. **Male flowers**: sepals 9, inner 3 connate into a pseudocorolla, outer 6 much smaller than inner ones; petals 6; stamens 6–9, connate at base, outer 3(6) much shorter than inner ones, anthers with suboblique dehiscence. **Female flowers**: sepals and petals as in male; staminodes 0; carpels 15–20. **Drupes** ovoid to ellipsoid; endocarp crustaceous, velutinous; condyle lamelliform. **Seeds**: endosperm absent; embryo curved, cotyledons thick, appressed, unequal.


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**Syrrhenema Miers**


Climbing shrubs; branches pilose. **Leaves** simple. **Inflorescence**: dense fascicles or heads. **Male flowers**: sepals 9–18, outer ones smaller than inner ones; petals 3; stamens 3–6, completely connate, introrse, anthers with transverse dehiscence. **Female flowers**: sepals as in male; petals 6; staminodes 6; carpels 3–5. **Drupes** globose; endocarp crustaceous, rugose; condyle septiciform. **Seeds**: endosperm absent; embryo curved, cotyledons thick, appressed.


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**Tiliacora Colebr.**


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**Tinospora Miers**


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**Triclisia Bentham.**


Robust, twining lianes; young branches densely rusty-tomentellous. **Leaves** simple; lamina entire, rarely serrate. **Male inflorcescences** of corymb-like cymes or of small, many-flowered panicles. **Male flowers** with 9–18 sepals, all densely pubescent outside, outer ones bract-like, inner ones suborbicular and somewhat united; petals 6, very small or absent, glabrous and somewhat fleshy; stamens 3–6, free; another thecae with obliquely longitudinal dehiscence; gyroecium replaced by a tuft of rusty hairs. **Female inflorcescences** similar to male. **Female flowers** with sepals similar to those of male; petals 3–6 or 0; staminodes reduced; carpels 6–40, pubescent, narrowed into a cylindrical style. **Druplets** obovoid, flattened, stipitate; exocarp usually velvety, sparsely puberulous; endocarp rugose and fibrous-hairy. **Seeds** without endosperm.


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**References**


EXELL, A.W. & MENDONÇA, F.A. 1937/1951. *Menispermaceae*. Con...
Seed plants of southern tropical Africa: families and genera

**Menyanthaceae**
(Asteridae—Asterales)
(Euasterids II—Asterales)


**Nymphoides** Ség.


**Mesembryanthemaceae**
(Caryophyllidae—Caryophyllales)
(Core Eudicots—Caryophyllales; under Aizoaceae)


*++Aptenia** N.E.Br.


Sthn trop. Afr. 1: *Aptenia cordifolia* (L.f.) N.E.Br., native to sthn Afr. but cultivated worldwide and recorded as naturalised in Mozambique.

**Delosperma** N.E.Br. emend. Lavis


**Mesembryanthemum** L. emend. L.Bolus


Sthn trop. Afr. 1 or 2: *Mesembryanthemum cryptanthum* Hook.f. (=*Opophyton dactylinum* (Welw. ex Oliv.) N.E.Br.), and probably *M. crystallinum*

**References**


MESEMBRYANTHEMACEAE: References

DICOTYLEDONS

**Molluginaceae**
(Caryophyllidae—Caryophyllales)
(Core Eudicots—Caryophyllales)


Sthn trop. Afr.: genera 7, species 22.

**Corbichonia Scop.**


**Glinus L.**


**Hypertelis E.Mey. ex Fenzl**


**Limeum L.**


Semprevivalea J.Gay; Exell: 198 (1929).


**Mollugo L.**


**Pharnaceum L.**


**Psammotropha Eckl. & Zeyh.**


References


**Monimiaceae**
(Magnoliidae—Magnoliaceae)
(Magnoliids—Laurales)


Sthn trop. Afr.: genus 1, species 1.

**Xymalos Baill.**

STANNARD: 42 (1997); White *et al.*: 379 (2001); COATES PALGRAVE: 212 (2002); PHIRI (Unpublished).

Monotypic genus: *Xymalos monospora* (Harv.) Baill., Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

References


Montiniaceae
(Rosidae—Rosales)
(Euasterids I—Solanales)


Sthn trop. Afr.: genera 2, species 2.

Key to genera
[after Mendes (1978)]

Leaves alternate; male flowers usually 4-merous, bracteate; capsule ellipsoid, smooth, loculicidal; seeds with a broad papery wing .................... Montinia
Leaves opposite or subopposite; male flowers usually 3-merous, ebracteate; capsule flask-shaped, tuberculate and spiny, indehiscent; seeds wingless ...... Grevea

Grevea Baill.

Small dioecious, deciduous trees or shrubs. Leaves simple, opposite or subopposite, penninerved, petiolate; stipules 0. Male flowers in terminal or axillary, few-flowered inflorescences; bracts very small, obsolete or absent; calyx: tube ± cupular, truncate, subentire or shallowly 3-lobed; petals 3, arising below margin of disc, imbricate; stamens (?2)3, alternipetalous, arising with petals, with introrse anthers dehiscing by longitudinal slits; disc fleshy, cupular, usually elevated in centre into a vestigial ovary. Female flowers solitary, terminal; calyx tube elongated, smooth and longitudinally striate or tuberculate to echinulate, with usually 4 inconspicuous lobes; petals usually 4; disc epigynous; staminodes present; ovary bicarpellary; style columnar, short and thick; stigmas 2-lobed; ovules 2-seriate on each placenta. Fruit indehiscent, crowned by persistent style. Seeds subellipsoid to subglobose; endosperm abundant, horny.


Montinia Thunb.


References

Moraceae
(Hamamelidaceae—Urticales)
(Eurosids I—Rosales)


Sthn trop. Afr.: genera 10, species 69.

Key to genera
[adapted from Rohwer (1993)]

1a Inflorescences urceolate (‘figs’), enclosing the flowers ................................................................. Ficus
1b Inflorescences not urceolate:
  2a Plants with curved or straight spines; bracts and/or tepals usually with immersed glands accumulating a yellow dye .................. Maclura
  2b Plants unarmed; bracts and tepals without yellow glands:
    3a Inflorescences bisexual:
      4a Filaments straight in bud:
        5a Stipules connate ......................................................................................................................... Trilepisium
        5b Stipules free ................................................................................................................................. Treculia
      4b Filaments flexed in bud:
        6a Inflorescence axis not expanded; filaments springing back elastically at anthesis .................... Streblus
        6b Inflorescence axis expanded into a (mostly) discoid or variously shaped structure bearing many flowers; filaments straightening gradually at anthesis: 
          7a Interfloral bract present, peltate ................................................................................................. Bosqueiopsis
### Antiaris Lesch.


Trees, monoecious or dioecious; lateral branches self-pruning. **Leaves** distichous on lateral branches, pinnately veined; stipules semi-amplexicaul, free. Inflorescences on minute spurs, in leaf axils or just below leaves, unisexual, involucrate. **Staminate inflorescences** pedunculate; flowers many; tepals 2–7, free; stamens 2–4, straight in bud; pistillode 0. **Pistillate inflorescences** sessile or pedunculate, uniflorous; perianth partly adnate to receptacle, 4-lobed; ovary adnate to perianth, stigmas 2, ligulate, equal. **Fruit** forming a drupaceous whole together with enlarged fleshy, orange to scarlet-coloured receptacle. **Seed** large, without endosperm; cotyledons thick, equal.


### Bosqueiopsis De Wild. & T.Durand


Trees or shrubs, monoecious or (?sometimes androecious. **Leaves** distichous, pinnately veined to subtriplinerved; stipules fully amplexicaul, free. **Inflorescences** in leaf axils or just below leaves, bisexual or staminate, discoid or subglobose to turbinate-capitate; bracts interfloral, peltate, marginal bracts often basally attached. **Staminate flowers** several to many; tepals 3 or 4, connate; stamens (1)2, flexed in bud; pistillode present. **Pistillate flower** 1, central, partly adnate to receptacle; perianth 4-lobed; ovary adnate to perianth; stigmas 2, band-shaped, equal. **Fruit** forming a drupaceous whole with an enlarged, fleshy, orange to yellow receptacle, crowned with remnants of staminate flowers and bracts. **Seed** large, without endosperm; cotyledons thick, unequal.


### Dorstenia L.


### Ficus L.


### Maclura Nutt.


### Milicia Sim


*Chlorophora* Gauden. in part.

Diocious trees. **Leaves** distichous, pinnately veined; stipules semi-amplexicaul, free. **Inflorescences** in leaf axils, spicate,
bracteate. **Staminate flowers**: tepals 4, basally connate; stamens 4, inflexed in bud; pistillode present. **Pistillate flowers**: many; tepals 4, basally connate; ovary free, stigmas 2, filiform, markedly unequal in length. **Fruiting perianth** enlarged, ± fleshy, greenish. **Fruit** a syncarp; perianth and exocarp fleshy. **Seed** small; endospore present; cotyledons thin, equal, plane.


**Morus L.**


**Streblus Tour.**

Louareiro: 599, 614 (1790); Berg: 21 (1991); Rohwer: 446 (1993); Coates Palgrave: 131 (2002); Mapaura & Timberlake: 166 (2002).

Shrubs or small trees, dioecious or sometimes monoecious. **Leaves** distichous, pinnately veined; stipules semi-amplexicaul, free. **Inflorescences** in leaf axils, bracteate. **Staminate inflorescences** spicate; tepals 4, basally connate; stamens 4, inflexed in bud, pistillode present. **Pistillate inflorescences** uniflorous; tepals 4, free; ovary free; stigmas 2, filiform, subequal in length. **Fruiting perianth** enlarged, hardly fleshy, green. **Fruit** a free, dehiscent drupe, white fleshy exocarp pushing out black endocarp body (pyrene). **Seed** large; endospore absent; cotyledons thick, equal.


**Treculia Decne. ex Trécul**


Trees, dioecious or sometimes monoecious. **Leaves** almost distichous, pinnately veined; stipules semi-amplexicaul, free. **Inflorescences** unisexual, sometimes bisexual, borne in leaf axils and/or (especially pistillate ones) on older wood down to trunk, globose to obovoid-capitate, with a thick rachis and many peltate, long-stipitate bracts. **Staminate flowers**: perianth 2–4–(5)-lobed; stamens 2–4, straight in bud; pistillode usually absent. **Pistillate flowers** without a perianth; stigmas 2, filiform, equal. **Fruit** a syncarp, covered with indurate tips of interfloral bracts. **Seed** large, with remnants of endospem; cotyledons unequal, curved, one thick, the other thin.


**Trilepisium Thouars**


_Moraceae: Milicia_


**References**


Moringaceae
(Dilleniidae—Capparidales)
(Eurosids II—Brassicales)

Moringa
Adans.


Sthn trop. Afr.: genus 1, species 1.

Moringa ovalifolia Dinter & A.Berger is endemic in SW Angola and Namibia; *M. oleifera Lam. is widely cultivated, e.g. in Zambia.

References


Myricaceae
(Hamamelidaceae—Juglandales)
(Eurosids I—Fagales)

Morella
Lour.


Sthn trop. Afr.: genus 1, species 3.


References


Myristicaceae
(Magnoliidaceae—Magnoliaceae)
(Magnoliids—Magnoliaceae)

Evergreen trees or lianes, dioecious or monoeocious, often aromatic; sap coloured; indumentum of stellate-branching, shortly stalked T-shaped or uniseriate hairs. *Leaves* alternate, simple, entire, often gland-dotted; stipules 0. *Inflorescences* paniculate.
or capitate; bracts often present, usually deciduous; bracteoles mostly absent. **Flowers** unisexual, regular, small; perianth saucer- or funnel-shaped, campanulate or urceolate; lobes valvate. **Male flowers**: perianth 3- or 4-lobed; stamens with filaments fused into a long, exserted column; anthers 2–6, the two of a pair, anatropous, adnate to column about apical part, laterally connate, extrorse, opening by longitudinal slits; rudimentary gynoecium 0. **Female flowers**: perianth 3- or 4-lobed; gynoecium 1-carpellate; ovary superior, 1-locular, usually sessile; ovule 1, ± basal, bitegmic, usually anatropous; style short or absent; stigmas 2, ± joined. **Fruit** a drupe, mostly dehiscing into 2 valves and therefore also referred to as a monocarpellate capsule; pericarp fleshy, leathery or cartilaginous. **Seed** partially or completely enclosed by an often brightly coloured aril ± lobed at apex; testa usually in 3 layers: outer membranous or fleshy, middle one woody, inner one membranous, usually intruding into folds of endosperm; endosperm abundant, entire or ruminate, very oily; embryo very small, with basal, suberect, spreading or connate cotyledons.

Genera 19, species ± 400, pantropical, 5 genera reported for Africa; sthn trop. Afr. genera 2, species 2, Angola, Zambia. *Myristica fragrans* Houtt., the Nutmeg tree, originally native of the Moluccas, has so far not been recorded as cultivated or established in the region.


**Key to genera**

Leaves with 15–60 pairs of lateral nerves, ± cordate at base; inflorescences paniculate; aril of seed very deeply laminar ................................................. **Pycnanthus**

Leaves with 5–10 pairs of lateral nerves, rounded to cuneate at base; inflorescences capitatem; aril of seed lobulate at apex ................................................. **Staudtia**

**Pycnanthus** Warb.

**Warburg**: 99 (1895); **White**: 56 (1962); **Fouilloy**: 90 (1974); **Pope**: 37 (1997); **Verdcourt**: 4 (1997).

Trees or lianes; indumentum of branching-stellate, ± erect hairs. **Leaves** mostly cordate at base, main lateral nerves pronounced, in 15–60 pairs. **Inflorescence** paniculate, divaricately branched, with flowers clustered in many dense, obovoid-globose heads at ends of inflorescence branches. **Male flowers** with 2–6 anthers. **Seed** with fleshy aril, laminar almost to base.


**Staudtia** Warb.

**Warburg**: 129, 241 (1897); **Fouilloy**: 102 (1974); **Pope**: 40 (1997); **Verdcourt**: 7 (1997).

Trees; indumentum of shortly stalked, T-shaped, ± appressed hairs. **Leaves** rounded to broadly cuneate at base, main lateral nerves faint, in 5–10 pairs. **Inflorescence** capitate, with flowers densely clustered in subglobose, shortly pedunculate heads in leaf axils. **Male flowers** with 3 or 4 anthers. **Seed** with aril thinly fleshy; lobulate at apex.

Species 1, W Africa; sthn trop. Afr.: Staudtia kamerenensis Warb. var. gabonensis (Warb.). Fouilloy, Angola, Zambia.

**Myrothamnaceae**

(Hamamelidaceae—Hamamelidae)

(Core Eudicots—Gunnerales)


Sthn trop. Afr.: genus 1, species 1.

**Myrothamnus** Welw.

**White**: 67 (1962); **Mendes**: 30 (1970); **Mendes**: 69 (1978); **Puff**: 1 (1978); **Mendes**: 2 (1981); **Bywater**: 1 (1984); **Kubitzki**: 468 (1993); **Glen et al.**: 62 (1999); **Wanntorp et al.**: 86 (2001).

Species 2: 1 from Madagascar, the other: Myrothamnus flabellifolius Welw. from tropical and southern Africa; sthn trop. Afr.: Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

**References**

**Myrothamnaceae**

**References**


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### Myrsinaceae

(Dilleniidae—Primulales)

(Asterids—Ericales)


**Identification of additional genus using the key in the above reference:** *Ardisia* will key out to contrast 3b but can be distinguished from *Embelia* by its almost sessile anthers (not having filiform filaments) and the shortly united (not free) petals.

**Ardisia Sw.**


Low, soft-wooded, rhizomatous shrubs; branchlets glabrous, longitudinally striate. *Leaves* alternate, petiolate, spathulate to narrowly oblanceolate, chartaceous, glabrous, with numerous small raised dots on lower surface. *Inflorescences* axillary, 4–7-flowered pseudofascicles.

*Ardisia* Sw.


*Low, soft-wooded, rhizomatous shrubs; branchlets glabrous, longitudinally striate.

*Leaves* alternate, petiolate, spathulate to narrowly oblanceolate, chartaceous, glabrous, with numerous small raised dots on lower surface.

*Inflorescences* axillary, 4–7-flowered pseudofascicles.

*Flowers* bisexual or female; female flowers consisting only of calyx and gynoecium.

*Calyx* 5, imbricate, broadly ovate to suborbicular, minutely fimbriate to erose, glandular.

*Petals* 5, very shortly connate, imbricate, lanceolate, sparsely dotted, abaxially minutely puberulous.

*Stamens* 5; filaments very short, flattened and fused into a short staminal tube fused to corolla tube; anthers large, narrowly lanceolate, acuminate to apiculate at apex, often with dark dots on dorsal face, longitudinally dehiscent.

*Ovary* ovoid to conical, sparsely lepidote towards apex; free-central placenta with 6–8 ovules; style filiform; stigma punctiform.

*Fruit* a globose, 1-seeded, indehiscent, glabrous drupe with brittle endocarp. *Seed* globose, covered with membranous rudiments of placenta.


**Embelia Burm.f.**


**Myrsine L.**


**Rapanea Aubl.**


**References**


**Myrtaceae**

(Rosidæ—Myrtales)

(Rosids—Myrtales)


Sthn trop. Afr.: genera ± 75: 2 indigenous with 15 species of which 1 is exotic; and at least 3 exotic genera of which at least 13 species have become naturalised.

**Callistemon R.Br.**


Cultivated; according to Coates Palgrave (2002) *Callistemon viminalis* (Salisb. ex Gaertn.) Don ex Loudon has escaped in some areas of central Zimbabwe, and sthn Afr.
**Eucalyptus** L’Hér.


Sthn trop. Afr.: Many species are cultivated, some occur as escapes; Coates Palgrave (2002) lists 9 species that have become naturalised in Zimbabwe.

**Eugenia** L.


**Psidium** L.


**Syzygium** Gaertn.


Sthn trop. Afr. 8, including *Syzygium cumini* L. Skeels which has escaped from cultivation in Zimbabwe and Mozambique [Coates Palgrave: 833 (2002)]; Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

**Nyctaginaceae**

(Caryophyllidae—Caryophyllales)

(Core Eudicots—Caryophyllales)


Sthn trop. Afr.: genera 5, species 12.

**Boerhavia** L.


**Commicarpus** Standl.


**Mirabilis** L.


Sthn trop. Afr. 1: *Mirabilis jalapa* L., introduced from tropical America; now widely cultivated and naturalised in Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

**Phaeoptilum** Radlk.


**Pisonia** L.


Sthn trop. Afr. 1: *Pisonia aculeata* L., Mozambique, and sthn Afr., possibly introduced from tropical America.

**References**


**Nympheaceae**
(Magnoliidae—Nympheales)
(Basal families)


Sthn trop. Afr.: genus 1, species 7.

**Nympheae L.**


**Ochnaceae**
(Dilleniidae—Theales)
(Eurosids I—Malpighiales)


Additional family characters: Perennial or annual herbs; leaves sometimes sessile or with amplexicaul petiole; staminodes present, 5 of them petaloid; ovary 1-locular (or 3-locular at the base), with 3 parietal placentas, each bearing many ovules; fruit a capsule with 3 septical valves; seeds many, small.

Sthn trop. Afr.: genera 4, species ± 47.

**Key to genera**

[after Robson (1963)]

1a Fruit a 3-valved septicidal capsule; ovary 1-locular (or 3-locular at the base) with 3 parietal placentas, each bearing many ovules in 2 rows; style terminal; staminodes absent; seeds without endosperm; perennial or annual herbs ....................................... (ALBUMINOSAE) Sauvagesia

1b Fruit composed of 1 or more drupelets (often black) on an enlarged red or purplish receptacle; ovary lobed, with (3–)5–15 1-ovulate locules; style gynobasic; staminodes absent; seeds without endosperm; trees, shrubs or shrublets (EXALBUMINOSAE):

2a Stamens 10, with anthers much longer than filaments and dehiscing by apical pores; petals yellow ............................................................ (OURATEA) Ouratea

2b Stamens 13 or more or, if 8–10, then anthers dehiscing longitudinally and equalling the filaments; petals yellow to orange, pink or white:

3a Stipules entire or fringed or bifid, not striate, deciduous; petals pale yellow to orange (very rarely white); drupelets without internal projection of endocarp; pigment under bark absent .................................................................................................................................................... (OCHNA) Ochna

3b Stipules laciniate or deeply divided into linear segments, markedly longitudinally striate, persistent on first-year shoots; petals white to pink; drupelets with internal projection of endocarp; yellow pigment present under the bark .............................................................. Brackenridgea

**Brackenridgea** A.Gray

Robson: 252 (1963); Bamps: 5 (1967); Robson & García: 23 (1973); Coates Palgrave: 733 (2002).


**Ochna** L.

Exell & Mendonça: 284 (1951); Robson: 225 (1963); Robson & García: 2 (1973); White *et al.*: 416 (2001); Coates Palgrave: (2002); Izidine & Bandeira: 51 (2002); Mapaura & Timberlake: 166 (2002).


**Ouratea** Aubl.

Aublet: 397 (1775); Exell & Mendonça: 292 (1951); Robson: 255 (1963).


Trees or shrubs, usually completely glabrous. Leaves petiolate to sessile and amplexical; lamina with margin serrate to ciliate or entire; stipules entire, not striate, coriaceous, free or ± united infrapetioIarly, caducous or ± persistent. Inflorescence paniculate to racemose or umbellate or rarely reduced to 1 or 2 flowers, terminal or axillary, sometimes at base of current year’s growth; bracts scale-like, caducous or ± persistent; pedicels articulated at or above base. Sepals 5, quincuncial in bud, green or yellow in flower, persistent and usually enlarging and becoming coriaceous with varying shades of red in fruit. Petals 5, yellow or rarely white, not or scarcely unguiculate, deciduous. Stamens 10, diplostemonous, free; anthers yellow or orange, elongate and frequently narrowed upwards, often rugose, dehiscing by terminal pores, deciduous; filaments stout, much longer than anthers, persistent, or absent. Carpels 5–10, apparently free at base, 1-ovulate; styles slender, gynobasic, completely united; stigma terminal, not enlarged. Fruit of 1 to several free, black or brown 1-seeded drupelets with fleshy
or coriaceous mesocarp, inserted on enlarged red or purplish receptacle. **Seeds** straight or curved, without endosperm or internal projection of endocarp; embryo straight or ± curved, incumbent or accumbent, isocotylous or heterocotylous.


**Sauvagesia L.**
Linnaeus: 203 (1753); Exell & Mendonça: 284 (1951); Robson: 260 (1963); Robson & Garcia: 25 (1973); Amaral: 184 (1991).

**Vauzagesia** Baill.; Exell & Mendonça: 284 (1951); Robson: 262 (1963).

Perennial or annual herbs, completely glabrous, with erect shoots and frequently ± elongate-ascending branches from base; stems slender, wiry, angular. **Leaves** elliptic or oblong-elliptic to oblanceolate, narrowing towards base but usually not petiolate, ± oblong-ascending branches from base; stems slender, wiry, angular. **Leaves** elliptic or oblong-elliptic to oblanceolate, narrowing towards base but usually not petiolate, margin serrulate and increscentiate; stipules with laciniate margins, longitudinally striate, free, persistent. **Inflorescence** paniculate to racemose and terminal or reduced to solitary or rarely paired flowers in axils of foliage leaves; pedicels articulated at or above base. **Sepals** 5, quincuncial in bud, green with pale margin, persistent, not enlarging or changing colour in fruit. **Petals** 5, spreading, not unguiculate, deciduous, white to pink. **Androecium** of (2)3 whorls; outer staminodes many in a continuous ring, white in upper parts or wholly crimson to purplish, inner petaloid staminodes 5, free, antepetalous, white with crimson to purplish base, truncate to retuse or eroded at apex; stamens 5, antepetalous, free; filaments short; anthers oblong-linear, dehiscing longitudinally. **Ovary** with 3 parietal placentas (or axile at base), each placenta bearing many ovules in 2 rows; style simple, slender, stigma not enlarged. **Fruit** a capsule with 3 septical valves. **Seeds** many, small, with punctate testa.


**Ochnaceae: Ouratea**


**Key to genera**

[after Keay (1958)]

1a Stamens fused into a clyndric tube around the style; calyx strongly accrescent in fruit:

2a Calyx not splitting, much expanded in fruit forming a conspicuous funnel- to bowl-shaped structure around the fruit; branchlets terete; flowers in very short axillary racemes; dioecious shrubs or small trees ...................................................................................................................... **Aptandra**

2b Calyx in fruit at length splitting into 2 or 3 segments, at first enveloping the fruit; branchlets compressed or slightly winged; flowers in panicle clusters, bisexual; large trees ........................................................................................................................................................................ **Ongokea**

1b Stamens free from each other but sometimes variously adnate to the petals; calyx accrescent or not:

3a Stamens (plus staminodes, if present) more numerous than the petals; fruit superior, sometimes enveloped by the accrescent calyx:

4a Stamens ± 3–4 times as many as petals; leaves with main secondary nerves reaching the margin; flowers mostly in panicles .......................... **Coula**

4b Stamens (plus staminodes, if present) ± twice as many as petals; leaves with main lateral nerves looped or ending within the margin; flowers in short racemes or fascicles:

5a Calyx much enlarged in fruit and deeply lobed; flowers in few-flowered axillary fascicles ................................................................. **Heisteria**

5b Calyx not enlarged in fruit, or if enlarged then truncate; flowers mostly in short racemes:

6a Branchlets usually armed with spines; staminodes absent; flowers in umbellate racemes; petals densely villous within ................................ **Ximenia**

6b Branchlets without spines; flowers in narrow racemes; staminodes present or absent; petals glabrous within or plicate about the middle:

7a Calyx obvious, disciform in fruit or strongly accrescent and enveloping the fruit; petals glabrous within; staminodes present ........... **Olax**

7b Calyx very small, obsolete in fruit; petals pilose about the middle within; staminodes absent .................................................... **Pychopetalum**

3b Stamens as many as petals; fruit entirely or partly enclosed by the accrescent receptacle; flowers in axillary clusters or very short racemes; calyx not accrescent in fruit:

8a Flowers 4-merous; anthers fused to the petals for 1/4–1/2 their length .......................................................................................... **Strombosiopsis**

8b Flowers 5-merous; anthers not fused to the petals:

**References**


Aptandra Miers
Miers: 201 (1851); Exell & Mendonça: 337 (1951b); Villiers: 156 (1973).

Monoecious or dioecious shrubs or small trees, with many lenticels. Leaves simple, entire; base cuneate, apex mucronate; stipules absent. Inflorescences short, many-flowered axillary panicles, or flowers solitary or in pairs. Flowers bisexual, male or female. Calyx small, cupuliform, much accrescent in fruit. Petals 4, valvate, linear, apiculate, with 4 thick, alternipetalous glands. Stamens 4, epipetalous, extrorse; filaments fused into a tube around pistil; anthers fused into a ring, opening by annular pores. Ovary superior, 2-locular, slightly compressed; ovule 1 per locule; style filiform; stigma globose. Fruit a 1-seeded drupe surrounded by a much accrescent, highly funnel- to bowl-shaped, entire, coloured calyx. Seeds with fleshy, oily endosperm.


Coula Baill.
Baillon: 61 (1862); Exell & Mendonça: 331 (1951b); Keay: 645 (1958); Villiers: 144 (1973).

Tall trees with first branches at a height of 5–6 m; young parts covered with red hairs. Leaves simple, entire, glabrous when mature, lower surface red when fresh; secondary veins reaching leaf margin. Inflorescences many-flowered axillary panicles. Flowers bisexual. Calyx cup-shaped with margin entire to faintly 4- or 5-lobed. Petals 4 or 5, free, valvate. Stamens free, 3–4 times as many as petals, alterni- and epipetalous with filaments pressed against inner face of petals. Ovary 3- or 4-locular with 1 ovule per locule; style short, conical, ending in a 3-lobed stigma. Fruit a globose or ellipsoid drupe; endocarp woody, rugose. Seed 1; testa thin; endosperm starchy and oily.


Diogoa Exell & Mendonça

Small to tall trees, non-resinous; bark greenish with many whitish lenticels arranged in horizontal lines. Leaves glabrous; veins prominent on upper surface. Inflorescences: fascicles or short panicles. Flowers bisexual, greenish or yellow. Calyx with 5 glabrous, ± elliptic sepals fused at base. Petals 5, free to base, lanceolate. Stamens 5, epipetalous, free, adpressed to inner face of petals; filaments broad, fleshy and flattened; anthers opening by longitudinal slits. Disc adnate to ovary, rugose. Ovary (4)5-locular; ovule 1 per locule, pendent from a central placent; style conical, with channels, terminating in a (4)5-lobed stigma. Fruit a ± spherical drupe with a prominent equatorial ridge. Seed 1, ± spherical; endosperm copious.


Heisteria Jacq.
Jacquin: 4, 20 (1760); conserved name; Exell & Mendonça: 332 (1951b); Keay: 645 (1958); Lucas: 1 (1968); Villiers: 125 (1973).

Glabrous shrubs or small trees; branches weakly 2-winged. Leaves simple, entire. Inflorescences: flowers in few- or many-flowered axillary fascicles. Flowers bisexual. Calyx cup-shaped with entire or undulate margin. Petals 5, valvate, free except at base, pubescent on inner face. Stamens 10, in 2 whorls: large stamens alternipetalous, smaller ones epipetalous; filaments short, pressed against petals; anthers introrse, dehisching longitudinally. Ovary 3-locular, each locule with 1 ovule; placenta central; style conical, ending in a 3-lobed stigma. Fruit a drupe surrounded by strongly accrescent calyx. Seed ellipsoid, with yellowish oily endosperm.


Olax L.
Exell & Mendonça: 333 (1951b); Keay: 646 (1958); Garcia: 331 (1963); Lucas: 6 (1968); Villiers: 110 (1973); Garcia & Vidigal: 5 (1979); Coates Palgrave: 195 (2002).


Ongokea Pierre
Pierre: 1314 (1897); Exell & Mendonça: 338 (1951b); Keay: 649 (1958); Villiers: 159 (1973).

Glabrous, ± dioecious trees with a straight bole; branches compressed, 2-winged. Leaves elliptic, base cuneate, apex apiculate. Flowers unisexual or bisexual. Calyx short, cup-shaped, 4- or 5- dentate. Petals 4 or 5, valvate, ± linear, recurved to coiled; fleshy alternipetalous glands present between petals and stamens. Stamens epipetalous; filaments and anthers united into a tube completely enclosing gynoecium except for stigma; anthers opening by annular pores. Ovary I-locular with 1 or 2 ovules pendent from an erect free-central placenta; style filiform, ending in a pointed stigma. Fruit a drupe opening by 2 or 3 valves at maturity, almost completely hidden inside much accrescent calyx; exocarp smooth; mesocarp fleshy, surrounding thick, hard endocarp except at apex. Seed solitary, globose or ovoid, yellow.


Psychotepalum Bentham.
Bentham: 376 (1843); Keay: 647 (1958); White: 42 (1962); Villiers: 146 (1973); Phiri (Unpublished).

Glabrous woody twiners. Leaves alternate, lanceolate to lanceolate-elliptic, somewhat leathery.

Species 4: 2 from America, 2 from trop. Africa; sthn trop. Afr. 1: Psychotepalum cuspidatum R.E.Fr., known only from Zambia and described from a single sterile specimen collected about 90 years ago and not collected again since (White 1962).
**Strombosia** Blume

Blume: 1154 (1826–1827); Exell & Mendonça: 335 (1951b); Keay: 647 (1958); García: 334 (1963); Lucas: 9 (1968); Villiers: 133 (1973); García & Vidigal: 6 (1979); White et al.: 418 (2001); Coates Palgrave: 197 (2002).

Large trees; young branches flexuous, green, compressed, later pale brown, cylindrical. Leaves oblong or ovate-oblong, glabrous. Flowers bisexual, fasciculate on very short lateral shoots. Calyx: tube adnate to ovary; limb small, with 5 broadly ovate lobes. Petals 5, perigynous, valvate, connivent or patent-erect. Stamens 5, opposite petals; filaments adnate to petals; anthers dorsifixed. Ovary semi-inferior, 3–5-locular at base, covered by disc; ovules 3–5(6), pendulous in middle of locules from top of a central placenta; style short; stigma obtuse. Fruit drupaceous, crowned by vestiges of calyx limb; endocarp crustaceous. Seed pendulous, with a minute apical embryo, surrounded by fleshy endosperm.


**Strombosiopsis** Engl.

Engler: 148 (1897); Exell & Mendonça: 110 (1951a); Exell & Mendonça: 337 (1951b); Keay: 649 (1958); Lucas: 11 (1968); Villiers: 152 (1973); Breteler: 303 (2001).

Trees up to 30 m high; bark secreting a sticky red resin; young branches angular or 2-winged. Leaves simple, entire with secondary veins distinct on lower surface. Inflorescences short axillary or extra-axillary panicles or 6- to 25-flowered fascicles. Flowers bisexual, regular, white to yellowish. Calyx short, 4-toothed, green. Petals 4, free except at base, narrowly elliptic, fleshy, glabrous. Stamens 4, epipetalous, adpressed against inner face of petals; filaments short, broad; anthers narrowly elliptic. Ovary half-inferior to almost completely sunk in a ± quadrangular, 4-lobed, glabrous, fleshy disc; 4-locular, with 1 pendent ovule per locule from a central placenta; style short, conical, ending in a 4-toothed stigma. Fruit a drupe with accrescent petiole almost entirely enclosing fruit, with 4 calyx teeth at apex of fruit. Seed solitary, with brownish red endosperm.


**Ximenia L.**

Exell & Mendonça: 332 (1951b); Keay: 646 (1958); White: 42 (1962); García: 329 (1963); Villiers: 106 (1973); García & Vidigal: 1 (1979); Coates Palgrave: 196 (2002).


**References**


**Oleaceae**

(Asteridiae—Scrophulariales)

(Euasterids I—Lamiales)


**Chionanthus L.**


**Jasminum L.**


**Olacaceae**

(Olea A. DC.)

Ximenia L.


**Olea L.**


**References**


**OLEACEAE: Schrebera**

**Schrebera** Roxb.


**References**


**References**


**Oliniaceae**

(Rosidae—Myrtaleae)

(Rosids—Myrtaleae)


Sthn trop. Afr.: genus 1, species 2.

**Olinia** Thunb.


**References**


**Onagraceae**

(Rosidae—Myrtaleae)

(Rosids—Myrtaleae)


**Epilobium** L.


**Ludwigia** L.


*Jussiaea* L.; Exell: 188 (1929).


**Opiliaceae**

(Rosidae—Santalaleae)

(Core Eudicots—Santalaleae)


Opilia Roxb.


Shrubs, sometimes climbing; young branches and leaves glabrous or variously pilose. Leaves lanceolate or oblong-lanceolate, papyraceous to pergamentaceous, ± distinctly pellucid-punctulate; petiole very short, articulated at base. Inflorescences umbellate; peduncle slender, claviform; bracts & bracteoles ovate to lanceolate, usually caducous before anthesis. Flowers 5-merous, minute; receptacle flat. Calyx cupuliform. Petals reflexed, caducous. Stamens as many as or opposite petals, free or almost so, exceeding the petals; filaments filiform; anthers dorsifixed. Disc: lobes 5, fleshy, often irregularly toothed, alternating with stamens. Ovary superior; stigma sessile, entire or shallowly lobed. Fruit globose to ellipsoid, with a thin pericarp and a large stone. Seed large; embryo terete, embedded in rich endosperm, with 2 or 3 cotyledons.


Urobotrya Stapf

Stapf: 89 (1905); Hiepko: 137 (1985).

Shrubs, sometimes climbing; twigs densely puberulous. Leaves alternate, petiolate, coriaceous, oblong-elliptic, ovate or somewhat obovate, glabrous above, sparsely hairy beneath. Inflorescences racemose, usually solitary, rarely 2 per axil, with flowers solitary or 3–4(5) per bract; rachis slender; bracts narrowly lanceolate, mostly caducous; bracteoles very small, ovate. Flowers bisexual, 3–5-merous. Tepals free, oblong, acute. Stamens epipetalous, exceeding perianth; filaments filiform, white; anthers elliptic. Disc annular, fleshy. Ovary conical to cylindric; stigma sessile. Fruit an ellipsoid- or subglobose, red to orange drupe; mesocarp fleshy-juicy to coriaceous; endocarp crustaceous to woody. Seed large with basal hilum; embryo with 2 or 3 long cotyledons.

Species 7: 5 in tropical Asia, 2 in W and C Africa; sthn trop. Afr. 1: Urobotrya sparsiflora (Engl.) Hiepko, NE Angola.

References


Trees or shrubs, dioecious. **Leaves** alternate, distichous, simple, entire to serrate, often asymmetric at base, petiolate; stipules small, usually persistent, adaxial one arising below abaxial one. **Inflorescences** axillary or supra-axillary fascicles or racemes, often on old wood. **Flowers** unisexual, regular, small. **Calyx** cupular, truncate or 5-lobed; lobes imbricate or open. **Petals** 5, free, contorted, imbricate or valvate, flattened or galeate-cucullate. **Disc** intrastaminal, small or 0. **Male flowers**: stamens 5 or 10, in 1 series or in 2 and then alternately longer and shorter, absent in female flowers or represented by staminodes; anthers 2-locular, intorse or latrorse, opening lengthwise; pistillode linear-subulate, cylindric or narrowly conical. **Female flowers**: ovary superior, 2–5-locular, with 1(2) apical, pendulous, orthotropous or anatropous ovules per locule, without obturator; styles 1–5, simple or bipartite. **Fruit** a drupe; mesocarp fleshy; endocarp woody, bony or stony, usually tubercled, muricate, pitted or ridged. **Seeds** usually flattened-concave, ecarunculate; endosperm copious, oily; cotyledons broad.

**Key to genera**

Inflorescences axillary; flowers solitary or in glomerules; male petals imbricate; leaves usually pellucid-punctate; ovules anatropous. **Microdesmis**

Inflorescences terminal or on old wood, pseudoracemose-thyrsoform; male petals valvate or imbricate; leaves not pellucid-punctate; ovules orthotropous. ................................................................. Panda

**Microdesmis** Hook.f. ex Hook.
Hooker: t. 758 (1848); Hiern: 967 (1900); Hutchinson: 741 (1912); Léonard: 102 (1962); Villiers: 18 (1973); Radcliffe-Smith: 581 (1988); Webster: 68 (1994) under Euphorbiaceae; Radcliffe-Smith: 126 (2001) under Euphorbiaceae.

Dioecious shrubs or trees, sometimes lianescent; hairs simple. **Leaves** alternate, petiolate, simple, entire or dentate, pinnervised, pellucid-dotted; stipules small, usually persistent. **Inflorescences**: flowers small, shortly pedicellate, fasciculate in leaf axils; male ones multiflowered, female ones few or nearly solitary. **Male flowers**: sepalas (4)5(6), imbricate; petals 5, free, larger than sepalas, imbricate-contorted; stamens 5, anepipetalous, arising on a fleshy disc or receptacle adnate to the rudimentary ovary; filaments short; anthers basified; longitudinally dehiscent. **Disc 0. Ovary** (2)3- or 4-locular; ovule 1 per locule, pendant, orthotropous; stigmas (2)3 or 4, undivided, reflexed; pistillode present in male flowers. **Fruit** drupaceous, (2)3- or 4-seeded, ± 50 mm in diameter, very tardily dehiscent into (2)3 or 4 valves, leaving a large tri- or tetrapterygoid columna. **Seeds** oblong or ellipsoid, flattened; testa thickly coriaceous, greyish; endosperm copious, oleaginous; cotyledons cordate, truncate.

**Panda**


Small dioecious trees; branchlets slightly angular; buds in shoot axils, not leaf axils; indumentum simple. **Leaves** alternate, simple, serrulate, asymmetrical and ± cuneate at base; stipules minute. **Inflorescences** racemose, racemes on old wood fasciculate; female flowers solitary or paired, sometimes in shoot axils. **Calyx** cupular, truncate or faintly toothed. **Petals** 5, valvate below, faintly imbricate above, glabrous. **Stamens** 10, in 2 whorls of 5, outer ones epipetalous with short filaments; anthers basified; longitudinally dehiscent. **Disc 0. Ovary** (2)3- or 4-locular; ovule 1 per locule, pendulum, orthotropous; stigmas (2)3 or 4, undivided, reflexed; pistillode present in male flowers. **Fruit** drupaceous, (2)3- or 4-seeded, ± 50 mm in diameter, very tardily dehiscent into (2)3 or 4 valves, leaving a large tri- or tetrapterygoid columna. **Seeds** oblong or ellipsoid, flattened; testa thickly coriaceous, greyish; endosperm copious, oleaginous; cotyledons cordate, truncate.


**References**


Sthn trop. Afr.: genus 1, species 1.

*Argemone L.*
Exell & Mendonça: 48 (1937/1951); Exell: 180 (1960); Exell & Gonçalves: 1 (1973); Phiri (Unpublished).


**Passifloraceae**
(Eudicots—Violales)


Sthn trop. Afr.: genera 8, species ± 60.

**Key to genera**
1a Trees or shrubs, without tendrils; leaves ± coriaceous, sometimes glandular-dentate; flowers 5-merous, bisexual, with a well-developed corona: 
2a Style single, with 1 (sometimes faintly lobed) stigma; corona double; stamens many ................................................................. **Barteria**
2b Styles (2)–5(6); corona single or double; stamens 5 or 8–16: 
3a Corona double; stamens 8–11; small erect trees with palm-like habit ................................................................. **Paropsiopsis**
3b Corona single; habit not palm-like: 
4a Stamens 10–16; petiole with 2 glands at the apex ................................................................. **Viridivia**
4b Stamens 5; petiole without glands at the apex ................................................................. **Paropsia**
1b Shrubs, climbers or perennial herbs, usually with tendrils; leaves often membranous, sometimes coriaceous; flowers bisexual or unisexual; corona single or double or sometimes wanting: 
5a Flowers unisexual, bisexual or polyparous; corona absent or poorly developed (comprising a laciniate rim or membrane or a row of filaments or hairs); leaves usually with glands at the apex of the petiole or near the base of the lamina ................................................................. **Adenia**
5b Flowers bisexual, with a well-developed single or sometimes double corona; petiole with or without glands at the apex:
6a Sepals 3(4); petals 2(4); stamens 6(8); style single, very short, with a (3)4-lobed stigma; seeds smooth; petiole with glands at the apex; tendrillose heterophyllous shrub ................................................................. **Schlechterina**
PASSIFLORACEAE: Key to genera

**Adenia Forssk.**

Shrubs or trees without tendrils; branchlets usually hollow and often inhabited by ants. **Leaves** alternate or subdistichous, not lobed, elliptic to lanceolate, usually leathery, subsessile or petiole short, often shortly winged and decurrent on branches as a ridge; margin finely crenulate to subentire, set with many small glands; stipules small, caducous. **Inflorescences** axillary, sessile, either up to 4-flowered fascicles or horseshoe-shaped and 4–9-flowered, or flowers solitary; bracts many, imbricate, large, hairy; anthers oblong. **Flowers** bisexual, large, fragrant, sessile; hypanthium thickish, shallowly cup-shaped. **Sepals** 5, imbricate, resembling sepals. **Petals** 5, resembling sepals but slightly narrower, minutely pubescent on both faces. **Stamens** 8–11, arising at base of ovary; filaments filiform; anthers elongate, attached shortly above corolla base, 2-theecous, longitudinally dehiscent. **Corona** double: outer one short, irregularly laciniate; inner one very short, annular, slightly fleshy. **Ovary** subglobose, tomentose, on a short but distinct androgynophore; styles 3–5, filiform; stigmas capitae.


*Passiflora L.*

Widely cultivated, with 6 species recorded from the region, of which at least some have become naturalised; Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

**Schlechterina** Harms

Monotypic genus: Schlechterina mitostemmatoides Harms, Mozambique, and sthn Afr.

**Viridivia** J.H.Hemsl. & Verdc.

Small trees or shrubs without tendrils. **Leaves** mostly ovate or elliptic, denticulate, hairy on both surfaces. **Flowers** bisexual, usually developing before leaves, in dense racemes at end of short branches; bracts small, carinate, acute, soon caducous. **Sepals** 4, imbricate, sericeous outside, 3–7-nerved. **Petals** 4, smaller than sepals, 1-nerved. **Corona** shortly tubular, irregularly timbrate and with clavate whitish glands. **Stamens** 10–16; filaments free and hairy; anthers oblong. **Ovary** globose, stipitate, 1-locular; styles 4–6 with fleshy, kidney-shaped stigmas; ovules ± 50, anatropous, arranged in 2 rows on 4 or 5 placentas. **Capsule** subglobose, stipitate. **Seeds** ovoid, compressed, included in a cupulate aril.

References


Pedaliaceae

(Asteridae—Scrophulariales)

(Euasterids I—Lamiales)


Sthn trop. Afr.: genera 10, species 27.

Key to genera

[partly after Ihlenfeldt (1988)]

1a Spiny shrubs or small trees, soft-stemmed, and with trunks usually swollen at the base: ................................................................................................................ Sesamothamnus

1b Herbs or subshrubs, annual or perennial, erect or prostrate, sometimes with short swollen stems:

2a Fruit with 4 broad, parchment-like wings:

3a Erect annuals; corolla yellow-green to white, tube with a conspicuous sac-like spur at the base ............................................................................................. Holubia

3b Perennials with a short persistent stem and a tuberous root or a swollen tuber-like, partially subterranean stem; corolla yellow, orange, red or purple, tube often slightly swollen at the base but not conspicuously spurred: ........................................................................................................ Pterodiscus

2b Fruit without parchment-like wings:

4a Fruit a dehiscent, non-woody capsule; erect annuals or perennial herbs:

5a Locules of ovary/capsule of different size, only the larger, abaxial locule dehiscing; capsule with tubercles or conical spines or horns in basal portion ........................................................................................................... Rogeria

5b Locules of ovary of equal size; horns, if present, in apical portion:

6a Capsule with 4 spreading horns at the apex; seeds never winged; largest leaves usually sagittate or 3-lobed ............................................. Ceratotheca

6b Capsule without horns at the apex; seeds sometimes conspicuously winged; leaves very variable .................................................................................... Sesamum

4b Fruit woody, either dehiscent or tardily dehiscent only at the apex, armed with spines or hooks, or unarmed and walnut-like:

7a Fruit disc-like with 2 erect conical spines from near the centre; flowers on long slender pedicels; corolla obliquely campanulate, ± 2-lipped, white or pink, the tube streaked with darker colour inside ............................................................. Dicerocaryum

7b Fruit not disc-like; flowers sessile or on short pedicels, usually purple or yellow, corolla tube either funnel-shaped or cylindrical and constricted at the base, corolla lobes nearly equal or lower lip distinctly larger than upper:

8a Fruit laterally compressed, ovate or oblong in lateral view, with 2 obtuse protuberances on each face and either with 2 rows of curved arms along both margins, each bearing recurved spines, or margins with 2 rigid wings bearing recurved spines; procumbent perennial herbs with tuberous roots; ovules and seeds many ........................................................................................................ Harpagophyllum

8b Fruit subpyramidal with 4 spines at the basal angles, or walnut-like with tubercles but no spines; ovules and seeds not more than 4:

9a Erect or ascending annual herbs; corolla subequally 5-lobed, yellow; fruit subpyramidal, 4-angled with a spreading spine at each basal angle ........................................................................................................ Pedaliunum

9b Subshrubs with thick cylindric rootstock and prostrate to ascending branches; corolla with a distinctly enlarged lower lip, dark violet; fruit resembling a walnut, with tubercles and without spines .................................................................................. Linariopsis

Ceratotheca Endl.

Ihlenfeldt: 58 (1967); Abels: 224 (1975); Ihlenfeldt: 94 (1988); Ihlenfeldt:

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**DICOTYLEDONS**

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1069 (1994b).


**Dicerocaryum** Bojer

Ihlenfeldt: 59 (1967); Bruce: 421 (1953); Abels: 222 (1975); Ihlenfeldt: 106 (1988); Ihlenfeldt: 1065 (1994b).


**Harpagophytum** DC. ex Meisn.


**Holubia** Oliv.

Ihlenfeldt: 64 (1967); Ihlenfeldt: 89 (1988).


**Linariopsis** Welw.

Welwitsch: 53 (1869); Exell et al.: 126 (1930); Ihlenfeldt: 60 (1967).


**Pedalium** L.

Linnaeus: 1123 (1759); Ihlenfeldt: 64 (1967); Ihlenfeldt: 109 (1988); Ihlenfeldt: 1070 (1994b).

Erect or ascending annual herbs; stems simple or branched. **Leaves** petiolate, oblong to obovate, entire or coarsely dentate, subsucculent. **Flowers** solitary in leaf axils. **Corolla**: tube subcylindrical or narrowly funnel-shaped; limb spreading, subequally 5-lobed, yellow. **Stamens** included; thecae divergent; staminodium present or absent. **Ovary** bicalcarate, undivided, each locule with 2 pendulous ovules. **Fruit** indehiscent, subpyramidal, 4-angled, rounded to acute at apex and with a spreading spine at each basal angle, then abruptly contracted into a narrow collar below; mesocarp spongy. **Seeds** 1 or 2 in each locule, narrowly oblong in outline.


**Pterodiscus** Hook.


**Rogeria** J.Gay ex Delile


**Sesamothamnus** Welw.

Bruce: 417 (1953); Ihlenfeldt: 61 (1967); Ihlenfeldt: 87 (1988); Ihlenfeldt: 1064 (1994b); Coates Palgrave: 1014 (2002); Ihlenfeldt: 355 (2002).


**Sesamum** L.


**References**


Arborescent shrubs or climbers. Leaves alternate, petiolate, simple, oblong-ovate, obliquely cupulate-acuminate, penninerved, entire, glabrous; stipules 0. Inflorescences short, axillary and terminal racemes. Flowers regular, unisexual or bisexual; bracts small, subulate. Sepals 5, free, imbricate, lanceolate. Petals 5, free and lanceolate above but basal parts scale-like, thicker and loosely connivent. Stamens 9–13, arising on a short stout androgynophore; filaments free, filiform; anthers basifixed, 2-theccous, introrse, longitudinally dehiscent; represented by staminodes in female flowers. Ovary superior, 4- or 5-locular, borne at apex of stout gynophore; ovules axillary (not parietal as stated in Villiers 1973: 163), many, in 2 or 3 rows; style 4- or 5-fid at apex; ovary rudimentary in male flowers. Fruit a rounded berry. Seeds many, small, reniform, immersed in pulp.

Genus 1, species 1, W trop. Africa.


Pentadiplandra Baill.


Description as for family.

Monotypic genus: Pentadiplandra brazzeana Baill. (= P. gossweileri Exell); sthn trop. Afr.: Angola.

Phytolaccaceae
(Caryophyllidae—Caryophyllales)
(Core Eudicots—Caryophyllales)


Hilleria Vell.


Lophiocarpus Turcz.


Phytolacca L.


Piperaceae
(Magnoliidae—Piperales)
(Magnoliids—Piperales)


Sthn trop. Afr.: genera 2, species 11.
**Piperaceae**: Peperomia

**Peperomia Ruiz. & Pav.**


**Piper L.**


**References**


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**Rosporaceae**

(Rosidae—Rosales)

(Euasterids II—Apiales)


Sthn trop. Afr.: genus 1, species 2.

**Pittosporum Banks ex Sol.**


**References**


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**Plantaginaceae**

(Asteridae—Plantaginaceae)

(Euasterids I—Lamiales)


Sthn trop. Afr.: genus 1, species 3.

**Plantago L.**


Sthn trop. Afr. 3, Angola, Zambia, Zimbabwe, Malawi, and sfn Afr., widely distributed weeds; only 1 species: *Plantago palmata* Hook.f., is probably indigenous.

**References**


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**Plumbaginaceae**

(Caryophyllidae—Plumbaginaceae)

(Core Eudicots—Caryophyllales)

DICOTYLEDONS

PLUMBAGINACEAE

Seed plants of southern tropical Africa: families and genera

Dyerophytum Kuntze


Vogelia Lam.; Hiern: 635 (1898).

Plumbago L.


References

HIERN, W.P. 1898. Catalogue of the African plants collected by Dr. Friedrich Welwitsch in 1853–61, 1(3). Trustees of the British Museum (Natural History), London.

Angolaea Wedd.

Weddell: 300 (1873); Weddell: 208 (1874); Oliver: t. 2357 (1895); Baker & Wright: 123 (1909); Engler: 3 (1930); Hess: 370 (1953).

Herbs attached to rocks in fast-flowing freshwater, resembling a seaweed; stem and primary branches thick, transparent, green.

Leaves dichotomously divided into linear segments. Flowers bisexual, each enclosed in an irregularly bursting spathella (a membranous sac), either solitary near sinus of dichotomies or 2–5 in umbellate cymes near ends of branchlets; bracts similar to leaves but shorter and with flattened segments; spathella calyx-like, pedicellate and bursting by 3–5 unequal lobes. Tepals 2, minute. Stamens 3(4); filaments slightly flattened, free or 2 connate at base; anthers 2-thecous, oblong; pollen grains in diads, pale yellow. Ovary 1-loccular, stipitate, ellipsoid to narrowly ovoid, somewhat shorter than stamens; stigma subsessile, capitate, obliquely ovoid to hemispherical, papillose; placentia central, swollen, multi-ovulate. Capsule ovoid, 8-ribbed, dehiscing by 2 equal valves. Seeds many.

Monotypic genus: Angolaea fluitans Wedd., endemic in Angola.

Dicraeanthus Engl.

Engler: 94 (1905); Baker & Wright: 126 (1909); Engler: 46 (1930); Cusset: 66 (1987).

Herbs attached to rocks in fast-flowing freshwater; basal part thalloid, bearing long simple or branched branches floating in...
current. Leaves alternate, arranged all along branches at regular intervals, usually ± dichotomously divided. Flowers arranged in pedicelled or sessile inflorescences, either on main branches or on short branches in leaf axils; spathellas each enclosing an inverted flower, ovoid or ellipsoid, opening irregularly from the apex; pedicel far exerted after anthesis. 

**Tepals 2. Stamens** 2, surrounded by tepals, usually shorter than ovary; filaments fused in basal part; anthers intorse; pollen in diads. 

**Ovary** unilocular, very narrowly ellipsoid, borne on a well-developed gynophore; placenta central; ellipsoid, bearing many anatropous ovules; stigmas 2, conical; slightly fused at base. 

**Capsule** 8-ribbed, dehiscing by 2 equal valves remaining attached at apex. 

**Seeds** many, small, with reticulate testa.

Species 2, W trop. Africa; sthn trop. Afr. 72, Angola (record not confirmed).

**Ledermanniella Engl.** 


**Leiothylax Warm.** 

Warming: 147, 154 (1899); Baker & Wright: 124 (1909); Cusset: 202 (1980); Cusset: 52 (1987); Cook: 183 (1990); Cusset: 4 (1997).

Submerged freshwater herbs; basal part thalloid, foliaceous or ribbon-like. Leaves dichotomously branched, segments linear. Spathellas (spatheaceous bracts) in clusters along the stems, ovoid or ribbon-like. 

**Stems** long-exserted after anthesis, bearing the flower erect. 

**Tepals** 2, minute, one on each side of the andropodium. 

**Stamens** 2(3); filaments joined for at least half their length; anthers 2-locular, introrse; pollen in monads. 

**Ovary** spherical, 1-locular with central placentation, borne on a well-developed gynophore; placenta central; ellipsoid, flattened, with reticulate testa. 


**Sphaerothythax Bisch.** 


**Tristicha Thouars** 


**References**


**Current.**

**Ledermanniella Engl.**


**Leiothylax Warm.**

Warming: 147, 154 (1899); Baker & Wright: 124 (1909); Cusset: 202 (1980); Cusset: 52 (1987); Cook: 183 (1990); Cusset: 4 (1997).

Submerged freshwater herbs; basal part thalloid, foliaceous or ribbon-like. **Leaves** alternate, arranged all along branches at regular intervals, usually ± dichotomously divided. **Flowers** arranged in pedicelled or sessile inflorescences, either on main branches or on short branches in leaf axils; spathellas each enclosing an inverted flower, ovoid or ellipsoid, opening irregularly from the apex; pedicel far exerted after anthesis. **Tepals** 2. **Stamens** 2, surrounded by tepals, usually shorter than ovary; filaments fused in basal part; anthers intorse; pollen in diads. **Ovary** unilocular, very narrowly ellipsoid, borne on a well-developed gynophore; placenta central; ellipsoid, bearing many anatropous ovules; stigmas 2, conical; slightly fused at base. **Capsule** 8-ribbed, dehiscing by 2 equal valves remaining attached at apex. **Seeds** many, small, with reticulate testa.

Species 2, W trop. Africa; sthn trop. Afr. 72, Angola (record not confirmed).

**Sphaerothythax Bisch.**


**Tristicha Thouars**


Polygalaceae
(Rosidae—Polygales)
(Eurosids I—Fabales)


Sthn trop. Afr.: genera 5, species 86.

**Key to genera**

[after Keay (1954) and Exell (1960)]

1a Petals 5, subequal, united into a tube at the base; stamens 5; fruit drupaceous: 1b Petals 3 (others minute or absent); stamens usually 7 or 8 (4–8); fruit a capsule or samara:

2a Fruit fleshy, yellow or red; seeds very densely villous, with copious fleshy endosperm

Carpolobia G.Don, in part; Oliver: 136 (1868).

Species 2, W and C Africa; sthn trop. Afr.

2b Fruit hard, crustaceous; seeds finely hairy, without endosperm

Atroxima Stapf

Staph: 85 (1905); Exell: 218 (1932); Exell & Mendonça: 88 (1937/1951);

Carpolobia G.Don, in part; Oliver: 136 (1868).

Shrubs or woody climbers; branches, branchlets and leaves ± glabrous. **Leaves** alternate, petiolate, entire, coriaceous, elliptic-oblong, prominently reticulate on both surfaces; stipules absent or gland-like. **Inflorescences** usually long, slender, axillary racemes, rarely panicled, glabrous or pubescent; bracts and bracteoles small, long-persistent. **Flowers** irregular; pedicel usually slightly twisted so that keel petal is not in a strictly abaxial position. **Sepals** 5, free, caducous, similar in shape but interior ones larger. **Petals** 5, subequal, lanceolate, adnate to staminal tube below. **Stamens** 5; filaments partly to entirely fused into a sheath. **Ovary** 3-locular with 1 ovule per locule; style filiform; stigma punctiform. **Fruit** hard and dry, subglobose, crustaceous. **Seeds** usually 3, finely hairy; endosperm 0.


**Carpolobia G.Don**


Shrubs or trees; branchlets at first pubescent, becoming glabrous. **Leaves** alternate, shortly petiolate, ovate or obovate, lanceolate, elliptic or narrowly elliptic; stipules absent or small and gland-like or conical. **Flowers** irregular, in very short axillary racemes with pubescent rachis; pedicels usually twisted so that keel petal is not in a strictly abaxial position; bracts and bracteoles small, deltoid, usually long persistent. **Sepals** 5, free, 2 inner ones slightly larger. **Petals** 5, subequal in length, slightly or strongly unequal in shape, when strongly unequal then median petal concave-galeate, ciliate on margin, basal parts joined to staminal sheath; keel with appendage. **Stamens** (4)5; basal $\frac{1}{4}$–$\frac{3}{4}$ of filaments united into a sheath open at adaxial side; staminodes 0–3; anthers opening by 2 apical valves. **Ovary** (2)3-locular with 1 pendulous ovule per locule; stigma small, capitate. **Fruit** a drupaceous, subglobose berry, ± 10 mm in diam. **Seeds** 1–3, ellipsoid, flattened, with dense, long, silky hairs; endosperm copious; cotyledons folicaceous.


**Muralitia DC.**

Exell: 307 (1960); Binns: 87 (1968); Mapaura (Unpublished).


**Polygala L.**


**Securidaca L.**


References


Additional family characters: High-climbing woody lianes with lateral branchlets ending in tendrils.

Identification of additional genus: *Brunnichia* differs conspicuously in its habit: high-climbing woody liana with tendrils.

**Brunnichia** Banks ex Gaertn.

Gaertn.: 213 (1788); Hiern: 905 (1900); Baker & Wright: 119 (1909); Brandbyge: 540 (1993).

*Afrobrunnichia* Hutch. & Dalziel: 118 (1927); Hutchinson & Dalziel: 28 (1928); Robyns: 424 (1948); Cavaco: 5 (1963).

Woody, high-climbing vines with short lateral branches ending in tendrils; axillary buds 2, one forming a lateral branch, the other suppressed or forming a densely flowered inflorescence. **Leaves** elliptic, rounded to shortly cuneate at base, glabrous. **Flowers** bisexual; stipe much longer than short pedicel; floral tube and stipe 3-ridded. **Stamens** usually 8, exserted. **Ovary** swollen; styles 3. **Fruit** a triquetrous nut with 1 or 2 of the ridges expanded into flattened, leathery wings, enclosed in persistent accrescent floral tube. **Seed** triquetrous, deeply longitudinally 3-furrowed; endosperm irregularly ruminate.


**Fagopyrum** Mill.


Sthn trop. Afr. 1: *Fagopyrum esculentum* Moench, escape from cultivation; also in sthn Afr.

**Oxygonum** Burch. ex Campd.

Hiern: 902 (1900); Dammer: 231 (1903); Baker & Wright: 99 (1909); Milne-Redhead: t. 3216 (1935); Robyns: 401 (1948); Graham: 145 (1957a); Graham: 236 (1957b); Graham: 26 (1958); Binns: 88 (1968); Brylska & Lisowski: 551 (1988); Brandbyge: 541 (1993); Ortiz & Paiva: 167 (1999).

Species ± 30, tropical and southern Africa; sthn trop. Afr. ± 20, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

**Persicaria** (L.) Mill.


**Polygonum** L., in part; Baker & Wright: 103 (1909); Binns: 88 (1968).

References

CERARIA

Portulacaceae
(Caryophyllidaceae—Caryophyllales)
(Core Eudicots—Caryophyllales)

Avonia (E.Mey. ex Fenzl) G.D.Rowley

Ceraria H.Pearson & Stephens
Exell & Mendonça: 369 (1937/1951); Nyanungo & Olowokudejo: 775 (1986); Rowley: 376 (2002).

Portulaca L.


Portulacaria Jacq.
Coates Palgrave: 201 (2002); Phillips: 37 (2002).

Talinum Adans.

Talinum Adans.
Primulaceae

(Dilleniidae—Primulales)
(Asterids—Ericales)


Sthn trop. Afr.: genera 4, species 17. A family of some 22 genera and 500 species with almost world-wide distribution but found chiefly in north temperate regions.

**Key to genera**

[after Kupicha (1983)]

1a Ovary semi-inferior; staminodes present; pedicels with bract arising at or near the middle, thus geniculate .......................................................... **Samolus**

1b Ovary semi-inferior; staminodes present; pedicels with bract arising at or near the middle, thus geniculate:

2a Plants pilose; leaves lobate-dentate; flowers borne in short extra-axillary, few-flowered racemes .......................................................... **Anagallis**

2b Plants glabrous; leaves entire; flower solitary, axillary, usually arranged in racemes or spikes:

3a Capsule glabrous; leaves entire; flower solitary, axillary, usually arranged in racemes or spikes:

3b Capsule circumscissile or rarely indehiscent; small, relatively slender annual and perennial herbs .......................................................... **Lysimachia**

Anagallis L.


Ardisia Hook.f.

Hooker: 205 (1864); Taylor: 146 (1958a); Kupicha: 184 (1983).

Pilose creeping perennial herbs with leafy stems. Leaves alternate, orbicular, coarsely 5–9–lobed and toothed, petiolate. Flowers in few-flowered, extra-axillary, short-peduncled racemes, pedicellate and bracteate, inconspicuous. Calyx: segments 5, free or somewhat accrescent, persistent. Corolla campanulate, with 5 lobes ± as long as corolla. Stamens 5, opposite petals; filaments short, connate below into a continuous ring fused at base to corolla tube; anthers apiculate. Ovary multi-ovulate. Capsule globose, dehiscent by 5 apical valves or indehiscent, many-seeded; seeds angular, blackish, papillose.


Lysimachia L.


**Ptaeroxylaceae**

*(Rosidae—Proteales)*

*(Eurosids II—Sapindales; under Rutaceae)*


Sthn trop. Afr.: genus 1, species 1.

**Ptaeroxylon** Eckl. & Zeyh.


Monotypic genus: 


**References**


Rafflesiaceae
(Magnoliidae—Aristolochiales)
(Unplaced)


Sthn trop. Afr.: genus 1, species 1.

**Additional family characters:** Flowering buds emerging through bark of younger branches of members of Caesalpinioideae (Fabaceae); flowers many, not arranged in distinct groups or inflorescences.

**Berlinianche** (Harms) Vattimo-Gil

**Pilostyles** Guill., in part; Hiern: 908 (1900).

Small parasites of trees in family Fabaceae (Leguminosae), vegetatively much reduced, only flowers emerging on smaller branches of host. **Flowers** many, involucrate, globose, ovoid or ellipsoid, unisexual by abortion. **Perianth** segments 4–12, free, similar to bracts, imbricate, persistent, enclosing an annular disc at base. **Male flowers:** stamen filaments connate into a tube about a central column (pistillode); pistillode (and gynandroecial column) expanded apically into a disc (pileus) fringed with papillae; anthers sessile, 1–several-seriate below pileus rim. **Female flowers:** ovary inferior, surmounted by a fleshy disc; disc flat, concave or convex, sometimes appearing as a simple extension of style; style short, thick, conical or cylindrical; stigma capitulate, stigmatic surface hemispherical or a subapical annular ring. **Berry** globose, surrounded by persistent bracts and perianth segments.


**References**

Ranunculaceae
(Magnoliidae—Ranunculales)
(Eudicots—Ranunculales)


**Expanded family description:** **Flowers** irregular, with clearly distinct calyx and corolla. **Sepals:** posterior one spurred. **Petals:** 2 posterior ones spurred.

**Identification of additional genus:** **Delphinium:** 2 posterior petals with spurs; the only zygomorphic representative in the region.

**Clematis** L.


**Delphinium** L.
Limnaeus: 530 (1753); Limnaeus: 236 (1754); Milne-Redhead & Turrill: 19 (1952); Exell & Milne-Redhead: 101 (1960); Munz: 30 (1967); Exell: 139 (1970); Exell et al.: 14 (1973); Johnson: 599 (2002); Lebrun & Stork: 90 (2003).

Perennial herbs, erect; stems ± pubescent. **Leaves** mostly ± basal, palmatisect, often almost to base, palmatinnerved; petioles long. **Flowers** bisexual, irregular, in terminal, racemose or paniculate inflorescences. **Sepals** 5, petaloid, posterior one produced into a spur. **Petals** 2–5, 2 posterior ones with spurs ± joined and fitting into calyx spur. **Stamens** many, often with flattened filaments. **Carpels** 3(4), sessile; ovules many. **Fruit** of 3 pubescent follicles.

Species ± 320, mostly N temperate, also trop. African mountains; sthn trop. Afr. 3, Zambia, Malawi, Mozambique.

**Knowltonia** Salisb.
Exell & Milne-Redhead: 97 (1960); Exell et al.: 10 (1973); Rasmussen: 1 (1979).

Sthn trop. Afr. 1: **Knowltonia transvaalensis** Szyszyl., Zimbabwe, Malawi,
Mozambique, and sthn Afr.

**Ranunculus L.**


**Thalictrum L.**


**References**


**Resedaceae**

(Dilleniidae—Capparidales)

(Eurosids II—Brassiccales)


Sthn trop. Afr.: genera 2, species 2.

**Additional family characters and characters diagnostic for** *Caylusea*: Carpels free almost to base, each with 2 or 3 basal ovules; fruit composed of 5 or 6 follicles connate at base only.

**Caylusea A.St.-Hil.**

Saint-Hilaire: 29 (1837); Elffers & Taylor: 1 (1958); Abdallah: 36 (1967).

Erect to ascending annuals to biennials, occasionally bushy; stem simple or branched, striate, glabrous or often scabrous to sparsely hairy on angles, especially towards inflorescence. *Leaves* scattered or fasciculate, sessile, entire, linear or lanceolate, scabrid on nerves and margins, occasionally undulate. *Inflorescence* dense, spike-like terminal raceme; bracts linear-subulate, persistent; pedicels slightly shorter than bracts but elongating considerably in fruit. *Flowers* bisexual or rarely unisexual, usually irregular. *Calyx* 5-partite; sepals subequal, persistent. *Petals* 5, deciduous, arising at base of disc, dilated at base of limb into a membranous suborbicular appendage; 2 adaxial petals deeply 4- or 5-fid, 3 abaxial ones entire or 2-fid. *Stamens* 10–15, arising on disc; filaments papillose; anthers 2-thecous, dehiscing longitudinally. *Ovary* superior, stipitate, of 5 or 6 whorled carpels connate at base; ovules many, clustered at base of carpels. *Fruit* of open follicles spreading stellately, 7–12-seeded. *Seeds* kidney-shaped, sinus narrow, filled with carunculate tissue, rugulose with small rounded warts.

Species 4, Cape Verde Islands, N and E Africa; sthn trop. Afr.: *Caylusea abyssinica* (Fresen.) Fisch. & C.A.Mey., Malawi.

*Reseda L.*


**References**


**Rhamnaceae**

(Rosidae—Rhamnales)

(Eurosids I—Rosaales)


Sthn trop. Afr.: genera 11, species 27.
**Rhamnaceae: Key to genera**

DICOTYLEDONS

Key to genera

[partly after Johnston (1972) and Drummond (1966)]

1a Leaves distinctly opposite; stipules mostly interpetiolar ........................................... **Lasiodiscus**

1b Leaves alternate or subopposite to opposite, but then stipules not interpetiolar:

2a Petioles ± 2 mm long; leaf blades 10-20 mm long, linear-lanceolate; somewhat heath-like shrubs with stiff ascending leafy branches .......... **Phyllia**

2b Petioles longer than 2 mm; leaf blades usually longer than 20 mm and not linear-lanceolate:

3a Plants armed with stipular or axillary spines:

4a Leaves penninerved; spines not stipular ................................................................. **Scutia**

4b Leaves 3-5-nerved from the base; branches often with stipular spines .......................... **Ziziphus**

3b Plants unarmed or branches spine-tipped:

5a Climbing shrubs or lianes with coiled tendrils; ovary and fruit completely inferior:

6a Leaves toothed; mature fruits 3-winged before dehiscence ........................................ **Gouania**

6b Leaves entire; fruit not winged .................................................................................. **Helinus**

5b Shrubs or trees, or if lianes or scandent, then without coiled tendrils:

7a Fruit a fleshy drupe:

8a Leaves 3-5-nerved from the base ................................................................................ **Ziziphus**

8b Leaves penninerved:

9a Ovary and fruit apparently 1-locular; style simple, expanded at the top into a peltate stigma usually marked by furrows into 4(5)

9b Ovary and fruit 2-4-locular; style various not expanded at the top:

10a Ovary and fruit 2-locular; leaves entire with veins forming a regular herring-bone pattern; style thick, conical, 2-lobed; flowers 5-merous ......................................................... **Berchemia**

10b Ovary and fruit 2-4-locular; leaves usually serrate or crenate, if entire then flowers 4-merous; veins on leaves less regular than above; styles 2-4, free or united, ± filiform ........................................................................ **Rhamnus**

7b Fruit a capsule or winged and samara-like:

11a Fruit a capsule breaking up into 3(4) 1-seeded mericarps; leaves 3-5-veined at the base with middle vein with several lateral veins ........

11b Fruit samara-like with a 1-locular, 1-seeded ± spherical body bearing a linear-oblong terminal wing; leaves pinnately nerved .... **Ventilago**

**Berchemia** Neck. ex DC.

Exell: 226 (1932); Drummond: 424 (1966); Drummond & Torre: 8 (1973); Coates Palgrave: 668 (2002).


**Colubrina** Rich. ex Bronn.

Drummond: 430 (1966); Johnston: 2 (1971); Drummond & Torre: 13 (1973); Coates Palgrave: 672 (2002).


**Gouania** Jacq.

Jacquin: 263 (1763); Exell & Mendonça: 32 (1954/1956); Evrard: 447 (1960); Drummond: 434 (1966); Drummond & Torre: 15 (1973); White et al.: 443 (2001).

Climbing shrubs or lianes; branches provided with coiled tendrils, pubescent, glabrescent later. Leaves alternate, petiolate; lamina ovate, entire or dentate, penninerved but often 3-5-nerved from base; stipules small, caducous. Inflorescence a paniculate thyrse. Flowers usually bisexual. Sepals 5. Petals 5, cucullate; inserted below margin of disc. Stamens 5. Disc filling receptacle, 5-lobed. Ovary inferior, immersed in disc; style 3-fid or obscurely 3-lobed. Fruit a schizocarp, longitudinally 3-winged (or 3-angled), septicidal, separating into 3 woody or coriaceous, indeliscent cocci. Seeds compressed or plano-convex. Species 50–70, tropical and warm Old and New World; sthn trop. Afr. 3,

Angola, Zimbabwe, Malawi, Mozambique.

**Helinus** E.Mey. ex Endl.


**Lasiodiscus** Hook.f.


**Maesopsis** Engl.


Tall trees; bark silvery grey with vertical, twisted furrowing. Leaves opposite to somewhat alternate, petiolate, ovate-elliptic to oblong-ovate, penninerved with many subparallel tertiary veins, markedly glandular-serrulate; stipules subulate, caducous. Inflorescences divaricately branched axillary cymes. Flowers bisexual. Sepals 5, deltoid with minutely pubescent margins. Petals 5, not clawed, extremely concavo-convex and thus almost totally obscuring anther, even when dehiscing. Stamens 5, with ± sessile anthers. Disc thin, lining cup at its rim, minutely 10-lobed. Ovary apparently 1-locular, with a single basal, ascending, anatropous ovule; style simple, cylindric, projecting only slightly above petals; stigma peltate with 10 small marginal lobes. Fruit a ± obovoid drupe with a 1-seeded stone with style and stigma persistent; outer portion of mesocarp fleshy.

**Phylica L.**
Drummond: 430 (1966); Drummond & Torre: 14 (1973); Richardson et al.: 405 (2001); White et al.: 445 (2001); Coates Palgrave: 673 (2002); Phiri (Unpublished).


**Rhamnus L.**


**Scutia (DC.) Brongn.**
Drummond: 428 (1966); Drummond & Torre: 11 (1973); Johnston: 64 (1974); White et al.: 446 (2001); Coates Palgrave: 669 (2002).


**Ventilago Gaertn.**

Stout lianes up to 30 m long; branches somewhat zig-zag. Leaves alternate, petiolate, ovate-lanceolate or nearly ovate, denticulate, ± glabrous, penninerved with many, sub-parallel tertiary nerves; stipules minute, caducous. Inflorescences usually very densely crowded axillary cymes appearing like nodal glomerules. Flowers bisexual. Sepals 5, deltoid. Petals 5, usually clawed, concave and cucullate. Disc ± pentagonal or 5-lobed, thick, adnate to lower half of ovary, later somewhat accrescent. Stamens 5, adnate to base of petals; connective projecting beyond anthers. Ovary half-inferior, 2-locular, but one locule often sterile, with 1 basal ovule per locule; style short, 2-branched. Fruit dry, samara-like consisting of a basal 1-locular ± spherical body and a strap-like wing up to ± 60 mm long and 10 mm wide, ending in 2 minute persistent styles. Seed without endosperm; cotyledons fleshy.


**Ziziphus Mill.**
Exell & Mendonça: 28 (1954/1956); White: 228 (1962); Drummond: 419 (1966); Drummond & Torre: 2 (1973); Killick: t. 1739 (1977); Coates Palgrave: 665 (2002).


**References**


**Rhizophoraceae**

(Rosidae—Rhizophorales)

(Eurosids I—Malpighiales)


Additional family characters: Stamens with filaments fused into a long tube. Fruit a 5-locular capsule with 2 seeds per locule.
Identification of additional genus using the key in the above Bredenkamp reference: Anopyxis will run to Cassipourea from which it can be distinguished by the filaments fused into a long tube and by the 5-locular capsule with 2 seeds per locale.

**Anopyxis** (Pierre) Engl.

Engler: 48 (1900); Sprague & Boodle: 309 (1909); Keey: 286 (1954); Mendes: 36 (1970).

Large trees; branches glabrous. Leaves in 3- or 4-nate verticils, oblong to oblong-lanceolate, rounded at apex, subcoriaceous, glabrous, shiny, finely reticulate; stipules interpetiolar, linear. Inflorescences axillary, short cymes. Calyx broadly campanulate, softly tomentellous; lobes 5, ovate, obtuse, longer than fused basal part. Petals 5, free, linear-oblanceolate, entire or toothed, pubescent in upper part. Stamens 10, monadelphous; staminal tube cylindric, 10-crenulate at apex; anthers sessile between crenulations. Ovary 5-locular, sessile, depressed-globose, with 2 collateral, pendent ovules per locale. Fruit a 5-locular, loculicidal capsule, narrowly ovoid to ellipsoid, softly tomentellous. Seeds 2 per locale, winged in upper part with a membranous aril.


**Bruguiera** Savigny

Lewis: 6 (1956); Torre & Gonçalves: 87 (1978); Gonçalves & Torre: 19 (1979); Coates Palgrave: 785 (2002).


**Cassipourea** Aubl.

Exell: 162 (1928); White: 275 (1962); Mendes: 36 (1970); Torre & Gonçalves: 89 (1978); Gonçalves & Torre: 2 (1979); White et al.: 447 (2001); Bingham & Smith: 143 (2002); Coates Palgrave: 785 (2002); Izidine & Bandeira: 52 (2002).

*Weihea* Spreng.; White: 276 (1962) as synonym.


**Ceriops** Arn.

Lewis: 5 (1956); Torre & Gonçalves: 84 (1978); Gonçalves & Torre: 14 (1979).


**Rhizophora** L.

Lewis: 2 (1956); Mendes: 34 (1970); Torre & Gonçalves: 82 (1978); Gonçalves & Torre: 16 (1979); Coates Palgrave: 784 (2002).


**References**


**Rosaceae**

*Rosidae—Rosales* (Eurosid I—Rosales)


Mendes (1970); Mendes (1978).


Identification of additional genus: Hagenia will run to Leucosidea from which it can be distinguished by the 10–17 (not 5–7) leaflets per leaf; and the drooping panicles (not erect racemes).

**Agrimonia** L.


DICOTYLEDONS

Alchemilla L.

Cliffortia L.

Hagenia J.F.Gmel.

Prunus L.
Mendes: 1 (1970); Mendes: 10 (1978); Mendes: 2 (1981); White et al.: 452 (2001); Coates Palgrave: 249 (2002); Dombro et al.: 10 (2002).

Rubus L.

References

Rubieae (Asteridiae—Rubiales) (Euasterids I—Gentianales)


Main references consulted: Flora zambesiaca 5(1) & 5(2); Flore du Gabon 12 & 17; Flora of tropical east Africa: Rubieae (parts 1–3); Flora of west tropical Africa, edn 2, 2: 104–223.


Key to genera
[Genera comprising plants of different habit have been included in more than one key—adapted from Verdcourt & Bridson (1991) and Bridson (1998)]

1a Herbs or subshrubs (if climbing or scandent see Key 3); corolla lobes always valvate; raphides present, or if raphides absent and inflorescences clearly axillary, go to Key 2...

1b Dioecious or polygamio-dioecious trees; branchlets ringed by scars of fallen leaf bases. Leaves imparipinnate, crowded; leaflets 5–7(8) on each side, subopposite, sessile or almost so, narrowly oblanceolate; stipules large, adnate to base of petiole, sheathing branchlets. Inflorescence: large, terminal, drooping panicles. Flowers with 2 or 3 bracts embracing base of calyx tube. Calyx: tube with (4)5 'epicalyx'-lobes alternating with and inserted below (4)5 calyx lobes; calyx lobes in male flowers larger than epicalyx, in female and bisexual flowers smaller than epicalyx. Petals (4)5, alternating with calyx lobes, or 0. Stamens up to 20, inserted on annular hairy disc lining mouth of calyx tube. Gynoecium of (1)2 carpels free within receptacle; styles (1)2, terminal; stigmas asymmetrically dis-...
1b Plants woody, or sometimes with ± herbaceous shoots from a woody rootstock (pyrophytes or geofrutices); corolla lobes valvate, contorted or sometimes imbricate; raphides present or absent:

2a Climbing and/or scandent plants ................................................................. Key 3

2b Plants not climbing, but sometimes scrambling:

3a Plants subshrubby to shrubby, or occasionally with ± herbaceous shoots from a woody or rhizomatous rootstock, with the herbaceous shoots 0.1–2 m tall and mostly burnt off by annual fires (pyrophytes) ...................................................... Key 2

3b Shrubs or trees (0.75)2–20 m tall ................................................................. Key 4

Key 1—Herbaceous

1a Leaves and stipules similar, in whorls of 4–8; herbs and herbaceous climbers with ± rotate corollas; ovules solitary in each locule; fruits bilobed, indehiscent; plants often adhesive due to prickles and harsh hairs:

2a Petioles very well-developed, 10–80 mm long (in one species ± winged and difficult to tell from young leaf blades); corolla usually 5-merous .......... Rubia

2b Petioles very short or leaves sessile; corolla usually 4-merous .................................................. Galium

1b Leaves clearly different from the stipules, opposite, or less often in whorls of 3(5); corolla mostly clearly tubular:

3a Calyx with 5 free, showy, petal-like sepals ± as long as corolla tube; leaves markedly anisophyllous ............................................. Pentaloncha

3b Calyx lobes not showy and petal-like:

4a Leaf blades 100–340 mm long, densely felted underneath with cream-coloured hairs; stipules red, 30–40 mm long; ovary (2)3–5-locular with many ovules/seeds ......................................................... Stipularia

4b Leaves and stipules smaller, if similar in size then ovules 1 per locule; if ovules/seeds many, then locules 2:

5a Ovules (or seeds) 2–many in each locule:

6a Corolla lobes very narrowly lanceolate and about as long as, or longer than, the corolla tube; stigma capitate; flowers not heterostylos, both style and stamens exerted; capsule often with 1 persistent valve and 1 falling valve; small shrubs and herbs without raphides ........ Virectaria major (K. Schum.) Verdc.

6b Corolla lobes usually not so narrow and often shorter than the tube; stigma usually bilobed; flowers often heterostylos, with either stamens or style included; capsule mostly opening at the beak; raphides present (usually easily visible in ovary or fruit wall):

7a Inflorescences consisting of very lax elongated cymes, axillary (lateral) but only one per node; flowers 5-merous and leaves uniseriate; decumbent herbs of wet places with small white or blue flowers .............................................................. Pentodon

7b Inflorescences not as above; if flowers 5-merous, then other characters not so combined:

8a Flowers mostly 4-merous; leaf blades frequently linear to narrowly elliptic or uniseriate, or sometimes elliptic to ovate with lateral nerves ± discernible:

9a Flowers solitary, or fascicled at numerous nodes forming long interrupted spike-like inflorescences; leaves linear-subulate, rather sparse; corolla tube 1.5–2 mm long ........................................ Manostachya

9b Features not combined as above:

10a Beak of capsule as long as, or longer than, the rest of the capsule:

11a Robust subshrubby herbs with distinctly discolorous leaves; capsule rounded at the base ......................... Hedythyrsus

11b Delicate herbs; leaves not distinctly discolorous; capsule cordate at the base ................................................. Mitrasacmopsis

10b Beak of capsule shorter than the rest of the capsule:

12a Corolla tube cylindric, at least 20 mm long; anthers included and style exerted; flowers not heterostylos .... Conostomium

12b Corolla tube cylindric or funnel-shaped, shorter than 20 mm (sometimes with included anthers and exerted style but then usually heterostylos), or if 20 mm long then with both anthers and stigmas included:

13a Anthers and stigmas included, the latter always overtopped by the former; corolla tube narrowly cylindric ... Kohautia

13b Anthers and/or stigmas exerted or if both included then anthers overtopped by the stigma; corolla tube cylindric or funnel-shaped:

14a Stems strict, erect, usually unbranched; leaves linear or filiform; stipule sheath tubular, truncate or with 2 minute teeth; seeds dorsiventrally flattened .......................................................... Amphiasma

14b Stems lax or erect, mostly branched; leaves sometimes linear; stipular sheath scarcely tubular; seeds angular, subglobose or ovoid-trigonous:

15a Capsule with a thick bony wall and a solid beak, tardily dehiscent; prostrate perennial herbs often forming small mats .............................................................................. Lelya

15b Capsule with a thinner horny wall, with or without a beak but never solid, early dehiscent; plants upright or prostrate:

16a Capsule opening both septicidally and loculicidally; erect perennial herbs or subshrubs; inflorescences many-flowered, corymbose or subglobose heads; seeds ovoid-trigonous .................. Agathisanthemum

16b Capsule opening loculicidally; herbs annual or perennial, erect or prostrate, rarely subshrubby; inflorescences various but seldom many-flowered; seeds angular or subglobose ................................ Oldenlandia

8b Flowers mostly 5-merous; leaf blades mostly elliptic to ovate with obvious lateral venation, but if uniseriate then a decumbent subshrub:

17a Flowers solitary; corolla tube filiform, enlarged near apex; subshrub of rock crevices; leaves revolute ............... Batopedina

18b Flowers in several-flowered, sessile, pseudoaxillary clusters; corolla tube narrowly campanulate in upper half; procumbent perennial forest floor herbs .............................................................. Parapentas
17b. Flowers in more extensive inflorescences; habit of plants not as above; leaves larger, not revolute:
19a. Inflorescences capitate, or lax, much branched compound cymes, not elongating into simple “spikes” in fruit, although individual branches sometimes become spicate; corolla usually without a showy eye, the bases of the lobes not connate; fruit globose or obpyramidal, less often ovoid-oblong .......................................................... Pentas
19b. Inflorescences capitate, later elongating into a long simple “spike”, rarely with axillary spikes from the upper axils and frequently with solitary flowers at the lower nodes; corolla with a crimson hairy eye formed by the corolla bases of corolla lobes; fruits oblong .......................................................... Otomeria

5b. Ovules (or seeds) solitary in each locule, or flowers male:
20a. Style topped by a pollen presenter which is globose, cylindrical or mitriform and often ridged, 2–several-lobed at the apex when mature; flowers never heterostylos; inflorescences always axillary; fruit with 2–several woody pyrenes ................. Vangaerieae (go to Key 5)
20b. Style lacking a pollen presenter; flowers frequently heterostylos; fruit occasionally with pyrenes (but then inflorescence terminal) or sometimes with one many-seeded stone (putamen):
21a. Plants usually ericaceous (heath-like) in appearance, often dioecious; flowers unisexual, wind-pollinated; stigmas long and feathery; corolla markedly inconspicuous; disk absent; fruit dehiscing into 2 mericarps:
22a. Inflorescence made up of axillary, ± sessile flower clusters; fruit supported by a carpophore ........................................... Anthopseudum
22b. Inflorescence terminal, paniculate to thyrsoid-paniculate; fruit never supported by a carpophore ........................................... Galopina
21b. Plants generally not ericaceous in appearance; flowers hermaphrodite, insect-pollinated; stigmas not as above; corollas inconspicuous or moderately showy; disk present; fruit various:
23a. Corolla tube filiform or narrowly funnel-shaped; calyx lobes unequal, 1 or more enlarged; flowers not heterostylos, both stamens and style exerted; ovary bicarpellate, but often with one carpel reduced in fruit .................................................. Otiophora
23b. Corolla tube not markedly narrow; calyx lobes usually equal; flowers frequently heterostylos; ovary 2–5-locular; carpel reduction unusual in fruit:
24a. Ovules pendulous from near apex of locule; fruit dry or somewhat fleshy, indehiscent or tardily splitting into cocci:
25a. Slender erect annual herbs; corolla white:
26a. Flowers 3- or 4-merous ................................................................. Paraknoxia
26b. Flowers 5-merous .................................................................................. Neopentanisia
25b. Plants perennial, more robust herbs; corolla mostly blue:
27a. Flowers in heads arranged in umbel-like inflorescences; flowers fused in pairs consisting of 1 calyx, 2 corollas and 2 fused ovaries, each 1-locular ................................................................. Calanda
27b. Flowers, if in heads, not arranged umbel-like; flowers not fused in pairs ................................................................. Pentanisia
24b. Ovule erect from the locule base, or attached near middle of the septum; fruit drupe-like, or dry and variously dehiscent:
28a. Ovule erect from the locule base; flowers always terminal, often pedicellate; fruit drupe-like; creeping or sometimes shrubby herbs, often on forest floors:
29a. Leaves seldom cordate at base; pyrenes not dehiscent; subshrubby herbs:
30a. Flowers in heads surrounded by an involucre; endosperm not ruminate ................................................................. Trichostachys
30b. Flowers not in heads; endosperm ruminate or not ................................................................. Psychotria
29b. Leaves mostly cordate at base; pyrenes with a distinct line of dehiscence; endosperm not ruminate; usually small creeping herbs:
31a. Stipules with a membranous sheath within; pyrenes smooth ................................................................. Hymenocoleus
31b. Stipules without a membranous sheath within; pyrenes ribbed, often rugose ................................................................. Geophila
28b. Ovule attached near middle of the septum; flowers sessile in axils, or in terminal heads; fruit dry (often splitting) or less often succulent; herbs or subshrubs, usually in open situations:
32a. Ovary 3-locular; stigma 3-lobed; fruit with 3 cocci ................................................................. *Richardia
32b. Ovary 2-locular; stigmas 2-lobed or capitulate; fruits indehiscent, capsular with 2 valves, with 2 cocci or circumscissile:
33a. Fruit circumscissile about its middle, the top coming off like a lid; flowers in dense globose nodal clusters, minute (corolla tube up to 2 mm long); seeds with a ventral impressed X-like pattern .............................................. Mitracarpus
33b. Fruit indehiscent or opening by longitudinal slits, or 2-coccous; flowers in axillary or terminal clusters, usually larger; seeds lacking an X-like pattern:
34a. Succulent creeping plant of the seashore with imbricate leaves; stipules quite broad, sheathing, with very short processes; stems rooting at the nodes; fruits indehiscent; seeds not lobed .................................. Phylohydrax
34b. Plant not succulent, not growing on seashore but sometimes riverine; leaves not imbricate; stipules with longer processes; stems not rooting at the nodes; fruits dividing into cocci; seeds lobed:
35a. Fruit with 2 indehiscent or ± indehiscent cocci ................................................................. Diodia
35b. Fruit opening from apex to base or base to apex, or splitting into 2 cocci, one or both dehiscent ... Spermacoce

Key 2—Perennial herbs, sometimes woody at base, with woody rootstock (pyrophytes or geofrutescens)
1a. Calyx tubes joined together; fruits fleshy, fused into syncarps; corolla lobes valvate; raphides present (especially in ovary and fruit walls) ........................................... Morinda angolensis (R.D.Good) F.White
1b. Calyx tubes always free; fruit not compound; corolla lobes various; raphides present or absent:
2a. Ovules (or seeds) few to numerous in each locule:
3a. Corolla lobes valvate; flowers heterostylos; raphides present; capsules dehiscent; stipules fimbriate ................................................................. Pentas (partly)
Seed plants of southern tropical Africa: families and genera

Rubiaceae: Key 2—Perennial herbs

4a Flowers clearly axillary in both axils; inflorescence fasciculate with cupular bracteoles; corolla tube shorter than 12 mm, ± equal to the
lobes in length; fruit 5–15 mm in diameter:
5a Leaves suborbicular with subpalmate venation, petioles long, slender; flowers solitary; endemic in Angola .............................................. Ganguelia
5b Leaves distinctly longer than wide with pinnate venation; flowers mostly more than 1 per inflorescence:
6a Calyx limb 4–5 mm long, entire in bud, splitting into 2 or 3 lobes in mature flowers; anthers basifixed; fruit 10–15 mm across;
linear bacterial nodules present on midrib and petioles ............................................................... Sericanthe suffruticosa (Hutch.) Robb.
6b Calyx limb not as above; anthers dorsifixed; fruit 6–8 mm across; bacterial nodules absent ........................................... Tricalysia cacondensis Hiern
4b Flowers terminal; inflorescence not as above; corolla tube mostly longer and exceeding the lobes; fruit mostly larger:
7a Flowers 1–3; corolla pubescent outside, lobes (4)5(6); seeds free, with a small excavaion on the ventral face; stipules 6–16 mm long ........
............................................................................................................................................................... Leptactina (partly)
7b Flowers solitary; corolla glabrous outside, lobes 5 or 6–8; seeds in a pulpy placenta, not excavated; stipules not longer than 7 mm .......
............................................................................................................................................................... Gardenia (partly)
2b Ovules (or seeds) solitary in each locule:
8a Corolla lobes contorted; flowers not heterostyly; anthers and style always exerted; raphides
absent; seeds with excavation on ventral face; inflorescence terminal on leafless lateral branches (sometimes reduced or even entirely
suppressed); bacterial nodules present in leaf blades ................................................................. Pavetta (partly)
8b Corolla lobes valvate; corolla tube subequal or a little longer than the lobes, if longer, then usually bright blue; raphides absent or present;
flowers often heterostyly; seeds not excavated; inflorescences terminal or axillary; bacterial nodules absent in leaf blades except for some
species of Psychotria.
9a Flowers heterostyly; stigma bifid; pyrene walls cartilaginous to crustaceous; inflorescences terminal:
10a Corolla blue, white, lilac or purple; corolla tube longer than the lobes; ovules pendulous fruit ± dry ........ Pentanisia schweinfurthii Hiern
10b Corolla white; corolla tube ± equaling the lobes or a little longer; ovules erect; fruit fleshy:
11a Inflorescence axes not white; pyrenes without well-marked dehiscence; testa red-brown or purplish; endosperm often ruminate;
stipules entire or bifid, often caducous, never becoming corky ................................................................. Psychotria (partly)
11b Inflorescence axes white, tinged purple; pyrenes with ± well-marked dehiscence; testa pale; endosperm not ruminate; stipules ±
truncate, often becoming corky ...................................................................................................................... Chassalia umbralectola Vatke
9b Flowers not heterostyly; style topped with a pollen presenter which is globose, cylindrical or mitriform, often ridged, 2–several-lobed at
the apex when mature; pyrene-walls crustaceous to woody; inflorescences axillary:
12a Ovary 2-locular:
13a Corolla coriaceous, drying wrinkled, glabrous; buds obtuse; leaves glabrous, drying the characteristic yellow-green of an alu-
minium-accumulator; pyrenes very thickly woody, irregularly ridged with lines of dehiscence apparent ........................................................ Multidentia concrescens (Bullock) Bridson & Verde.
13b Corolla not coriaceous nor drying wrinkled; buds acuminate; leaves hairy or velvety, the blades not drying yellow-green;
pyrenes not so thickly woody:
14a Small subshrub 0.15–0.3 m tall; calyx lobes narrowly oblong, elliptic or lanceolate, 0.8–5 mm long; leaves hairy beneath
but not so densely as to hide the surface ......................................................................................... Pygmaeothamnus zeyheri (Sond.) Robyns
14b Shrub or subshrub 0.6–5 m tall; calyx lobes linear, 1.5–4 mm long; leaves velvety beneath, surface obscured ......................
......................................................................................................................................................... Rytigynia decussata (K.Schum.) Robyns
12b Ovary 3–8-locular, a few flowers sometimes with 2-locular ovaries:
15a Corolla tube 17–25 mm long, sometimes curved, rusty tomentose outside; calyx lobes 5–13 mm long, lanceolate-triangular;
fruit ± 14 mm across, with a rusty coloured velvety pubescence; leaf blades drying dark, with a fine network of pale yellowish
nerves on upper surface and pale velvety beneath ................................................................. Ancyranthis rubiginosus Desf.
15b Corolla tube much shorter; other characters not as combined above:
16a Plants glabrous to pubescent; leaf blades sometimes with fine white pubescence, finely velvety beneath or occasionally
felted beneath (if in doubt try both leads):
17a Stems branched; leaf blades often acuminate at apex; calyx lobes reduced or dentate; corolla never large; lobes blunt, apiculate or
distinctly tailed ......................................................................................................................... Rytigynia (partly)
17b Stems mostly unbranched; leaf blades infrequently acuminate; calyx and corolla various:
18a Leaves mostly in whors of 3–5; calyx limb truncate, dentate or lobed; corolla large or small, lobes blunt, apiculate or
infrequently subulate (F. chlorantha) .......................................................................................... Fadogia
18b Leaves in pairs, rarely in whors of 3; calyx limb with linear or linear-oblong lobes; corolla small, lobes distinctly
apiculate ................................................................................................................................................ Pachystigma (partly)
16b Plants with a conspicuous indumentum; leaf blades densely velvety or felted on lower surface:
19a Calyx lobes 0.5–1 mm long; calyx tube and corolla similarly covered by dense, pale, curled hairs; fruit ± 10 mm across,
drying black, ± glabrous or with scattered cottony hairs; indumentum on young stems and lower surface of leaves
especially densely felted; small shrubs 0.3–4 m tall, with branched stems ........................................ Fadogiella
19b Calyx lobes longer; calyx tube indumentum often differing in density and/or type from that on the corolla; fruit often
larger, mostly yellow, orange or reddish becoming brownish when dry, often with golden velvety hairs; indumentum
on stems and leaves mostly velvety but sometimes with curled hairs; branched shrubs or single-stemmed subshrubs .......
......................................................................................................................................................... Tapiphyllum (partly)
Key 3—Climbing or scandent (herbaceous or woody)

1a Plants covered with curved prickles; leaves and stipules similar to each other, in whorls of (2)4(8); corolla rotate to subcampanulate; fruit fleshy, 2-seeded ........................................................... Rubia

1b Plants not prickly but spines sometimes present; leaves usually paired, very different from stipules; corolla distinctly tubular:

2a Flowers showy, 1–several, appearing axillary on alternate sides of successive nodes; calyx lobes reddish, oblanceolate, contorted in bud; corolla silvery pinkish subulate; fruit large, up to 100 x 55 mm .......................................................... Sherbournia bignoniiflora (Welw.) Hua

2b Flowers and inflorescences not as above, or if flowers showy then corolla not silky; fruit much smaller:

3a Plants petioled; leaves paired or in whorls of 3, long-petiolate and coriaceous at base; fruits flattened, outer pericarp falling off to expose 2 compressed, winged pyrenes attached by long filiform stalks .......................................................... Paederia

3b Plants not evil-smelling; leaves not as above; fruit not of this characteristic structure:

4a Flowers in solitary, terminal or axillary, many-flowered, spherical heads; flowering branches with strongly curved hooked axillary spines ....

4b Combination of characters not as above:

5a Inflorescence axillary; corolla lobes valvate in bud:

6a Stigma divided into 4 or 5 lobes or arms; ovary 4- or 5-locular; ovules/seeds many .......................................................... Sabicea

6b Pollen presenter cylindric, 2-lobed at the tip; ovary 2-locular; ovules/seed 1 per locule:

7a Leaves, branches and recurved spines often in whorls of 3 .......................................................... Vangueriella

7b Leaves and branches opposite; spines absent:

8a Leaves coriaceous, glabrous, drying bright green; stipules with a strongly keeled lobe; inflorescences not pedunculate; calyx limb reduced to a rim, shorter than the disc; anthers reflexed; fruit didymous; seeds with endosperm not streaked by granules ....

8b Leaves chartaceous to coriaceous, not drying bright green; stipules lacking a keeled lobe; inflorescence pedunculate; calyx limb at least equalising the disc, often dentate, occasionally lobed; anthers exerted but not reflexed; fruit ± obcordate in outline; seed with endosperm streaked with granules .............................................. Psychodra

5b Inflorescence terminal, often one-sided pseudoaxillary or sometimes with additional axillary inflorescences near apex of main stem:

9a Corolla lobes valvate in bud, flowers heterostylous; stipules 2- or morelobed:

10a Ovules/seeds 1 per locule; raphides present .......................................................... Psychotria

10b Ovules/seeds many per locule; raphides absent or present:

11a Flowers mostly in pairs on lax panicles; fruit ± 5 mm in diameter, tardily dehiscent into 2 cocci; raphides present ... Sacosperma

11b Flowers in ± dense, often showy panicles, mostly with one or more of the peripheral flowers developing one very large, showy, brightly coloured sepal with palmate venation; corolla lobes reduplicate-valvate in bud, tube mostly hairy outside, longer than 15 mm; fruit large (15–25 mm in diameter); .......................................................... Musaenda

9b Corolla lobes contorted in bud; fruit more than 10 mm in diameter, indehiscent; raphides absent:

12a Ovary 1-loccular with 2(3)4 parietal placentas; pollen presenter large:

13a Flowers solitary, terminal, pubescent outside; pollen simple .......................................................... Pseudogardenia

13b Flowers several in terminal clusters, glabrescent to pubescent outside; pollen in tetrads .............................................. Macrophyra

12b Ovary 2(3 or 4)-locular with placenta attached to the septum or axile, or ovule basal if solitary:

14a Ovules/seeds 1 to several per locule; seeds either globose (if solitary) or frequently with an adaxial excavation; anthers with short filaments:

15a Ovules 1–several, impressed on a placenta attached to the septum; corolla with 5 reflexed lobes; seeds several per fruit, with a small cavity and entire endosperm; stipules often triangular-ovate, dark green when fresh, turning black when dry .......................................................... Tarenna

15b Ovule single, erect from the base of each locule; corolla with 4 or 5 spreading lobes; seed 1 per fruit, spherical with strongly ruminate endosperm; stipules fimbriate or shortly sheathing and aristate, not dark green to black .... Rutidea

14b Ovules/seeds many; anthers almost sessile:

16a Vegetative parts completely glabrous; corolla tube glabrous outside; fruit barrel-shaped with a long peduncle, smooth when ripe .......................................................... Atractogynae

16b Vegetative parts with silky or tomentose indumentum; corolla tube silky outside; fruit narrowly to broadly ellipsoid, ribbed and often wrinkled between ribs .......................................................... Aoranthe

Key 4—Shrubs or trees

1a Leaf blades 100–340 mm long, with white, feltedomentum beneath; stipules 30–40 mm long, reddish; inflorescences axillary, each enclosed in an involucre .................................................................................. Stipularia africana Beauv.

1b Leaf blades, stipules and inflorescences not as above:

2a Flowers sessile, in a dense, sessile, many-flowered cluster subtended by broad bracts and borne at ends of lateral shoots opposite a single leaf; leaves up to 1.4 m long and 0.5 m broad; habit resembling that of Carica papaya .......................................................... Schumanniphyton

2b Combination of characters not as above:

3a Flowers in globose or capitate heads:

4a Calyces ± joined together; fruits a fleshy syncarp:

5a Inflorescences 4–9 mm in diameter (excluding corollas), 5–20-flowered; flowers heterostylous; corolla lobes valvate, later spreading; ovules/seeds 1 per locule; raphides present .......................................................... Morinda

5b Inflorescences 30–50 mm in diameter (excluding corollas) distinctly more than 35-flowered; flowers not heterostylous; corolla lobes

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imbricate, remaining erect; ovules/seeds many; raphides absent:
6a Stipules small, triangular, apex obtuse or sharply notched, ± persistent; placenta attached to middle of sepalum, somewhat discoidal with ovules spreading in all directions ................................................................................................................................. Sarcoccephalus
6b Stipules large, elliptic or obovate, deciduous or ± persistent; placenta attached to upper third of sepalum, Y-shaped, ovules spreading in all directions but predominantly pendulous ......................................................................................................................... Nauclea
4b Calyces not joined together; fruits not forming a syncarp:
7a Inflorescence heads perfectly and densely spherical; bracts caducous or insignificant; interfloral bracteoles absent or present:
8a Ovules solitary and pendulous in each locule; fruit fleshy ......................................................................................................................... Cephalanthus natalensis Oliv.
8b Ovules many; fruit dry:
9a Corolla lobes valvate, ending in an appendage; seeds small, with winged margins:
10a Stipules conspicuous, oval, flat, often reddish; capsule ribbed; stigma nitritiform ................................................................. Halica
10b Stipules not conspicuous, triangular, caducous; capsule not ribbed; stigma spherical to bilobed in bud ....................... Corynanthe
9b Corolla lobes imbricate; stipules not so markedly conspicuous, never red; flowering heads solitary; seeds not winged:
11a Leaves paired, broadly elliptic; inflorescence terminal, at least 20–40 mm across (including corollas); calyx lobes spathulate, persistent; wood bright orange; stipules 30–56 x 15–35 mm, oblanceolate to broadly oblanceolate ...........
................................................................. Burttdavya nysica Hoyle
11b Leaves in whorls of 3 or 4, lanceolate; inflorescence lateral, up to 25 mm across (including corollas); calyx lobes obovate, eventually deciduous; wood not bright orange; stipules smaller, ± triangular, bifid ............................................................... Bertiera angusiana

7b Inflorescence heads not perfectly spherical, often subtended by bracts:
12a Ovules/seeds many per locule; ovary 2-, 4- or 5-locular:
13a Corolla lobes terminating in a conspicuous appendage; stigma spherical, undivided; ovary 2-locular ....................... Corynanthe
13b Corolla lobes small, without terminal appendage; style ending in 4 or 5 narrow branches; ovary 4- or 5-locular ........ Sabicea
12b Ovules/seeds 1 per locule:
14a Corolla lobes valvate; flowers heterostylos; inflorescence with bracts surrounding base of inflorescence; bacterial nodules absent from leaves; raphides present ................................................................................................................. Psychotria
14b Corolla lobes contorted; flowers with style and anthers always exerted; inflorescence with bracts small or sometimes larger and ± membranous; bacterial nodules present in leaves; raphides absent ............................................................................................................................................. Pavetta (partly)

3b Flowers solitary or in lax to compact or spike-like inflorescences:
15a Inflorescences spike-like, racemose or narrowly thyrsoid:
16a Inflorescences subtended by large red leaf-like, paired, stipitate, venose bracts; corolla cylindric below, funnel-shaped or narrowly campanulate above with erect lobes, glabrous outside; fruit a capsule; seeds conspicuously winged ................................................................. Hymendictyon floribundum (Hochst. ex Steud.) B.L.Robinson
16b Inflorescences not subtended by conspicuous bracts; corolla ± salver-shaped, pubescent outside; fruit a berry; seeds not winged .................................................................................................................................................................. Bertiera angusiana N.Hallé
15b Inflorescences not as above:
17a Calyx limb often white, eccentric, entire or ± shallowly lobed, venose and accrescent, up to 28 mm wide in fruit; fruit dry and often tardily dehiscent; corolla tube narrowly tubular, 3–5 mm long ................................................................................................................................................ Carphalea
17b Calyx limb not as above, usually with 4 or 5 distinct lobes or teeth, or reduced to a rim:
18a At least a few calyx lobes large and leaf-like in each inflorescence, mostly longer and wider than 20 mm, white, cream or red:
19a Fruit ± succulent or at least indehiscent; corolla lobes reduplicate-valvate, apiculate ............................................... Musaenda (partly)
19b Fruit dry, dehiscing at the apex; corolla lobes induplicate-valvate, bearing subapical filiform appendages up to 2 mm long ................................................................. Pseudomusaenda
18b Calyx lobes equal or slightly unequal and green, or if 1 or 2 enlarged into a coloured lamina then not as long or wide as 20 mm:
20a Small tree or shrub growing in the littoral zone just above high tide level, the stems covered with large leaf scars; leaves large, crowded at the ends of the branchlets; calyx limb truncate; corolla white, salver-shaped, velvety outside, the tube 
± 25 mm long with 4–9 lobes; ovary 4–9-locular; fruit globose, fibrously woody, up to 35 mm in diameter, containing 
one multi-seeded stone ........................................................................................................... Guettarda speciosa L.
20b Not growing in the littoral zone, or if so then calyx limb, corolla, fruit and habit not as above:
21a Corollas valvate, mostly white and not markedly showy; flowers heterostylos; raphides absent:
22a Inflorescences axillary or supra-axillary:
23a Inflorescences corymbose to subumbellate, at least some flowers pedicellate; ovules many in each locule; fruit orange or red when ripe ....................................................................................................................... Pauridiantha
23b Inflorescences congested, pedicels usually absent; ovule solitary in each locule; fruit not orange or red:
24a Leaves with many arching lateral nerves and closely parallel scalariform tertiary venation; locules 4–12; ovules erect; fruit blue when ripe, with 4–12 pyrenes; inflorescences axillary, sessile or pedunculate .......... Lasianthus
24b Leaves with venation mostly closely reticulate; locules 2; ovules pendulous; fruit probably green to black when ripe, 1-seeded; inflorescences supra-axillary or less often axillary, always pedunculate ............ Craterispernum
22b Inflorescences terminal:
25a Stipules entirely sheathing, ± 10 mm long, several-fimbriate; ovary superior; fruit apex devoid of calyx limb remains ...................................................................................................................................................... Gaertnera
25b Stipules sheathing only at the base, not fimbriate; ovary inferior; fruit crowned by calyx limb or with apical scar:
26a Styles divided into 6–8 filiform lobes; ovary with 4–10 locules, each containing 2(3) collateral erect ovules, but only 1 develops into a seed in each locule; corolla-tube ± 10 mm long, woolly tomentose outside or at least with pubescent lines; drupes red, with woody putamen; plants mainly littoral or in coastal bushland .......................... 26b Styles 2-fid; ovary 2-locular; other characters not as combined above:

27a Pyrenes without a well marked dehiscence; testa red-brown or purplish; endosperm often ruminate; baccellar nodules sometimes present in the leaves; stipules entire or bifid........................................... 27b Pyrenes with ± well marked dehiscence; testa pale; endosperm not ruminate; baccellar nodules never present in the leaves; stipules never lobed, frequently becoming corky:

28a Inflorescence axes not white; pyrenes opening by 2 marginal slits; flower-buds never winged; shrubs with leaves mostly developing after the flowers have matured; stems corky ................................................. 28b Inflorescence axes often white tinged purple; pyrenes opening by 1 dorsal slit; flower buds and corolla lobes often with longitudinal narrow wing-like keels (but not present in some species); flowers contemporaneous with mature leaves; stems not markedly corky .......................................................... 21b Corollas valvate, contorted or sometimes imbricate; flowers mostly with secondary pollen presentation, occasionally heterostylous or homostylous (if both valvate and heterostylous then corolla usually coloured or pubescent); raphides absent:

29a Corolla lobes valvate; style topped with a globose, cylindrical or mitriform pollen presenter, often ridged; pollen presenter 2- to several-lobed at apex when mature, hollow with style attached internally or occasionally with style attached at the base; flowers heterostylous; locules 2–10; pyrene walls woody or sometimes crustaceous; inflorescences always axillary .......................................................... 30a Spines present; corolla showy; fruit large:

31b Lateral spurs absent or present; flowers not supra-axillary; corolla not trumpet-shaped; seeds many, up to 5 mm in diameter:

32b Corolla tube distinctly longer than the lobes; calyx limb with short triangular teeth, persistent in fruit; leaves mostly developing after the flowers have matured; stems corky .......................................................... 32a Corolla tube much shorter than the lobes; calyx lobes oblong, ovate or spatulate, persistent and ± accrescent in fruit; leaves very often pubescent .......................................................... 33a Plants deciduous; flowers and fruit clustered on mature stems with the leaves restricted to apical and lateral inflorescences always axillary ........................................................................................................... 33b Plants evergreen, or if deciduous then other characters not combined as above:

34a Inflorescences axillary, in both axils of a node (sometimes at naked nodes) or sometimes supra-axillary, pedunculate or sessile, if on brachyblasts (contracted lateral spurs) see contrast 46a; corolla lobes usually contorted:

35a Flowers solitary, supra-axillary; corolla trumpet-shaped, longitudinally ribbed; fruit 20–33 mm long, thin-walled; seeds with fibrous coat ................................................. 35b Flowers 1–many, axillary; corolla, fruit and seeds not as above:

36a Inflorescences pedunculate, distinctly and rather laxly branched; flowers always pedicellate:

37a Stipules often blackening when dry; corolla tube cylindric, ± as long as lobes; seeds with a small ± circular excavation, or a partly ruminate endosperm ................................................. 37b Stipules not tending to blacken when dry; corolla tube and seeds not as above:

38a Corolla subrotate; tube ± 1 mm long; endosperm ruminate, visible as longitudinal striations on seed surface .............................................................. 38b Corolla funnel-shaped to campanulate; endosperm entire:

39a Corolla lobes usually longer than tube; calyx lobes divided nearly to base into narrowly triangular lobes; pollen presenter with 10 narrow membraneous ciliate wings .... 39b Corolla lobes shorter than tube; calyx shallowly lobed; pollen presenter not winged ....

40a Stipules 10–12 mm long, attenuate from a triangular base, eventually caducous; flowers not pedicellate, mostly borne at naked nodes; both anthers and style included well below the corolla throat; seeds 2–4 per fruit ................. 40b Stipules smaller, awned or more broadly triangular; inflorescences mostly borne at leafing nodes;
flowers often pedicellate; anthers and style both exserted, or less often either or both included at or near the throat; seeds 1, or few to several:
41a Calyx limb reduced to a rim, usually shorter than the disc, but occasionally truncate and ±
equaling the disc; corolla tube ± equal to lobes; anthers and style exserted; fruit 2-seeded;
seeds with a well-defined groove on ventral face (typical coffee-beans); inflorescence
1–several-flowered ................................................................. Coffea
41b Calyx limb mostly at least as long as the disc, truncate, dentate or lobed; fruit 2–many-seeded;
seeds lacking a ventral groove:
42a Stipules triangular-acuminate, sometimes shortly aristate, often caducous, sometimes
obscured by inflorescences even at apical node; small, round, often corollas leaves
often present at base of lateral branches; style undivided, shortly bifid at apex or
sometimes distinctly bifid, usually hairy; flowers several in sessile or pedunculate
glomerules, very rarely pedicellate:
43a Flowers 5(6)-merous; anthers exerted; bracts and bracteoles triangular-acuminate,
not forming cupules; seeds with endosperm entire and testa wrinkled-strapitate ..........
................................................................................................. Cremaspora triflora (Thonn.) K.Schum.
43b Flowers 4-merous; anthers included, or only tips showing; bracts and bracteoles
circular, often thinly chaffy; seeds with ruminate endosperm and testa with
fingerprint-like striations ............................................................... Polysphaeria
42b Stipules shortly sheathing at base, distinctly aristate; modified leaves not present at base
of lateral branches; style clearly 2-armed, usually glabrous; flowers fewer, stalked or subsessile:
44a Leaves with acumen very distinctive, 8–40 mm long; calyx limb tube truncate,
25–70 mm long, characteristically split down one side; anthers locellate; ovule/seeds
one per locule; testa apparently absent ... Calycosiphonia spathicalyx (K.Schum.) Robbr.
44b Leaves with acumen much shorter; calyx limb seldom as above; anthers not locellate;
ovules/seeds mostly more than one per locule; testa present:
45a Anthers ± medifixed, the connective not enlarged; theca ± contiguous and subparallel;
bacterial nodules absent ............................................................... Tricalysia
45b Anthers basifixed, the connective enlarged so that the theca diverge; linear
bacterial nodules often present along the midrib and petiole ............ Sericanthe
34b Inflorescences terminal on main and lateral branches (occasionally appearing axillary by extreme reduction
of lateral branches, in which case bacterial nodules are present in the leaves) or lateral (i. e. alternate,
with inflorescence in only one axil at each node); sometimes with a few axillary inflorescences in
addition to the terminal one, or borne on brachyblasts (contracted lateral spurs); corolla lobes contorted,
valvate or sometimes imbricate:
46a Subshrubs; corolla lobes valvate, very narrowly lanceolate, subequal to tube in length, suberect;
both capitate stigma and stamens exerted; calyx lobes not persistent in fruit; capsule often with 1 persistent
and 1 falling lobe; seeds numerous, unwinged ........................................ Viricertaintya major (K.Schum.) Verdc.
46b Mostly shrubs or trees; corolla lobes and fruit not as above:
47a Corolla tubular below, funnel-shaped to campanulate above; corolla lobes erect, often cowl-shaped
and ending in an appendage; capsule narrowly ellipsoid or subcylindric; seeds with wing bifid at
one end:
48a Petiole with articulate base; abaxial side of leaf blade hairy; corolla appendages absent; anthers
included; style exerted .............................................................. Hymenodictyon
48b Petiole not articulate at base; abaxial side of leaf blade glabrous; corolla appendages present;
anthers and style either both included or both exerted:
49a Corolla tube gradually widening; corolla lobes with a spherical, curved or linear and terminal-
ly thickened appendage; anthers and style exerted, stigma spherical and undivided; capsule
loculicidal and above somewhat septicidal ........................................ Corynanthe
49b Corolla tube differentiated in an apical bladder and a basal narrow cylindrical part; corolla
lobe appendages linear, terminally not thickened; anthers and style included; stigma bilobed;
capsule septicidal and mostly partly loculicidal .......................................... Pausinyostiala
47b Corollas not as above; fruit, if capsular, then ± globose and not lenticellate; seeds unwinged, or with
a fimbriate wing:
50a Corollas with a coloured star-shaped eye at the throat; corolla lobes valvate or imbricate; flowers
heterostyly or isostyly; ovules many in each locule; fruit berry-like, slightly fleshy to
fleshy:
51a Each stipule almost completely divided into 2 separate lobes, rather small and caducous;
corolla lobes imbricate (quinquincal); calyx lobes ± leaf-like, often somewhat spatulate,
persistent in fruit; fruit globose, slightly fleshy but soon dry. ................................... Heinsia
51b Each stipule entire or if divided not completely 2-lobed; corolla lobes reduplicate-valvate;
calyx lobes triangular, at the most slightly spatulate; fruit fleshy, indehiscent, often lenticellate ................................................................. Mussaenda (partly)

50b Corollas lacking an eye as above; corolla lobes contorted; flowers mostly with secondary pollen presentation; ovules 1–many in each locule; fruit berry-like (often large and ± woody), drupe-like or sometimes capsular.

52a Inflorescences consisting of several- to many-flowered cymes, one borne at every other node; flowering nodes often with only 1 developed leaf; leaf pairs on non-flowering nodes either of 2 similar or very dissimilar leaves:

53a Leaf pairs on flower-bearing and non-flowering nodes similar; ovary 4-locular........ Morelia

53b Flower-bearing node with only 1 developed leaf; ovary 1- or 2-locular:

54a Flowers with densely hairy throat; anthers exerted from corolla tube; fruit less than 10 mm in diameter ................................................................. Aidia

54b Flowers with glabrous throat, sometimes with a band of hairs below the anthers; anthers ± included in corolla tube; fruit longer than 50 mm:

55a Leaf pairs on non-flowering nodes of 2 very dissimilar leaves; flower buds and corolla lobes tapering to a fine point; ovary 2-locular with axile placentas ........ ................................................................. Massularia

55b Leaf pairs on non-flowering nodes of 2 similar leaves; flower buds and corolla lobes blunt-tipped; ovary 1-locular with 2 parietal placentas .......... Brenania

52b Inflorescences not as above and the flowering nodes not anisophyllous; flowers and fruit small to large:

56a Inflorescences strictly lateral; stipules green, moderately conspicuous, triangular or ovate, scarcely sheathing; seeds not held together by pulpy tissue, seed surface with a fingerprint-like pattern of striations:

57a Shrubs or small trees, seldom less than 1 m tall; corolla tube narrowly cylindric ..........

................................................................. Oxyanthus

57b Small shrubs, or less often a tree, 0.3–1.8(–8) m tall; corolla tube cylindric at base and funnel-shaped above .............................................. Mitriostigma axillare Hochst.

56b Inflorescences and stipules not as above; seeds 1 or few to numerous, often held together by pulpy tissue; seed surface lacking a fingerprint-like pattern:

58a Plants with brachyblasts (contracted lateral spurs) or cushion shoots:

59a Flowers precocious, subtended by a series of chaffy bracts/bracteoles; corolla tube narrowly cylindric, 10–42 mm long; calyx limb ± 1.5 mm long, shortly tubular, repand to shortly dentate, persistent in fruit; fruit 5 mm in diameter, 2-seeded................................. Argocoffeopsis ekctensis (Wernham) Robbr.

59b Flowers contemporary with the leaves; bracts/bracteoles not chaffy; calyx limb tube 1–2.5 mm long, distinctly lobed; fruit few- to many-seeded:

60a Corolla tube usually at least 15 mm long; calyx lobes narrowly triangular to lanceolate .................. Gardenia brachythamnus (K.Schum.) Launert

60b Corolla tube up to 7 mm long; calyx lobes ovate, often spatulate, separated by broad sinuses:

61a Corolla rotate, tube scarcely exceeding calyx limb tube; calyx lobes 4–7 (–13) mm long; fruit yellow-green or brown when ripe, 18–33 x 17–25 mm ................................................................. Catunaregam

61b Corolla funnel-shaped, tube longer than the lobes; calyx lobes 0.5–1.5 (–2.5) mm long; fruit black, 5–7 mm in diameter ................................................................. Coddia rudis (E.Mey. ex Harv.) Verdc.

58b Plants without brachyblasts or cushion shoots, lateral branches often short but with leaves clearly spaced:

62a Inflorescence usually borne on a very short shoot above a single leaf; corolla tube variously shaped, hairy outside:

63a Flowers markedly showy; corolla tube 25–230 mm long, narrowly cylindric at base, campanulate or funnel-shaped above, terminal, solitary or sometimes 2 or 3 together; corolla lobes contorted to the left or right; fruit ± ovoid to globose, 18–85 mm long; ovules many; seeds many, compressed:

64a Flowers surrounded at base by persistent scarious scales; leaves deciduous, tufted at ends of shoots; calyx tube very short, lobes spreading .... Euclinia

64b Flowers not surrounded at base by scarious scales; leaves not markedly tufted at ends of shoots ...................................................... Rothmannia

63b Flowers moderately showy; corolla up to 30 mm long; corolla lobes contorted to the left; fruit globose, ± 13 mm in diameter; ovules 2–10; seeds few, free; testa absent:
65a Corolla campanulate ............................. Heinsenia diervilleoides K.Schum.
65b Corolla salver-shaped, often split along one side .................... Aulacocalyx

62b Inflorescence essentially terminal, sometimes overtopped by the growing apex, or pseudoaxillary (due to suppression of lateral branches); corolla tube mostly cylindric to narrowly funnel-shaped and glabrous or hairy outside:

66a Flowers 1 or up to 3, markedly showy, sometimes overtopped by the stem apex; fruit large; seeds many, in pulpy tissue:

67a Deciduous shrub; corolla yellow-green, purple-spotted; corolla tube much shorter than lobes; calyx limb with corky ridges protecting bud in dry season, not persistent in fruit but leaving a bull’s-eye-like scar .............. Phellocalyx vollesenii Bridson

66b Flowers, if showy, then more numerous, never overtopped by stem apex; fruit mostly small to moderately large; seeds 1–few, or if many then seeds free:

69a Fruit a capsule, ± globose; seeds with a fimbriate wing; corolla distinctly pubescent outside; lobes 4–6; anthers ± two thirds exserted .........................

69b Fruit not dehiscent; seeds never winged; corolla pubescent or more often glabrous outside; lobes 4 or 5 (6); anthers usually fully exserted:

70a Calyx lobes subfoliaceous, 8–30 mm long, persistent in fruit; corolla large, tube 10–110 mm long, pubescent outside; fruit large, 8–22 mm in diameter; seeds many; stipules often conspicuous, either triangular and erect or ± rounded and reflexed:

71a Corolla tube much longer than lobes; anthers included, thecae undivided .............................................................. Leptactina

71b Corolla tube shorter than or ± as long as tube; anthers sessile but more than half exserted, thecae divided into many small chambers arranged in 4 narrow longitudinal bands ................ Dictyandra

70b Calyx lobes not nearly as conspicuous as above; corolla generally smaller; seeds 1–many; stipules less conspicuous, never rounded and reflexed:

72a Flowers 4-merous; fruit 2-seeded; seeds ± hemispheric with an excavation on the ventral face:

73a Bacterial nodules usually present in the leaf blades, either scattered or arranged along the midrib; inflorescence sessile, laxly corymbose to subcapitate, never with rachis articulated, sometimes inflorescence pseudo-axillary due to reduction of lateral branches; bracteoles stipule-like; pollen presenter entire; seeds rugulose, moderately shiny ...................... Pavetta

73b Bacterial nodules absent; inflorescence sessile or pedunculate; rachis sometimes white or tinted, often articulated; bracteoles linear, short; pollen presenter with 2 divaricate arms; seeds dull, often rusty-coloured, not rugulose .......... Ixora

72b Flowers 5(6)-merous; fruit 1–many-seeded; seeds variously shaped, entire or ruminate; stipules sometimes with the central area darkened:

74a Corolla lobes valvate; flowers heterostylos, borne in clusters on old wood ................................................. Stelechantha

74b Corolla lobes contorted; flowers not heterostylos, usually in cymes or in clusters but rarely on old wood:

75a Ovary 1-locular; ovules many on 2(4) parietal placentas:

76a Deciduous shrubs with conspicuous scarious or chaffy
76b Evergreen shrubs to medium-sized trees; stipules triangular to duck bill-shaped, not scarious or chaffy; flowers usually small ......................... *Coptosperma*

75b Ovary 2-locular; ovules 1–many; placenta axile or basal: 77a Flowers solitary or in pairs ......................... *Psilanthus* 77b Flowers in few- to many-flowered inflorescences: 78a Corolla tube campanulate in upper part; stipules 12–30 mm long, slightly fused at base; fruit ellipsoid, ribbed and often wrinkled between ribs ..... *Arunthe* 78b Corolla tube cylindrical, often narrowly so; stipules shorter than 10 mm, free; fruit smooth, often ± globose: 79a Ovule 1 per locale, with basal placenta; apex of anther connective slender, tapering, exceeding the anther by 0.3–0.4 mm .......... *Nichallea* 79b Ovules more than 1 per locale, or if only 1 than placenta not basal; anther connective shortly apiculate or not exceeding the thecae ..... *Tarenna*

**Key 5—Vanguerieae (from couplet 20a in Key 1 and couplet 29a in Key 4)**

1a Spines present:
2a Branches and leaves usually in whorls of 3 ............................................................................................................. *Vangueriella*

2b Branches and leaves opposite:
3a Calyx lobes conspicuous, leaf-like, 5–9 mm long, ± 7 times as long as the calyx tube, persistent in fruit; spines supra-axillary on the branches, or present on trunks of saplings, often quite robust; pyrenes 3–5 ................................................................. *Lagynias lasiantha* (Sond.) Bullock

3b Calyx lobes not so conspicuous; other characters not combined as above:
4a Spines present on trunks of young trees, or restricted to young or coppice shoots and ternately arranged, or less often paired from leaf axes; ovary 2- or 3-locular; corolla tube lacking ring of deflexed hairs inside; corolla lobes not apiculate; fruit 12–25 mm long .................

4b Spines positioned above lateral branches (sometimes reduced cushion shoots), or from leaf axis of more mature stems; other characters not combined as above:
5a Calyx lobes linear, 1.0–3.5 mm long, persistent in fruit; ovary always 2-locular .................. *Rytignya bugoyensis* (K.Krause) Verde.

5b Calyx lobes triangular, up to 1 mm long, acute; ovary 2- or 3-5-locular:
6a Inflorescences many-flowered, corymbose; peduncles 8–35 mm long .................................................. *Plectroniella armata* (K.Schum.) Robyns

6b Inflorescences few-flowered, or flowers solitary; peduncles seldom reaching 8 mm in length:
7a Stipules with a few hairs inside; pedicels 8–15 mm long; corolla tube 2.5–4 mm long ....................... *Canthium kunstzeanum* Bridson

7b Stipules with tuft of hairs inside; pedicels shorter; corolla tube not longer than 2 mm:
8a Spines only occasionally arising above reduced cushion shoots; calyx limb 0.25–0.6 mm long, truncate or shortly toothed; locules 2 or 3(5); fruit subglobose ................................................................. *Rytignya* (partly)

8b Spines always arising above reduced cushion shoots; calyx limb 0.5–1 mm long, divided almost to base into triangular or narrowly triangular lobes; locules always 2; fruit somewhat dorsiventrally flattened .................. *Canthium* subgen. *Canthium*

1b Spines absent (rarely some side branches spine-like in *Vangueria randri* and *Cuviera semseii*):
9a Branches and/or leaves usually in whorls of 3–5:
10a Ovary 2-locular; pollen presenter 2-lobed at apex .............................................................................. *Vangueriella*

10b Ovary 3–5-locular; pollen presenter 3–5-lobed or ridged ............................................................................................ *Fadogia*

9b Branches and leaves opposite:
11a Inflorescences entirely enclosed in bud by paired connate persistent bracts, umbellate or sometimes 1-flowered; pollen presenter solid with style attached to the base; leaves usually with tertiary venation obscure; corolla throat densely congested with hairs ..................... *Pyrostria*

11b Inflorescences never enclosed by paired bracts; pollen presenter hollowed at the base with the style attached internally; other characters not combined as above:
12a Corolla lobes 20–40 mm long, linear-lanceolate, greatly exceeding the tube, erect, tomentose or pubescent outside; fruit 20–40 mm long with calyx remains triangular to linear; pyrenes 2.................................................................. *Vangueriopsis lanciflora* (Hiern) Robyns

12b Corolla lobes not as above; fruit smaller, or if large then with more than 2 pyrenes, or with calyx remains cupular:
13a Climbing and/or scandent plants:
14a Leaves coriaceous, drying bright green, glabrous; stipules with a strongly keeled lobe; inflorescences not pedunculate; calyx limb reduced to a rim, shorter than the disc; anthers reflexed; fruit didymous; seeds with endosperm not streaked with granules ............ *Pydrax* subgen. *Phallaria*

14b Leaves chartaceous to coriaceous, not drying bright green, glabrous or pubescent; stipules lacking keeled lobe; inflorescences pedunculate; calyx limb at least equaling the disc, often dentate, occasionally lobed; anthers exerted but not reflexed; fruit ± obcordate in outline; seeds with endosperm streaked with granules .......................................................................................... *Keetia*

13b Trees, shrubs (sometimes subscandent), or subshrubby herbs:
RUBIACEAE: Key 5—Vanguerieae

15a Ovary/fruit 2-locular (rarely with occasional 3-locular ones as well); pollen presenter 2-lobed at tip:

16a Subshrubby herbs or single-stemmed shrubs from a woody rootstock, up to 2 m tall:

17a Leaves coriaceous; corolla coriaceous, drying wrinkled; pyrenes very thickly woody; inflorescences frequently supra-nodal ................................................................. Multidentia concrescens (Bullock) Bridson & Verde.

17b Leaves not coriaceous; corolla not coriaceous; pyrenes not thickly woody; inflorescences axillary:

18a Plants small, 150–300 mm tall; leaves glabrous or with sparse bristly hairs on both surfaces; calyx lobes somewhat leaf-like, narrowly oblong, elliptic or lanceolate; fruit 15–20 mm across ... Pygmaeothamnus zeyheri (Sond.) Robyns

18b Plants larger, at least 0.5 m tall; leaves velvety beneath, discolorous; calyx lobes linear; fruit up to 10 mm across ...............

................................................................. Rytigynia decussata (K.Schum.) Robyns

16b Shrubs or trees (1–)2–20 m tall:

19a Styles usually at least twice as long as the corolla tube; pollen presenter ± cylindric; stipules glabrous within; disc sometimes pubescent; inflorescences usually subtended by leaves; seed with cotyledons perpendicular to ventral face:

20a Trees or shrubs, sometimes scandent; leaves typically subcoriaceous to coriaceous, drying light green, or occasionally chartaceous in deciduous species; if plants scandent, then stipules triangular to truncate at the base with a strongly keeled lobe; calyx limb consisting of a dentate to repand rim, usually much shorter than the disc, only occasionally equalling the disc; anthers usually reflexed; fruit not or scarcely indented at the apex except when ± didymous; pyrene cartilaginous to woody with shallow apical crest ................................................................. Psydrax

20b Scandent bushes with lateral branches set at right angles to the main ones, often subtended by modified leaves; leaves chartaceous to subcoriaceous, rarely coriaceous; stipules lanceolate to ovate or triangular, acuminate; calyx limb repand to dentate, equalling or sometimes exceeding the disc; anthers usually erect; fruit strongly or slightly indented at the apex, typically obcordate in outline; pyrene woody with lid-like area surrounding the crest (either positioned on ventral face or across the apex) ........................................................................................................... Keetia

19b Styles usually only slightly longer than the corolla tube (save in Multidentia exserta which has stipules hairy within); pollen presenter mostly as broad as long; stipules hairy or glabrous within; disc glabrous; inflorescences often subtended by leaves; seeds with cotyledons parallel to ventral face:

21a Calyx lobes linear-oblong or oblong-spathulate, 2.3–4 mm long, persistent on fruit; inflorescence clearly branched, bearing linear or subfoliaceous bracts and bracteoles; corolla lobes acuminated or shortly appendaged .... Cuviera (partly)

21b Calyx lobes, if present, not as above; inflorescence branched or unbranched, but bracts and bracteoles usually inconspicuous; corolla lobes blunt, or if acuminate or appendaged then inflorescence ± unbranched:

22a Calyx limb tube cupular, repand or lobed but lobes rarely exceeding it; fruit large; pyrenes very thickly woody, strongly irregularly ridged with lines of dehiscence apparent; leaves discolorous, mostly with a conspicuous network of tertiary nerves; corolla tube with a ring of deflexed hairs inside, lobes never apiculate; pollen presenter spherical to elongate-ellipsoid, ribbed ................................................................. Multidentia

22b Calyx limb tube obsolete or short; lobes absent or, if present, usually greatly exceeding the tube; pyrenes not so thickly woody, nor ridged as above; other characters not combined as above:

23a Flowers mostly in many-flowered pedunculate dichasial or complicately branched cymes, occasionally subumbellate by reduction; leaves often restricted to new growth but not strictly so:

24a Stipules seldom sheathing at the base when mature, often becoming corky outside, if lobed then lobe not decurrent and often caducous; leaves strictly restricted to new growth; inflorescence with flowers usually arranged to one side of the ultimate inflorescence branch; calyx limb ± obsolete; fruit obvoid in outline and strongly indented at the apex or obovoid ........ Canthium subgen. Afrocanthium (partly)

24b Stipules sheathing at the base, bearing a linear to subulate, often decurrent lobe; leaves occasionally restricted to new growth; inflorescence not as above; calyx limb lobed to the base or almost so; leaves often somewhat unequal; fruit slightly indented at the apex ................... Canthium subgen. Lycioserissa

23b Flowers solitary, or in few- to several-flowered fascicles, subumbellate or less often with rudimentary branches, peduncles mostly, but not always, suppressed; leaves well spaced along branches or restricted to cushion shoots:

25a Leaves restricted to very short reduced branchlets or cushion shoots, hence pseudo-verticillate in appearance; inflorescences always at leafless nodes ........................................... Canthium subgen. Afrocanthium (partly)

25b Leaves not restricted to short branchlets; inflorescences in axils of normal leaves:

26a Flowers functionally unisexual, the female inflorescence 1-flowered, the male few- to many-flowered; stipules not pubescent inside; corolla tube very short, 1–2 mm long; lobes erect ................................................................. Canthium subgen. Bullockia

26b Flowers not functionally unisexual; stipules pubescent to villose inside; corolla tube usually, but not always, longer than 2 mm; corolla lobes mostly spreading:

27a Corolla tube glabrous or with few hairs within; calyx limb lobed to the base; young stems scarcely lenticillate; fruit 13–25 mm across; corolla lobes neither acuminate nor appendaged ........................................... Canthium subgen. Lycioserissa

27b Corolla tube with a ring of deflexed hairs within, or occasionally glabrous; calyx limb shortly tubular, sometimes dentate; young stems often conspicuously lenticillate; fruit up to 14 mm across; corolla lobes blunt, acuminate or appendaged:

28a Leaf blades drying blackish, up to 40 mm long, acute to obtuse at apex; stipules with few hairs inside; corolla lobes acute ....................................................... Canthium kuntzeanum Bridson
Agathisanthemum Klotzsch
(Rubiioideae—Hedyotideae)


Aidia Lour.
(Cinchonioideae—Gardenieae)

Randia L. in part; Hiern: 457 (1898); Good: 12 (1926b).

Small trees or shrubs. Leaves opposite, petiolate, in equal pairs or at flowering-bearing nodes unequal, or even one reduced to a decidual scale; domatia sometimes present; stipules basally ± triangular, erect, acute to subulate, often deciduous. Flowers bisexual, pedicellate, 5-merous, in unilateral, apparently axillary inflorescences at every other node; inflorescences lax or condensed cymes up to 70 mm long, few- to many-flowered, subsessile or pedunculate; bracts small, often deciduous. Calyx: tube ovoid or turbinate; tubular part of limb well-developed; lobes reduced or at least not over 3 mm long. Corolla white, yellow or green, the central part sometimes red; tube cylindrical, with throat hairy; lobes contorted, overlapping to the left, acute. Stamens exerted; filaments arising in upper part of throat; anthers sagittate; pollen grains simple. Ovary 2(3)-locular, each locule containing a peltate hemispherical many-ovuled placenta; style exserted, developed into an oblong striate club of 2 adhering lobes. Fruit globose, small, marked with a circular scar left by the deciduous calyx-limb. Seeds many.

Species 18, tropical Asia and Africa; sthn trop. Afr. 3, Angola, Zambia, Zimbabwe, Malawi, Mozambique.

Amphiasma Bremek.
(Rubiioideae—Hedyotideae)

DICOTYLEDONS
RUBIACEAE: Key 5—Vanguerieae
Ancylnanthos Desf.
(Ixoroideae—Vangueiriae)


Anthospernum L.
(Rubioidae—Anthospermae)


Aoranthe Somers
(??Cinchonoideae—Mussaendae)


Trees or lianas, sometimes shrubby; younger parts with silky or tomentose indumentum; twigs terete, often hollow. Leaves decussate, shortly petiolate, oblong to obovate, often unequal at base, hirsute, especially on nerves; tuft-domatia in axis of secondary and tertiary nerves; mesophyll containing crystalline stars visible as very small dots; stipules interpetiolar, shortly connate at base, deciduous, leaving a ring of hairs on scar. Inflorescence terminal, pseudoaxillary, many-flowered, shortly pedunculate, erect, rarely ramiflorous. Flowers bisexual. Calyx tubular with 5 pointed lobes. Corolla salver-shaped, lobes 5–8, contorted to left. Stamens: anthers arising in throat of corolla, either sessile and half included, or with a distinct filament and exerted. Ovary 2-locular; ovules 1 per locule. Fruit a berry-like drupe; endocarp membranous. Seeds 1 per locule, hemispherical, without a groove; endosperm entire, without any adaxial intrusion; embryo half as high as seed; radicle inferior.


Atractogyne Pierre
(Cinchonoideae—Gardenieae)

Afrohamelia Wernham; Good: 8 (1926b); Gossweiler & Mendonça: 57 (1939).

Tall lianes with flexible stems. Leaves petiolate, ovate, symmetrical, acuminate, base rounded to cordate, with 4–6(7) arculate-ascending secondary nerves on each side of midrib, puberulous on midrib and nerves beneath; axillary domatia with a small rounded, ciliate opening; interpetiolar stipules small, apiculate, fused into a short tube at base. Inflorescences terminal, ± contracted cymes on lateral branches; floral buds elongate, subacute. Flowers bisexual or male, prostraneous. Calyx tubular with 5 pointed lobes. Corolla campanulate; lobes 5, ovate, contorted in bud. Stamens arising on lower half of corolla tube; filaments very short, attached to lower 1/4 of anther; anthers with or without pollen; connective prolonged beyond thecae; pollen in tetradras. Disc annular. Ovary 2-locular; ovules many, axile; style slender in basal part, then swollen and furrowed in upper 3/4; stigma 2-lobed, purple, not opening and spreading when non-functional. Fruit barrel-shaped with a long peduncle, smooth when ripe, solitary or few in an infructescence; exocarp subcoriaceous; seeds embedded in soft, juicy pulp. Seeds many, slightly angular; endosperm present; embryo straight with rounded cotyledons.


Aulacocalyx Hook.f.
(Ixoroideae—Aulacocalycaceae)

Shrubs or trees. Leaves petiolate, oblong-elliptic, acuminate to caudate-acuminate, base cuneate to ±cordate, domatia present or absent; stipules narrowly triangular, ± attenuate. Inflorescences few- to many-flowered, usually borne on a very short shoot above a single leaf; pedicels short to almost absent. Calyx tubular, lobes 5, varying in length. Corolla with a slender, pubescent tube, often split along one side, and 5 abruptly spreading lobes. Stamens 5; anthers sessile, linear, leaves on main twigs cordate and shorter; stipules forming a short sheath around stem with 2 interpetiolar awns. Flowers terminal but mostly appearing lateral by position on axillary and opposite brachyblasts with reduced or scarious leaves. Calyx small, mostly hidden by leaves of brachyblasts surrounding base of flower as an epicalyx; tube short; lobes 5–8, minute. Corolla salver-shaped, lobes 5–8, contorted to left. Stamens: anthers arising in throat of corolla, either sessile and half included, or with a distinct filament and exerted. Ovary 2-locular; ovules 1 per locule. Fruit a berry-like drupe; endocarp membranous. Seeds 1 per locule, hemispherical, without a groove; endosperm entire, without any adaxial intrusion; embryo half as high as seed; radicle inferior.


Argocoffeopsis Lebrun
(Cinchonoideae—Gardenieae)

Lianas climbing by means of horizontal or recurved lateral branches, sometimes shrubs; bark papery, brown or grey, peeling off characteristically. Leaves in some species deciduous and then flowers appearing before leaves; often dimorphic: leaves on lateral twigs cuneate and oblong and short-lived;...
usually medifixed, at least partly exerted. **Ovary** 2-locular, each locule with a pendulous placenta with 2–10 embedded ovules; style filiform or elongate-clavate, glabrous or rarely pubescent, undivided or shortly bilobed at apex. **Fruit** fleshy, subglobose, 1- to several-seeded, crowned by cylindrical calyx limb. **Seeds** subglobose, with abundant endosperm.


**Batopedina Verdc.**

(Rubioidae—Hedyotidieae)


Subshrubs with many branches from a thick woody rootstock, often tufted. **Leaves** opposite but sometimes appearing verticillate, linear to ovate; stipules with 3–5 short lobes from a short base. **Flowers** heterostylyous, solitary or paired, axillary or at apices of branchlets. **Calyx**: tube ovoid; lobes unequal, one foliaceous and rest minute or of varying sizes. **Corolla** tubular, enlarging at apex; throat hairy inside; lobes 5, ovate. **Stamens** 5, included or exserted. **Ovary** 2-locular with many ovules; style included or exserted; stigma lobes filiform. **Capsule** ovoid, splitting into 2 cocci. **Seeds** many, testa finely striate.

Species 3, Upper Volta, Ghana, DRC; stfn trop. Afr. 1: *Batopedina linearifolia* (Bremek.) Verdc., in Zambia. Doubtfully distinct from *Otomeria Benth.*

**Belonophora Hook.f.**

(‘7xoroideae—Aulacocalyceae)


**Diploteropos Wernham; Kerstingia K. Schum.**

Trees or shrubs resembling *Caffea*. **Leaves** paired; stipules elliptic, lanceolate or triangular, often tapering-subulate, deciduous. **Flowers** sessile, in fascicles on both sides of successive nodes. **Calyx** bracteolate at base; tube campanulate; limb with 5 rounded imbricate lobes. **Corolla** salver-shaped; tube slender, somewhat narrowed at base, adpressed pubescent outside, glabrous at throat; lobes 5, ovate. **Stamens** 5, included or exserted. **Ovary** 2-locular with many ovules; style included or exserted; stigma lobes filiform. **Capsule** ovoid, splitting into 2 cocci. **Seeds** many, testa finely striate.

Species 5, Upper Volta, Ghana, DRC; stfn trop. Afr. 1: *Belonophora linearifolia* (Bremek.) Verdc., in Zambia. Doubtfully distinct from *Otomeria Benth.*

**Brenania Keay**

(Cinchonoideae—Gardenieae)


Tall trees, glabrous, young parts glutinous; branchlets stout. **Leaves** petiolate, obovate-ob lanceolate, subcordate to cuneate at base, apex rounded and very bluntly and shortly acuminate; stipules united, truncate, ciliate on margin, persistent. **Inflorescences** cyrmore, ± 50 mm long, borne laterally opposite a single leaf at alternate nodes; axis becoming woody in fruit. **Flowers** glabrous except inside of corolla tube. **Calyx** shortly tubular, truncate or obscurely 5-toothed. **Corolla**: tube cylindrical, lobes 5, suborbicular, contorted. **Stamens** 5; anthers ± included, linear, sessile. **Disc** cup-shaped, glabrous. **Ovary** 1-locular, with 2 parietal placentas and many ovules; style with slightly thickened, 2-lobed stigma. **Fruit** subglobose, glabrous, with thick fleshy mesocarp, and a thick, woody endocarp. **Seeds** many, lenticular, irregularly ovate in outline.


**Breonia Ridsdale**

(Cinchonoideae—Naucleaeae)


**Adina Salisb.;** Good: 1 (1926b); White: 398 (1962).


**Burttadaya Hoyle**

(Cinchonoideae—Naucleaeae)

Hoyle: t. 3318 (1936); Ridsdale & Bakhuizen van den Brink: 548 (1975);
Unarmed trees; branches glabrous. Leaves paired, petiolate, large, ovate or broadly elliptic; stipules large, elliptic to broadly obovate, deciduous. Inflorescences globose, solitary, terminal, with flowers very densely crowded on a ± globose, fleshy, ± pilose receptacle; interfilar bracteoles absent. Calyx 5-lobed, lobes free, linear-spathulate, persistent. Corolla ± tubular; lobes 5, imbricate. Stamens: filaments very short; anthers 2-thecous. Ovaries closely contiguous but not fused, each 2-locular; locules with many ovules, placentas attached to middle of septum; style slender, exserted; stigma red, narrowly conical with widened base and blunt tip, succulate. Fruiting heads globose, but individual fruits not joined, red, irregularly breaking, crowned by persistent calyx lobes. Seeds not winged, but sometimes angular; testa reticulate; embryo straight, surrounded by albumen.


Otocephalus Chiov.

Perennial herbs containing raphides. Leaves in whorls of 3, sessile, ovate-lanceolate to lanceolate, glabrous; stipules triangular, acute. Inflorescences: flowers fused in pairs, crowded into heads arranged in umbel-like terminal inflorescences; bracts present or absent. Calyx shared by 2 corollas; sepals only (1)2 per flower, one much longer than the other. Corolla funnel-shaped, blue; lobes 5, much shorter than tube. Stamens sessile, arising in sinus between corolla lobes. Ovary: each flower pair has 2 ovaries, each consisting of 1 fertile locule with 1 pendulous ovule and a reduced sterile carpel; the ovaries of a flower pair are fused by their sterile carpels; both ovaries with a style and 2-lobed stigma. Fruit a single subtrigonal, usually slightly curved mericarp from each ovary. Seeds with relatively large embryo with foliaceous cotyledons.

Monotypic genus: Calandra rubricaulis K.Schum., endemic to Angola.


Shrubs or small trees. Leaves opposite, petiolate, papery to subcoriaceous, glabrous; domatia absent or present in axes of lateral nerves but rather inconspicuous and sparsely ciliate; stipules shortly sheathing, with triangular limbs bearing a subulate to linear caducous lobe, pubescent and beset with colleters inside. Flowers bisexual, 7- or 8-merous, axillary with 1–4 flowers borne in each axil, stalked; bracts 2 or 3, cupular or saucer-shaped (referred to as calyculi), usually totally obscuring the pedicel, pubescent and beset with numerous colleters inside, often with linear or subfoliaceous lobes. Calyx: tube campanulate, obscured by the calyculi; limb truncate or with rudimentary teeth. Corolla white or ?yellow, glabrous outside; tube cylindric below but widening above, slightly shorter than or slightly longer than the lobes; lobes 7 or 8, contorted in bud, spreading. Stamens 7 or 8, attached at mouth of corolla tube, exserted, erect; filaments, ± ½ as long as anthers; anthers narrowly linear-lanceolate, with thecae transversely divided into cells, apiculate at apex, scarcely hasteate at base, attached ± ⅓ of their length from base. Disc annular. Ovary 2-locular; placentas small, fleshy, attached near middle of septum; ovules 1 or 2, deeply immersed in placenta; style cylindric, slender, glabrous, exceeding corolla tube; stigma exserted, 2-lobed. Fruit rather fleshy, 1- or 2-seeded; calyx limb persistent. Seeds dark, ± hemispherical; small depression present on apex or on curved face near apex; testa apparently absent, surface smooth to somewhat rugulose at low power magnifications; endosperm dark purplish in colour (preserved material), entire; embryo straight, with radicle inferior.


Plectonica in sense of many authors.


Dirichletia Klotzsch; White: 406 (1962).


**Chassalia** Comm. ex Poir.  
(Rubiaceae—Psychotrieae)  

Shrubs or less often small trees or subshrubby herbs, with mostly glabrous or only finely pubescent stems. Leaves opposite or rarely ternate, mostly acuminate, usually quite thin, shortly to distinctly petiolate, usually glabrous; stipules interpetiolar, ovate to triangular or quite short and broad, sometimes united into a small sheath, entire or with 2 short filaments, often with collers and hairs within the base, mostly persistent. Flowers bisexual, 4- or 5-merous, heterostylosous, mostly small, in branched panicles, the ultimate elements usually being small heads but in a few species flowers pedicellate; bracts small. Calyx: tube mostly ovoid or oblong, ribbed, free limb mostly very short; lobes triangular or linear but mostly very short. Buds often winged. Corolla white, pink or purple, sometimes yellow inside; tube cylindric, hairy or glabrous inside; lobes often winged; corolla often curiously prominent in dry material. Stamens included or exerted. Disc cylindric, distinct. Ovary 2-locular; ovules solitary in each locule, erect from base; style included or exerted; stigma lobes linear. Fruits succulent, with 2 pyrenes; pyrenes pale, semiglobose or semi-ellipsoid, ventral surface often grooved, often with a median dorsal keel along which dehiscence takes place. Seeds concavo-convex, with a pale testa; endosperm not ruminate.

Species ± 45, mostly trop. Africa and Madagascar, extending east as far as Philippines; sthn trop. Afr. 3, Angola, Zambia, Malawi, Mozambique. Closely allied to Psychotria.

**Chazaliella** E.M.A. Petit & Verdc.  
(Rubiaceae—Psychotrieae)  

Shrubs, often flowering before leaves are fully developed; stems usually 2-ribbed, all but youngest shoots usually covered with pale brown soft cork. Leaves opposite or in whorls of 3 or 4, mostly drying pale, petiolate or subsessile, usually deciduous; nodules 0; domatia mostly small, in branched panicles, the ultimate elements usually being small heads but in a few species flowers pedicellate; bracts small. Calyx: tube mostly ovoid or oblong, ribbed, free limb mostly very short; lobes triangular or linear but mostly very short. Buds often winged. Corolla white, pink or purple, sometimes yellow inside; tube cylindric, hairy or glabrous inside; lobes often winged; corolla often curiously prominent in dry material. Stamens included or exerted. Disc cylindric, distinct. Ovary 2-locular; ovules solitary in each locule, erect from base; style included or exerted; stigma lobes linear. Fruits succulent, with 2 pyrenes; pyrenes pale, semiglobose or semi-ellipsoid, ventral surface often grooved, often with a median dorsal keel along which dehiscence takes place. Seeds concavo-convex, with a pale testa; endosperm not ruminate.

Species ± 45, mostly trop. Africa and Madagascar, extending east as far as Philippines; sthn trop. Afr. 3, Angola, Zambia, Malawi, Mozambique. Closely allied to Psychotria.

**Psychotria** L., in part.

**Coddia** Verdc.  
(Rubiaceae—Psychotrieae)  


**Conostomium** (Stapf) Cufod.  
(Rubiaceae—Psychotrieae)  


**Coptosperma** Hook.f.  
(Rubiaceae—Psychotrieae)  
Hooker: 86 (1873a); De Block et al.: 455 (2002); Degreef et al.: 367 (2002).

Shrubs to medium-sized trees. Leaves subcoriaceous to strongly coriaceous, puberulous to glabrous; tip often acute to obtuse; petioles mostly shorter than 3 mm, but may be up to 30 mm; stipules triangular to duck bill-shaped, never drying black. Inflorescences terminal or axillary, many-flowered; partial inflorescences generally ± compact; bracts present; bracteoles scale-like, triangular to ovate, glabrous or ciliolate, usually at base of ovary. Flowers generally 5-merous but few species with both 4- and 5-merous flowers, usually small. Calyx short, usually glabrous; lobes triangular, ± as long as tube, or tube ± truncate. Corolla: tube shorter than 10 mm; lobes usually shorter than 10 mm, usually glabrous outside, contorted. Stamens with anthers exerted from corolla tube. Ovary with 1–4(–8) ovules, pendulous or ascending from a small placenta or impressed in a large placenta. Fruit drypaeaceous, 1-locular, brown or sometimes red turning black. Seeds 1(2), suborbicular to ellipsoid; hilum irregular or rarely round; annulus absent; endosperm ruminate, at least around hilum.

Species ± 50, if Enterospermum Hiern and Zygoon Hiern are included; Madagascar and continental Africa; sthn trop. Afr. 6, ?Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

**Corynanthe** Welw.  
(Cinchonoideae—Coptosapelteae)
Tree branches. Leaves petiolate, ovate or elliptic, secondary nerves prominent; domatia usually present; stipules interpetiolar, caducous; collets inserted parallel with outer margin of stipules. Inflorescences axillary or terminal, thyrsic, ± loose but terminal flowers subcapitate. Flowers 4(5)-merous. Calyx with short tube and triangular to rounded lobes, often with 1 or 2 collets in sinuses. Corolla: tube trumpet-shaped; lobes valvate, ± as long as tube, with cowl-shaped tip and a long, linear to narrowly club-shaped subapical appendage. Stamens: anthers exserted, sagittate, ± obtuse or acute, stigmatic surface on their inner faces. Ovary 2-locular; placenta fleshy, pendulous, bearing many upwardly imbricate ovules; style far exserted, glabrous; stigma ovoid to spherical, undivided. Fruit an elongated capsule loculicidally dehiscent from top and slightly septicidal, with persistent calyx. Seeds with striking membranous wing narrowly triangular at apex, forked like a swallow tail at base.


Craterispermum Benth. (Rubioideae—Psychotrieae)

Glabrous trees or shrubs mostly with yellow-green foliage. Leaves opposite, petiolate, blades mostly oblong or elliptic, often coriaceous; venation mostly closely reticulate; stipules intrapetiolar, broad, connate to form a tube, made up of 2 triangular parts joined by thinner tissue, undivided, persistent or deciduous. Flowers bisexual, heterostylos, 5-merous, in small subcapitate or somewhat elongated, occasionally 2-branched cymes; peduncles short or less often long and slender, strongly compressed, axillary or more usually supra-axillary; bracteoles present. Calyx: tube obconic or truncate; limb cupular, truncate, sinuate or shortly 5-dentate, persistent. Corolla salver-shaped or somewhat funnel-shaped with short or elongated tube and densely hairy or less often glabrous throat. Stamens either included in throat or exserted; anthers linear-oblong, dorsifixed. Disc annular, thick. Ovary 2-locular; ovules solitary in each locule, pendulous from apex; style filiform; stigma divided into 2 linear, papillate branches or fusiform, bifid. Fruit subglobose, pea-like, sessile or pedicellate, (1,2)-locular, 1-seeded; endocarp chartaceous. Seeds pendulous, hemispherical or almost bowl-shaped, dorsally convex, ventrally deeply excavated; albumen fleshy; embryo small with a superior radicle.

Species 15–20, widespread in trop. Africa and also in the Seychelles and Madagascar; sthln trop. Afr. 4, Angola, Zambia, Zimbabwe, Malawi, Mozambique.

Cremaspora Benth. (Cinchonoideae—Cremasporeae)

Shrubs, small trees or sometimes lianes or with subscendent branches; stems and foliage almost glabrous to densely hairy; branches appearing supra-axillary and often supported by rounded leaves very different from the main foliage. Leaves opposite, shortly petiolate, mostly thinly coriaceous, mostly oblong-oblong; stipules keeled, acuminate, soon deciduous. Flowers sweetly scented, rather small, in sessile, mostly dense axillary clusters; bracts and bracteoles triangular-acuminate, not forming cupules. Calyx: tube ovoid; limb campanulate with 5 triangular to lanceolate teeth. Corolla white, cylindrical or very narrowly funnel-shaped, glabrescent or pubescent outside, glabrous to pilose at throat; lobes 5, narrowly oblong, ± obtuse or acute, strictly contorted, pubescent outside. Stamens 5, inserted at mouth of tube; filaments very short; anthers buff, dorsifixed, linear, apiculate, ± bifid at base, fully exserted. Disc shallowly bowl-shaped, becoming more cylindric in fruit. Ovary 2-locular, with a single ovule in each locule, pendulous from apex; style green, filiform, exserted, hairy save at extreme base, the apical 1 mm divisible into 2 lobes which do not spread and bear the stigmatic surface on their inner faces. Fruit ovoid, indehiscent, leathery-walled, 2-locular, (1)2-seeded. Seeds half-ovoid, compressed, rugulose; testa characteristically finely transversely wrinkled- striate; albumen horny, not ruminate; embryo small with inferior radicle; placenta elongated, lying along whole side of seed.


Crossopteryx Fenzl (Cinchonioideae—Coptosapelteae)

Small trees or shrubs, unarmed or sometimes spinose. Leaves opposite, often large, mostly ± oblong or elliptic, petiolate, usually coriaceous and persistent; stipules small, basally ± connate, often acuminate, deciduous. Flowers bisexual or sometimes sterile, in subsessile or pendunculate, many-flowered axillary cymes; bracts and bracteoles linear to lanceolate or elliptic, often leaf-like and accrescent. Calyx: tube obconic or truncate, sometimes 3- or 4-angled; limb tube ± suppressed; lobes 3–6, linear to ovate, often leaf-like and accrescent, mostly longer than corolla, persistent. Corolla funnel-shaped, campanulate or barrel-shaped, retrorsely hairy or bristly inside but throat glabrous, outside glabrous or pilose; lobes 5 or 6, spreading or reflexed, elongate, mostly caudate-acuminate, sometimes very markedly so. Stamens 5, arising in throat; anthers exserted. Disc depressed, lobed. Style thick, narrowed at both ends, stiffly pubescent to glabrous, sometimes with a conspicuous globular swelling near base; pollen presenter cylindrical, mitriform or peltate, 2–10-grooved. Ovary (1)2–5-
locular; ovules solitary in each locale, pendulous. **Fruit** drupaceous, often large, ovoid or subglobose, sometimes obscurely angled, with 1–5, 1-seeded pyrenes.

Species 2 ± 0, trop. Africa, mostly western and central; sthn trop. Afr. 4, Angola, Malawi, Mozambique.

**Dictyandra** Welw. ex Hook.f.  
(Cinchonoidae—Pavetteae)

Hooker: 85 (1873a); Hiem: 456 (1898); Good: 9 (1926b); Hallé: 86 (1970); Robbrecht: 108 (1984); Bridson & Verdcourt: 686 (1988).

Shrubs or small trees. **Leaves** opposite, petiolate, with domatia; stipules flattened, triangular and erect or rounded and bent back. **Flowers** bisexual, 5-merous, pedicellate, in terminal corymbs. **Calyx**: tube ovoid or turbinate; tubular part of limb short; lobes ± erect, contorted. **Corolla** with tube about equaling lobes; lobes narrowly lanceolate, contorted. **Stamens**: anthers exerted, subsagittate, thecae simple, or locellate with 4 vertical lines of small compartments. **Ovary** 2-locular, thick-walled, with an ovate peltate placenta covered with very many ovules; style rather thick, with an exerted bilobed stigma. **Fruit** globose or ellipsoid, crowned with persistent calyx lobes. **Seeds** squarish, angular, small, black, shining and smooth, with a hilar pit.

Species 2, tropical W Africa; sthn trop. Afr. 1: **Dictyandra arborescens** Hook.f., Angola.

**Didymosalpinx** Keay  
(Cinchonoidae—Gardenieae)

Keay: 61 (1958a); Bridson & Verdcourt: 523 (1988); Coates Palgrave: 1060 (2002); Robbrecht & De Block: 165 (2002).

*Gardenia* in sense of Swynnerton: 80 (1911).

Erect or scrambling shrubs, entirely glabrous (except inside of corolla tube); some lateral branches modified into paired, straight supra-axillary spines held at right angles. **Leaves** opposite, petiolate, ± elliptic, usually with small ciliate pit domatia; stipules subulate, slightly connate at base. **Flowers** bisexual, rather large, 5-merous, axillary or supra-axillary, solitary on both sides of node, sweetly scented at night; pedicels well-developed. **Calyx**: tube short, with colleters inside; lobes narrowly triangular. **Corolla** funnel-shaped with strong midpetaline nerves, pilose inside, glabrous outside; lobes ovate-triangular, much shorter than tube. **Anthers** included, sessile in uppermost portion of tube. **Ovary** 1-locular with 2 opposing parietal placentas which may be ± joined to form a ± 2-locular ovary; ovules deeply embedded in placenta. **Fruit** globose or ellipsoid, slightly ribbed, crowned with persistent calyx; testa thin, leathery. **Seeds** 10–15, lenticular, embedded in pulpy placental tissue.


**Diodia** L.  
(Rubioidae—Spermacoceae)


(Cinchonoidae—Gardenieae)


**Randia** L., in part.

Deciduous small shrubs or trees; branches with very unequal internodes, some slender and elongated, others at apices very condensed; petiolar scars prominent. **Leaves** opposite, petiolate, tufted at ends of shoots; blades thin, with pubescent domatia; stipules scarious, persistent. **Flowers** fragrant, solitary, terminal, 5(6–8)-merous, surrounded at base by scarious scales. **Calyx**: tube cylindrical-turbinate; free tubular part of limb very short; lobes elongate, persistent. **Corolla** turning black on drying; tube short to very long, cylindric, apical part narrowly to broadly funnel-shaped, tube pubescent towards base; lobes contorted, overlapping to the left. **Stamens** sessile, apices of anthers just about reaching mouth of throat; pollen grains in tetrads, golden yellow. **Ovary** with 2 placentas forming 2 locules; ovules many; style swollen into an ellipsoid swelling at level of anthers with 2 closely adnate stigmatic lobes. **Fruit** globose or pyriform, crowned with persistent calyx lobes; peduncle accrescent. **Seeds** irregularly lenticular, compressed.


**Fadogia** Schweinf.  
(Ixoroideae—Vanguerieae)

Good: 23 (1926b); Verdcourt: 786 (1991); Bridson: 265 (1998); Bingham & Smith: 143 (2002); Lantz *et al.*: 182 (2002).

**Tomnocalyx** Robyns, in part; White: 422 (1962).


**Fadogiella** Robyns  
(Ixoroideae—Vanguerieae)


Subshubby herbs (suffrutices) or shrubs, completely softly tomentose, mostly much branched. **Leaves** opposite, or less often in whorls of 3, shortly petiolated; stipules with triangular or sheathing connate bases and subulate appendages. **Flowers** relatively large, in subsessile or shortly pedunculate, dense, few- to many-flowered cymes. **Calyx**: tube globose with a short ± subcuneal limb or short, triangular teeth. **Corolla** thick, cylindric or obovoid, obtuse or shortly acuminate at apex in bud; mostly yellow or greenish, densely tomentose; tube cylindric, glabrous or hairy at throat, with a ring of deflexed hairs inside; lobes reflexed, obtuse or shortly apiculate. **Stamens** inserted at throat; anthers exerted or partly exerted. **Ovary** (3)4- or 5-locular, each locule with a pendulous ovule; style slender, exerted; pollen presenter cylindric or coroniform, sulcate, (3)4- or 5-lobed at apex. **Fruit** drying black, globose, crowned with calyx limb, sometimes ribbed, containing (3)4 or 5 pyrenes, ± glabrous. **Pyrenes** thinly woody, not crested around apex, point of attachment ± beaked, very slightly textured. **Cotyledons** very much shorter than radicle.

**Feretia Delile**

(Ixoroideae—Octotropideae)


**Gaertnera Lam.**

(Rubiaceae—Psychotieae)

Lamarck: 273 (1792); Verdcourt: 42 (1989); Malcomber: 42 (2002).

Shrubs or small trees; branches glabrous or pubescent. Leaves opposite, mostly distinctly petiolate, often rather coriaceous; stipules intrapetiolar, joined, sheath distinctly leafy or truncate or with 4–many setae. Inflorescences cymose, terminal, usually many-flowered, capitate to laxly paniculate; bracts and bracteoles present, the latter often adnate to calyx. Flowers bisexual, sweetly scented, 5-merous, pedicel- lanceolate. Calyx mostly sweet-scented, funnel-shaped or salver-shaped; tube usually elongate and cylindric but sometimes shorter than limb; lobes 5, valvate. Stamens inserted beneath throat; anthers linear, included. Ovary superior, 2-locular with one erect ovule in each locale; style filiform, sometimes thickened and puberulous towards apex, with 2 linear stigmatic lobes. Fruit globose, obovoid or fusiform, smooth or ribbed, indehiscent, fleshy. Pyrenes and seeds similarly shaped, globose to fusiform; albumen copious; embryo small, erect.


**Galinierea Delile**

(Ixoroideae—Hypobathreae)


Shrubs or small trees; branches glabrous or pubescent. Leaves opposite, petiolate; domatia present or absent; stipules triangular. Flowers bisexual, sweetly scented, 5-merous, pedicelate in pedunculate axillary cymes; bracts and bracteoles present. Calyx glabrous or pubescent; tube extremely short; lobes ovate. Stamens arising at top of corolla tube, exserted and spreading when mature; filaments short; anthers dorsifixed near base, narrowly oblong, with distinctly apiculate connexive. Disc annular. Ovary 2-locular; placenta small, attached near top of locules, bearing 2 pendulous ovules or rarely one ovule on a larger placenta; style short, subulate, pubescent; stigmatic club deeply bifid, but two halves often held together; 5 membranous ciliate wings present on each lobe. Fruit fleshy, globose, 2-locular; calyx limb persistent. Seeds (2–)4 per fruit, ± $\frac{1}{4}(1\frac{1}{2})$-spherical, finely reticulate; endosperm ruminate; placenta forming a small aril-like structure at apex of pair of seeds.


**Galium L.**

(Rubiaceae—Rubiaceae)


**Galopina Thunb.**

(Rubiaceae—Anthospermeae)


**Ganguelia Robbr.**

(Ixoroideae—Gardenieae—Gardeniinae)


Geophytaceae with massive underground storage organs and tend- er, hardly branched supraterranean twigs, ± all parts densely covered with long soft hairs. Leaves suborbicular, coriaceous to almost succulent, apex ± emarginate, base widely cuneate; venation subpalmate; petiole slender; stipules interpetiolar, ovate with acute tip, free to base and not sheathing. Inflorescences: flowers solitary, pseudo-axillary; bracteoles ovate with acute tip. Flowers with left-contorted aestivation. Calyx long-tubular; lobes 5, narrowly triangular. Corolla: tube slender; lobes 5, narrow, ± $\frac{1}{2}$ as long as tube. Stamens: anthers 5, sessile in uppermost part of corolla tube, with small, narrowly triangular, sterile apical appendage; pollen in tetrads. Ovary 2-locular, with 2 peltate axile placentas with many ovules adnate to ± entire septum; style slightly surpassing anthers, almost thread-like but upper part slightly swollen, terminating in 2 short, papillar stigmatic lobes. Fruit unknown.


**Gardenia J.Ellis**

(Cinchonoideae—Gardenieae—Gardeniinae)

Good: 14 (1926b); Verdcourt: 345 (1979b); Bridson & Verdcourt: 500 (1988); Bridson: 226 (1998); White et al.: 475 (2001); Coates Palgrave: 1051 (2002); Mapaura & Timberlake: 168 (2002).


**Geophila D.Don**

(Rubiaceae—Psychotieae)


Perennial forest floor herbs, mostly with slender creeping stems rooting at nodes. Leaves opposite, with mostly long petioles; blades ovate-cordate to rounded-reniform; stipules interpetiolar, ovate, entire or bilobed at apex. Flowers bisexual, sometimes heterostylous, mostly in terminal umbels or sometimes solitary, often on long peduncles held erect from main stems, occasionally with an involucre of quite conspicuous...
bracts. **Calyx**: tube obovoid, limb short, 5–7-lobed; lobes subulate or linear, spreading or reflexed, persistent. **Corolla** cylindrical or funnel-shaped; lobes 4–7, spreading or recurved; throat pilose inside. **Stamens** 4–7, arising in corolla tube; filaments filiform; anthers dorsifixed, included or exerted. **Disc** swollen. **Ovary** 2-locular; ovules solitary in each locule, erect from base, anatropous; style slender, included or exerted; stigma lobes 2, linear, densely papillate or stigma subcapitate-bifid. **Fruit** a drupe, fleshy, containing 2 pyrenes; pyrenes plano-convex, dorsally compressed, obesely ribbed, rugulose and often with an annular area at junction of ventral and dorsal surfaces, 1-seeded. **Seeds** same shape as pyrenes, ventral surface plane; testa membranous; endosperm corneous.


**Guettarda L.**

[?Antirheoideae—Guettardeae]  


**Hallea J.-F.Leroy**  
(Cinchonoideae—Coptosapelteae)


Tall trees, sometimes with small, knee-like pneumatophores; bark grey to brown, irregularly cracked and flaking; branchlets often 4-angled, glabrous or hairy. **Leaves** large, petiolate, oblong to elliptic, to broadly ovate, entire, with small domatia, glabrous above, mostly hairy beneath. **Inflorescences** terminal and/or axillary, of 3–many dense spherical heads with pubescent receptacles, flowering branches developing monopodially; bracteoles linear-spathulate, dorsally compressed, obesely ribbed, rugulose and often with an annular area at junction of ventral and dorsal surfaces, 1-seeded. **Seeds** same shape as pyrenes, ventral surface plane; testa membranous; endosperm corneous.


**Heinsenia K.Schum.**  
(Ixoroideae—Aulacocalyceae)


Trees or shrubs with branching similar to that of many *Rothmannia* species and characteristic evergreen foliage. **Leaves** opposite, petiolar, thinly coriaceous, usually with ± transversely parallel venation; domatia absent or present and pubescent; stipules triangular, acute or acuminate, soon falling. **Inflorescences** 1–several or occasionally 2–many-flowered on very short terminal branchlets subtended by a single leaf but often lateral and pseudoaxillary owing to sympodial growth of stem; bracts small. **Calyx** tube ovoid to tubular; limb shortly cylindric, with 5 triangular to lanceolate teeth. **Corolla** ± pubescent to densely adpressed silky outside, narrowly campanulate; lobes 5, ovate to lanceolate. **Stamens** anthers linear, elongate, apiculate, sessile, usually medifixed, included or slightly to completely exerted; pollen grains simple. **Ovary** 2-locular; each locule with a pendulous placenta carrying 2–10 embedded ovules; style filiform or elongate-clavate, glabrous or rarely pubescent, apical part sometimes 10-ribbed, and divisible into lobes up to 4–5 mm long bearing stigmatic surfaces; the whole style is divisible almost to the base if pulled gently. **Fruit** fleshy, 1–several-seeded, subglobose, crowned by persistent calyx limb. **Seeds** subglobose with abundant endosperm, apparently devoid of a testa; embryo with radicle superior.


**Hedthyrsus Bremek.**  
(Rubioidae—Hedytideae)

Bremekamp: 149 (1952b); Verdcourt: 105 (1989).

Small erect shrubs, invariably turning blackish on drying and with distinctly discolorous leaves. **Leaves** very shortly petiolate, elliptic to lanceolate, rather thick, closely placed, lateral nerves invisible or very obscure; stipule-sheath usually hairy, divided into several subulate fimbriae. **Flowers** heterostylyous, small in many-flowered, dense, terminal corymbs or panicles. **Calyx**: lobes 4, triangular or lanceolate, often with fimbriae between. **Corolla** shortly subcylindric, slightly widened above; lobes 4; throat glabrous or sparsely hairy inside. **Stamens** well exerted in short-styled flowers. **Ovary** 2-locular; ovules few on peltate placenta; style filiform; stigma lobes subglobose. **Capsule** depressed hemispherical, produced into a conical beak which splits loculicidally and septicidally into 4 diverging valves. **Seeds** few, much compressed, elliptic or oblong, sometimes subangular and often slightly winged at both ends or all round, reticulate.


**Heinsia DC.**  
(Cinchonoideae—Mussaendeae)

Candolle: 390 (1830); Hallé: 131 (1970); Bridson & Verdcourt: 476 (1988); Bridson: 213, 226 (1998); Coates Palgrave: 1072 (2002); Phiri (Unpublished).

Stoloniferous creeping herbs rooting at nodes, with erect flowering branches, or sometimes erect shrubs. **Leaves** opposite, in 2–6 pairs on flowering stems; stipules bifid at apex or divided into 2 completely separate lobes; a membranous cylindrical or cupular sheath present at nodes inside stipules. **Inflorescences** terminal or rarely axillary, ± capitate, often with a cup-like involucr. **Flowers** sessile or subsessile, 5-merous, distinctly or obscurely heterostylos. **Corolla:** funnel-shaped. **Stamens** arising in middle of corolla tube; anthers linear or oblong. **Ovary** 2-locular with a single erect ovule per locule; style bifid. **Frucht** depressed-globose, usually orange, sometimes red, inflated, full of watery juice, crowned with persistent calyx; pyrenes 2, semi-ellipsoid, brittle, dorsal face convex and not ribbed, ventral face with 1 or 2 grooves, basally dehiscent by 2 short lateral fissures. **Seeds** semi-ellipsoid, with entire albumen.


**Hymenodictyon Wall.**
(Cinchonoideae—Coptosapeltae)


**Hyperacanthus E.Mey. ex Bridson**
(Cinchonoideae—Gardeniae—Gardeniniae)


**Ixora L.**
(Cinchonoideae—Pavetteae)

Shrubs or small trees. **Leaves** opposite or rarely ternate, sessile or petiolate; blades usually entirely glabrous, less often pubescent beneath, very rarely puberulous above; domatia and bacterial nodules absent; stipules with a truncate to triangular limb, usually connate for most of the length, bearing a short or long, cuspidate or aristate lobe. **Flowers** bisexual, usually fragrant, 4(5)-merous, few to many, usually borne in triads in terminal, sessile to long-pedunculate ± lax cymes or rarely spherical heads; branches of inflorescence opposite and articulate or less often absent; pedicels present or absent; bracts stipule-like; bracteoles present or rarely absent. **Calyx** often reddish in colour, glabrous to shortly pilose or less often pubescent; tube ovoid; limb short, sometimes almost absent, usually as wide as tube; truncate or more usually 4(5)-toothed, shortly lobed or occasionally with well-developed lobes. **Corolla** white, yellow, pink or red, glabrous outside or rarely pilose; tube cylindric, usually slender, only slightly widened at throat, naked or somewhat bearded at throat; lobes conorted in bud, spreading or reflexing, lanceolate, narrowly elliptic or ovate, much shorter than or occasionally equalling the tube in length. **Stamens** arising at mouth of tube, exerted and spreading or erect in mature flowers; filaments very short; anthers attached near base, linear, apiculate and sagittate, twisted when dehisced. **Disc** annular, fleshy. **Ovary** 2-locular, small; placentas fleshy attached near top of septum; ovules solitary, immersed in placentas; style slender, equalling or slightly exceeding corolla tube, glabrous or sometimes pilose; stigma exerted, 2-lobed; lobes always completely separate when mature, usually recurved, equaling or a little shorter than anthers. **Frucht** a drupe, usually red (dull brown in dry specimens), spherical or 2-lobed, slightly fleshy or coriaceous, containing 1 or 2, 1-seeded, thin-walled pyrenes; calyx limb persistent. **Seeds** frequently undeveloped, rusty brown in colour, hemispherical with a deep circular excavation in centre of the plane ventral face, convex dorsal face not sculptured but sometimes with minute protuberances which are occasionally shiny; endosperm entire, cartilaginous; embryo dorsal, curved; cotyledons foliaceous; radicle pointing downwards.


**Keetia E.Phillips**
(Ixoroideae—Vangueriaceae)

**Kohautia Cham. & Schltldl.**
(Rubioideae—Hedyotaceae)
Bremekamp: 56 (1952b); Verdcourt: 228 (1976); Mantell: 85 (1989).


**Kraussia Harv.**
(Ixoroideae—Octotropideae)


**Lagynias E.Mey. ex Robyns**
(Ixoroideae—Vangueriaceae)


**Lasianthus Jack**
(Rubioideae—Morindeae)

Shrubs or rarely small trees, rarely foetid, glabrous to hairy or strigose. **Leaves** opposite, mostly acuminate, thin to coriaceous, petiolate, usually with many arching lateral nerves and close venation; stipules interpetiolar, usually broadly triangular or lanceolate, not divided, persistent or deciduous. **Flowers** bisexual or sometimes unisexual, sometimes
heterostylos, mostly small, mostly in sessile axillary fascicles or glomerules or less often in pedunculate, simple or branched inflorescences; pedicels mostly absent; bracts present, usually small. **Calyx**: tube subglobose, ovoid, oblong or urceolate; limb 3–6-toothed or lobed, persistent. **Corolla** often white or pink, salver-shaped or somewhat funnel-shaped; tube densely hairy at throat; lobes 4–6, spreading or erect. **Stamens** 4–6, arising in throat of corolla; filaments very short; anthers dorsifixed near their base, included or shortly exserted. **Disc** swollen and fleshy. **Ovary** 4–12-locular; ovules solitary in each locule, erect from base, bent, anatropous; style short or elongate, glabrous or hairy, shortly 4–10-lobed at apex, lobes linear or obtuse. **Fruits** succulent, very often blue but sometimes pink, purple, white or black, with 4–12 pyrenes; pyrenes cartilaginous or bony, segment-shaped or pyriform, 3-angled with flat sides, dorsal curved face often grooved, keeled or winged, 1-seeded. **Seeds** narrowly oblong, curved, with membranous tests and fleshy albumen.

Species ± 170, predominantly in eastern tropical Asia, ± 20 species in trop. Africa and 1 in the W. Indies; sthn trop. Afr. 3, Angola (Cabinda), Zambia, Zimbabwe, Malawi, Mozambique.

**Lelya Bremek.**
(Rubiodeae—Hedyotideae)

Prostrate perennial herbs. **Leaves** paired, small, shortly petiolate; stipules in lower part of stem with sheath produced into an undivided triangular lobe, in upper part deeply bifid into narrowly triangular fimbriae or less often with 3 fimbriae. **Flowers** small, bisexual, dimorphic, in terminal triads or sometimes solitary. **Calyx**: tube ovoid or ellipsoid; lobes 4, equal, oblong-elliptic or oblong-spathulate, rather thick, exceeding tube, joined at base to form a free tube. **Corolla**: tube shortly cylindric or narrowly funnel-shaped, sparsely pilose inside; lobes 4, elliptic-oblong to oblanceolate. **Ovary** 2-locular; placentas and 8 to fairly many ovules; style stoutly filiform, minutely bifid at apex, stigma-lobes short, subglobose or ellipsoid. **Fruit** capsular with bony walls, ellipsoid, produced into a solid beak; at length apically loculicidally dehiscence. **Seeds** few per locule, blackish, angular, pitted.

Monotypic genus: **Lelya prostrata** (R.D. Good) W.H. Lewis var. prostrata, and var. angustifolia (Bremek.) W.H. Lewis in widely separated areas of trop. Africa; sthn trop. Afr.: Angola, Zambia, Malawi. Scarcely separable from *Oldenlandia*, but apart from the bony fruits the pollen differs from all known species of that genus.

**Leptactina Hook.f.**
(Cinchonioideae—Pavetteae)
Hooker: 73 (1871); Good: 9 (1926b) as Leptactinia; Verdcourt: 491 (1979a); Robbrecht: 106 (1984); Bridson & Verdcourt: 688 (1988); Bridson: 220, 227 (1998); Robbrecht & De Block: 125 (1999); White *et al.*: 478 (2001); Coates Palgrave: 1040 (2002).


**Macrosypha Hook.f.**
(Cinchonioideae—Gardeniae—Gardeniinae)
Hooker: 86 (1873a); Hiern: 463 (1898); Bridson & Verdcourt: 491 (1988).

Climbing or small erect shrubs, ± hairy. **Leaves** opposite, petiolate, mostly clustered at apices of shoots; stipules rather large, interpetiolar, ovate-lanceolate, thickly scarious, striate, imbricate with leaves at ends of shoots, at length deciduous. **Flowers** bisexual, scented, 5- or 6-merous, shortly pedicellate, several to many in terminal sessile clusters. **Calyx**: tube ellipsoid or obconic; tubular part of limb short; lobes subulate or linear-lanceolate, erect, persistent. **Corolla** white, cream, yellow, pink or red, ± salver-shaped, with a narrow tube, or funnel-shaped, glabrescent to pubescent outside, glabrous inside save at base which is densely hairy, or glabrous at base with rest of tube pubescent; lobes elliptic to rounded, shortly clawed, spreading, contorted. **Stamens**: anthers just exserted between corolla lobes or included; pollen in tetrads. **Ovary** 1-locular; ovules many on 2(–74) parietal placentas; style long-excorted or included, thick; stigma large, globose, grooved. **Fruit** subglobose, many-seeded.


**Manostachya Bremek.**
(Rubiodeae—Hedyotideae)

Woody-based herbs. **Leaves** sessile, linear or subulate, upper ones gradually passing into bracts; stipular sheath produced into a subglobose capsule dehiscing loculicidally. **Fowers** sessile or shortly pedicellate, 4-merous, heterostylos, solitary or in axillary cymes arranged at many well-separated upper nodes in very open, elongate, spike-like inflorescences, or each apparent cyme actually an inflorescence terminating a brachyblast; bracteoles present. **Calyx**: tube ovoid; limb tube not developed; teeth narrowly triangular. **Corolla**: tube short, cylindric or funnel-shaped, lobes ± as long or slightly longer. **Anthers** included in long-styled flowers. **Ovary** 2-locular; placentas peltate, attached to middle of septum; ovules several, immersed in placenta. **Style** glabrous, exserted in long-styled flowers, included in short-styled flowers; stigmatic lobes 2, ovoid or filiform. **Fruit** a subglobose capsule dehiscing loculicidally. **Seeds** few, brown, oblong, dorsiventrally compressed, not becoming gluitinous when wet; tests cells with thick cell walls and large perforations forming a reticulate network in the lumen.


**Massularia (K.Schum.) Hoyle**
(Cinchonioideae—Gardeniae—Gardeniinae)

**Randia L., in part; Gossweiler & Mendonça: 56 (1939).**

Shrubs with erect stem up to 100 mm in diameter and plagiotropic branches. **Leaves** opposite, at least slightly petiolate, narrowly elliptic to broadly ovate; branches markedly heterophyllous with one leaf of a pair up to 5 times longer or more than the other; domatia absent; stipules triangular, mucronate, glabrous outside, hairy on inner surface. **Inflorescences** cymose, few- to many-flowered, terminal to lateral. **Flowers** bisexual, articulated in upper half of a short pedicel; buds
subulate. **Calyx** long-tubular, shortly dentate at top. **Corolla** glabrous; tube exceeding calyx tube; lobes 5, very narrowly triangular, spreading. **Stamens** 5; anthers very narrowly oblong, sessile, 2 medulliferous or apices at level of corolla mouth; pollen in irregular tetrads cohering in rhombic clusters. **Ovary** 2-locular; placentas ellipsoid, multi-ovulate; style glabrous, exserted, ending in 2 swollen, narrowly triangular stigmatic lobes. **Fruit** obvoid to subglobose with 10–20 faint longitudinal grooves; mesocarp thick, fleshy. **Seeds** flattened obvoid, contained inside fleshy placental tissue; embryo straight; cotyledons stipulate.


Erect or prostrate annual or perennial herbs with 4-angled stems. **Leaves** opposite; blades linear-lanceolate to ovate or broadly elliptic; stipules connate with petioles to form a fimbriated sheath. **Flowers** not heterostylous or only slightly so, in dense, spherical, sessile, terminal or axillary heads. **Calyx** tube obconic, obvoid or subglobose; teeth 4–5, 2 often longer, sometimes with minute supplementary ones between. **Corolla** salver-shaped or funnel-shaped; tube often with an internal ring of hairs; lobes 4; throat glabrous or hairy. **Stamens** arising in throat; anthers included or exserted. **Disc** fleshy. **Ovary** 2(3)-locular; ovules solitary in each locule, attached by the ring of hairs; lobes 4; throat glabrous or hairy. **Stamens** exserted; anthers linear, somewhat sagittate, subbasifixed on short filaments. **Fruit** 4-locular; placentas peltate, each with 2–4 ovules; style ± as long as corolla tube, with exserted, fusiform, reddish pollen presenter. **Seed** globose, crowned by short calyx. **Seeds** hemispherical with inner face ± concave.

Monotypic genus: **Mitracarpus villosus** Schult. & Schult.f.


Evergreen, glabrous shrubs or trees. **Leaves** petiolate, oblong-elliptic, rather abruptly and obtusely acuminate, with many domatia along midrib and in axils of secondary veins. **Inflorescences** many-flowered corymbiform cymes; bracts small, ciliate. **Calyx** deeply cupular, usually shortly ciliate, rarely pubescent. **Corolla** white, fragrant; tube densely hairy in upper part and mouth; lobes 5, oblong, obtuse-acute, ± as long as tube, reflexed, overlapping to the left in bud. **Stamens** exserted; anthers linear, somewhat sagittate, subbasifixed on short filaments. **Ovary** 4-locular; placentas peltate, each with 2–4 ovules; style ± as long as corolla tube, with exserted, fusiform, reddish pollen presenter. **Fruit** globose, crowned by short calyx. **Seeds** hemispherical with inner face ± concave.

Monotypic genus: **Morelia senegalensis** A.Rich.


**Appunettia R.D.Goode:** 30 (1926b); White: 400 (1962) as synonym.

Trees, shrubs or less often lianes, with mostly glabrous, less often hairy or tomentose stems. **Leaves** opposite or rarely in whorls of 3, sometimes only 1 at flowering nodes; stipules leafy, undivided, free or forming a sheath with the petioles. **Flowers** generally heterostylos, bisexual or rarely unisexual, in tight capitula, flowers usually joined, at least by bases of calyces, capitula sometimes bearing single, large, coloured bracts or occasionally many smaller bracts; capitula 1–several at nodes, frequently arranged in umbels, pedunculate or rarely sessile. **Calyx** tube urceolate or hemispherical, limb swollen or annular. **Corolla** 2–4-locular, sometimes imperfectly so; style with 2 short to long linear branches; ovules solitary in locules, attached to septum below middle or near base, ascending, anatropous or amphitropous. **Fruit** syncarpous (very rarely scarcely so), succulent, containing several pyrenes; pyrenes cartilaginous or bony, 1-seeded or joined into a 2–4-locular woody structure. **Seeds** obovoid or reniform, with a membranous testa and fleshy endosperm.

Species ± 80, throughout the tropics; sthn trop. Afr. 4, Angola, Zambia, Malawi.
**Multidentia Gilli**  
(Verbenoideae—Vanguerieae)


Shrubs or small trees to 12 m tall, or sometimes pyrophytic subshrubs, mostly glabrous, unarmed; stems often lenticellate. **Leaves** mostly restricted to new growth, paired or rarely ternate, petiolate; blades chartaceous to coriaceous, typically glaucous beneath, with a conspicuous network of finely, or less often, coarsely reticulate tertiary nerves; domatia present as tufts of hair, or absent; stipules sheathing at base, pubescent within, provided with a somewhat linear keeled lobe. **Flowers** (4)5(6)-merous, usually medium-sized, borne in pedunculate cymes, usually at nodes from which leaves have fallen, except in pyrophytic species; bracteoles linear to lanceolate, small. **Calyx** chartaceous or coriaceous; limb cupular, truncate, repand, dentate, or cupular below and lobed above. **Corolla** normal or coriaceous and drying wrinkled; tube cylindric, ± equal to lobes or occasionally much longer, glabrous outside with a ring of deflexed hairs inside and usually rather sparsely pubescent at throat; lobes reflexed, rounded or oblong, thickened towards apex. **Stamens** set at throat; anthers partly or fully exerted, oblong-ovate or oblong with dark-coloured connective tissue on dorsal facet except for margin, often apiculate. **Ovary** 2-locular; style slightly longer, or less often up to twice as long as corolla tube, slender; pollen presenter ± as broad as long or less, often elongate, ribbed, hollow to mid-point, apex cleft to ± mid-point when mature; disc glabrous. **Fruit** a 2-seeded drupe, large, subglobose, laterally compressed, often somewhat didymous, often lenticellate, crowned by a persistent calyx limb. **Pyrenes** thinly woody, broadly elliptoid, somewhat curved, truncate at point of attachment, with a line of dehiscence extending from point of attachment to apex, then arching on either side back towards point of attachment but stopping short of it, very strongly rugulose, (except in *Multidentia pobeguinii*); seeds with endosperm entire; testa finely reticulate; embryo slightly curved; radicle erect; cotyledons ± 1/3 as long as embryo, set perpendicular to ventral face of seed.


**Mussaenda L.**  
(Cinchonidaceae—Mussaendae)

Linnaeus: 177 (1753); Hiern: 452 (1898); Wernham: 299 (1916); Good: 3 (1926b); Hepper & Keay: 164 (1963); Bridson & Verdcourt: 460 (1988); Puff et al.: 35 (1993); Bridson: 213, 222, 223, 226 (1998); White et al.: 479 (2001); Coates Palgrave: 1039 (2002).

Shrubs, scandent shrubs or lianas. **Leaves** petiolate; blades usually elliptic with an acute or acuminate apex, pubescent or less often glabrous; stipules entire to completely bilobed, persistent or caducous. **Flowers** usually yellow to red or sometimes white, occasionally sweet-scented, isostylous or heterostylyous, borne in terminal panicles. **Calyx**: tube oblong, turbinate or ovoid; lobes 5, usually subulate, linear, slightly spathulate or sometimes short and dentate or rounded, persistent or caducous; frequently several lobes on each inflorescence develop into a stalked white, creamy yellow or some-times red dilated lamina; colleters usually present between calyx lobes. **Corolla**: tube cylindric, narrowly funnell-shaped or abruptly widened to accommodate the anthers, with flattened or fine hairs at throat and between anthers; limb 5-lobed, lobes reduplicate in bud, spreading at maturity, often with centre portion connate, with short hairs and often a star of longer, coloured hairs above. **Stamens**: anthers 5, with tips just level with the throat or inserted up to halfway down the tube, linear, connective very slightly acuminate at apex, attached by very short filaments near base. **Ovary** 2(3 or 4)-locular; ovules numerous, inserted on fleshy placenta; style slender, sometimes divided into 2 arms; stigma included or occasionally exerted, lobes 2, ± oblong to fusiform. **Fruit** fleshy, indehiscent, globose, ellipsoid or oblong, sometimes crowned by persistent calyx lobes. **Seeds** many, pale brown to blackish, small, usually ± flattened, reticulate.

Species 100, Old World tropics; sthn trop. Afr. 7, Angola, Zambia, Zimbabwe, Malawi.

**Nauclea L.**  
(Cinchonidaceae—Cinchoneae)

Linnaeus: 243 (1762); White: 413 (1962); Hepper & Keay: 163 (1963); Ridsdale & Bakhuizen van den Brink: 547 (1975); Bridson & Verdcourt: 441 (1988).

Medium-sized to large trees; terminal vegetative buds strongly flattened. **Leaves** opposite, petiolate, axils of nerves with or without domatia; stipules ovate, obovate or elliptic, flattened, adpressed, deciduous or ± persistent. **Inflorescences** terminal or terminal and lateral with unbranched axes; nodes with reduced leaves and stipules surrounding young inflorescence not modified into bracts; true peduncle glabrous or pubescent, elongating. **Flowers** 4- or 5-merous. **Calyx** glabrous or pubescent inside; tube developed or not; lobes triangular or oblong, obtuse, with or without persistent appendages. **Corolla**: tube funnel-shaped; lobes oblong, imbricate. **Stamens** arising in throat, exerted; filaments short, glabrous; anthers basifix, introrse. **Ovaries** entirely fused to each other, 2-locular; placenta attached to upper third of septum, Y-shaped with 2 short ascending arms and a long basal one; ovules many in each locale, mostly pendulous, some erect or horizontal but these mostly aborting; style exerted; stigma spine-shaped. **Fruits** indehiscent, connate into a fleshy syncarp. **Seeds** ovoid or ellipsoid, sometimes compressed, not winged.


**Neopentanisia Verdc.**  
(Rubiaceae—Knoxiae)


Small, erect annual herbs; stems slender. **Leaves** opposite, glabrous, subsessile; stipular sheath divided into subulate lobes. **Flowers** bisexual, dimorphic. **Inflorescence** a terminal spike or head. **Calyx**: lobes ± 5, 1 or 2 of them small and leaf-like, the others minute. **Corolla**: tube filiform, slender, densely villous around the mouth; lobes 5, oblong-ovate with valvate aestivation. **Stamens** in long-styled flowers included, in short-styled ones exerted. **Ovary** bilocular; ovules solitary, pendulous. **Fruit** 2-lobed, each lobe subglobose, strongly papillate.

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Seed plants of southern tropical Africa: families and genera
Species 2, endemic to DRC and Angola.

**Nichallea Bridson**
(Cinchonoidaceae—Pavetteae)

Bridson: 288 (1978b).

Shrubs; branches at first pubescent or glabrous, later covered with reddish brown bark. **Leaves** opposite, petiolate, ± elliptic; domatia small or absent; stipules short, oblong or broadly triangular, apex aristate. **Flowers** bisexual, fragrant, (4)5-merous. **Inflorescences** terminal or pseudoterminal, asymmetric; subtending leaves very unequal, sometimes reduced to a single leaf; bracteoles inconspicuous. **Calyx** tube obconic, tubular part of limb short; lobes ovate to triangular. **Corolla** white, turning black when drying, trumpet-shaped; tube cylindrical, slender; lobes ± half as long as tube, with dextrorse aestivation. **Stamens** exserted; anthers linear, ± basifixed on short filaments in mouth of corolla, connective slightly exceeding anther. **Disc** annular, glabrous. **Ovary** 2-locular; placenta short, fleshy; ovule 1 per locule; style filiform, sparsely pubescent; stigma narrowly clavate, fully exserted, usually longer than corolla lobes. **Fruit** baccate, globose, containing 1, 1-seeded pyrene. **Seed** ± globose, flattened above, longitudinally striate.

Monotypic genus: **Nichallea soyauxii** (Hiern) Bridson, trop. Africa; sthn trop. Afr.: Angola (Cabinda).

**Oldenlandia L.**
(Rubiaceae—Hedyotidae)


**Otiophora Zucc.**
(Rubiaceae—Hedyotidae)


**Otomeria Benth.**
(Rubiaceae—Hedyotidae)

Bentham: 405 (1849); Good: 3 (1926b); Verdcourt: 5 (1953a); White: 413 (1962); Verdcourt: 213 (1976); Verdcourt: 78 (1989); Bridson: 219 (1998).

**Tapinopentas** Bremek.; White: 421 (1962).

Annual or perennial, erect, subprostrate or twining herbs with mostly hairy stems. **Leaves** paired; stipules with base divided into several narrow segments. **Flowers** bisexual, small and white or rather large and coloured, monomorphic or dimorphic, in cymose heads, which in fruit develop into a long simple spike with fruits geminately arranged and a solitary remotely placed flower in axil at base of spike. **Calyx**: tube ovoid or elongate-oblung; lobes 5, unequal: 1–3 foliaceous and larger than the rest, alternating with small collerettes. **Corolla**: tube long and narrow, with a markedly ovoid-oblung apical dila-
tion in long-styled forms; throat densely hairy; lobes in small-flowered species elliptic, but in large-flowered species broader, ovate to orbicular, narrowing to base where lobes are often connate for a short distance. **Stamens** completely exserted in short-styled forms. **Style** exserted in long-styled forms, stigma bifid with filiform lobes; anthers completely included in apical dilation of corolla tube. **Capsule** oblong, compressed, ribbed, opening by apical valves and also frequently splitting longitudinally. **Seeds** small, reticulate.


**Oxyanthus DC.**
(Cinchonoidaceae—Gardenieae—Gardeniinae)

Good: 16 (1926b); Bridson: 113 (1979a); Bridson & Verdcourt: 526 (1988); Robbrecht et al.: 17 (1996); Bridson: 226 (1998); Sonké: 1 (1999); White et al.: 479 (2001); Coates Palgrave: 1060 (2002); Msekandiana & Mlangeni: 42 (2002).


**Pachystigma Hochst.**
(Ixoroidaceae—Vanguerieae)


**Paederia L.**
(Rubiaceae—Paederieae)


**Paraknoxia Bremek.**
(Rubiaceae—Knoxiaeae)


Annual herbs. **Leaves** paired, shortly petiolate; stipules small, with several deltoid segments from a short base. **Flowers** bisexual, small, dimorphic, some flowers with anthers included and style exserted and others completely vice versa, in small sessile terminal heads. **Calyx**: tube short; lobes small, 3 or 4, sometimes 1 enlarged and rest minute, or all minute. **Corolla**: tube narrowly funnell-shaped; lobes 3 or 4, oblong; throat hairy. **Ovary** 2-locular; ovules solitary in each locule, pendulous; style filiform; stigma bifid, lobes filiform. **Fruit** ovoid, indehiscent, but longitudinally grooved and where fruit breaks off a little cup is left being the persistent woody flanged pedicel; between this flange and base of fruit masses of raphides present. **Seeds** narrowly ellipsoid or ovate in outline, strongly compressed.

Monotypic genus: *Paraknoxia parviflora* ( Stapf ex Verdc.) Verdc. ex Bremek., E and C Africa; sthn trop. Afr.: Angola, Zimbabwe, Malawi; close to *Pentanisia*.
**Parapentas** Bremek.
(Rubioidoeae—Hedyotidoeae)
Bremekamp: 50 (1952b); Verdecourt: 53 (1953c); Verdecourt: 224 (1976); Robbrecht: 174, 186 (1981a); Robbrecht: 718 (1981c).

Procumbent perennial forest floor herbs. **Leaves** paired, petiolate, well-developed and with lateral venation clearly evident; stipule sheath divided into several subulate, collaretipped lobes. **Flowers** bisexual, white or lilac, isostylous or heterostylos, terminal or pseudo-axillary, sessile, usually solitary or sometimes paired. **Calyx**: tube campanulate; lobes 5, ± equal, linear or linear-oblong. **Corolla**: tube narrowly tubular, glabrous or sparsely to densely pilose within throat; lobes 5, elliptic, minutely papillate inside. **Stamens** and **style** exerted in isostylosy species, in normally heterostylosy species stamens usually well-exserted. **Ovary** 2-locular with peltate placentas and numerous ovules. **Fruit** an obconic or globose capsule, sometimes compressed beneath, not beaked, dividing into 4 valves. **Seeds** numerous, brown, angular, pitted.

(Cinchonoideae—Pauridiantheae)
Hooker: 69 (1873a); White: 414 (1962); Verdecourt: 152 (1976); Verdecourt: 51 (1989); Bridson: 224 (1998); White et al.: 482 (2001); Coates Palgrave: 1040 (2002).


Shrubs, small trees or subscandent woody plants. **Leaves** opposite or ternate, shortly petiolate; petioles compressed, channelled; blades acuminate or caudate, usually with acarodomatia; midnerve channelled; stipules interpetiolar, tri-nerved; blades acuminate or caudate, usually with 8–11 pairs of prominent secondary nerves on each side of midrib and hairy to glabrous domatia; stipules interpetiolar, caducous, in vernation interlocking with each other or enclosing one another. **Inflorescence** thyrse, axillary; stipules at base caducous. **Flowers** (4)5-(6)-merous. **Calyx**: tube short, inside densely hairy; lobes triangular to rounded, sometimes with 1 or 2 collater in sinuses. **Corolla** glabrous outside; tube with a short, basal, cylindrical portion and a campanulate-inflated upper portion longer than basal portion, hairy inside; lobes with valvate aestivation, cowl-shaped, hairy inside, each with a very long, filiform apical appendage. **Stamens** anthers included, sessile, sagittate, medifixed, with acuminate apex, dehiscing longitudinally, arising ± in middle of campanulate portion of tube. **Disc** indistinct. **Ovary** 2-locular; placenta pendulous, arising at top of septum, covered with many upwardly imbricate ovules; style shorter than corolla tube; stigma 2-lobed. **Fruit** an ellipsoid septicidal capsule with tips of valves slightly loculicidal. **Seeds** winged, very narrowly elliptic in outline, with apical portion narrowly triangular, and basal part deeply divided into 2 long very narrowly triangular wings; central endosperm-bearing portion ellipsoid, $1/3$–$1/4$ as long as entire seed; embryo surrounded by endosperm.


**Pavetta** L.
(Cinchonoideae—Pavetteae)
Good: 24 (1926b); Bridson & Verdecourt: 619 (1988); Bridson: 221, 223, 227 (1998); Bridson: 567 (2001); White et al.: 484 (2001); Bingham & Smith: 143 (2002); Coates Palgrave: 1109 (2002); Mapaura & Timberlake: 168 (2002).


**Pentaloncha** Hook.f.
(Position uncertain)
Hooker: 73 (1873a); Hiern: 79 (1877); Oliver: t. 2326 (1894); Good: 8 (1926b); Hallé: 226 (1966).

Decumbent herbs rooting at lower nodes; young parts minutely hairy. **Leaves** large, but leaves of a pair usually different in size, sometimes markedly so, petiolate, oblancoate; base long-cuneate; apex subacute; glabrous above; veins pubescent on lower surface, 8–14(17) secondary veins on each side of midrib; stipules interpetiolar, very narrowly lanceolate, very long-acute, entire or sometimes bifid, glabrous. **Inflorescences** dense, pedunculate, axillary, 5–20-flowered cymes. **Flowers** small, bisexual, pedicelled, usually 5-merous. **Calyx**: tube campanulate in flower, globose in fruit; lobes subequal, pedicelled and spatulate-lanceolate, leaf-like, ± as long as corolla, persistent. **Corolla** tubular, slightly funnel-shaped, densely pubescent inside except towards base, densely hisurate in throat, puberulous outside; lobes ovate-triangual. **Stamens** arising in middle of corolla tube (in longistylosy form), or shortly below the throat (in brevistylosy form); anthers

Species ± 20–25, confined to trop. Africa and Madagascar; sthn trop. Afr. ± 5, Angola (Cabinda), Zambia, Zimbabwe, Malawi, Mozambique.
subsessile, linear-oblong, slightly lunate, apiculate; pollen simple. **Disc** annular, yellow. **Ovary** 2(3)-locular, puberulous; style slender, glabrous; stigma narrowly 2-lobed; ovules many, on peltate, axile placentas. **Fruit** spherical, indehiscent, crowned by the slightly accrescent calyx. **Seeds** spherical, reddish brown, pitted, sitting in slight depressions in peltate placentas.


**Pentanisia Harv.**
(Rubioideae—Knoxieae)

**Phellocalyx**


**Pentas Benth.**
(Rubioideae—Hedyotideae)


**Pentodon Hochst.**
(Rubioideae—Hedyotideae)


**Phellocalyx Bridson**
(Cinchonoideae—Gardenieae)

Glabrous or hairy shrubs or small trees with supra-axillary branches. **Leaves** usually thinly coriaceous with a characteristic divaricate venation, usually oblong-elliptic to lanceolate, less often more rounded; stipules triangular, acuminate or aristaate with raised midline. **Flowers** sessile or rarely pedicellate, usually small in sessile or pedunculate bracteate clusters; bracts and bracteoles forming a complicated pattern of primary bracts; secondary bracts often supporting triads of flowers, and bracteoles often several per flower usually joined to form a cup at base of calyx. **Calyx**: tube campanulate or tubinate; tube of limb cup- or bowl-shaped, obconic or sometimes tubular, occasionally covering corolla in bud, truncate or 4- or 5-toothed, persistent. **Corolla**: tube narrowly funnell-shaped or cylindric, densely hairy at throat; lobes 4 or 5, strictly contorted, overlapping to the left (as seen in bud), ovate to oblong, acuminate, spreading. **Stamens** 4 or 5, inserted in corolla tube, filaments very short; anthers linear, fixed at back near base, included or partly exserted, sometimes minutely apiculate. **Disc** small but evident, fleshy. **Ovary** 2-locular; ovule solitary in each locule, pendulous; style filiform, exserted, usually shortly pubescent or hairy, with filiform or rarely ± ellipsoid undivided or slightly to distinctly bifid stigma. **Fruits** pea-like with rather tough epicarp, 1- or 2-locular, 1- or 2-seeded. **Seeds** subglobose to plano-convex with striate-sulcate tests and very ruminate endosperm.

Species 20, trop. Africa, Madagascar, Comoro Islands; sthn trop. Afr. 5, Angola (Cabinda), Zambia, Malawi, Mozambique.

**Pouchetia A.Rich. ex DC.**
(Ixoroideae—Hypobathreae)
Candolle: 393 (1830); Hierm: 466 (1898); Hepper & Keay: 130 (1963); Hallé: 263 (1970).
DICOTYLEDONS

Low to tall shrubs with glabrous vegetative parts. Leaves opposite, petiolate, narrowly oblong to elliptic, attenuate at both ends, shiny; domatia absent; stipules broadly triangular, long-acuminate. Inflorescences axillary, few-flowered, pedunculate, in pairs at successive nodes. Flowers bisexual, sessile. Calyx cup-shaped, glabrous, with 5 unequal subspathulate lobes. Corolla ± funnel-shaped, glabrous outside, with 5 ovate lobes, contorted. Stamens very narrowly oblong, sessile, with apices exserted. Ovary 2- or 3-locular, locules sometimes fusing in upper part; ovules 2–8 per locule; pollen presenter far exserted, spindle-shaped. Fruit baccate with juicy edible pulp. Seeds 1–15; testa fibrous; endosperm copious; embryo straight.


Pseudogardenia Keay
(Cinchonoidae—Gardenieae)

Climbing shrubs or lianes with pubescent internodes. Leaves opposite, shortly petiolate, obovate, ± pubescent on lower surface; stipules intrapetiolar, narrowly triangular, acicular, pubescent, ± persistent; domatia absent. Inflorescence: flowers solitary, terminal on lateral branches. Calyx narrowly conical; lobes 5(6), ovate or elliptic, imbricate. Corolla narrowly funnel-shaped, conspicuous, Rothmannia-like, densely sericeous outside, glabrous or puberulous inside; tube up to 160 mm long; lobes 5(6), ovate or lanceolate. Stamens 5(6); anthers sessile, linear, arising in mouth of corolla tube, half-exserted, often twisted in upper part. Ovary 1-locular with 2 long parietal, many-ovuled placentas; style partly pubescent, with a spindle-shaped pollen presenter at level of anthers terminating in 2 small subglossous stigmatic lobes. Fruit baccate, subglobose, 10–12-ribbed, crowned with ± persistent calyx. Seeds lenticular, many amassed in placental tissue.


Pseudomussaenda Wernham
(Cinchonoidae—Isertieae)

Erect or sometimes probably scrambling shrubs or subshrubs. Leaves opposite, petiolate, lanceolate to ovate; stipules triangular or bifid. Flowers bisexual, ± sessile, heterostylos, fairly large, in several- to many-flowered cymose terminal inflorescences; 1–several peripheral flowers often have 1 calyx lobe enlarged into a petaloid, coloured, stipitate lamina. Corolla: tube elongate, ± oblone; lobes 5, ± subulate. Corolla: tube narrowly cylindrical, upper part containing anthers somewhat swollen; lobes (4)5, ovate, induplicate-valvate, usually drawn out into a filiform appendage very evident in the buds which have (4)5 apical subulate projections; throat velvety hairy. Stamens included in swollen part of tube. Ovary 2-locular, each locule with many ovules borne on the marginal portions of very narrowly oblong curved placenta which resemble lamellae; style ± ¾ as long as corolla tube in short-styled flowers; stigmas just exserted in long-styled flowers; stigma bilobed, with lobes linear or ovoid. Fruit dry, mostly capsular, with rather incomplete loculicidal dehiscence or sometimes not dehiscent; calyx lobes soon caducous. Seeds small, reticulate.


Psilanthus Hook.f.
(Ixoroidae—Coffeaceae)

Shrubs or small trees. Leaves opposite, petiolate, papery to subcoriaceous; domatia usually present, hairy; stipules shortly sheathing, with a truncate to triangular limb usually bearing a linear to subulate lobe, often caducous. Flowers bisexual, (4)5-merous, terminal or axillary or both terminal and axillary, solitary or paired, sessile to shortly pedicellate; bracts and bracteoles absent or glabrous; flower sometimes subtended by young leaves above bracteoles. Calyx: tube ovate to campanulate; limb subequaling the disc; 5-lobed or irregularly toothed, and margin beset with colleters. Corolla white; tube cylindrical but widened at apex, equalling to over twice as long as lobes, glabrous or sparsely pubescent outside; lobes contorted in bud, spreading. Stamens: anthers set at mouth of corolla, sessile, linear, shortly apiculate at apex, scarcely hasteate at base, usually attached above to well above the middle, with apical part exserted or sometimes entirely included, occasionally tending to adhere towards base. Disc annular. Ovary 2-locular; placentas small, attached to middle or somewhat above middle of septum; style cylindrical, slender, glabrous, usually much shorter than corolla tube; stigma included, bifid; arms linear to narrowly oblong, sometimes not separating. Fruit a drupe, ellipsoidal or broader than long and distinctly 2-lobed, containing 2, 1-seeded cartilaginous pyrenes; calyx lobes greatly or not at all accrescent. Seed oblong-ellipsoid, grooved on inner face; endosperm pale in colour, horny, asymmetrically folded from groove, embryo somewhat curved; testa thin, smooth at low magnifications.

Species ± 20, Old World, E to Australia; sthn trop. Afr. 2, Angola.

Psychotria L.
(Rubioidae—Psychotrieae)
Good: 31, 32 (1926b); Verdcourt: 26 (1976); Verdcourt: 9 (1989); Bridson: 220, 221, 222, 224 (1998); White et al.: 488 (2001); Bingham & Smith: 144 (2002); Coates Palgrave: 1126 (2002).


Psydrax Gaertn.
(Ixoroidae—Vanguerieae)
DYCOTYLEDONS

RUBIACEAE: Psydrax


Pygmaeothamnus Robyns
(Ixoroideae—Vangueriaceae)


Pyrostria
Comm. ex Juss.
(Ixoroideae—Vangueriaceae)


*Richardia L.
(Rubioideae—Spermacoceae)


Rothmannia Thunb.
(Cinchonoideae—Gardenieae—Gardeniinae)


Rubia L.
(Rubioideae—Rubieae)


Rutidea DC.
(Cinchonoideae—Pavetteae)


Scandent shrubs, often with hairy stems. Leaves paired, petiolate; domatia absent or present as hairy tufts in axils of lateral and sometimes tertiary nerves beneath; bacterial nodules absent; stipules with 3–15 filmbriae or with a single lobe. Flowers bisexual, 4- or 5(6)-merous, sessile or pedicellate in pyramidal to racemiform or hemispherical to flat-topped panicles, terminal on the main or short lateral branches, sessile to pedunculate (the presence of rudimentary leaves frequently renders this character ambiguous); bracts and bracteoles present, either conspicuous and exceeding calyx or inconspicuous. Calyx: tube ovoid to campanulate; limb tube usually short, slightly wider than tube, bearing 4 or 5(6) ovate, subulate, filiform to linear or triangular lobes. Corolla white or cream, usually small, salver-shaped; tube cylindrical to funnel-shaped, glabrous to sparsely pubescent inside; lobes 4 or 5(6), contorted in bud, spreading or reflexed. Stamens arising in mouth of tube, exserted, or at least partly so; filaments short; anthers attached near base or occasionally near middle, usually shortly apiculate. Disc glory, glabrous. Ovary 2(3)-locular (or in-completely so); ovules solitary, inserted on a small fleshy placenta ascending from base of ovary; style slender, greatly or less often scarcely exceeding corolla tube, glabrous or nearly so or less often densely pubescent just above base; stigma ± exserted, fusiform, clavate or broadly elliptic to globose, entire or rarely 2- or 3-lobed. Fruit 1-locular, frequently orange to red, drupaceous, spherical, somewhat fleshy with a chartaceous endocarp; calyx limb persistent or less often deciduous. Seed 1, globose, filling the cell, hilum basal, irregular; testa thin, reticulate; albumen horny, deeply ruminate; embryo curved.


Rytigynia Blume
(Ixoroideae—Vangueriaceae)


Plectonia in part.


Sabicea Aubl.
(Cinchonoideae—Isertiaceae)

Aublet: 192 (1775); Hiern: 454 (1898); Gossweiler & Mendonça: 83 (1939); Hepper: 289 (1958); White: 420 (1962); Bridson & Verdcourt: 469 (1988); Bridson: 222, 223 (1998).

Lianes, straggling shrubs or sometimes scarcely woody climbers, usually ± hairy. Leaves opposite, petiolate; stipules entire or emarginate, often comparatively large, mostly with conspicuous colleters within. Flowers sometimes showing limited heterostyly, small or medium-sized, in sessile or pedunculate, several- to many-flowered paniculate or capitate axillary inflorescences, or in a few cases plant cauliflorous; bracts often conspicuous, sometimes forming an involucre. Calyx: tube elliptoid-oblong or ovoid; tubular part of limb sometimes cylindric and elongated; lobes often well-developed. Corolla usually ± white; tube mostly narrowly cylindric; lobes small, valvate. Stamens with very short filaments or ± sessile; anthers ± medifixed, narrowly oblong, arising towards base of tube in long-styled flowers and near throat in shorter-styled flowers but only tips exserted, if at all. Ovary 4- or 5-locular, with elliptic placentas usually externally covered with ovules; style slender, glabrous, divided into 5 long narrow astigmatic lobes, or style with 5 arms terminating in slightly thicker stigmatic lobes. Fruits globose, many-seeded, fleshy berries. Seeds irregularly ovoid, compressed, mostly angular, finely reticulate or striate.
Species 120, tropical America, trop. Africa and Madagascar; sthn trop. Afr. ± 6, Angola, Zambia.

Sacosperma G.Taylor (Rubioideae—Hedyotideae)
Taylor: 218 (1944); Bremekamp: 43 (1952b); Hallé: 121 (1970).

Small woody lianes with twining stem. Leaves petiolate, base cuneate, apex ± attenuate or subacuminate; domatia present; stipules 2- or more-lobed. Inflorescences terminal, many-flowered, laxly paniculate; floral bracts minute or absent; flowers heterostylos, subsessile, turning black when dry; aestivation valvate. Calyx divided to base into 5 ± equal, ovate-triangular to linear lobes. Corolla tubular, much longer than calyx, glabrous outside, barbate inside in upper half; lobes 5, short, triangular. Stamens 5, arising in upper half of corolla tube, subsessile and included, or on short filaments arising at mouth of corolla tube (in short-styled flowers). Disc cushion-shaped, glabrous. Ovary 2-locular; placenta peltate, attached to middle of septum; ovules many; style glabrous, exserted from mouth of corolla tube, with 2 diverging stigmatic lobes. Fruit globose, 10-ribbed, tardily septicidally dehiscent into 2 apically split parts. Seeds many, small, angular, slightly dorsiventrally flattened, subcaruncular.

Species 2, trop. Africa; sthn trop. Afr. 1: Sacosperma paniculatum (Benth.) G.Taylor, Angola (Cabinda).

Sarcoccephalus Afzel. ex Sabine (Cinchonideae—Naucleaceae)
Sabine: 442 (1824); Good: 1 (1926b); Bridson & Verdcourt: 439 (1988); Bridson: 223 (1998).

Small to medium-sized trees; terminal vegetative buds flattened. Leaves opposite, petiolate, axis of nerves with or without domatia; stipules deltoid, obtuse or slightly notched at apex, ± persistent. Inflorescences terminal or terminal and lateral with unbranched axes; young inflorescence surrounded by reduced leaves and stipules not modified into bracts; true peduncle glabrous or pubescent, elongating. Flowers 4- or 5-merous. Calyx densely pubescent inside, lobes obtuse to triangular with or without deciduous or persistent appendages. Corolla: tube funnel-shaped; lobes oblong, imbricate in bud. Stamens arising in tube, not exserted; filaments short, glabrous; anthers basifixed, introrse. Ovaries of adjoining flowers entirely fused to each other, 2-locular; placenta ± discoidal, attached to middle of septum; ovules numerous in each locule, spreading in all directions; style exserted; stigma spindle-shaped. Fruits indehiscent, joined to form a fleshy syncarp. Seeds ovoid or ellipsoid, not winged.


Schumanniphyton Harms (Cinchonideae—Gardenieae)
Harms: 313 (1897); Good: 169 (1926a); Hallé: 21 (1970).

Chalazocarpus Hiern: 469 (1898); Good: 169 (1926a).

Slender, small to fairly tall trees, in habit somewhat reminiscent of Carica papaya, with straight, erect, usually unbranched stems bearing a few unbranched, slender, caducous branches in whorls of 3–5 mainly near top, each branch bearing 3 leaves at apex; scars left by fallen leaves oval, long visible. Leaves very large, often exceeding 1 x 0.5 m, petiolate or sessile, lanceolate to obovate, entire; stipules interpetiolar, triangular, protecting terminal bud of branch. Inflorescence sessile, borne just above the terminal leaf on a flat, circular, glabrous area with 50 to more than 100 densely crowded sessile flowers. Flowers bisexual. Calyx small, tubular, irregularly toothed. Corolla tube very long, cylindric; lobes 5–11, spreading, turned towards left in bud, lanceolate. Stamens as many as corolla lobes; anthers arising in upper part of corolla tube below mouth, sessile, medifixed. Ovary 2–5-locular; each locule with a perianth axile placenta bearing many anatropous ovules; style filiform, ending in 3 or 4(5) ± spreading stigmatic lobes just emergent or in mouth of tube. Fruit globose, with thick, ± dry wall, indehiscent, ± sessile, in clusters of 7–9, often long-persistent. Seeds ± 10–50 per fruit, brown or black; endosperm white, hard; embryo yellow with straight radicle and suborbicular cotyledons.


Sericanthe Robbr. (Cinchonideae—Gardenieae—Diplosporineae)


Sherbournia G.Don (Cinchonideae—Gardenieae)

Scandent shrubs or lianes. Leaves opposite, petiolate, mostly thinly coriaceous; stipules rather large, oblong or elliptic, obtuse, deciduous. Flowers bisexual, in 1–several-flowered inflorescences on one side of stem at successive nodes, often ± sessile. Calyx: tube turbinate, sometimes ribbed; tubular part of free limb short; lobes 5, rather large, obtuse, contorted and overlapping to the right. Corolla rather large; tube funnel-shaped to campanulate, constricted at base, thickly silky outside, glabrous inside save for a densely barbate portion at base in constriction; lobes 5, short and broad, overlapping to the left. Stamens: anthers ± sessile, arising in throat of corolla; pollen grains single. Ovary 2(3)-locular, obconic; style clavate, sulcate; stigma scarcely separating into 2 lobes; ovules many, immersed in vertical rows on 2 placenta. Fruit oblong-ellipsoid. Seeds many, reticulate and wavy-rugulose.


Spermacoce L. (Rubioideae—Spermacoceae)

**RUBIACEAE: Spermacoce**

**DICOTYLEDONS**


**Stelechantha Bremek.**
(Cinchonoideae—Pauridiantheae)

**Urophyllum** Wall. in part as to *U. cauliflorum* R.Good.

Erect perennial herbs, subshrubs or shrubs up to 3m high; foliage, inflorescences and young shoots characteristically covered with a dense velvety tomentum. **Leaves** opposite or in whorls of 3 or 4, subsessile or shortly petiolate, usually markedly discolorous; stipules connate in lower part, drawn out into a linear apex, eventually deciduous. **Inflorescences** axillary, dense, usually opposite, with flowers few to many in ± globose cymes, or 1–few-flowered fascicles; bracts and bracteoles present, often fairly conspicuous. **Flowers** fairly small, but large in *T. rhodesiacum*, subsessile to shortly pedunculate. **Calyx** lobes 5, mostly erect and linear to linear-lanceolate, less often ovate to oblom-triangualr. **Corolla** apiculate in bud; green, yellow or white, densely hairy outside; tube cylindrical, glabrous, occasionally hairy at throat, with a ring of deflexed hairs within; lobes reflexed, usually apiculate. **Stamens** inserted at throat; anthers ± exserted. **Ovary** 4–5-(6)-locular with one pendulous ovule per locule; style slender, usually exserted; pollen presenter cylindric or coroniform, sulcate and 4–5–lobulate. **Fruit** subglobose, usually crowned by persistent calyx, velvety or infrequently ± sparsely hairy, with 3–5 pyrenes, or fruit oblique and reduced to 1 pyrene.


**Tarenna Gaertn.**
(Cinchonoideae—Pavetteae)
Hiern: 457 (1898); Bridson: 377 (1979b); Bridson & Verdcourt: 584 (1988); Bridson: 222, 225, 227 (1998); White et al.: 499 (2001); Coates Palgrave: 1084 (2002).

Erect perennial herbs, subshrubs or shrubs up to 3m high; young parts glabrous or ± pubescent. **Leaves** opposite, petiolate; narrowly elliptic to ovobate, up to 350 mm long, densely whitish-tomentose underneath; stipules reddish, 30–40 mm long, broadly ovate, acuce, persistent, glabrous or hairy at base. **Inflorescences** axillary, capitate, with several sessile heterostylos flowers enclosed in a deep, campanulate, (3)4-lobed bracteate involucre. **Calyx** tubular with 5 pubescent lobes. **Corolla** tubular; lobes 5, spreading. **Stamens**: anders very narrowly elliptic, apiculate, subsecise, partly exserted in brevistylos flowers, deeply hidden in longishistolous ones. **Ovary** (2)3–5-lobular, glabrous, with long narrow placenta bearing many ovules; style glabrous, ending in (2)3–5 narrowly elliptic stigmatic lobes. **Fruit** succulent, fleshy, globose, bright red when ripe. **Seeds** many, small, brown.


**Triainolepis** Hook.f.
(Rubioidae—Triainolepideae)

Erect perennial herbs, subshrubs or shrubs up to 3m high; young parts glabrous or ± pubescent. **Leaves** opposite, petiolate; blades lanceolate to ovate or oblong-elliptic, often curved; stipules ovate or ovate-triangualr, divided into 3–5 lobes. **Flowers** bisexual, heterostylos, (4)5-merus, in terminal corymb; bracts small or minute. **Calyx** tube campanulate, limb cupular, unequally 5–7-toothed. **Corolla** white, yellowish or tinged red, salver-shaped, tomentose to woolly outside; tube with throat and sometimes upper half inside densely barbate with white hairs; lobes lanceolate, hairy outside, glabrous inside. **Stamens** arising at top of corolla tube, exserted or included. **Disc** mostly glabrous. **Ovary** 4–10-locular, each locule with 2(3) collaret, erect, anatropous ovules; style filiform, glabrous, exserted or included; stigma lobes 4–10, filiform, straight or twisted, sometimes coherent. **Fruits** usually red, globose or depressed-globose, drupaceous, containing a woody or bony 4–10-celled
putamen, entire or slightly to deeply incised between locules; locules 1-seeded. Seeds ellipsoid, compressed, with membranous testa and fleshy albumen.


Tricalysia A.Rich. ex DC.
(Cinchoniceae—Gardenieae—Diplosporineae)

Empogona Hook.f.

Trichostachys Hook.f.
(?)Rubioideae—Psychotrieae
Hooker: 24, 128 (1873a), name conserved; Hiern: 226 (1877); Gossweiler & Mendonça: 57 (1939).

Perennial herbs or subshrubs. Leaves opposite, petiolate, lanceolate; stipules ovate to lanceolate. Inflorescence terminal, globose to oblong, involucrate heads or dense terete spikes. Flowers bisexual, small, white. Calyx: tube campanulate to obvoid; lobes 4–6, spreading, hispid or ciliate, persistent. Corolla funnel-shaped or subcampanulate, not much longer than calyx, throat hairy; lobes 4–6, ovate or lanceolate, spreading, valvate in bud. Stamens 4–6, arising in throat of corolla; filaments short; anthers included, linear, glabrous, fixed above base. Disc cushion-shaped or raised. Ovary 2-locular; ovaes solitary, erect; style slender, glabrous, with 2 short obtuse branches. Fruit small, ovoid or subglobe; pyrenes 2, planoconvex, crustaceous. Seeds smooth; testa membranous; endosperm fleshy.


Uncaria Schreb.
(Cinchoniceae—Coptosapelteae)

Ourouparia Aubl.; Hiern: 435 (1898).

Woody lianes or sometimes forming scrambling bushes or thickets; young stems ± quadrangular; flowering branches bearing strongly curved hooked spines. Leaves paired, petiolate, elliptic, apex acuminate; stipules simple or 2-lobed, deciduous. Inflorescences globose, solitary, axillary or terminal. Flowers not fused, pedicellate. Calyx: tube ellipsoid, free part well-developed, shallowly 5-undulate to distinctly 5-toothed, persistent. Corolla: tube filiform-cylindrical, funnel-shaped at throat; lobes 5, imbricate or quincuncial. Stamens: filaments very short; anthers apiculate, 2-theceous. Ovary 2-locular; placentas petalate, entirely covered with imbricated ascending ovules; style long and narrow, well exerted from corolla; stigma slightly thickened with 2 marks on either side. Fruits fusiform, dry, dehiscent, borne on accrescent pedicels.

Seeds small, with long fine wings from opposite ends, mostly 1 from one end and 2 or 3 from the other.

Species 34, tropics, mainly Asia and Indonesia; sthn trop. Afr. 1: Uncaria ariflora G.Don, Angola.

Vangueria Comm. ex Juss.
(Ixoroideae—Vanguerieae)

Tapiphyllum as to T. parvifolium (Sond.) Robyns; Van Wyk & Van Wyk: 274 (1997).


Vangueriella Verdc.
(Ixoroideae—Vanguerieae)


Straggling or scandent branches; branches (and sometimes stout spines?) in whorls of 3. Leaves in whorls of 3 (or sometimes paired?), petiolate, oblong, apex sharply acuminate; stipules with triangular base with subulate, eventually deciduous appendage. Inflorescences axillary, ± many-flowered distichous cymes. Flowers bisexual, small to medium-sized; bracts small or scarcely developed; buds lanceolate or cylindric, acute. Calyx: tube campanulate, adpressed-pubescent; lobes linear-lanceolate. Corolla: tube campanulate or cylindric; lobes oblong, usually shorter than tube. Stamens: anthers small, half-exserted, ovate or ovate-lanceolate; filaments very short. Disc glabrous. Ovary 3-locular; ovules 1 per locale, pendulous; style shortly exserted, cylindric to narrowly obconic; stigmatic club crown- or mitre-shaped, 2-lobed at apex. Fruit compressed bilobed, containing 2 pyrenes and crowned by calyx limb.


Vangueriopsis Robyns
(Ixoroideae—Vanguerieae)


Virectaria Bremek.
(Rubiioideae—Hedysteaceae)
Good: 3 (1926b) as Virecta; Bremekamp: 21 (1952b); Verdcourt: 35 (1953b); Bridson & Verdcourt: 457 (1988); Verdcourt: 415 (1993); Bridson: 218, 226 (1998); Dessain et al.: 1 (2001).

Annual or perennial herbs or subshrubs with erect or procumbent, glabrescent to stiffly hairy stems from a fibrous rootstock. Leaves paired; stipules small, deltoid, entire to fimbriated. Inflorescences few- to many-flowered cymose clusters
at apices of main shoots. **Flowers** bisexual, small, never dimorphic. **Calyx**: tube ovoid or urceolate, often bristly hairy; lobes 5 or 6, equal or unequal, spathulate, filiform or lanceolate. **Corolla**: tube narrowly cylindric to funnel-shaped; lobes 4–6(7), deltoid to lanceolate, suberect. **Disc** cylindric, or consisting of 2 separate cones. **Stamens** 4–6, far exerted on slender filaments; anthers narrowly oblong, ± medifixed. **Ovary** 2-locular; ovules many, on placentas on central partition. **Fruit** a characteristic globose capsule splitting in a plane at right angles to the central partition into 2 valves of which 1 usually remains attached to the rachis. **Seeds** small, subglobose, reticulately pitted, brownish.


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Rutaceae
(Rosidae—Sapindales)
(Eurosids II—Sapindales)


Sthn Afr. genera 11, species ± 50.

Identification of additional genera using the key in the above reference:

*Citrus* will not run well in the key, but its winged articulated petioles and its well-known segmented, aromatic berries with
leathery skin and pulp of small juicy sacs distinguish it clearly from the indigenous species.

Fagaropsis will run to 15b and partly to 20a, but it can be distinguished from *Zanthoxylum* by its opposite (not alternate)
leaves; (6)8 stamens; 4-locular (not 1-locular) ovary; and baccate (not capsular) fruit.

*Ruta* will run to 1b, having pinnately divided leaves, but being a perennial herb it will run no further.

Calodendrum Thunb.

Mendonça: 181 (1963); Mendonça & Sousa: 3 (1973), White et al.: 508
(2001); Coates Palgrave: 414 (2002).

Species 2, tropical and sthn Afr.; sthn trop. Afr. 1: *Calodendrum capense*
(L.f.) Thunb., Zimbabwe, Malawi, Mozambique, and in sthn Afr.

Citropsis (Engl.) Swingle & M.Kellerm.

Exell & Mendonça: 274 (1951); Mendonça: 193 (1963); Mendonça & Sousa:
13 (1973); Coates Palgrave: 422 (2002).


*Citrus L.*

Exell & Mendonça: 275 (1951); Mendonça: 209 (1963); Mendonça & Sousa:

Evergreen shrubs or small trees, sometimes with spines beside
buds. Leaves alternate, simple, thick and leathery; petioles winged and usually jointed at junction with blades. Flowers bisexual or male, solitary or in racemes. Petals 4, or 5, white, sometimes reflexed. Stamens 20–40, at least 4 times as many as petals, joined in groups. Fruit a segmented, aromatic, gland-dotted berry with a thick leathery rind and a pulp of small juicy saccs.

Sthn trop. Afr. 2. *Citrus limon* (L.) Burm.f. and *C. sinensis* (L.) Osbeck have become naturalised in eastern Zimbabwe.

**Clausena** Burm.f.


**Fagaropsis** Mildbr. ex Siebenl.


Deciduous trees, usually with buttresses; young branches, leaves and inflorescences cinereous-pubescent, older branches glabrous. Leaves opposite, imparipinnate; leaflets opposite, 2–4(6)-jugate, subsessile or petiolulate, margin entire with a row of rather closely spaced pellucid gland dots. Inflorescence of cymose clusters in branched panicles and in sessile clusters on main rachis, arising from buds at end of previous year’s branches, before or together with new leafy branches. Flowers unisexual by abortion, pedicellate. Sepals 4, united at base, ovate, acute, whitish-pubescent. Petals 4 (sometimes 5 or 6 in the female flowers), imbricate in bud, oblong-lanceolate. Male flowers with (6)8 stamens, shorter than petals; ovary vestigial, glabrous. Female flowers with staminodes; disc annular; ovary globose, 4-locular with 1 pendulous ovule in each locule; style very short; stigma reflexed. Fruit baccate, subglobose, somewhat depressed, glandular-foveolate. Seed ovoid, pendulous; endosperm present.


**Oricia** Pierre


**Ruta** L.


Perennial, aromatic (sometimes nauseatingly so), glabrous herbs. Leaves alternate, pinnately divided, spotted with glands. Sepals 4, lanceolate. Petals 4, in central flower 5, hooded, dark yellow, margin toothed or hairy. Stamens 8–10. Styles fused. Fruit a 4- or 5-celled capsule.

Recorded as occasional garden escapes, e.g. *Ruta chalepensis* L. in Angola.

**Thamnosma** Torr. & Frém.


**Toddalia** Juss.


**Vepris** Comm. ex A. Juss.


**Zanthoxylum** L.


**References**


Salicaceae
(in broad sense)
(Dilleniidae—Violales)
(Eurosids I—Malpighiales; includes Flacourtiaceae (in broad sense) in part)

Trees or shrubs, sometimes dioecious, sometimes spiny. **Leaves** alternate, sometimes fascicled, simple, entire or toothed, often with salicoid dentation; stipules present, sometimes foliaceous and subpersistent, or 0. **Inflorescences** axillary or terminal, sometimes epiphyllous, racemose, spicate, corymbose, paniculate, fasciculate, or flowers solitary. **Flowers** bisexual or unisexual, at least functionally, often small and inconspicuous. **Sepals** (3–8–15), free or connate below, sometimes connate with lower part of ovary, contorted or imbricate, rarely valvate. **Petals** usually either 0 or equal in number and similar to sepals, free. **Disc** cup-shaped and ± adnate to adaxial surface of calyx, or annular or divided into separate glands. **Stamens** 2–many, free or rarely connate, sometimes alternating with staminodes, arising singly or in groups on receptacle, between disc lobes or glands, or in flowers with cup-shaped disc on disc rim in sinuses between lobes; anthers mostly small, ovoid to ellipsoid, rarely linear, 2-theceous, opening by longitudinal slits. **Ovary** superior or more rarely semi-inferior, 1-locular, sometimes incompletely separtate by intrusion of placenta; with (1)–many ovules on 2–8 parietal placentas, rarely ovules axile or basal; styles 1–8, entire or branched. **Fruit** baccate or capsular and usually (2)–6–valved, sometimes a drupe. **Seeds** usually small, sometimes arillate, sometimes with a basal tuft of long dense hairs; endosperm fleshy, copious, rarely thin or 0.

Sthn trop. Aft.: genera 12, species 33.


See under Flacourtiaceae (in broad sense), p 208, and under Chase et al. 2002, for a discussion on the suggested treatment of this family.

**Key to genera**

1a Perianth absent .................................................................................................................................................................................................... **Salix**

1b Perianth present, either of sepals only or of both sepals and petals:

2a Petals absent; anthers mostly shorter than 1 mm and not much longer than broad:

3a Leaves with linear or circular pellucid glands; stamens connate at the base with the alternating disc glands .......................................................... **Casearia**

3b Leaves generally without pellucid glands (very fine glands are very rarely present in **Doryalis**); stamens free:

4a Stamens in bundles of ± 10 alternating with the sepals; fruit a capsule .................................................................................................................................. **Bivinia**

4b Stamens irregularly arranged; fruit a berry or a berry-like drupe:

5a Ovary 1-locular; flowers bisexual; spines absent ........................................................................................................................................ **Ludia**

5b Ovary falsely 3–8-locular; flowers unisexual, rarely bisexual; spines generally present:

6a Stamens surrounded by a ring of disc glands; ovary with 2 ovules per locale, one above the other; fruit a berry-like drupe with 1-seeded pyrenes in pairs .................................................................................................................................................................................................. **Flacourtia**

6b Stamens intermingled with disc glands and alternating with them; ovules 1–6 per placenta; fruit a berry with 1 or 2 seeds ........ **Doryalis**

2b Petals present, sometimes similar to sepals; anthers of varying size:

7a Inflorescence epiphyllous (on petiole or on midrib of leaf lamina):

8a Sepals, petals and stamens all 5; style entire; flowers always bisexual .................................................................................................................................. **Mozquereysia**

8b Sepals and petals 3 or 4(5); stamens 20–40; flowers unisexual or bisexual (plants polygamous) ....................................................................................................................... **Phyllobotryon**

7b Inflorescence axillary, terminal or cauline:


SIEBENLIST, S. 1914. Forstwirtschaft in Deutsch-Ostafrika.


DICOTYLEDONS

SALICACEAE: Key to genera

9a Flowers up to 90 mm in diameter with a conspicuous central golden mass of stamens; anthers mostly longer than 2 mm, linear; plant often spiny .................................................................................................................... Oncoba

9b Flowers less than 80 mm in diameter; stamens fewer and less conspicuous than above; anthers shorter than 1 mm, not much longer than broad; plant not spiny:

10a Stamens many, not collected in bundles opposite petals; fruit a berry .............................................................................................................. Scolopia

10b Stamens equal in number to petals or in bundles opposite petals; fruit usually a capsule:

11a Leaves with 5–9 nerves from base; flowers unisexual; seeds with a red aril ........................................................................................................... Trimeria

11b Leaves peninnerved; flowers bisexual; seeds without an aril:

12a Style simple with a capitate or minutely bilobed stigma; flowers in pedunculate cymes; stipules deltoid ............................................ Gerrardina

12b Styles 2–6 or 2–6-cleft; flowers in racemes or panicles; stipules absent or large and orbicular or reniform ............................................. Homalium

Bivinia Jaub. ex Tul.
(Homalieae)
Jaubert & Tul.: 78 (1857); Wild: 294 (1960); Wild & Vidigal: 37 (1973); Sleumer: 51 (1975); Coates Palgrave: 758 (2002); Mapaura & Timberlake: 165 (2002).

Tall trees; bark light grey; branches thin; branchlets greyish brown with pale lenticels, with a thin grey pubescence when young. Leaves alternate, petiolate, ovate, broadly elliptic or somewhat obovate, long-acuminate at apex, crenate-dentate; stipules absent. Flowers bisexual, in axillary or rarely terminal, dense, cordate racemes; pedicels articulated near middle; bracts small and linear; receptacle very shallow. Sepals 5 or 6, valvate, with broad, truncate, pubescent glands adnate to base of each sepal. Petals 0.

Stamens in fascicles of 10 alternating with sepals; filaments folded in bud; anthers globose, very small. Ovary 1-locular with 4–6 multi-ovulate placentas; styles 4–6, filiform; anthers small, connective generally rather obscure.


Gerrardina Oliv.
(Homalieae)
Wild: 287 (1960); Wild & Vidigal: 30 (1973); Sleumer: 37 (1975); Killick: 72 (1976); Bredenkamp: 305 (2000); White et al.: 272 (2001); Mapaura (Unpublished).


Homalium Jacq.
(Homalieae)


Ludia Comm. ex Juss.
(Flacourtieae)

Unarmed small trees or shrubs. Leaves alternate, petiolate, persistent, entire, oblong, oblanceolate, obovate or elliptic, apex usually shortly attenuate, base cuneate, nerves in 6–8 pairs, steeply ascending; stipules 0. Flowers bisexual, small, solitary or rarely 2 or 3 together from same axil, subsessile, subtended by several minute suborbicular bracts. Sepals 5 or 6, in one whorl, imbricate, densely pubescent outside and in upper part of inside, reflexed at anthesis. Petals 0. Stamens 40–60, arising on a flat receptacle with several small glands, among many hairs; filaments filiform; anthers small, connective generally rather obscure. Ovary glabrous, 1-locular, with 2–4 parietal placentas bearing few to many ovules; style columnar, 2–4-lobed or -partite at apex. Fruit baccate, with persistent style, 1-locular, hardly or tardily and irregularly dehiscent; pericarp coriaceous. Seeds few; testa hard.


Mocquerysia Hua
(Scopoliaceae)

Unarmed, single-stemmed shrubs. Leaves alternate, simple,
DICOTYLEDONS

petiolate, narrowly obovate, cuneate at base, long-acuminate at apex, dentate to denticulate, glabrous; stipules linear-acuminate, glabrous. Inflorescences epiphyllous, usually in 1-flowered cymes in 2–6 groups per leaf on petiole or on midrib in lower 1/4 of lamina. Flowers bisexual; pedicel pubescent, ± as long as flower; bracts narrowly ovate. Sepals 5, imbricate, very narrowly ovate to linear-ovate, pubescent, persistent. Petals 5, imbricate, narrowly ovate to linear-ovate, pubescent, persistent. Stamens 5: filaments very short, glabrous; anthers lanceolate, glabrous or glabrescent. Ovary 1-locular, with 3 multi-ovulate parietal placentas, tomentose; style simple, truncate, persistent in fruit. Fruit an ovoid capsule, pubescent to glabrescent, surrounded by perianth.


**Oncoba Forssk.**

(Tribal affinities not yet known)


**Phyllobotryon Müll.Arg.**

(Scolopiaceae)


Erect, glabrous shrubs, not or little branched. Leaves alternate, clustered near tips of branchlets, petiolate, persistent, elongate-obovate or -spathulate, apex rounded but tip abruptly serrate-dentate; lateral nerves 14–18 pairs, prominent on both faces; stipules lanceolate, caducous. Inflorescence epiphyllous, 1–3(4)-flowered, on midrib of upper 2/3–3/4 of lamina, glabrous; median bract ovate-lanceolate, accrescent. Stamens 5; filaments very short, glabrous; anthers lanceolate, glabrous or glabrescent. Ovary 1-locular, with 3 multi-ovulate parietal placentas, tomentose; style simple, truncate, persistent in fruit. Flowers bisexual or unisexual (plants polygamous), pedicelled. Petals 4–6, imbricate, rather irregular and dry, ovate, ciliate. Sepals 3 or 4(5), imbricate, rather irregular and dry, ovate, ciliate. Stamens 25–40, free; filaments subulate; anthers almost basifixed, longitudinally dehiscence, apiculate by protruding connective. Ovary superior, glabrous, 1-locular, with 2 or 4 multi-ovulate parietal placentas; style simple, shortly 2–4-fid. Capsule opening with 2 or 3 valves; pericarp woody. Seeds weakly arillate, with endosperm.


**Salix L.**

(Salicaceae)


**Scolopia Schreb.**

(Scolopiaceae)


**Trimeria Harv.**

(Homalieae)


References


**SALICACEAE**: Moquerysia
naturelles, sér. 4, Botanique 8: 78.


Azima Lam.

Hiern: 659 (1898); Verdcourt: 1 (1968); Vickery: 375 (1983); Coates Palgrave: 921 (2002).


Dobera Juss.


*Platymitium* Warb.: 279, t. 31 (1895).

Much-branched, evergreen, unarmed trees. **Leaves** elliptic or obovate, subcoriaceous or thin, glaucous, almost glabrous, petiolate. **Flowers** bisexual, sessile in axillary or terminal panicles, small, greenish white. **Calyx** ovoid, 3- or 4(5)-toothed, sometimes ± bilobed. **Petals** 4(5), free, elliptic, oblong or linear-oblong, sometimes ± spathulately, imbricate. **Stamens** 4(5), hypogynous; filaments dilated basally, strongly connate forming a tube, free and filiform above; anthers ovoid. **Disc** composed of 4 glands each at base of a petal and alternating with stamens. **Ovary** 1-locular; style short; stigma obsolete or truncate; ovules 2. **Fruit** a subglobose or ellipsoidal 1-seeded drupe.

Species 2, both occurring in trop. Africa, one extending to southern Arabian Peninsula and India; sthn trop. Afr. 1: *Dobera loranthifolia* (Warb.) Harms, Mozambique.

Salvadora L.

Hiern: 659 (1898); Verdcourt: 7 (1968); Vickery: 377 (1983); Coates Palgrave: 921 (2002).

*Salvadora persica* (L.) DC. Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

References


**SALICACEAE: References**

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SANTALACEAE


Osyridicarpos A.DC.


Osyris L.
Hiern: 938 (1900); Baker & Hill: 433 (1911); White: 40 (1962); Hilliard: 391 (1994); Coates Palgrave: 194 (2002); Bingham (Unpublished).


Thesium L.
Hiern: 936 (1900); Baker & Hill: 411 (1911); Lawalrée: 65 (1972); Hilliard: 53 (1991); White et al.: 520 (2001); Mapaura (Unpublished).


References

Sapindaceae
(Rosidae—Sapindales)
(Eurosids II—Sapindales)


Key to genera
[adapted from Davies & Verdcourt (1998)]

1a Flowers appearing when plant is leafless:

2a Flowers bisexual; petals 4; stamens 8, arising in a bundle where the 5th petal is deficient ................................................................. Erythrophysa

2b Flowers unisexual; petals absent; stamens 4–7, not arising in a bundle:

3a Disc cushion-shaped; stamens arising in pockets in the disc; ovary 3-locular, locules 1-ovulate ................................................................. Haplocoelum

3b Disc flat or cup-shaped; stamens arising within the disc; ovary 2-locular, locules 2-ovulate ................................................................. Zanha

1b Flowers and leaves appearing together:

4a Leaves simple:

5a Leaves sticky-glandular and shiny, at least when young, margin entire ......................................................................................... Dodonaea

5b Leaves not sticky, margin entire, crenate or serrate:

6a Leaf apex narrowly acuminate or acute, rarely bluntly acuminate; buds covered by imbricate sepals; leaf nervation not forked towards margin ................................................................................................................................. Allophylus

6b Leaf apex obtuse, emarginate or rarely shortly acuminate; buds opening precociously; leaf nervation prominent and forked near margin ................................................................. Pappea

4b Leaves compound:

7a Plants climbing by tendrils:

8a Leaves pinnate, the rachis winged ......................................................................................... Paullinia

8b Leaves biternate, the rachis not winged ........................................................................ Cardiospermum

7b Plants not climbing by tendrils:

9a Leaves bipinnate ........................................................................................................................................ Macphersonia
9b Leaves pinnate:

10a Stamens 4 or 5:

11a Leaf rachis winged; petals minute, without a scale ................................................................. Filicium

11b Leaf rachis not winged; petals with hair-fringed scales ....................................................................... Lepisanthes

11c Petals absent:

13a Lower leaflets much reduced, tending to resemble stipules .................................................................... Glenniea

13b Lower leaflets slightly smaller than the upper ones:

14a Stamens arising in pockets in the cushion-shaped disc; ovary 3-locular, locules 1-ovulate ....................... Haplocoelum

14b Stamens arising inside the disc; ovary 2-locular, locules 2-ovulate ....................................................... Zanha

10b Stamens 6–14(–30):

15a Petals 3 or 4; flowers radially or bilaterally symmetrical:

16a Leaves trifoliolate ......................................................................................................................................... Allophylus

16b Leaves usually with 2 or more pairs of leaflets, rarely abnormally trifoliolate:

17a Flowers radially symmetric; sepals 5, free; petals 4, without claw and without a scale ................................ Majidea

17b Flowers bilaterally symmetric; sepals 4 or 5, partly fused into a campanulate, urceolate or cup-shaped calyx; petals 3 or 4 with a claw and a basal scale:

18a Single-stemmed shrubs or small trees with palm-like habit with a crown of large leaves, ovary 3–9-locular with 1 ovule per locule:

19a Fruit not ribbed or lobed, 5–7-locular; leaves mostly longer than 1 m; anther filaments thickening towards the base ...

Radlkofera

19b Fruit ribbed or lobed, 3–9-locular; leaves up to 1 m long; anther filaments not thickening towards the base ........

Chytranthus

18b Branched shrubs or small trees; leaves much shorter than 1 m; ovary with 3 locules with 1 or 2 ovules per locule:

20a Fruit an inflated, beaked bladder; ovary with 2 ovules per locule ........................................................... Erythrophylla

20b Fruit either a 3-lobed drupe or of 1–3 free mericarps; ovary with 1 ovule per locule .................................... Pancobia

15b Petals absent or 5; flowers symmetric:

21a Petals absent:

22a Sepals opening precociously in bud before the elongation of the filaments ................................................. Stadmannia

22b Sepals remaining imbricate around the elongated and folded filaments in bud:

23a Inflorescence arising from the trunk or branches; fine network of veins on leaflets very prominent; ovary deeply 3-lobed ........................................................................................................................................ Placodiscus

23b Inflorescence from leaf axils; fine network of veins on leaflets not prominent; ovary not lobed .................... Lecaniodiscus

21b Petals 5:

24a Petals 2–5 x as long as sepals, with short free broad hairy scales; stamens 8; leaves with lowermost leaflet pair stipule-like ...

Eriocoeulum

24b Plant without the above characters combined:

25a Filaments glabrous throughout ................................................................................................................. Haplocoelopsis

25b Filaments hairy, at least for part of their length:

26a Buds opening precociously to reveal sessile anthers; leaflets in 1–5 pairs .................................................... Blighia

26b Buds covered by imbricate sepals; leaflets in 2–18 pairs:

27a Tree with palm-like habit; stamens 14–20 ............................................................................................... Deinbolia

27b Branched trees; stamens 6–10:

28a Ovary 3-lobed, narrowly 3-winged; stamens 8; fruit of 2 or 3 broadly winged mericarps ...................... Atalaya

28b Ovary 2-lobed, not winged; stamens 5–8; fruit of 2 or 3 ellipsoid or compressed, but not winged, mericarps:

29a Vegetative parts and sepals glabrous; fruit of 1–3 ellipsoid indehiscent mericarps .................................. Lepisanthes

29b Vegetative parts and sepals greyish green or rusty tomentose; fruit of (1)2 dehiscent mericarps ... Aporrhiza

Allophylus L.


Aporrhiza Radlk.


Trees, functionally monoecious; bark grey-brown or grey-green; branchlets fulvous-tomentose or -pubescent. Leaves paripinnate; leaflets 2–4-jugate, oblong-elliptic or elliptic. Inflorescence a terminal or axillary paniculate thyrsus. Flowers functionally unisexual, regular. Sepals 5, free almost to base, ovate to ovate-elliptic. Petals 5, slightly shorter than sepals, unguiculate, cream or creamy white, each with 2 hairy scales formed by inflexed margin above claw. Disc deeply lobed, glabrous. Stamens 6–8; filaments pilose. Ovary 2-locular, pilose, locules 1-ovulate; style short, 2-lobed. Fruit capsular, of 2 divergent, platter-shaped, loculicidally dehiscent cocci. Seeds 1 in each locule, with an arillose covering lower half.

Atalaya Blume

Blighia K.D.Koenig

Cardiospermum L.

Chytranthus Hook.f.
Glossolepis Gilg; Exell: 87 (1928).

Small trees or shrubs, usually single-stemmed and often with a palm-like habit, polygamous or dioecious. *Leaves* paripinnate, up to 1 m and longer, with ± 4–8 pairs of ± opposite leaflets; stipules absent. *Inflorescences* spicate racemes arranged in rows or groups on old wood or roots. *Flowers* slightly irregular with petals crowded to one side and stamens or ovary on opposite side. *Calyx* 6–8(15); filaments filiform, conspicuously hairy; anthers 2-thecous, dorsifixed, linear-oblong. *Disc* urn-shaped, 5, ovate, ciliolate.


Eriocoeulum Hook.f.

Small slender trees, spuriously polygamous, often monoecious; bark smooth, grey; branchlets fulvous-tomentose. *Leaves* paripinnate, shortly petiolate or subsessile; leaflets 3- or 4-jugate, oblong-elliptic, lowest pair often resembling stipules. *Inflorescence* ± terminal or axillary, paniculate or racemoid thyrse. *Flowers* regular, whitish, sweetly scented. *Sepals* 5, almost free. *Petals* 5, each with a short broad pilose or pubescent scale. *Disc* patelliform or collar-like with a free scarious margin. *Stamens* 8; staminodes shorter in female flowers. *Ovary* 3 locular, densely hairy, locules 1-ovulate; pistillode subglobose in male flowers. *Fruit* capsular, 3-gonous, 3-locular, loculicidally dehiscent; valves lanuginous at base within. *Seeds* 1 per locale, ellipsoid, with an arillode at base.


Glennia Hook.f.
Hooker: 404 (1862); Leenhouts: 411 (1975); Davies & Verdcourt: 52 (1998); Coates Palgrave: 649 (2002).

Dioecious, monoecious or polygamous shrubs or trees; bark grey, smooth. *Leaves* alternate, simple or pinnate; leaflets in 1–6 pairs, uppermost largest, lowermost much smaller, ob lanceolate, elliptic to lanceolate, entire but sometimes undulate, glabrous except main veins underneath, main lateral veins in 4–14 pairs. *Inflorescence* terminal, axillary or cymose, paniculate or thyrsoid with few spreading...
branches. **Flowers** regular. **Sepals** 3–5, ± free. **Petals** 0 or 5. **Stamens** 4–8, well exerted. **Ovary** 2- or 3-lobed; ovules 1 per locule; style 2- or 3-locular and -lobed. **Seeds** without aril.


**Haplocoeolus** F.G.Davies

Shrubs or small trees with dense leafy crown; probably monoeocious. **Leaves** pinnate; leaflets entire, lowermost ones reduced, stipule-like, one of the pair inserted on or shortly above petiole, sometimes caducous. **Inflorescence** axillary, racemose, slender, simple or branched. **Flowers** regular. **Sepals** 5, united shortly at base; lobes unequal, oblong-ovate. **Petals** 5, elliptic-lanceolate to ovate, exceeding sepals at maturity, scale 2-lobed, half as large as limb. **Disc** a complete ring, flat, broad, glabrous. **Male flower**: stamens 9, glabrous.

**Female flower**: staminodes 8, curved in bud, glabrous; ovary 2-lobed, 2-locular; style truncate, with 2 stigmatic grooves. **Fruit** subglobose, grooved.

Monotypic: *Haplocoeolus africana* F.G.Davies, tropical east Africa and Angola. The Angolan material may represent a separate, closely related taxon.

**Haplocoeolus Radlk.**

Shrubs or small trees with dense leafy crown; probably monoeocious. **Leaves** pinnate; leaflets entire, lowermost ones reduced, stipule-like, one of the pair inserted on or shortly above petiole, sometimes caducous. **Inflorescence** axillary, racemose, slender, simple or branched. **Flowers** regular. **Sepals** 5, united shortly at base; lobes unequal, oblong-ovate. **Petals** 5, elliptic-lanceolate to ovate, exceeding sepals at maturity, scale 2-lobed, half as large as limb. **Disc** a complete ring, flat, broad, glabrous. **Male flower**: stamens 9, glabrous.

**Female flower**: staminodes 8, curved in bud, glabrous; ovary 2-lobed, 2-locular; style truncate, with 2 stigmatic grooves. **Fruit** subglobose, grooved.

Monotypic: *Haplocoeolus africana* F.G.Davies, tropical east Africa and Angola. The Angolan material may represent a separate, closely related taxon.

**Lecaniodiscus** Planch. ex Benth.

Trees or shrubs, dioecious, sparsely pubescent. **Leaves** pinnate, petiolate; leaflets 3–7-jugate, entire. **Inflorescence** an axillary racemoid or paniculate thyrs, often borne in axils of fallen leaves. **Flowers** yellow. **Sepals** 5, free nearly to base. **Petals 0 Disc lobed. Stamens** 8–13; filaments glabrous; staminodes present in female flowers. **Ovary** 3-locular, locules 1-ovulate; style short, stigmas 3-lobed; pistillode present in male flowers. **Fruit** 1-locular (by abortion), slightly asymmetrically ellipsoid capsule, indehiscent or tardily and irregularly splitting from base. **Seed** completely surrounded by an arillose.


**Lepisanthes** Blume


Monoeocious evergreen trees. **Leaves** pinnate; leaflets in 1–3 pairs, opposite or alternate, entire, glabrous, lowermost leaflets often reduced and sometimes stipulate-like. **Inflorescences** terminal and axillary, paniculate or simple. **Flowers** regular, greenish yellow. **Sepals** 4–5, free, unequal, strongly imbricate. **Petals** 0–4, ovate, clawed, fringed with small hairs. **Disc** pentagonal, lobed, convex. **Stamens** 5–7, hairy at base. **Ovary** 2(3)-lobar and -locular with 1 ovule per locule; style entire; ovary rudiment in male flowers a cushion of hairs. **Fruit** of 1(–3) indehiscent mericarps, developed ones ellipsoid, but 1 or 2 abortive at base. **Seeds** without aril.


**Macphersonia** Blume
Blume: 156 (1847); Exell: 534 (1966); Exell & Sousa: 41 (1973); Davies & Verdcourt: 37 (1998); Coates Palgrave: 651 (2002).

Dioecious small trees or shrubs; branchlets pubescent and pilose. **Leaves** 2-paripinnate with 3–6 pairs of pinnae; leaflets 5–10(–15)-julate, obliquely oblong, entire, nearly glabrous. **Inflorescence** an axillary racemoid thyrs. **Flowers** unisexual, regular. **Sepals** 5, petaloid, slightly connate at base. **Petals** 5, small, unguiculate, each with 2 linear scales at base formed by infolding of margin. **Disc** annular, glabrous. **Stamens** 7 or 8; filaments glabrous. **Ovary** 2(3)-locular; locules 1-ovulate; pistillode very small in male flowers. **Fruit** baccate, usually 1- or 2-locular and 1- or 2-seeded (by abortion). **Seed** with a thin arille.

Species ± 8 species in Madagascar and the Comoro Islands, and 1, *Macphersonia gracilis* O.Hoffm. (=*M. hildebrandtii* O.Hoffm.), extending to eastern trop. Africa; sthn trop. Afr.: Mozambique.

**Majidea** Kirk ex Oliv.
Olivier: t. 1097 (1871); Mendes: 105 (1970); Davies & Verdcourt: 17 (1998).

Monoeocious tall trees with greyish bark; twigs, leaves and inflorescences initially densely fasciculate-hairy. **Leaves** with 5–9 pairs of leaflets; rachis 4-angled, with lines of simple hairs on angles; leaflets ovate to lanceolate, slightly asymmetric, entire, glabrescent. **Inflorescence** terminal, paniculate. **Flowers** regular, subtended by herbaceous bracts. **Sepals** 5, free, concave, herbaceous, externally hairy. **Petals** 4, without claw or scale. **Disc** a complete circle. **Stamens** 7 or 8(–10); filaments folded in bud, glabrous; anthers sagittate. **Ovary** 3-lobed, 3-locular with 2 ovules in each locule; style long, hairy with a glabrous, channeled tip. **Fruit** a dehiscent trigonous capsule, opening to reveal 3 bright pink valves. **Seeds** 1 or 2 per valve, ovoid, without aril, softly velvety, blue-black; cotyledons spirally arranged.


**Pancovia** Willd.

Sthn trop. Afr. at least 1: *Pancovia golungensis* (Hiern) Exell & Mendonça,
but probably 2 or more, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

**Pappea** Eckl. & Zeyh.


**Paullinia** L.


**Placodiscus** Radlk.


Small trees or shrubs. **Leaves** paripinnate, 4–7-jugate, very large, usually crowded at ends of branches; leaflets petiolulate, oblong-elliptic, abruptly acute-acuminate, entire, glabrous. **Inflorescences** racemes, axillary or arising on old wood. **Flowers** regular; pedicels articulated near base. **Calyx** binate, tomentellous outside. **Petals** 8 or 9; filaments twice geniculate in bud, pilose; anthers oblong, introrse, basi-dorsifix, **Ovary** 3(4)-locular and 3(4)-persistent. **Stamens** (3)4–7, coiled in bud; **Stigma** 2-lobed; pistillode absent in male flowers. **Fruit** 1-locular (by abscission), ± puberulous. **Seed** 1, pendulous from apex of locule; testa provided with stomata; arillode absent.


**References**


BLUME, C.L. 1825. Bijdragen tot de flora van Nederlandsch Indië. Landts Drukkerij, Batavia.


DICOTYLEDONS

SAPINDACEAE: References


Sapaceae
(Dilleniidae—Sapotales)
(Asterids—Ericales)


Sthn trop. Afr.: genera 12, species 34.

Key to genera
[partly after Kupicha (1983)]

1a Calyx of 2 distinct whorls of sepals, either 3 + 3 or 4 + 4; petals often with conspicuous lateral appendages:

2a Calyx with 3 + 3 sepals; corolla of 6 deeply 3-lobed petals joined into a tube at the base; staminodes glabrous, standing away from the ovary; anthers relatively small (1–1.5 mm long) .............................................................................................................. Manilkara

2b Calyx with 4 + 4 sepals; corolla of 8 deeply 3-lobed petals joined into a tube at the base; staminodes usually 8, pilose abaxially and on margins, and erect or loosely coherent into a cone round the ovary and the style; anthers relatively large (2.5 mm or longer):

3a Stipules large and conspicuous .......................................................................................................................................................... Baillonella

3b Stipules absent or minute:

4a Leaves clustered at branch ends; leaves usually 8, pilose abaxially and on margins, and erect or loosely coherent into a cone round the ovary and the style; anthers relatively large (2.5 mm or longer):

4b Leaves not clustered at branch ends; seeds with small basal scar, containing abundant endosperm ........................................................................................................................................................................ Minusops

5a Stipules absent:

5b Stipules present, at least on youngest leaves ................................................................................................................................. Synsepalmum

6a Leaves with inconspicuous, surface of lamina divided into small polygonal areoles by tertiary vein reticulation; seeds subseriplaced, faintly 5-ribbed with small basal scar .............................................................................................................................................. Sideroxylon

6b Leaves not as above, lateral nerves widely spaced and curving from midrib to margin, lamina not sericeous below:

7a Lateral nerves of leaves closely spaced, straight and parallel, diverging at a wide angle from the midrib; lower leaf surface silvery or coppery sericeous with a dense indumentum of appressed hairs ...................................................................................................................... Chrysophyllum

7b Lateral nerves of leaves closely spaced, straight and parallel, diverging at a wide angle from the midrib; lower leaf surface silvery or coppery sericeous with a dense indumentum of appressed hairs ...................................................................................................................... Sideroxylon

8a Leaves not as above, lateral nerves widely spaced and curving from midrib to margin, lamina not sericeous below:

9a Fruit 1, 23–5-seeded; seeds laterally compressed; endosperm copious .............................................................................................................. Chrysophyllum

9b Fruit 1-seeded; seeds not much compressed; endosperm absent:

10a Lateral nerves of leaves closely spaced, straight and parallel, diverging at a wide angle from the midrib; lower leaf surface silvery or coppery sericeous with a dense indumentum of appressed hairs ...................................................................................................................... Englerophyton

10b Leaves not as above, lateral nerves widely spaced and curving from midrib to margin, lamina not sericeous below:

11a Stipules present, at least on youngest leaves ................................................................................................................................. Synsepalmum

11b Stipules absent:

12a Sepals united in lower half, forming a woody, shallowly lobed cupule in fruit; leaves with inconspicuous tertiary nerves ....

12b Sepals free almost to the base; leaves with conspicuous tertiary nerves .............................................................................................................. Pouteria
Bailonella Pierre


Unarmed trees. Leaves spirally arranged, clustered at shoot apex; venation brochidodromous, with parallel secondaries, tertaries oblique. Inflorescences densely clustered at shoot apex in axils of small scale leaves. Flowers bisexual. Calyx of 2 whorls of 4 free sepals, outer whorl valvate. Corolla tube shorter than lobes, hairy; lobes 8, divided to base into 3 segments; median segment erect; lateral segments spreading, exceeding median segment, undivided. Stamens 8, in a single whorl arising at top of corolla tube; filaments free; anthers extrorse, glabrous; staminodes 8, alternating with stamens, erect, narrowly lanceolate, hairy. Ovary 8-locular, hairy; placentation basi-ventral; style slightly exserted. Fruit 1- or 2-seeded, indehiscent, fleshy. Seed broadly ellipsoidal, with a thick, hard, shining testa; scar broad, covering adaxial surface of seed; embryo vertical, with thick, fleshy plano-convex cotyledons and exserted radicle; endosperm absent. 


Chrysophyllum L.


Donella Pierre ex Baill.


Englerophytum K. Krause


Inhambanella (Engl.) Dubard


Manilkara Adans.


Trees; branches terete, striate. Leaves alternate, sessile, lanceolate, acuminate, base cuneate; stipules absent. Flowers bisexual or unisexual (dioecious), in fascicles on old wood or on branches, often subtended by spirally arranged bracts. Calyx a single whorl of 5 free, quincuncial sepals. Corolla broadly tubular; tube shorter than the 5 broadly ovate lobes. Stamens ± 20 in a single whorl, ± 3 opposite each corolla lobe and arising at top of corolla tube; filaments well-developed, glabrous; anthers extrorse, glabrous, absent in female flowers; staminodes 5 or more, much shorter than corolla lobes, usually petaloid, fimbriate, glabrous, often inflexed and covering ovary. Disc absent. Ovary many-locular; placentation axile; style usually included. Fruit usually depressed-globose; several- to many-seeded; outer pericarp often woody. Seeds strongly laterally compressed; testa smooth, shining; scar adaxial, nearly full-length, very narrow; embryo with thin foliaceous cotyledons and exserted radicle; endosperm copious.


Pouteria Aubl.


Tall, deciduous, often dioecious trees, often with strongly buttressed or deeply fluted bole. Leaves usually spirally arranged, rarely opposite, chartaceous or coriaceous, ± clearly pellucid-punctate, densely pubescent to subglabrous; lateral nerves many-paired, looped distally and running parallel to leaf margin or extending to leaf edge to form the thickened margin, tertiary veins conspicuous; stipules 0. Flowers often unisexual, (4;5)-merous, sessile or shortly pedicellate, fasciculate in axils of current or fallen leaves. Calyx a single whorl of 4–6 sepals ± free to base, or 6–11 in a closely imbricate spiral. Corolla: tube slightly shorter than longer lobes; lobes 4–6(–9), simple, sometimes fringed or papillate, usually erect. Stamens 4–6(–9), arising in lower or upper half of tube, rarely free; anthers usually extrorse or laterally dehiscent, included; staminodes, if present, usually as many as corolla lobes, small, ± subulate or rarely petaloid. Disc present or absent. Ovary 1–6(–16)-locular, subglobose, densely pilose; placental...
Species ± 200, Old and New World tropics, Africa ± 5; sthn trop. Afr. 3, Angola, Zambia, Zimbabwe, Malawi, Mozambique.

**Sideroxylon L.**


**Synsepalum (A.D.C.) Daniell**

**Tridesmostemon Engler**

*Sideroxylon* in sense of Greaves: 71 (1927).

Trees. Leaves spirally arranged; stipules absent. Flowers bisexual, solitary or in few-flowered fascicles, axillary or in axils of fallen leaves. Calyx a single whorl of 5 free imbricate sepals. Corolla cymtiflorum; lobes 5, free almost to base, simple, imbricate, spreading or reflexed at tip. Stamens 10–15, 2 or 3 opposite each corolla lobe, arising 1/3–1/2-way up on corolla lobes; filaments of each pair or group of 3 fused almost to apex, hairy; anthers extrorse, hairy or glabrous; staminodes 5, usually 3-dentate at apex, hairy. Disc absent. Ovary 10-locular; placationtumtum axile; style slightly exserted. Fruit subglobose, several-seeded. Seed strongly laterally compressed; testa smooth, shiny; scar adaxial, almost full length, very narrow; embryo with thin foliaceous cotyledons and exserted radicle; endosperm present.


**Vitellariopsis Baill. ex Dubard**


**References**
### Scrophulariaceae (including Orobanchaceae)

*(Asteridae—Scrophulariales)

*(Euasterids I—Lamiales)*

**Key to genera**

*based mainly on Philcox (1990), Fischer (1999c) and Smithies (2000)*

1a Ovary with 1 ovule in each locule; fruit consisting of 2(1) ± ovoid cocci:

2a Two lateral corolla lobes ascending and united with 2 posterior (upper) lobes to form a 4-lobed upper lip; anterior (lower) lobe aborted or reduced to a small tooth

= **Hebenstretia**

2b Corolla limb usually with a 1- or 2-lobed upper lip and 3-lobed lower lip, occasionally upper lip 4-lobed with 1 well-developed anterior lobe

= **Selago**

1b Ovary with 2–many ovules in each locule; fruit a capsule, berry or drupe:

3a Plants holoparasitic, lacking chlorophyll, or apparently so because of other colouring masking green colour; leaves scale- or bract-like or aborted:

4a Corolla tube bent abruptly above the middle, usually 2-lobed; anthers 1-thecate

= **Striga**

4b Corolla straight or somewhat curved but not abruptly bent above the middle, ± regular or 2-lipped; anthers 2-thecate, but sometimes thecae unequal and one may be subobsolete:

5a Corolla distinctly 2-lipped; ovary 1-locular with parietal placentation; seeds subglobose

= **Orobanche**

5b Corolla subregular to somewhat 2-lipped:

6a Succulent root parasite; stem simple, often thickened at the base; ovary 1-locular

= **Cistanche**

6b Herbaceous to slightly succulent parasites; stem simple or branched; ovary 2-locular:

7a Corolla yellow or orange with red or markedly darker veins; anther thecae equal or unequal, all fertile

= **Alectra**

7b Corolla variously coloured, if yellow, without darker veins; anther thecae unequal, one fertile, one barren or subobsolete

= **Harveya**

3b Plants not apparently or actually holoparasitic; leaves with chlorophyll:

8a Flowers spurred or markedly saccate, pouched or gibbous:

9a Corolla tube pouched on anterior side:

10a Annual herbs, glabrous or glandular-pilose

= **Misopates**

10b Shrubs or small trees with stellate hairs on many parts

= **Anastrabe**

9b Flowers spurred at the base:

11a Erect herbs or undershrubs

= **Nemesia**

11b Creeping or prostrate herbs

= **Diclis**

8b Flowers neither spurred, saccate nor gibbous:

12a Leaves mostly alternate, upper leaves sometimes opposite, never all leaves radical:

13a Stamens 2; staminodes absent

= **Anticharis**

13b Stamens 4, rarely 5:

14a Leaves circular; small creeping herbs

= **Sibthorpius**

14b Leaves not circular; plants erect, prostrate or tufted:

It has recently been proposed to divide Scrophulariaceae into several families (Judd *et al.*, 2002; Angiosperm Phylogeny Group, 2003). One of these families, Orobanchaceae, has in the past been considered to differ sufficiently to warrant family status. In its strictest circumscription it comprises some 220 species in about 15 genera of root-parasitic herbs with leaves reduced to scales; flowers in which the anterior corolla lobes cover the posterior lobes in bud; and a 1-locular ovary with parietal placentation (Mabberley 1997). Only two of the genera here dealt with fall in this group: *Cistanche* and *Orobanche*.

Young *et al.* (1999), Goldblatt & Manning (2000), and Olmstead *et al.* (2001) use as the defining morphological synapomorphy of Orobanchaceae the external anterior lobes in corolla activation. In the context of the present work and in the light of the present knowledge it is not considered useful to attempt to place all genera here dealt with into one of the several families which have been proposed.

Sthn. trop. Aft.: genera 54, species 264.
<table>
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<td><strong>15a</strong> Foetid shrubs; branches straight, rigid, subspinescent with age ......................................................... Antherothamnus</td>
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<tr>
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<tr>
<td>16a Capsule thick-walled, ± globose, compressed in upper part at right angles to the septum; plants prostrate or decumbent subshrubs ................................................................. Aiptosimum</td>
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<td>17b Calyx 5-lobed nearly to base; leaves well-developed:</td>
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<td>18a Corolla 4-lobed; tube constricted towards base, throat not bearded ................................................................. *Digitalis</td>
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<td>18b Corolla shortly 5-lobed; tube not constricted towards base, throat bearded or with a V-shaped band of clavate hairs inside:</td>
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<tr>
<td>19a Corolla tube scarcely expanded at apex; anterior anthers shortly exserted; seeds with 6–8 longitudinal ribs ........ Camptoloma</td>
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<tr>
<td>19b Corolla tube abruptly expanded at apex; usually no more than tips of anterior anthers visible in mouth of corolla; seeds not ribbed ................................................................. Jamesbrittenia</td>
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<td><strong>12b</strong> Leaves opposite or at least subopposite with upper ones sometimes alternate, or leaves radical, fascicled or verticillate:</td>
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<td><strong>20a</strong> Stamens 2, with or without staminodes:</td>
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<td>21b Leaves not divided; plant terrestrial, creeping or erect:</td>
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<td>22a Corolla tube short, limb subrotate; stamens exserted ....................................................................................... Veronica</td>
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<td><strong>20b</strong> Stamens 4, rarely 2 by abortion of anterior pair:</td>
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<td><strong>24a</strong> Trees, shrubs, distinctly woody undershrubs, or slender climbers:</td>
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<td>25b Plant not climbing:</td>
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<td>26a Fruit baccate, indehiscent:</td>
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<td>27a Tree or shrub; calyx 3–5-cleft; corolla tube 18–33 mm long ..................................................................................... Halleria</td>
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<td>27b Shrub or robust herb; calyx 5-partite; corolla tube up to 5 mm long ........................................................................ Teedia</td>
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<td>28a All 4 anthers clearly exserted from the corolla tube:</td>
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<td>29b Weakly woody perennial; branches not spreading horizontally ........................................................................... Sutera</td>
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<td>28b Anthers ± included in corolla tube or only 1 pair of anthers exserted:</td>
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<td>30a Anthers 2-thecate with thecae free, diverging:</td>
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<td>31a Flowers in terminal or axillary cymes; leaves entire to toothed in upper half; capsule not compressed, with 2-fid valves ........................................................................................................ Freylinia</td>
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<td>31b Flowers mostly solitary; leaves coarsely toothed throughout; capsule strongly longitudinally compressed, appearing broadly unilaterally winged ....................................................................... Graderia</td>
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<tr>
<td>30b Anthers 1-thecate by the fusion of 2 thecae:</td>
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<td>32a Foetid shrubs; branches straight, rigid, subspinescent with age ................................................................. Antherothamnus</td>
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<tr>
<td>32b Plants of different habit:</td>
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<td>33a Posterior filaments continuing down the corolla tube in the form of raised lines, often to base, sometimes very briefly:</td>
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<tr>
<td>34a Corolla tube scarcely expanded at apex; anterior anthers shortly exserted; seeds with 6–8 longitudinal ribs ......................................................................................................................... Camptoloma</td>
</tr>
<tr>
<td>34b Corolla tube abruptly expanded at apex, usually not more than tips of anterior anthers visible in mouth of corolla tube ........................................................................................................ Jamesbrittenia</td>
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<tr>
<td>33b Posterior filaments not continuing down the corolla tube in the form of raised lines:</td>
</tr>
<tr>
<td>35a Posterior stamens included, arising halfway up the tube or higher; anterior stamens either included or anthers just visible in mouth of corolla tube ........................................................................ Manuela</td>
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<tr>
<td>35b One or both pairs of stamens exserted at anthesis, arising near base of tube .................................................... Sutera</td>
</tr>
<tr>
<td><strong>24b</strong> Herbs or herbaceous undershrubs:</td>
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<tr>
<td>36a Leaves all in a basal rosette:</td>
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<tr>
<td>37a Leaves petiolar to subsessile, glabrous to sparsely hairy; tufted marsh or aquatic herbs with or without stolons .......... Limosella</td>
</tr>
<tr>
<td>37b Leaves sessile to subsessile, pubescent to hispid, at least on lower surface; small pokalioidaceous perennials usually growing on shallow soil overlying rock ........................................................................................................... Craterostigma</td>
</tr>
<tr>
<td>36b Leaves not all radial; ± erect herbs or undershrubs, not aquatic:</td>
</tr>
<tr>
<td>38a Anthers 1-theçous, strictly or by confluence of the 2 thecae:</td>
</tr>
<tr>
<td>39a Anthers strictly 1-theçous:</td>
</tr>
<tr>
<td>40a Flowers solitary, axillary, pedicellate; lower pair of anthers with a 2-branched connective ................... Pseudosopubia</td>
</tr>
</tbody>
</table>
DICOTYLEDONS  SCROPHULARIACEAE: Key to genera

40b Flowers in spikes, racemes or clusters; anthers without a 2-branched connective:
   41a Corolla tube rather sharply curved at or above the middle and often dilated at the curve; anthers basifixed. ... *Striga*
   41b Corolla tube straight or sometimes slightly curved; anthers dorsifixed:
      42a Flowers small, sessile or sub sessile, usually in spikes or globose clusters; corolla lobes subequal; ovary elliptic ................................................................. *Buchnera*
      42b Flowers large, usually petiolate and in racemes (rarely sessile and in spikes); corolla lobes unequal; ovary ovate, ovoid or globose:
         43a Stamens didynamous, arising at 2 levels in the corolla tube; style never exceeding lower pair of stamens ...
            ........................................................................................................................................... *Cycnium*
         43b Stamens equal in length, arising at 1 level in the corolla tube; style exceeding the stamens ... *Rhamphicarpus*

39b Anthers 1-thecous by confluence:
   40a Posterior filaments not continuing down in the corolla in the form of raised lines:
   45a Posterior stamens included, arising halfway up the tube or higher; anterior stamens either included or anthers just visible in mouth ....................................................................................................................................... *Manulea*
   45b One or both pairs of stamens exerted at anthesis, arising near base of tube .............................................. *Sutera*
   44b Posterior filaments continuing down the corolla tube in the form of raised lines, often to base, sometimes very briefly:
      46a Stigma very short (up to 2 mm), often minutely bifid, stigmatic surface ± terminal:
         47a Corolla tube scarcely expanded at apex; anterior anthers shortly exerted; seeds with 6–8 longitudinal ribs, testa reticulate in furrows between ribs ................................................................. *Camptoloma*
         47b Corolla tube abruptly expanded at apex; usually no more than tips of anterior anthers visible in mouth of corolla; seeds not ribbed, testa reticulate ................................................................. *Jamesbrittenia*
      46b Stigma tongue-shaped (tip occasionally minutely bifid), often ± equaling or longer than the style, flattened, with 2 marginal bands of stigmatic papillae:
         48a Bract either adnate to pedicel (or part of pedicel) only, or to pedicel and base of calyx tube (never more than lower third):
            49a Capsule beaked; orange patches, if present on corolla limb, located on all lobes, forming a radial pattern ...
               ......................................................................................................................................... *Zaluzianskya*
            49b Capsule not beaked; orange/yellow patches present on corolla limb but only on posterior lip ................................................................. *Melanospermum*
         48b Bract at least halfway up the calyx tube, rarely less:
            50a Calyx strongly 5-ribbed; corolla tube much longer than calyx ................................................................. *Zaluzianskya*
            50b Calyx not strongly ribbed; corolla tube ± as long as calyx or slightly longer ....................................... *Polycarena*

38b Anthers with 2 fertile thecae, or 1 theca fertile, the other sterile and often variously modified:
   39a Anthers with 2 equal or subequal fertile thecae:
   51a Plants with a basal rosette of leaves; stem ± elongated:
      52a Stamens and staminodes, if present, arising at top or in throat of corolla tube, anterior ones often with appendages at base and a knee-like bend:
         53a Plants with a basal rosette of leaves, or with a very short, densely leafy stem .................................. *Craterostigma*
         53b Plants not with a basal rosette of leaves; stem ± elongated:
            54a Plants up to 1 m high; leaves usually longer than 100 mm; flowers 20–30 mm long; anterior stamens with 2 basal appendages ................................................................. *Artanema*
            54b Plants distinctly smaller; leaves no longer than 50 mm; flowers smaller than above; anterior stamens with 1 basal appendix:
               55a Leaves pinnately veined; seeds with round pits:
                  56a Calyx with winged sepals; ovary with a distinct asymmetric hairy disc; capsule at first poricidal, later septicidal ................................................................................................................... *Torenia*
                  56b Calyx not winged; disc very small or absent, glabrous; capsule septicidal ........................................... *Lindernia*
               55b Leaves palmately veined; seeds smooth or with longitudinal grooves:
                  57a Lower lip of corolla with many-celled club-shaped hairs at the base; seeds with longitudinal grooves; endosperm pitted ................................................................. *Crepidorhopalon*
                  57b Lower lip of corolla with glandular or 1-celled hairs; seeds smooth ............................................. *Lindernia*
   52b Stamens and staminodes, if present, arising in corolla tube; anterior pair without or with appendages:
      53b Calyx not markedly unequally lobed, but sometimes ± 2-lipped:
         54a Corolla 4-lobed, regular, rotate; calyx deeply 4- or 5-lobed .................................................................. *Scoparia*
         54b Corolla 5-lobed; tube funnel-shaped or campanulate; calyx 5-toothed or 5-lobed:
            55a Anther thecae separate, usually on short stalks:
               56a Plant aquatic or amphibious, glabrous to subglabrous ....................................................................... *Limnophila*
               56b Plant terrestrial, strongly glandular-pubescent, viscid, foetid; capsule globose ............................... *Stemodia*
            55b Anther thecae distinct, in contact with each other but often widely diverging:
               56a Flowers distinctly pedicellate:
DICOTYLEDONS

SCROPHULARIACEAE: Key to genera

64a Capsule shortly beaked and reflexed at maturity .................................................. Stemodiopsis
64b Capsule neither beaked nor reflexed:

65a Capsule strongly longitudinally flattened, appearing unilaterally winged, included in persistent calyx ................................................................. Gradera
65b Capsule neither strongly flattened nor winged:

66a Bracts and bracteoles absent:

67a Pedicels 10–20 mm long; corolla clearly 2-lipped; plant drying green .......... Mimulus
67b Pedicels up to 5 mm long; corolla subtorate but not truly 2-lipped; plant drying blackish .............................................................. Micrargeria

66b Bracts and/or bracteoles present:

68a Only bracts present; pedicels 4–14 mm long ................................................. Gerardiina
68b Both bracts and bracteoles present; pedicels 2–4 mm long; plant drying blackish glabrous to subglabrous .............................................. Micrargeria

63b Flowers sessile or apparently so:

69a Bracteoles absent; corolla neither thin nor conspicuously veined; seeds winged ................................................................................. Buttonia
69b Bracteoles present:

70a Corolla yellow or cream; plant hemiparasitic, drying black; stems rather stout; leaves often toothed, sometimes reduced to scales .......................................... Alectra
70b Corolla pinkish white to purple; plant not parasitic; stems very slender, almost filiform; leaves narrowly linear ................................................. Baumia

51b Anthers with 1 fertile theca and 1 modified sterile theca or appendage:

71a Plant climbing: ...................................................................................... Jamesonia
71b Plant not climbing:

72a Plant hemiparasitic, drying black and with scale-like leaves or only a few small green leaves ................. Lapeytiea
72b Plants not hemiparasitic, not drying black; leaves not scale-like, green:

73a Anthers free, not cohering; annual with deeply pinnatifid leaves with 3–7 linear lobes .................... Arnotia
73b Anthers all coherent or coherent in pairs; annuals or perennials with entire to pinnatifid leaves .......... Alectra

Alectra Thunb.

Melasma P.J.Bergius in part; Hiern: 767 (1898); Good & Exell: 118 (1929).


Anastrebe E.Mey. ex Benth.


Antherothammus N.E.Br.


Anticharis Endl.


Aptosimum Burch. ex Benth.
Hiern: 755 (1898); Hemslsey & Skan: 267 (1906); Good & Exell: 116 (1929/1930); Philcox: 3 (1990); Fischer: 199 (1999c).


Artanema D.Don
Don: t. 234 (1834) name conserved; Good & Exell: 117 (1929/1930); Hepper: 361 (1963); Fischer: 192 (1999c).

Erect perennial herbs with simple or sparsely branched, glabrous, quadrangular stems. Leaves opposite, shortly petiolate, ovate to lanceolate, acuminate at apex, serrulate except cuneate base, scabrid above, penninerved. Inflorescence a lax raceme with a pair of flowers at each floriferous node. Flowers 2-lipped, reddish purple with paler throat. Calyx glabrous, 5-lobed; lobes ovate to lanceolate. Corolla slightly irregular; upper lip 2-lobed, with glandular hairs inside; lower lip 3-lobed; tube gradually widening, much longer than lobes. Stamens 4; filaments of anterior stamens geniculate and incurved, papillate and with glandular hairs, filaments of posterior stamens ± straight, much shorter; anthers with 2 equal thecae. Ovary globose, glabrous; style filiform; stigma 2-lobed. Fruit a septicidal capsule. Seeds with alveolate endosperm.

Species 4, Old World tropics; sthn trop. Afr. 1: Artanema longifolium (L.) Vatke, Angola.

Bacopa Aubl.

Moniera P.Browne; Good & Exell: 117 (1929/1930).


Baumia Engl. & Gilg
Engler & Gilg: 365 (1903); Hemslsey & Skan: 456 (1906); Good & Exell: 127 (1929/1930); Hepper: 361 (1963); Fischer: 192 (1999c).
DICOTYLEDONS

**Crepidotropis Palnt**

**Crepidotropis Palnt.**

**DICOTYLEDONS SCROPHULARIACEAE: Baumia**

**DICOTYLEDONS SCROPHULARIACEAE: Baumia**

Erect, slender, hispid annual herbs; stem simple or slightly branched above middle. **Leaves** opposite, sessile, deeply pinnatifid with 3–7 linear, costate, usually entire lobes. **Flowers** solitary in axils of upper leaves and in short terminal spikes; bracteoles 2, lanceolate, ± as long as calyx. **Calyx** campanulate, slightly constricted at top, 10-ribbed, coarsely hairy outside, glabrous within; lobes 5, nearly equal, short, triangular. **Corolla**: tube cylindric, widening slightly upwards, ± as long as calyx; lobes 5, ± equal, rounded, reflexed. **Stamens** 4, ± equal, very shortly exserted; filaments filiform; anthers free, glabrous, one theca perfect, opening longitudinally, the other much reduced, club-shaped. **Ovary** 2-locular, glabrous; ovules many; style filiform, glabrous, thickened towards tip, curving downwards with line of hairs on underside of curve. **Capsule** orbicular, compressed, enclosed in calyx.

Monotypic genus: **Baumia angolensis** Engl. & Gilg, known only from Angola. Differs from *Sophia* mainly in the free, not coherent, anthers.

**Buchnera L.**


**Sthn trop. Afr. 4, Angola, Zambia, Zimbabwe, Malawi, and sthn Afr.**

**Crepidorhopalon Eb. Fisch.**


**Species 29, Africa and Madagascar; sthn trop. Afr. 15, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.**

**Cycnium E. Mey. ex Benthe. emend. Engl.**


**Sthn trop. Afr. 5, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.**

**Diclis Benthe.**

Hieron: 756 (1898); Philcox: 12 (1990); Mielcarek: 67 (1996); Fischer: 22 (1999e).

**Sthn trop. Afr. 3, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.**

**Buchnera L.**


**Sthn trop. Afr. 4, Angola, Zambia, Zimbabwe, Malawi, and sthn Afr.**

**Bugonia McKen ex Benthe.**


**Sthn trop. Afr. 1: Bugonia natalensis** McKen ex Benthe., Zimbabwe, Mozambique, and sthn Afr. (N Namibia).

**Camptoloma Benthe.**


**Cistanche Hoffmanns. & Link**


**Root parasites totally lacking chlorophyll, fleshy; stems succulent, simple, often thickened at base. **Leaves** reduced to fleshy scales. **Inflorescence** congested, spicate. **Flowers** simple or sub sessile, bracteate, bibracteolate, rather large. **Calyx** gamosepalous, 4- or 5-lobed, persistent; lobes obtuse, rounded, equal or 2 posterior ones narrower. **Corolla** tubular below, funnel-shaped above, ± curved or bent; limb 5-lobed, spreading, lobes broad, equal or subequal. **Stamens** 4, didynamous, ± exserted, arising deep in corolla tube; anthers usually bearded. **Stigma** globular; style apically decurved. **Ovary** unilocular, ovules many; style apically decurved; stigma globular. **Capsule** bi-valved. **Seeds** many, minute.

A genus of 16 species, southern Mediterranean Europe and north Africa; Ethiopia to India and northwest China; sthn trop. **Afr. 1: Cistanche tubulosa** (Schenk) Hook.f., Mozambique.

**Craterostigma Hochst.**


**Sthn trop. Afr. 4, Angola, Zambia, Zimbabwe, Malawi, and sthn Afr.**

**Crepidorhopalon Eb. Fisch.**


**Species 29, Africa and Madagascar; sthn trop. Afr. 15, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.**

**Cycnium E. Mey. ex Benthe. emend. Engl.**


**Sthn trop. Afr. 5, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.**

**Dicylis Benthe.**

Hieron: 756 (1898); Philcox: 12 (1990); Mielcarek: 67 (1996); Fischer: 22 (1999e).

**Sthn trop. Afr. 3, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.**

**Digitalis L.**

Linnaeus: 621 (1753); Philcox: 77 (1990).

Biennial or perennial herbs or rarely small shrubs. **Leaves** alternate or sometimes predominantly basal, simple, variously dentate to subentire. **Flowers** irregular, in terminal, bracteate, racemes. **Calyx** 5-lobed; lobes equal to subequal, shorter than corolla tube. **Corolla** tubular, cylindrical or inflated-globose, usually constricted towards base; limb usually bilabiata with lips spreading or erect, upper lip shorter. **Stamens** 4. **Capsule** conical to ovoid, septicidal. **Seeds** small, many.

**Species ± 20, Europe, Mediterranean and Canary Islands; naturalised elsewhere in the world, as an escape from cultivation; sthn trop. Afr. 1: *Digitalis purpurea* L. recorded from Zimbabwe and Malawi.**

**Dopatrium Buch.-Ham. ex Benthe.**


**Sthn trop. Afr. 7, Angola, Zambia, Zimbabwe, Malawi, and sthn Afr.**

**Freylinia Colla**


**Sthn trop. Afr. 1: Freylinia tropica S. Moore, Zimbabwe, Mozambique, and sthn Afr.**

**Gerardiina Engl.**

Hieron: 770 (1898); Philcox: 154 (1990); Mielcarek: 81 (1996).

Graderia Benth.
Hiern: 772 (1898); Philcox: 149 (1990).

*Sebisia* Presl; Hiern: 772 (1898).


Halleria L.


Hedbergia Molau

Perennial herbs, sometimes shrubby, erect to scrambling, branched below, becoming tufted, pubescent. **Leaves** opposite, sessile, crenate or serrate, decreasing in size above. **Flowers** solitary, axillary, shortly pedicellate, ebracteolate. **Calyx** 4-lobed; lobes straight. **Corolla** subrotate, 5-lobed; limb weakly bilabiate but not separated into galea and lip. **Stamens** 4, didynamous; anther thecae 2, equal, parallel, mucronate. **Style** simple, filiform; stigma entire. **Capsule** ovoid. **Seeds** many, white, longitudinally winged.


Halleria L.


Hedbergia Molau

Annual, rigid, erect, branched herbs. **Leaves** opposite to alternate, linear, entire or trifid. **Flowers** small, solitary-axillary or terminally racemose, bi-bracteolate. **Calyx** campanulate, 5-lobed; lobes ovate to lanceolate, acute or obtuse. **Corolla** limb subequally 5-lobed; lobes entire; tube enlarged above, sometimes incurved. **Stamens** 4, somewhat didynamous, included; anthers free, bithecal; thecae arched or parallel, distinct, apically attached. **Ovary** 2–4-locular; ovules many. **Capsule** globose to subglobose. **Seeds** many, obovoid.

Species 5, tropical west, east and southern Africa with 1 in India; sthn trop. Afr. 1: *Micrargeria filiformis* (Schumach. & Thonn.) Hutch. & Dalz., Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.
**Micrargeriella** R.E.Fr.
Fries: 290 (1916); Philcox: 154 (1990); Mielcarek: 95 (1996); Bingham & Smith: 144 (2002).

Perennial, erect herb; stems simple or sparsely branched. **Leaves** alternate, scale-like, entire. **Flowers** medium-sized, terminally racemose, pedicellate, bi-bracteolate. **Calyx** campanulate, shortly 5-lobed. **Corolla** 5-lobed; lobes broad, entire, subequal, erect, spreading, tube enlarged above, somewhat incurved. **Stamens** 4, didynamous, included, glabrous; anthers free, thecae apically attached, becoming divergent at anthesis. **Ovary** bilocular; ovules many.

Monotypic genus: *Micrargeriella aphylla* R.E.Fr., presently known only from Zambia.

**Mimulus L.**
Hiern: 758 (1898); Good & Exell: 117 (1929/1930); Philcox: 36 (1990); Mielcarek: 62 (1996); Fischer: 74 (1999c).


**Misopates Raf.**


**Nemesia Vent.**


**Orobanche L.**


**Polycarena Benth.**


**Pseudosopubia Engl.**
Engler: 28 (1897); Hemsley & Skan: 440 (1906); Brummitt (Unpublished).

Hers or subshrubs. **Leaves** opposite or nearly so, sessile to shortly petiolate, entire. **Flowers** solitary, axillary, pedicellate. **Calyx** campanulate, 5-lobed; lobes ± equal. **Corolla**: tube suddenly inflated above base; limb oblique, 2-lipped; lobes 5, rounded. **Stamens** 4, didynamous, included, dimorphic, all arising nearly on same level; upper pair smaller, with appendage; lower pair with a 2-branched connective: upper branch shorter, curved upwards and terminating in a disc-shaped appendage; anthers all 1-thecous and dehiscing by a terminal pore. **Ovary** 2-locular; ovules many. **Capsule** ovoid, 2-valved. **Seeds** many, rather large, angular, oblique, deeply pitted.

Species 7, trop. Africa; presence in sthn trop. Afr. is uncertain, but given as Angola by Brummitt (Unpublished).

**Rhamphicarpa** Benth. emend. Engl.


**Scoparia L.**
Hiern: 766 (1898); Good & Exell: 118 (1929/1930); Philcox: 77 (1990); Mielcarek: 32 (1996); Fischer: 34 (1999c).

Sthn trop. Afr. 1: *Scoparia dulcis* L., a pantropical weed originally from the New World, recorded from Angola, Zambia, Malawi, Mozambique, and sthn Afr.

**Selago L.**

**Sibthorpiaceae**
Linnaeus: 631 (1753); Linnaeus: 279 (1754); Hiern: 766 (1898); Philcox: 75 (1990); Mielcarek: 228 (1996); Fischer: 208 (1999c).

Perennial, small, creeping herbs; stems rooting at nodes. **Leaves** alternate, petiolate, suborbicular-reniform, crenate to incised. **Flowers** axillary, 4–to 8-merous, solitary or fasciculate, pedicellate. **Pedicelles** ebracteate. **Corolla** 4–8-lobed; lobes somewhat unequal. **Corolla** rotate; tube short; lobes equaling calyx in number or one more, entire, subequal, spreading. **Stamens** 4–8, equaling corolla lobes or one or two less; filaments short, filiform, subequal; anthers sagittate; thecae contiguous at apex. **Style** short; stigma capitulate. **Capsule** somewhat compressed, loculicidal. **Seeds** few, oblong-ovoid, reticulate or smooth.


**Sopubia Buch.-Ham. ex D.Don**
Hiern: 772 (1898); Philcox: 143 (1990); Mielcarek: 199 (1996).


**Stemodia L.**
Linnaeus: 1091, 1118 (1759); Philcox: 38 (1990); Mielcarek: 42 (1996); Fischer: 64 (1999c).

Annual, glandular-pubescent, much-branched, often aromatic herbs, or subshrubs. **Leaves** opposite or verticillate, occasionally alternate below, simple, subentire to variously toothed. **Flowers** irregular, in lax terminal racemes or solitary-axillary, pedicellate. **Pedicelles** uni- or bibracteolate. **Corolla** 5-lobed; lobes narrow, equal or subequal. **Corolla** tubular; tube cylindrical; upper lip broad, emarginate to entire; lower lip trilobed. **Stamens** 4, didynamous, included; filaments slender; anther...
thecae stipitate, all fertile. **Style** usually bilobed. **Capsule** globose, ovoid, sometimes acuminate, valves 2, bifid or 4; usually loculicidally dehiscent. **Seeds** many, small, striate.

Species ± 30, tropics of both Old and New World; sthn trop Afr. 1: *Stemodia serratula* Benth., Zambia, Mozambique.

### Stemodiopsis Engl.


### Striga Lour.

Hieron: 778 (1898); Good & Exell: 120, 121 (1929/1930); Hepper: 127 (1990); Mohamed et al.: 60 (2001).


### Sutera Roth


### Teedia Rudolphi


### Torenia L.


### Veronica L.


### Zaluzianskya F.W.Schmidt


### References


FISCHER, E. 1989a. Contributions to the flora of Central Africa II. *Crepidotroporchalon*, a new genus within the relationship of *Craterostigma, Torenia* and *Lindernia* (Scrophulariaceae) with two new or noteworthy species from Central and South Central Africa (Zaire, Zambia). *Feddes Repertorium* 100(9–10): 439–450.


Tall, glabrous trees; young branches weakly angular. Leaves alternate, distichous, simple, ± symmetric, entire but undulate; petiole very short, flattened above; stipules minute, early caducous (Breteler 2002). Inflorescences terminal or subterminal, axillary racemes. Flowers bisexual, regular. Calyx cupular with truncate or toothed margin. Petals (corolla probably represents a corona, presumably of staminodial origin) 12–16, valvate and connate in bud and opening irregularly in 6 or 7 lobes free or joined at base, often falling as 1 piece. Stamen(s) ± 50, arising centrifugally on or around disc, essentially epipetalous, often falling with corolla; anthers 2-thecous, basifixed, opening by longitudinal slits. Ovary superior, 4–8–locular, with 2 apical-axile, pendulous, anatropous, bitegmic ovules per locule; style 1; stigma entire. Fruit ± ovoid drupe with mesocarp (not endocarp) lignified. Seeds usually 1, with embryo embedded in deeply ruminate endosperm.

Genera 5, species 20, tropical W Africa; sthn trop. Afr. genus 1, species 1.


Scytopetalum Pierre ex Engl.

Engler: 244 (1897); Exell & Mendoça: 347 (1951); Letouzey: 116 (1960); Germain: 326 (1963); Letouzey: 186 (1978).

Description as for family.

Scytopetalaceae

(Dilleniidae—Theales)

(Asterids—Ericales; under Lecythidaceae)


References

SCYTOPETALACEAE: References

Trees or shrubs, erect or sometimes scandent, sometimes spiny, usually containing bitter substances; pubescence usually simple, sometimes glandular. Leaves alternate, pinate or rarely simple, without gland dots; stipules spiny (Harrisonia) or 0. Inflorescences paniculate, racemose or cymose, terminal and axillary. Flowers regular, unisexual, sometimes with rudiments of opposite sex, or bisexual, small. Sepals (3)4 or 5(6), nearly always partly united, valvate to slightly imbricate. Petals (3)4 or 5(6), usually free, imbricate or valvate. Stamens 4–10, arising at base of disc, free; filaments sometimes with an appendage at base; anthers 2-thecous, with longitudinal slits. Disc annular, cushion- or cup-shaped. Ovary superior, (2–)4 or 5–7-locular and -lobed or carpels free; ovules 1(2) per locule/carpel, apical or basal, anatropous or hemitropous, bitegmic; styles (2–)4–8, variously connate or free. Fruit a berry or composed of drupaceous or dry mericarps. Seeds with little or no endosperm.

Genera 13, species ±110, widely distributed in the tropics and subtropics, with main centres in tropical America and tropical west Africa; sthn trop. Afr.: genera 3, species 7. Kirkia Oliv. and Suriana L., formerly usually included in Simaroubaceae, are here dealt with under Kirkiaceae and Surianaceae respectively.

Key to genera

| 1a Plants armed; fruit a globose or lobed berry                                                                 | Harrisonia |
| 2a Stamens 4 or 5, without hairy appendages at base; leaves not crowded at tips of branches | Brucea |
| 2b Stamens 10, with hairy appendages at base; leaves usually crowded towards tips of branches | Quassia |

Brucea J.F.Mill.


Shrubs or small trees; at least younger parts ± furrigineous-pubescent or tomentose. Leaves often ± crowded towards ends of branches, usually imparipinnate; leaflets opposite, in 3–5 pairs, entire to shallowly recond, base asymmetric. Inflorescence axillary, spiciform or in spiciform panicles, polygamous. Flowers usually in distant small glomerules. Sepals 4 or 5, united towards base, imbricate. Petals 4 or 5, free, imbricate. Stamens 4 or 5, arising beneath and between lobes of disc, reduced in female flowers. Disc fleshy, (3)4(5)-lobed. Gynoecium of 4 or 5 carpels, free or joined at base, each with 1 pendulous ovule; absent or vestigial in male flowers; styles 4 or 5, free. Fruit of drupaceous mericarps developing from 1–4 carpels of each flower. Seed 1 per mericarp.


Harrisonia R.Br. ex A.Juss.


Erect or sometimes scandent shrubs or small trees; bark of trunk and larger branches corky, pale brown, often with conical corky bosses surmounted, at least at first, by a prickle; smaller branches ± prickly or unarmed, pubescent to ± glabrous. Leaves not crowded at ends of branches, usually imparipinnate; leaflets opposite, in 2–7 pairs, usually asymmetric, margins crenate-serrate to crenate, sometimes entire; petioles and rachis winged. Inflorescences paniculate, axillary or terminal. Sepals 4 or 5(6), united at base. Petals 4 or 5(6), much longer than sepals, valvate, pubescent to glabrous outside. Stamens 8–10; filaments with a hairy appendage at base. Disc annular. Ovary 4- or 5-locular, globose or 4- or 5-lobed, with 1 pendulous ovule per locule; styles completely fused; stigma capitulate, 4- or 5-lobed. Fruit a 4- or 5(6)-lobed, depressed-globose berry with 4 or 5(6) seeds.

Species 3 or 4, in trop. Africa, SE Asia and tropical Australia; sthn trop. Afr.: 1: Harrisonia abyssinica Oliv., Angola, Zambia, Malawi, Mozambique.

Quassia L.

Linnaeus: 553 (1762); Exell & Mendonça: 278 (1951); Nooteboom: 514 (1962); Stannard: 10 (2000).


Trees or shrubs; branchlets glabrous. Leaves imparipinnate,
2–5(–8)-jugate; not crowded at tips of branches; leaflets ± opposite, usually with pitted glands in upper (and sometimes in lower) surface; petiole and rachis not winged. **Flowers** in terminal and axillary thyrses. **Calyx** 2–5-lobed, or often bud rupturing irregularly to give a variable number of lobes. **Petals** 5, imbricate, puberulous. **Stamens** 10, 5 antepetalous ones somewhat shorter; filaments with hairy appendage at base. **Disc** annular to subcylindric, sometimes partially enveloping ovary, with furrows on outside accommodating stamens. **Gynoecium** of 5 carpels free, except for cohering styles, each ovary, with furrows on outside accommodating stamens. **Fruits** of 1–3(4) dipyramidal mericarps. **Seeds** 1 per mericarp.


**References**

**Solanaceae**
(*Asteridae—Solanales*)
(*Euasterids I—Solanales*)


**Classification of Solanaceae**
[adapted from D’Arcy (1991) and Hunziker (1979)]

**Key to genera**

1a *Calyx* becoming enlarged, bladdery and enclosing the fruit:
1b *Calyx* not inflated:

2a *Calyx* lobes with wings down the back ................................................................. *Nicandra*

2b *Calyx* lobes not winged:

3a Flowers fascicled ................................................................................................. *Withania*

3b Flowers solitary ................................................................................................. *Physalis*

1a *Flowers trumpet-shaped, longer than 10 mm* ....................................................... *Cestrum*

1b *Flowers urn-shaped, usually shorter than 10 mm* ................................................ *Discopodium*

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Seed plants of southern tropical Africa: families and genera
*Cestrum L.*

Hiern: 754 (1896); Coates Palgrave: 1000 (2002). Sthn trop. Afr; 4, Angola and elsewhere in the region; introduced from Central America; also naturalised in sthn Afr.

*Datura L.*

Hiern: 753 (1896); Wright: 256 (1906); Heine: 325 (1963); Binns: 98 (1968); Mapaura (Unpublished). Sthn trop. Afr; 4, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.; several species of American origin have become widely naturalised.

*Discopodium Hochst.*

Hochstetter: 22 (1844); Wright: 253 (1906); Heine: 328 (1963); D’Arcy: 23 (1976); White et al.: 552 (2001). Small trees or shrubs. Leaves petiolate, entire, elliptic to oblong-elliptic, broadly acuminate, cuneate at base, glabrous or slightly pubescent on midrib. Flowers small, in axillary fascicles; pedicels longer than flowers. Calyx ± half as long as corolla, with 5 spreading, broadly triangular lobes, scarcely accrescent. Corolla cylindrical, tormentous outside above calyx; lobes 5, half as long as tube, ± reflexed or spreading. Stamens included, arising above middle of corolla tube; filaments short, filiform; anthers opening by longitudinal slits. Style short, included. Fruit a globose berry 6–8 mm in diameter. Species 1–3; monotypic according to D’Arcy (1976); Discopodium penninervium Hochst., Malawi.

*Lycium L.*


*Nicandra Adans.*


*Nicotiana L.*


*Physalis L.*

Hiern: 750 (1896); Wright: 246 (1906); Heine: 329 (1963); Binns: 98 (1968); Zhang & Lu (1999). Sthn trop. Afr; 4, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.; several species of American origin have become widely naturalised, including the cultivated *Physalis peruviana* L.

*Solanum L.*


References


Sphenocleaceae
(Asteridae—Asterales)
(Euasterids I—Solanales)

Sphenoclea Gaertn.

Thulin: 2 (1973); Thulin: 116 (1983); Welman: 31 (2000); Mapaura (Unpublished); Phiri (Unpublished).

Sthn trop. Afr.: genus 1, species 1.

Identification of additional genus: Usteria can be immediately distinguished by its calyx which consists of a very short tube with 3 very small triangular and 1 very large narrowly oblong sepal.

Strychnosc L.

Good & Exell: 102 (1929); White: 340 (1962); Leeuwenberg: 353 (1983); White et al.: 342 (2001); Coates Palgrave: 923 (2002); Mapaura & Timberlake: 165 (2002). In all these references the genus is placed under Loganiaceae.

Usteria Willd.

Wildenow: 1 (1790); Baker: 517 (1903); Good & Exell: 102 (1929); Onochie & Leeuwenberg: 46 (1963); Leeuwenberg & Bamps: 141 (1979). In all these references the genus is placed under Loganiaceae.

Climbing shrubs or lianes with long internodes and smooth glabrous branchlets. Leaves opposite, equal in each pair, simple, petiolate, broadly elliptic, subacute to rounded at apex, entire, with 3 or 4 pairs of conspicuous lateral nerves, glabrous. Inflorescence a lax, multiflowered terminal panicle, minutely puberulous. Flowers bisexual. Calyx: tube very short; lobes 4; 3 very small, 1 large and foliaceous. Corolla trumpet-shaped; tube long, cylindrical; lobes 4, subequal, ovate, acute, valvate. Stamen 1, exerted, arising near throat of corolla tube; filament glabrous; anther elliptic, with 2 separate thecae, glabrous. Ovary superior, globose, 2-locular with many ovules on an axile placenta; style filiform, exserted; stigma very small. Fruit a coriaceous, narrowly ovoid, septicidally 2-valved, apiculate capsule marked with 2 dehiscence lines. Seeds ellipsoid, surrounded by a very broad wing; endosperm sparse, fleshy; embryo straight.


References


Maritime shrubs, much branched and spreading; stems grey-green, tomentellous and with glandular hairs when young, with conspicuous leaf scars when older. **Leaves** alternate, crowded, simple, upright, oblanceolate, thick, margins entire and revolute, venation ± invisible; petiole short to 0. **Flowers** bisexual, regular, in few-flowered cymes hardly longer than leaves, or solitary; bracts similar to leaves. **Calyx** deeply 5-lobed; lobes imbricate, persistent. **Petals** 5, free, imbricate. **Stamens** 10, in 2 whorls; filaments densely pilose towards base, alternate filaments somewhat shorter, and sometimes 5 filaments without anthers; anthers 2-theccous, rounded, dorsifix, with longitudinal slits. **Ovary** superior, of 5 free, densely pilose, 2-ovulate carpels; ovules collateral, basal and ascending; styles free, lateral. **Fruiting carpels** dry, 1-seeded, capable of floating. **Seeds** without endosperm; embryo conduplicate.

Genera 4, species 5, pantropical and in warm regions, 3 endemic in Australia; sthn trop. Afr. genus 1, species 1.

**Arnott**: 360 (1834); **Wild & Phipps**: 210 (1963) under Simaroubaceae; **Mabberley**: 692 (1997); **Takhtajan**: 311 (1997); **Beentje**: 1 (1998).

**Suriana L.**

Linnaeus: 284 (1753); **Wild & Phipps**: 210 (1963); **Wild et al.**: 1 (1969) (under Simaroubaceae); **Beentje**: 1 (1998).

**Description as for family.**

Monotypic genus: **Suriana maritima L.**, pantropical; in Africa confined to east coast; sthn trop. Afr.: Mozambique.

**References**


**Tamaricaceae**

(Dilleniidae—Violales)

(Core Eudicots—Caryophyllales)

**Bredenkamp, C.L.** in **Leistner**: 544 (2000).

Sthn trop. Afr.: genus 1, species 1.

**Tamarix L.**

**Exell & Mendonça**: 117, 369 (1937/1951); **Obermeyer**: 36 (1976); **Baum**: 19 (1978); **Coates Palgrave**: 740 (2002).

Species 54, Eurasia and Africa; sthn trop. Afr.: **Tamarix usneoides** E.Mey. ex Bunge (= **T. angolensis** Nied.), Angola, and sthn Afr.

**References**


**Theaceae**

(Dilleniidae—Theales)

(Asterids—Ericales)

Trees, usually evergreen. **Leaves** alternate, simple, entire or serrulate, subcoriaceous; stipules 0. **Flowers** bisexual or sometimes unisexual, regular, axillary, solitary or sometimes paired or in fascicles, often with 1 or more pairs of bracteoles below calyx. **Sepals** 5(6), free to connate in lower third, imbricate, usually persistent. **Petals** 5(6), free or slightly joined, imbricate, opposite or alternating with sepals. **Stamens** many, in 1 or more whorls or in bundles of 3 stamens each opposite sepals and adnate to corolla at base; anthers 2-theccous, basifix, opening lengthwise, sometimes at first by oblique apical pores; connec-
tive sometimes produced into an apiculus. Ovary superior, 2(3)- or falsely 4- or 6-locular, usually with 2 axile, anatropous, bitegmic ovules per locule; styles 5 or 6, free with papillose stigmas, or united with a 2-lobed stigma. Fruit a loculicidal capsule (often leaving a persistent central column), or indehiscent. Seeds to many per locule; endosperm scanty to 0; embryo straight to curved.

Genera 22, species 610, mostly tropical and subtropical, some in temperate regions; sthn trop. Afr.: genera 2, species 3.

Don: 224 (1825); Melchior: 109 (1925); Exell: 30 (1927) under Ternstroemiaceae; Exell & Mendonça: 131, 387 (1937/1951); Robson: 405 (1961); Verdcourt: 1 (1962).

**Key to genera**

Leaves toothed; flowers in solitary or paired dichasia, with short pubescent peduncles; fruit a many-seeded, 5(6)-valved capsule ........................ Ficalhoa
Leaves entire with inrolled margins; flowers solitary on long glabrous peduncles; fruit indehiscent or opening irregularly from top, ovoid, abruptly acuminate at apex. Seeds few, ellipsoid, with thick testa; endosperm usually reduced; embryo curved horse-shoe-like, oil-rich.

Species 85, tropics, 2 in Africa; sthn trop. Afr. 2, Angola, Malawi. Formerly sometimes placed in Ternstroemiaceae.

**Ficalhoa** Hiern

Trees with terete branches. Leaves with serrulate margins. Flowers bisexual, small, in solitary or paired dichasia; peduncle short, pubescent. Petals alternating with sepals, quincuncial, connate in lower third to form a suburceolate corolla, eventually deciduous. Stamens in 5 bundles of 3 stamens each opposite sepals and adnate to corolla at base; connective not produced. Ovary 5(6)-locular, obtusely 5(6)-lobed, subhemispherical; ovules minute, many per locule on a central spongy placenta; styles 5(6), free almost to base to connate almost halfway, diverging. Fruit a 5(6)-valved, loculicidal capsule, hemispherical, woody. Seeds many, small, irregularly compressed-ovoid with loosely reticulate testa; endosperm scanty; embryo straight.


**Ternstroemia** Mutis ex L.f.

*Adinandrella* Exell: 30 (1927); Martins: 63 (1994).

Evergreen trees. Leaves with entire, inrolled margins. Flowers sometimes unisexual through reduction, solitary, on long glabrous peduncles. Petals opposite sepals or irregularly disposed. Stamens in 2 whorls, ± aggregated into clusters, ± free; connective produced into an apiculus. Ovary 2(3)-locular or falsely 4–6-locular; style simple, with capitate, faintly bilobed stigma. Fruit indehiscent or opening irregularly from top, ovoid, abruptly acuminate at apex. Seeds few, ellipsoid, with thick testa; endosperm usually reduced; embryo curved horse-shoe-like, oil-rich.

Species 85, tropics, 2 in Africa; sthn trop. Afr. 2, Angola, Malawi. Formerly sometimes placed in Ternstroemiaceae.

**References**


**DICOTYLEDONS THEACEAE**

1a Stamens as many as calyx lobes ................................................................. Struthiola
1b Stamens twice as many as calyx lobes:

2a Calyx tube articulated above the ovary ....................................................... Gaidia

2b Calyx tube not articulated above the ovary:

**Thymelaeaceae**
(Dilleniidae—Euphorbiales)
(Eurosids II—Malvales)


Sthn trop. Afr.: genera 8, species ± 34.

**Key to genera (and 1 species)**

[after Peterson (1978)]
Craterosiphon Engl. & Gilg

Engler & Gilg: 233 (1894); Staner: 334, 370 (1935); White: 270 (1962); Mendes: 106 (1970); Monteiro: 155 (1970); Robyns: 20 (1975); Lebrun & Stork: 376 (2003); Phiri (Unpublished).

Erect shrubs, lianes or small trees; young branches red-brown with prominent corky lenticels. Leaves opposite or alternate, petiolate, coriaceous, ovate to narrowly elliptic to lanceolate, glabrous, margin recurved. Flowers bisexual, in 3-(4-)flowered, almost sessile axillary clusters; pedicels slender. Calyx receptacle tube funnel-shaped, not contracted above ovary. Stamens 8, minute, scale-like, arising at throat of receptacle between filaments. Ovary 1-locular, sessile; style filiform; stigma capitate. Fruit drupaceous with sclerified pericarp, inside persistent receptacle tube. Seed without endosperm; cotyledons thick.


Dais L.

Peterson: 631 (1958b); Peterson: 16 (1978); Zavada & Lawrey: 11 (1995); White et al.: 566 (2001); Coates Palgrave: 780 (2002); Mapaura (Unpublished).


Dicranolepis Planch.

Planchon: t. 798 (1848); Pearson: 238 (1910); Moore: 117 (1919); Gossweiler & Mendonça: 57, 90 (1939); Aymonin: 64 (1966).

Shrubs or small trees. Leaves alternate, 2-ranked, shortly petiolate, obliquely ovate, ciliate-acuminated. Flowers bisexual, usually solitary in axils of leaves, sessile; receptacle tube slender, dilated at base. Sepals 5, oblanceolate-oblong, spreading or reflexed, pubescent on both surfaces. Petals opposite calyx lobes, and ± as long as these, entire or variously divided. Stamens 10, in 2 whorls in 2 throat of receptacle tube, ± exserted. Disc cup-shaped. Ovary shortly pedunculate, 1-locular; style slender; stigma capitate. Fruit drupaceous, surrounded by persistent, ± fleshy base of receptacle tube. Seeds without endosperm; testa thin, ± fused with pericarp; cotyledons large.


Gnidia L.


Passerina L.

Peterson: 630 (1958b); Peterson: 214 (1959); Breidenkamp & Van Wyk: 29 (2002); Coates Palgrave: 777 (2002); Mapaura (Unpublished).


Peddiea Harv.


Struthiola L.

Peterson: 319 (1958a); Peterson: 629 (1958b); Peterson: 215 (1959); Peterson: 144 (1964); Mapaura & Timberlake: 177 (2002); Mapaura (Unpublished).


Synaptolepis Oliv.

Oliver: t. 59 (1870); Pearson: 245 (1910); Burtt Davy et al.: 98 (1958); Peterson: 215 (1959); Peterson: 5 (1978).

Small shrubs or woody climbers; branches slender, often twining; bark lenticellate. Leaves alternate or opposite, petiolate, ovate to elliptic-lanceolate, membranous to coriaceous, glabrous, lateral nerves parallel, spreading, prominent beneath, margin thickened. Inflorescences: terminal cymes or axillary. Flowers 5-merous, solitary or fascicled in leaf axils, bracteate; pedicel sometimes glandular. Calyx: tube cylindric, glabrous.

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Petals forming an erect, entire or lobed, often ciliate ring at base of calyx lobes. Stamens 10, in 2 whorls in upper part of calyx tube, episepalous whorl usually slightly exserted. Disc minute, ± deepy lobed. Ovary 1-locular, shortly stipitate; style slender; stigma capitulate, papillate. Fruit dry, ovoid, enclosed in persistent base of calyx tube. Seeds without endosperm; embryo with fleshy cotyledons.

Species 5, trop. Africa and 1 in Madagascar; sthn trop. Afr. 3, Zimbabwe, Malawi, Mozambique.

References


Dicotyledons

Trapa "B" (Rosidae—Myrtales)
(Rosids—Myrtales; under Lythraceae)


Sthn trop. Afr.: genus 1, species 1.

Trapa L.


References


\*Tropaeolaceae

(Rosidae—Capparidales)
(Rosidae II—Brassicaceae)

Herbs, annual, perhaps sometimes biennial, slightly succulent, mostly glabrous, trailing. Leaves alternate, simple, peltate,
lamina circular, very slightly lobed; stipules only present in seedlings. **Flowers** bisexual, irregular, solitary, axillary, showy, on long pedicels. **Calyx** 5-lobed, unequal, dorsal one extended into a long nectariferous spur. **Petals** 5, free, heteromorphic, clawed. **Stamens** 4 + 4, anthers 2-thecous, opening by longitudinal slits. **Ovary** superior, 3-locular, with 1 pendulous, apical-axile, atropalous, bitegmic ovule per locule; style simple, divided at apex into 3 stigmatic lobes. **Fruit** dividing into 3, 1-seeded, fleshy mericarps. **Seeds** elongate; endosperm ± 0; embryo straight.

Genera 3, species 89, Central and South America; South tropical Africa: species 1.


**Tropaeolum L.**


**Description as for family.**

Sthn trop. Afr.: 1; *Tropaeolum majus* L. is reported from Angola, but it is doubtful whether it is naturalised there. Sparre & Andersson (1991) state that ‘there is no wild population known of *T. majus*’, and they speculate that the species is the result of spontaneous hybridisation between *T. minus* L. and *T. ferreyrae* Sparre. It is reported as being subspontaneous on some of the Mascarenes and the Canary Islands.


Sthn trop. Afr.: genera 6, species 18.

**Key to genera**

[mainly after Fernandes (1978)]

1a Flowers mostly solitary, axillary:

2a Annual herbs; flowers small (up to 4.5 mm long), nearly concealed in axils of leaves; leaves crowded at ends of branches .................. **Hyalocalyx**

2b Shrubs, perennial herbs or shrubs; flowers larger, not as above; leaves scattered along the branches:

3a Shrubs or perennial herbs rarely taller than 1 m; petals ± 12 mm long, yellow .......................................................... **Piriqueta**

3b Shrubs up to 2 m tall with slender ± erect branches; petals ± 25 mm long, yellow in upper part, dark red-brown below forming a conspicuous “eye” ................................................................. **Turnera**

1b Flowers in racemes or panicles:

4a Shrubs or much branched undershrubs; capsule 1-seeded; seed straight, longitudinally striate-sulcate, submuricate ........................................... **Stapfiella**

4b Annual or perennial herbs; capsule many-seeded; seeds straight or curved, regularly reticulate-alveolate:

5a Capsule linear (not less than 3.5 times as long as wide), usually constricted between the seeds; seeds straight; petals with a basal ligule .............

................................. **Tricliceras**

5b Capsule ellipsoid, not constricted between the seeds; seeds curved; petals without a ligule ................................................. **Streptopetalum**

**Hyalocalyx Rolfe**

Rolfe: 257 (1884); Fernandes: 353 (1978); Fernandes: 5 (1980).

Annual herbs covered with long, ± appressed yellowish hairs; stem erect, usually much branched from base. **Leaves** elliptic to elliptic-lanceolate, petiolate; stipules 0. **Flowers** solitary in axils of upper, very closely arranged leaves, heterostylos. **Sepals** hyaline-membranous, connate in lower half. **Petals** and stamens adnate to base of calyx tube, falling off with calyx and stamens after pollination. **Stamens**: filaments linear, flattened below; anthers cordate-ovate. **Ovary** ovoid, with 3 parietal placentas; styles 3, filiform, straight, with laciniate-flabellate stigmas. **Capsule** 3-valved, opening loculicidally from apex. **Seeds** oblong-obovoid, curved, with rigid, reticulate-alveolate testa; aril entire; albumen abundant, oily.

Monotypic genus from Madagascar, SE and East Africa: **Hyalocalyx setifer** Rolfe; Sthn trop. Afr.: Mozambique.

**Piriqueta Aubl.**


Sthn trop. Afr.: 1; *Piriqueta capensis* (Harv.) Urb., Zimbabwe, Mozambique, and Sthn Afr.
Stapfiella Gilg

Much branched undershrubs or shrubs; young branches densely leafy, with yellowish, antrorse hairs. Leaves petiolate, usually elliptic and serrate at margin, frequently glandular-punctate; stipules 0. Flowers in terminal and axillary panicles or racemes. Calyx connate below middle, with 5 tubercles within. Petals arising at mouth of calyx tube, eligulate, white, whitish or nearly translucent. Stamens: filaments filiform, arising at mouth of calyx tube. Ovary 1-locular, 1-ovulate; ovule basal; stigmas fringed. Capsule ellipsoid or clavate, shortly rostrate, dehiscing septicidally into 3 valves from apex downwards. Seed obovoid, straight, longitudinally striate-reticulate.


Streptopetalum Hochst.


Tricliceras Thonn. ex DC.


References

Urticaceae
(Dilleniidae—Urticales)
(Eurosids I—Rosales)


Sthn trop. Afir.: genera 12, species ± 30.

Key to genera
[after Friis (1991)]
1a Plants with stinging hairs (i.e. hairs with a sac-like base, calcified walls and bulbous tip, liberating an irritating fluid), at least on the inflorescences and petioles:
2a Stipules free, lateral; shrubs or small trees with soft wood ........................................................ Obetia
2b Stipules fused, intrapetiolar; woody climbers or erect, short-lived or perennial herbs:
3a Woody climbers with adventitious or axillary roots from the climbing stems; stinging hairs mostly restricted to petioles and inflorescences;
   female perianth with tepals accrescent, becoming fleshy and orange or red in fruit ............................................................... Urera
3b Erect, short-lived or perennial herbs, not climbing and without adventitious or axillary roots from the stems; usually with stinging hairs on all aerial parts of the plant; female perianth membranaceous in fruit:
4a Female perianth of 3 ± united tepals (sometimes also with 1 minute free tepal), forming a 1-sided cover on the ovary or achene; stinging hairs often more than 5 mm long ............................................................ Girardinia
4b Female perianth of 4 free, very unequal tepals; stinging hairs shorter than 5 mm .................................................................... Laportea
1b Plants completely without stinging hairs:
5a Leaves opposite, not or only slightly heteromorphic, the 2 leaves of a pair equal or subequal in size and shape:
6a Inflorescence a pedunculate capitulum with a disc- or bell-shaped receptacle .................................................. Lecanthis
6b Inflorescence not as above, or if receptacle disc- or bell-shaped then capitulum sessile:
7a Stipules fused, intrapetiolar .......................................................................................................................... Pilea
7b Stipules free, lateral:
8a Male flowers with 4 stamens; inflorescences of long, often pendent, interrupted spikes .................................................. Boehmeria
8b Male flowers with only 1 stamen; inflorescences dense axillary clusters ........................................................................ Drogeutia
5b Leaves alternate, or if opposite than the 2 leaves of a pair strongly heteromorphic, being unequal in size and/or shape:
Boehmeria Jacq.

Shrubs or small trees, sometimes woody-based herbaceous perennials, monococious or dioecious, usually ± pubescent, stinging hairs absent; cystoliths dot-like. **Leaves** opposite, petiolate, lamina trilobed, equal- or unequal-sided, dentate, sometimes lobed; stipules lateral, free or ± connate. **Inflorescences** axillary, usually spike-like, with flowers gathered in unisexual glomerules along inflorescence axis (rarely sessile and globular); bracts small, deciduous. **Male flowers** (3)4-merous with membranaceous tepals; rudimentary ovary present or absent. **Female flowers** with tubular perianth, constricted and 2–4-toothed at apex, completely enclosed in and partly adnate to persistent perianth. **Achene** ovoid, small, ejected by reflexed staminodes.

Species ± 50, pantropical and in warm temperate regions; Africa, including sthn trop. Afr.: *Boehmeria macrophylla* Hornem., Angola, Zambia, Zimbabwe, Malawi and Mozambique.

Didymodoxa E.Mey. ex Wedd.
Friis & Wilmot-Dear: 45 (1988); Friis: 60 (1989b); Friis: 114 (1991); Friis & Immelman: 29 (2001).

**Urtica** L., in part.


Droguetia Gaudich.


Elatostema J.R.Forst. & G.Forst.

Erect, annual and perennial, monococious herbs, without stinging hairs; stems prostrate and ascending; cystoliths linear. **Leaves** distichous, alternate, sessile or very shortly petiolate, asymmetric; stipules fused, intrapetiolar (presence of 2 pairs of stipules indicates that genus has opposite leaves but one leaf of each pair is rudimentary or totally reduced). **Inflorescences** unisexual, axillary, sessile, consisting of very densely clustered flowers and surrounded by almost free bracts in male inflorescences or by somewhat fused bracts in female inflorescences. **Male flowers** 4- or 5-merous; tepals generally with a horn-like dorsal appendage; rudimentary ovary absent or indistinct. **Female flowers** with 3–5 very reduced tepals and 3-scale-like staminodes, sometimes sterile. **Ovary** ovoid with penicillate stigma. **Achene** ovoid, small, ejected by reflexed staminodes.

Species ± 200, often very polymorphic, in the tropics of the Old World; sthn trop. Afr.: 3: Angola, Zambia, Zimbabwe, Malawi and Mozambique.

Girardinia Gaudich.


Laportea Gaudich.

**Fleurysia** Gaudich.; Burtt Davy et al.: 100 (1958).


Lecanthus Wedd.

Annual or short-lived perennial herbs, monococious or apparently dioecious, without stinging hairs; cystoliths elongated. **Leaves** opposite, petiolate; stipules intrapetiolar, fused. **Inflorescences** single in leaf axils, unisexual, rarely bisexual, pedunculate; receptacles surrounded by fused bracts. **Male inflorescences** usually small, ± bell- or cup-shaped, usually with less than 10 male flowers; male flowers 4- or 5-merous, with rudimentary ovary. **Female inflorescences** larger, with many flowers on a flat, disc-shaped receptacle; flowers (3)4-merous, tepals ± markedly culate, ovary erect, stigma penicillate, staminodes present. **Achene** ovoid, verrucose.


Obetia Gaudich.

**Pilea** Lindl.


**Pouzolzia** Gaudich.


**Procris** Comm. ex Juss.

Perennial herbs, often epiphytic or epilithic, monoeccious or dioecious by abortion, without stinging hairs; stems juicy or succulent. **Leaves** distichous, opposite and heteromorphous with one leaf of each pair reduced in size, or leaves apparently alternate, with one in each pair completely reduced; lamina crenate or serrate, rather fleshy, penninerved, with linear fleshy peduncles. **Male flowers** pedicellate, pentamerous, with rudimentary pistilode. **Female flow-**

**Urera** Gaudich.


**Vahlia** Thunb.


References
Valerianaceae
(Asteridae—Dipsacales)
(Euasterids II—Dipsacales)


Valeriana L.

References

Verbenaceae
(Asteridae—Lamiales)
(Euasterids I—Lamiales)

Sthn trop. Afr.: genera 7, species 42 (including naturalised exotics). Clerodendrum, Karomia, Premna and Vitex [see Sales: 189 (2001)] are placed under Lamiaceae.

Chascanum E.Mey.

*Duranta L.
Linnaeus: 637 (1753); Baker & Stapf: 287 (1900); Burtt Davy et al.: 101 (1958); White: 368 (1962); Sanders: 308 (1984); Coates Palgrave: 976 (2002); Mapaura (Unpublished).
Species 17, tropical America; some species widely cultivated and naturalised; sthn trop. Afr. 1: *Duranta repens* L., recorded from Angola, Zambia, Zimbabwe, Malawi. *D. erecta* L. has escaped from cultivation in sthn Afr.

Lantana L.

Lippia L.

*Phyla Lour.*
Lippia as to L. nodiflora (L.) Michx.; Baker & Stapf: 279 (1900); Hiern: 829 (1900).

Priva Adans.
Sthn trop. Afr. 6, Angola, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Stachytarpheta Vahl
Valerianoides Medik.; Hiern: 830 (1900).
Sthn trop. Afr. 5 (of which 2 or 3 may be indigenous), Angola, Zimbabwe, Mozambique, and in sthn Afr.

References


**Violaceae**

(Dilleniidae—Violales)

(Eurosids I—Malpighiales)


**Hybanthus** Jacq.


Calceolaria Loecl.; Hiern: 34 (1896).


**Rinorea** Aubl.


**Viola** L.


**Viscaceae**

(Rosidae—Santalales)

(Core Eudicots—Santalales; under Santalaceous)


Sthn trop. Afr.: Genus 1, species 16.
**VISCUM L.**


**Ampelecissus Planch.**


**Cayratia Juss.**


**Cissus L.**


**Cyphostemma (Planch.) Alston**


**Rhoicissus Planch.**


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**References**


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**Vitaceae**

(Ampelidaceae)
(Rosidae—Rhamnales)
(Rosids)


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**References**


Zygophyllaceae (Rosidae—Sapindales) (Eurosids I)


**Tribulus L.**


**Zygophyllum L.**


**References**
*Agavaceae*

(Liliidae—Asparagales)
(Monocots—Asparagales)

Compiled by G.F. Smith

Amended family notes [following Verhoek: 60 (1998)]; Genera 8, species ± 300, exclusively New World tropics, subtropics and temperate, widely naturalised; sthn trop. Afr.: genera 2, species 3.

Key to genera

Flowers erect; perianth fused into a tube below the middle; filaments and style not swollen; bulbils plant-like ........................................................ *Agave*

Flowers pendulous; perianth segments ± free; filaments swollen at base; style base dilated, 3-angled; bulbils globular ...................................... *Furcraea*

*Agave L.*

Manfreda Salisb. Runyonia Rose. Littaea Tagl.

*Agave americana* L. and *A. sisalana* Perrine from central America have become naturalised in many areas; also in sthn Afr.

*Furcraea Vent.*
Ventenat: 65 (1793); Drummond: 41 (1907); Forster: 77 (1986); Couper: 277 (1986); Kahn: 142 (1997); Thiede: 78 (2001).

Caudex up to 1.2 m tall. Leaves vibrant or glaucous green, in a terminal rosette. Flowers pendulous, campanulate, often replaced by small, globular bulbils. Perianth mostly free, forming a very short tube. Filaments swollen below middle. Style stout, swollen basally with 3 prominent angles.

Species ± 20, tropical America; sthn trop. Afr. 1, introduced: *Furcraea foetida* (L.) Haw. (= *F. gigantea* Vent.), escaped from sites of habitations and plantations for fibre production, mainly in the bushveld and subtropical areas; it is colloquially known as Mauritius hemp or Green Aloe, and is naturalised in Zambia and Zimbabwe. Although not yet recorded from Angola, Malawi or Mozambique, it more than likely also occurs in the subtropical areas of these countries.

References


Alismataceae

(Alismatidae—Alismatales)
(Monocots—Alismatales)


Sthn trop. Afr.: genera 6, species 8.

Identification of additional genus using the key in the above reference: *Ranalisma* runs to *Alisma* from which it can be distinguished by its more than 20 carpels arranged on an elongated receptacle.

*Alisma L.*


*Burnatia* Micheli


*Caldesia* Parl.
Seed plants of southern tropical Africa: families and genera

**ALISMATACEAE: Caldesia**

*Caldesia reniformis* (D.Don) Makino, Angola, Zambia, and southwestern Africa.

**Limnophyton** Miq.

*C. reniformis* (D.Don) Makino, Angola, Zambia, and southwestern Africa.

**Ranalisma** Stapf

*R. reniformis* (D.Don) Stapf, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and southwestern Africa.

**Wiesneria** Micheli

*C. reniformis* (D.Don) Stapf, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and southwestern Africa.

**References**


**MONOCOTYLEDONS**

**Alliaceae**

(Liliidae—Asparagales)

(Monocots—Asparagales)


*Nothoscordum* Kunth

*N. cordatum* is an introduced, nearly cosmopolitan, troublesome weed.

**Tulbaghia** L.

*B. disticha* (L.f.) Herb., Angola, Zambia, Zimbabwe, Malawi, Mozambique, and southwestern Africa.

**References**


**Amaryllidaceae**

(Liliidae—Asparagales)

(Monocots—Asparagales)


*S. reniformis* (D.Don) Stapf, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and southwestern Africa.

**References**


Identification of additional genus using the key in the above reference: *Cryptostephanus* keys out to *Clivia* from which it differs in having a corona of 6 or 12 scales inside the perianth tube.

**Ammocharis** Herb.


**Boophone** Herb.


**References**

**Alliaceae**

(Liliidae—Asparagales)

(Monocots—Asparagales)


*S. reniformis* (D.Don) Stapf, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and southwestern Africa.

**References**


Identification of additional genus using the key in the above reference: *Cryptostephanus* keys out to *Clivia* from which it differs in having a corona of 6 or 12 scales inside the perianth tube.
**Crinum L.**


**Cryptostephanus Welw. ex Baker**

Evergreen rhizomatous herbs. *Rhizome* subbulbous, tunicated. **Leaves** several, distichous, firm, strap-shaped, obtuse, without midrib. **Inflorescence** a many-flowered, compact cluster; scape stout, fleshy, solid, shorter than leaves, compressed with 2 sharp edges, to narrowly winged, persisting in fruit; spathe valves several, unequal, soon withering. **Flowers** regular or weakly irregular; very narrowly to widely funnel-shaped, erect to spreading. **Corona** of 12 linear or 6 bifid scales arising at base of each tepal. **Stamens** arising in 2 rows in perianth tube, 3 lower stamens subseesible, upper 3 on filaments shorter than anthers. **Ovary** globose; ovules 2–many per locale; style short and stout, or long-filiform and exserted; stigma capitate. **Fruit** a subglobose, red berry. **Seeds** turgid, with phytomelanous coat.


**Cyrtanthus Aiton**

*Anoiganthus* Baker; Binns: 18 (1968).


**Pancratium L.**


**Scadoxus Raf.**

Haemanthus L. in part.


**Anthericaceae**
(Liliidae—Asparagales) (Monocots—Asparagales; under Agavaceae)


Sthn trop. Afr.: genus 1, species ± 35.

**Chlorophytum Ker Gawl. emend. Nordal**

*Anthericum* L. in part.


**References**

**Aponogetonaceae**

(Alismatidae—Najadales)

(Monocots—Alismatales)


Sthn trop. Afr.: genus 1, species 7.

**Aponogeton L.f.**


Key to genera

1a Aquatic herbs, free-floating; leaves forming a densely pilose rosette; inflorescence hidden, with a single female flower and a few male flowers ...

2a Lamina of mature leaves compound; spadix with or without a terminal naked appendix:

3a Spadix ending in a naked appendix:

4a Leaf solitary in each growth period; leaf blade essentially sagittate to trisect but with main divisions highly dissected and subdivided ... Amorphophallus

4b Leaves usually several; leaf blade deeply pedatifid to pedatisect ...

Remusatia

3b Spadix not ending in an appendix but usually with zone of male flowers reaching the apex:

5a Leaves few to many:

6a Leaves pinnatisect, erect; leaflets oblong-elliptic, deciduous, leaving persistent petiole; lactifers absent ... Zamioculcas

6b Leaves trifid to laciniate-pinnatifid with slit-like perforations extending to the margin; lactifers present ... Cercestis

5b Leaf solitary:

7a Flowers with fleshy perianth; ultimate lobes of leaves broadly elliptic to linear ... Gonatopus

7b Flowers lacking a perianth; ultimate lobes of leaves trapcoid ... Anchomanes

2b Lamina of mature leaves simple; spadix without or with a naked terminal appendix:

8a Spadix with a naked terminal appendix; leaves peltate ...

*Colocasia

8b Spadix without a terminal sterile appendix; leaves not peltate or peltate (Remusatia):

9a Flowers with a fleshy perianth; inflorescence borne at or below ground level; anthers borne on slender filaments ... Stylochaeton

9b Flowers without a perianth; inflorescence, if basal, borne above ground level.
ARACEAE: Key to genera

**10a** Stamens of male flowers connate into synandria:
- **11a** Leaves 1 or 2, peltate, radical; petiole not geniculate at apex .................................................. Remusatia
- **11b** Leaves several; petiole geniculate, attached to base of lamina .................................................. Anubias

**10b** Stamens of male flowers free:
- **12a** Leaves radical; peduncle radical, much longer than the spathe .................................................. Zantedeschia
- **12b** Leaves cauline; peduncle cauline, shorter to not much longer than the spathe:
  - **13a** Lactifers present; flagelliform shoots present; leaf blade oblong-lanceolate, cordate, hastate or rarely trifid to pinnatifid .... Cercestis
  - **13b** Lactifers absent; flagelliform shoots absent; leaf blade always simple, acute to rounded at base .................. Culcasia

### Amorphophallus Blume ex Deane.
- **Binns**: 19 (1968); **Mayo**: 28 (1985); **Niépce-Nyame**: 26 (1988); **Ittenbach** et al.: 1 (1997) [not seen]; **Itenbach & Lobin**: 147 (1997); **Mayo et al.**: 235 (1997); **Mayo et al.**: 64 (1998); **Mapaura** (Unpublished).

### Anchomanes Schott
- **Schott**: 314 (1853); **Brown**: 161 (1901); **Engler**: 51 (1911); **Mayo & Bogner**: 24 (1985); **Mayo et al.**: 218 (1997); **Mayo et al.**: 62 (1998).

Herbs, often very robust. **Stem** a small to gigantic, erect to rhizomatous, seasonally dormant tuber. **Leaves** solitary, basal, often gigantic; petiole very long, terete, aculeate, rarely smooth, sheath very short; blade sagittate at first, later trisect with primary divisions divided ± dichotomously or pinnately, secondary divisions irregularly pinnatifid, ultimate lobes very variable in size and shape; primary lateral veins of ultimate lobes pinnate, mostly running into margin, higher order venation reticulate. **Inflorescence** solitary, usually appearing before leaf; peduncle shorter than petiole, usually aculeate. **Spathe** erect, boat-shaped, narrowly oblong-lanceolate to oblong-elliptic, not constricted, basally convolute or not, apex marcescent. **Spadix** cylindric, sessile to sub sessile, much shorter to subequal to spathe; female zone subequal to male zone or much shorter; male zone contiguous with female, fertile up to apex. **Flowers** unisexual; perianth 0. **Male flowers**: stamens free; anthers sessile or filaments short; thecae ovate-oblong, opposite, dehiscing by apical slit. **Female flowers**: ovary 1-locular; ovule 1, erect, anatropous, placenta basal; stylar region shortly conic or 0; stigma 2-lobed to V-shaped, discoid or depressed-globose. **Fruit** a large, oblong-ellipsoid berry borne in a cylindric, red to partly white spike. **Seeds** obvoid to oblong-ovoid; testa very thin, smooth, transparent; embryo large, green; endosperm absent. **x** = 20; chromosomes very large.

Species 7 or 8, trop. Africa; 2 in sfn trop. Afr., Angola, Zambia, Malawi, Mozambique.

### Anubias Schott
- **Schott**: 398 (1857); **Brown**: 182 (1901); **Engler**: 2 (1915); **Crusio**: 1 (1979); **Niépce-Nyame**: 10 (1988); **Mayo et al.**: 180 (1997); **Mayo et al.**: 56 (1998).

Anuariella Rendle: 115 (1913).

Evergreen herbs; rhizome thick, creeping, with short internodes. **Leaves** several; petiole usually smooth, rarely shortly and sparsely spiny, geniculate apically; sheath relatively short; blade simple to trifid, lanceolate, ovate, elliptic, nearly triangular to subsagittate, glabrous or midrib and primary veins densely pilose abaxially, primary lateral veins pinnate, secondary lateral veins parallel-pinnate, tertiaries transverse between them. **Inflorescence** 1–3 in each floral symposium; peduncle ± as long as petiole or shorter. **Spathe** elliptic-ovate, or ovate, not constricted, only weakly differentiated into tube and blade, slightly convolute at base, closing after anthesis and persistent to fruiting stage, uniformly green or cream to reddish tinged, paler within. **Spadix** cylindric, shorter or sometimes much longer than spathe, sessile or stipitate; female zone free, usually densely flowered, shorter than male zone and usually contiguous with it, rarely with bisexual flowers between; male zone fertile to apex. **Flowers** unisexual; perianth 0. **Male flowers**: synandrium of 3–8 stamens; filaments connate, short, connectives thick, fleshy; thecae lateral or marginal or ± completely covering synandrium, dehiscing by longitudinal slits. **Female flowers**: ovary (1–)2 or 3-locular; ovules many per locule, anatropous; placenta axile; stylar region narrower than ovary; stigma discoid. **Fruit** a depressed-globular to obovoid, green to pale green many-seeded berry. **Seeds** small, irregularly ovoid to subcylindric; testa rough, thickish; embryo axile, elongate; endosperm cyp. **x** = 24, **36**.


### Cercestis Schott
- **Schott**: 414 (1857); **Niépce-Nyame**: 64 (1988); **Mayo et al.**: 228 (1997); **Mayo et al.**: 63 (1998).

Perennial herbs, climbing to creeping, small to robust, with simple, articulated lactifiers; stem long with long internodes, bearing only small scale leaves, followed by thicker flowering stems with several foliage leaves and short internodes. **Leaves** many; petiole forming short to long sheath, ± clearly geniculate at apex; blade oblong-lanceolate or oblong to cordate, sagittate or hastate, or trifid with acuminate segments, sometimes laciniate-pinnatifid with slit-like perforations extending to margin; resin canals pellucid, linear or punctate; primary lateral veins pinnate, running into marginal vein, higher order venation reticulate. **Inflorescences** usually 1–4 in each floral symposium; peduncle shorter than spathe. **Spathe** erect, thick, boat-shaped to subcylindric, convolute basally into a tube, gaping apically at anthesis, persistent to marcescent. **Spadix** sessile, shorter than spathe; female zone shorter than and contiguous with male. **Flowers** unisexual; perianth 0. **Male flowers** with 2–4 free anthers on very short filaments and broad connectives; thecae shortly oblong to almost linear, opening by small apical slit. **Female flowers**: ovary 1-locular, obovoid; ovule 1; placenta parietal to subbasal; stigma ± sessile, discoid. **Fruit** an obovoid to ellipsoid red berry with thick pericarp, arranged in ellipsoid to oblong

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*Colocasia* Schott

[Description of *Colocasia esculenta* (L.) Schott, from Mayo (1985):] Robust, acaulescent herb to 2 m high or more; stem a swollen starchy tuber. Leaf broadly ovate in outline, peltate, cordate-sagittate, held pendent from z erect petiole, apex obtuse, basal lobes ± rounded, primary lateral veins arching towards margin and forming regular, parallel series. Spathe 0.2–0.3 m long, basal tube green, short; apical blade yellow to orange, much longer. Spadix shorter than spathe, with conic sterile appendage up to 40 mm long (occasionally reduced to absent). Flowers unisexual; tepals 0.

*Colocasia esculenta* (L.) Schott is cultivated and naturalised throughout the humid tropics and subtropics.

*Culcasia* P. Beauv.

Perennial herbs, erect, repent or climbing, with slender branches, rooting at least from lower nodes; lactifers 0. Leaves many, often forming a terminal crown; petiole with fairly long, persistent sheath, ± clearly pulvinate apically; blade lanceolate to ovate-oblong; resin canals pellucid, linear or punctate; primary lateral veins pinnate, often forming a submarginal collective vein. Inflorescences 1–12 (–20) in each floral sympodium; peduncle short to relatively long. Spathe erect, boat-shaped, erect, green to whitish, convolute basally, gapping apically at anthesis, deciduous to marcescent. Spadix cylindric-clavate, subsessile to stipitate, ± equal to spathes in length; female zone usually densely flowered, shorter than male zone, contiguous with or separated by a laxly-flowered zone of sterile male flowers; male zone fertile to apex; axis often persistent in fruit. Flowers unisexual; perianth 0. Male flowers: stamens 2–4, free; anthers subsessile, connective thick, thecae oblong, dehiscing by a short apical slit. Sterile male flowers with 3 or 4 obpyramidal depressed staminodia. Female flowers: ovary 1–3-locular, depressed; ovule 1 per locule, anatropous; placenta subbasal; stigma sessile, hemispheric-discoid. Fruit a 1–3-seeded, globose to ellipsoid berry, mostly red, sometimes orange to greenish yellow; infructescence subglobose to cylindric. Seeds ovoid to ellipsoid; testa thin, smooth, brown; plumule lateral; endosperm 0. x = 21, 42.

Species ± 27, trop. Africa; sthn trop. Afr. 4, Angola (including Cabinda), Zambia, Zimbabwe, Malawi and Mozambique.

**Lemna L.**
Hepper: 1 (1973); Landolt: 262 (1986); Landolt: 117 (1994).


**Pistia L.**


**Remusatia Schott**

Small to medium, seasonally dormant perennial herbs; tuber subglobose, producing erect to spreading unbranched or branched stem branches from axis of small deciduous scale leaves; stem branches producing small, scaly, ovoid tubercles at nodes. Leaves 1 or 2, basal; petiole sometimes slender with relatively short sheath; blade petulate, cordate-lanceolate to cordate-ovate, basal ribs well-developed, primary lateral veins pinnate, forming submarginal collective vein very close to margin. Inflorescence solitary, appearing with or without leaf; peduncle shorter than petiole. Spathe strongly constricted between tube and fully expanded or convolute blade; tube with convolute margins, persistent, enclosing female and sterile zone of spadix; blade yellow or red, longer than tube, later deciduous. Spadix much shorter than spathe, sessile or subsessile; female zone subcylindric, ± half as long as spadix, separated from male zone by a much narrower zone of sterile male flowers; male zone ellipsoid or subclavate, obtuse, fertile to apex. Flowers unisexual; perianth 0. Male flowers with 2 or 3 stamens connate into a 4–6-sulcate synandrium with 4 or 6 oblong to elliptoid thecae dehiscing by an apical pore-like slit. Sterile male flowers each consisting of an elongated sterile synandrium. Female flowers: ovary 1-locular or partially 2–4-locular at apex; ovules many, hemiorthotropous; placenta 2–4 and parietal, or 1 and basal; stigma ± sessile, discoid-capsulate to slightly 3- or 4-lobed. Fruit an ovoid to globose, many-seeded berry; infructescence ellipsoid, borne within persistent spadix tube. Seeds ellipsoid to subglobose, covered by thick, succulent sarcotesta or testa irregularly costate; embryo axile, short; endosperm copious. x = 14, 21, 28.

Species 4, trop. Africa, Madagascar, tropical Asia to Indonesia and Australia; sthn trop. Afr. 1: Remusatia vivipara (Roxb.) Schott, Zambia.

**Sauromatum Schott**

Perennial herbs, small to medium, seasonally dormant; tuber subglobose or depressed-globose, sometimes large. Leaves usually solitary, rarely up to 3; petiole cylindric, erect, long, often spotted; sheath very short; blade deeply pedatifid to peltatisect; primary lateral veins of lobes pinnate, forming submarginal collective vein. Inflorescence solitary, appearing with or without leaves, borne at ground level; peduncle very short. Spathe slightly constricted between tube and blade; tube with...
coninate margins, ± cylindric and usually somewhat ventricose; blade longer than tube, narrowly oblong-lanceolate, erect at first, then reflexed and spiralled-revolute, margins undulate, inner surface conspicuously spotted. **Spadix** cylindric, ± as long as spathe, free, sessile; female zone short, separate from male zone by a much longer zone with sterile flowers in lower part and naked above; male zone short, followed by a very long-extended, relatively slender, smooth, cylindric appendix, suberect to somewhat forward-curving. **Flowers** unisexual; perianth 0. **Male flowers** with few free, ± sessile anthers; theca oblong-ovoid, dehiscing by a broad apical apex. **Sterile flowers** consisting of distinct, patent, filiform to terete staminodes with rounded to obliquely truncate-disciform apex. **Female flowers**: ovary 1-locular; ovules 1–4, orthotropous, with very short funicle on basal placenta; stigma subsessile, capitellate. **Fruit** an obpyramidal, reddish purple berry, densely congested in subglobose, sometimes slightly hypogaeal infructescence. **Seeds** inversely turpin-shaped; testa thin, dark-spotted, smooth, cylindric, very long-exserted, relatively slender, smooth, cylindric apiculus, suberect to somewhat forward-curving.


**Spirodea** Schled.
Landolt: 243 (1986); Landolt: 117 (1994).


**Stylochaeton** Lepr.


**Wolfia** Horkel ex Schled.


**Wolfiella** (Hegelm.) Hegelm.
Landolt: 164 (1984); Landolt: 335 (1986); Landolt: 117 (1994).


**Zamioculcas** Schott


**Zantedeschia** Spreng.

Richardia Kunth; Brown: 167 (1901).


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**References**


**Areaceae**

(Commelinids—Arecales)

**Expanded family description:** Acaulescent perennials climbing with aid of slender, whip-like organs, often bearing recurved hooks, referred to as cirri (singular: cirrus), when formed as an extension of leaf rachis, or flagella (singular: flagellum), when they are a modified inflorescence arising on side of leaf sheath. **Flowers** sometimes bisexual, sometimes in pairs: 1 female + 1 sterile male flower or 2 female flowers.

**Identification of additional genera:** The two additional genera can be distinguished from all other sthn trop. Afr. genera by their habit: both are climbers usually bearing either flagellae and/or cirri. They can be distinguished from each other as follows:

**Calamus:** Leaves with a knee above the often spiny sheath, rachis not ending in a cirrus; flowers unisexual.

**Eremospatha:** Leaves not kneed above the sheath which is striate-veined and not spiny; rachis prolonged into an armed cirrus; flowers bisexual.

**Sthn trop. Afr.: genera 6, species 17.**

**Borassus L.**


**Widespread throughout the less dry areas of trop. Africa; sthn trop. Afr:** 1. **Borassus aethiopum Mart.**, Zambia, Zimbabwe, Malawi, Mozambique, and introduced and probably naturalised in sthn Afr.

**Calamus L.**

Linnaeus: 325 (1753); Wright: 107 (1901); Russell: 166 (1968); Dransfield: 41 (1986); Uhl & Dransfield: 255 (1987); Dransfield & Uhl: 342 (1998).

**Acaulescent, climbing, dioecious, flowering each year when mature. Leaves pinnate, usually with a knee above sheath; sheath often bearing straight spines and sometimes a flagellum; rachis with sharp recurved hooks, not ending in a cirrus; leaflets many, with a single fold, with fine spines on margin and sometimes on lower surface. Inflorescence axillary; male branched to 3 orders; female to 2; outer sheathing bract strictly tubular; persistent; male flowers solitary; female flowers in pairs, or a female flower paired with a sterile male flower. Male flowers: calyx much shorter than corolla; stamens 6; anthers elongate, latrorse. Female flowers much larger than male ones; ovary with large, fleshy, recurved stigmas. Fruit 1–3-seeded, with 16–21 vertical rows of fimbriate scales. Seed: endosperm homogenous or ruminate; embryo basal or lateral.**

**Species ± 400, India and S China to Fiji and Australia, 1 in Africa: Calamus dearvatus. G.Mann & H.Wendl.; sthn trop. Afr.: Angola.**

**Eremospatha (G.Mann & H.Wendl.) H.Wendl.**

Wendland: 244 (1878); Wright: 111 (1901); Gossweiler & Mendonça: 63, 66 (1939); Russell: 168 (1968); Dransfield: 33 (1986); Uhl & Dransfield: 204(1). Monocotyledons and Gymnosperms. Trustees of the British Museum (Natural History), London.

**SCHOTT, H.W. 1853. Anchomanes. Oesterreichisches botanisches Wochenblatt 7: 398.**


Caespitose climbers, flowering each year when mature; stems long, slender, ringed. **Leaves** pinnate with ± 12–14 pairs of elliptic-ovate leaflets, without knee above sheath; rachis produced into a slender armed cirrus. **Inflorescence** branched to first order; flowers paired; bracts inconspicuous. **Flowers** bisexual. **Calyx** 3-lobed, campanulate. **Corolla** with 3 short lobes. **Stamens** 6, in a fleshy epipetalous ring; filaments short, broad, connate; anthers medifixed, latrorse. **Ovary** 3-locular; stigmata tongue-shaped. **Fruit** berry-like, 1–3-seeded, with sweet, fleshy mesocarp. **Seed** subbasally attached; embryo lateral.


**Hyphaene Gaertn.**


**Phoenix L.**


**Raphia P.Beauv.**


Sthn trop. Afr.: 6, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr. Coates Palgrave (2002) thinks that the isolated colonies of *Raphia farinifera* (Gaertn.) Hyl. in Zimbabwe and Mozambique may be relics of a once much wider population.

**References**


**Asparagaceae**

(in narrow sense)

(Liliidae—Asparagales)

(Monocots—Asparagales)


Sthn trop. Afr.: genus 1, species ± 40.

**Asparagus L.**

Baker: 425 (1898); Engler & Gilg: 196 (1903); Obermeyer & Immelman: 11 (1992); Malcomber & Sebsebe Demissie: 63 (1994); Lebrun & Strey: 60 (1995); Kabitzki & Rudall: 128 (1998); White et al.: 93 (2001); Mapaura (Unpublished).


**References**


AMENDED FAMILY NOTES: Genera 14 [the monotypic *Poellnitzia* has been subsumed under *Astroloba*—see Manning & Smith: 53 (2000)], species ± 780; sthn trop. Afr.: genera 8, species ± 70.

**Identification of additional genus using the key in the above reference by Smith & Meyer: Jodrellia** keys out to Bulbine, but filaments are beard only towards their apex, and the perianth consists of 2 types of tepals: the inner 1-nerved, the outer 3-nerved and wider than the inner ones.

**Aloe L.**


**Bulbine Wolf**


**Chortolirion A.Berger**


**Gasteria Duval**


**Haworthia Duval**


**Jodrellia Bajinath**


**Kniphofia Moench**


**Trachyandra Kunth**


**References**

Behniaceae
(Liliidae—Asparagales)
(Monocots—Asparagales; under Agavaceae)

Diocious, scindent climbers or subshrubs from short rhizomes. Leaves alternate, distichous, very shortly petiolate, without sheathing base; blades ovate with many parallel veins and many cross-veins, midrib prominent. Inflorescence an axillary helicoid cyme or flowers borne singly. Flowers regular, small, either functionally female or functionally male; pedicels articulated. Perianth marcescent, not twisted after anthesis; tepals 3 + 3, forming a short broad tube with lobes subequal, spreading, white or pale green. Stamens 3 + 3, arising from lower half of perianth tube, ± reaching mouth of tube; anthers 2-theorous, introrse, dehiscing by longitudinal slits. Ovary superior, 3-loccular and 3-carpellate; style simple, trigonous; stigma apical, tripartite; ovules few per locule, anatropous, in 2 rows on axile placentas. Fruit a berry with a short basal stipe, white. Seeds 3–15, angular, yellow to brown, drying blackish brown; embryo clavate; endosperm copious, without starch.

Genus 1, species 1, sthn trop. and sthn Afr.


Behnia Didr.

Description as for family.


References


Burmanniaceae
(Liliidae—Liliales)
(Monocots—Dioscoreales)


Additional family characters: Rhizome with clusters of tuberous bulbils. Leaves cauline, alternate. Flowers irregular; perianth urn-shaped. Stamens 6; anther connective attached to funnell-shaped stigma. Ovary 1-locular with 3 parietal placentas basally connate. Ovary wall together with perianth deciduous, leaving placenta column with seeds.

Identification of additional genus: Afrothismia can be distinguished from Burmannia by cauline leaves, and irregular, urn-shaped flowers in which the anther connective is attached to the funnell-shaped stigma.

Afrothismia (Engl.) Schltr.
Schlechter: 138 (1906); Jonker: 222 (1938); Hepper: 180 (1968); Cowley: 6 (1988); Maas-van de Kamer: 154 (1998); Brummitt (Unpublished).

Small, fleshy, saprophytic perennial herbs, usually with a single stem; rhizome cylindric, each node with clusters of tuberous bulbils, each with a filamentous root. Leaves alternate, cauline, small, scale-like, sparse. Flowers irregular, relatively large, in a simple or bifurcate, 1-4-flowered cincinnus. cauline, small, scale-like, sparse.


Burmannia L.

Flowers irregular, relatively large, in a simple or bifurcate, 1-4-flowered cincinnus. cauline, small, scale-like, sparse. Flowers irregular, relatively large, in a simple or bifurcate, 1-4-flowered cincinnus. cauline, small, scale-like, sparse.

Species probably only 1, very variable: Gloriosa superba L., Angola, Zam-


Wurmbea Thunb.


References


Key to genera

1a Fertile stamens 6(5):
   2a Filaments bearded; flowers usually ± regular:
      3a Plants glandular-pubescent; petals yellow; only known from Zimbabwe ................................................................. Triceratella
      3b Plants glabrous or variously hirsute but not glandular; petals blue, pink or white:
         4a Inflorescences all axillary, perforating the subtending leaf sheath ........................................................................... Coleotrype
         4b Inflorescences terminal, or terminal and axillary, not perforating the leaf sheath .......................................................... Cyanotis
   2b Filaments glabrous:
      5a Petals fused into a tube towards the base; inflorescences perforating the subtending leaf ................................................... Coleotrype
      5b Petals free; inflorescences not perforating the subtending leaf:
         6a Fruit indehiscent, hard, shiny metallic blue ...................................................................................................................... Pollia
         6b Fruit a 2- or 3-valved capsule:
            7a Flowers irregular; capsule with 2, 1-seeded locules .............................................................................................. Floscopa
            7b Flowers regular; capsule with 3, 2–10-seeded locules .............................................................................................. Stanfieldiella
      1b Fertile stamens 3; filaments bearded or glabrous:
         8a Inflorescences subtended by a leaf-like or bract-like spathe; staminodes typically with 4(–6)-lobed antherodes ...................... Commelina
         8b Inflorescences not enclosed in a spathe; staminodes, if present, with 2- or 3-lobed antherodes:
            9a Fruit indehiscent, a ± fleshy berry with 3 locules, each with 2 or 3 seeds ........................................................................... Palisota
            9b Fruit a (2- or)3-locular capsule:
               10a Petals unequal, the anterior (lower) one smaller than the others; capsule 2-locular or unequally 3-locular ............................. Aneilema
               10b Petals equal:
                  11a Main stem very short; inflorescences ± scapose; filaments glabrous; antherodes not lobed .................................................. Anthericopsis
                  11b Main stem usually well-developed, bearing terminal and/or lateral cincinni; all filaments usually bearded; antherodes 3-lobed or hastate .................................................. Murdannia

Aneilema R.Br.


Anthericopsis Engl.

Engler: 139 (1895); Clarke: 75 (1901); Bremen: 365 (1966); Faden: 83 (1995).

Perennial, completely glabrous herbs, dormant in dry season; tubers at ends of thin wiry roots. Leaves spirally arranged, all or mostly in a basal rosette, sessile. Inflorescence sometimes subsessile at first flowering, eventually long-pedunculate, scapose or subscapose, terminal and axillary, composed of 1 or 2 sessile, contracted, bracteolate cincinni arranged umbel-like at summit of scape. Flowers bisexual, regular, pedicelled. Sepals 3, free, equal, sepaline. Petals 3, free, equal, not clawed. Stamens 3, antepetalous, free, equal; filaments glabrous; staminodes 3, antepetalous, free; antherodes small, unlobed. ovary 3-locular, 3-valved; ovules many. Fruit a 3-valved capsule. Seeds 8–12 per locule, uniseriate, hilum linear; embryotega semilateral. x = 7.

Monotypic: Anthericopsis sepalosa (C.B.Clarke) Engl. (=Aneilema sepalosa

Commelinaceae

(Commelinidaceae—Commelinales)

(Commelins—Commelinales)

Fish, L. in Leistner: 591 (2000).

Sthn Afr.: genera 11, species ± 86.
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Coleotrype C.B. Clarke


Commelina L.

Commelina. 3, free, subequal, sepaline or petaline.

Cyanotis D.Don


Floscopa Lour.
Clarke: 84 (1901); Brenan: 26 (1968); Faden: 124 (1998).


Murdannia Royle


Palisota Rchb. ex Endl.

Perennial herbs, generally medium- to large-sized, with a distinct aerial main stem or with rosettes of leaves at ground level. Leaves spirally arranged or in pseudowhorls, petiolate. Inflorescence thyrsoform, pedunculate, terminal and/or axillary. Flowers bisexual and male, slightly irregular, pedicellate. Sepals 3, subequal. Petals 3, free, subequal. Stamens 3, 2 posterior ones shorter and with sterile pollen, anterior stamen longer and with fertile pollen; staminodes 2 or 3, subequal or posterior one different or lacking. Ovary 3-locular; ovules 1–8 per locule; style short, glabrous. Fruit a 3-locular, 3-valved capsule. Seeds 2–10 per locule, 1-seriate, hilum linear, embryotega lateral. x = 11, 12(?), 22.

Species 17, pantropical and warm temperate; stkh trop. Afr: 1: Pollia condensata C.B.Clarke, Angola.

Stanfieldiella Brenan

Bufforesta C.B.Clarke, in part.

Perennial herbs with monopodial, ± elongate stem; roots fibrous. Leaves spirally arranged, petiolate. Inflorescence terminal and/or axillary thyrses or reduced to a single cincinnus, never perforating leaf sheaths. Flowers bisexual, regular, pedicellate. Sepals 3, free, subequal, sepaline, usually glandular-pubescent. Petals 3, free, equal, not clawed. Stamens 6, subequal, filaments ± straight, glabrous. Ovary 3-locular. Fruit a 3-locular, 3-valved capsule. Seeds 2–10 per locule, 1-seriate, hilum linear, embryotega lateral. x = 5(?), 15, 16, 19(?).


Triceratella Brenan

Annual herbs, small, glandular-pubescent, resembling a small species of Juncus; main stem erect. Leaves spirally arranged, linear, sessile. Inflorescences single, leaf-opposed cincinnus. Flowers bisexual, ± regular, subsessile. Sepals 3, free, subsessile, longer than petals, glandular-pubescent. Petals 3, free, subequal, not clawed, yellow. Stamens 6, equal or subequal; filaments pubescent; anthers with a narrow connective, opening lengthwise. Ovary 3-locular, sessile, glabrous; style filiform, short, glabrous; stigma capitulate; ovules biseriate, many in each locule. Fruit a 3-locular capsule; after dehiscence the 3 valves curve outwards and resemble 3 small horns. Seeds many, biseriate, ± hemispherical, exarillate, hilum punctiform, embryotega dorsal.

Monotypic: Triceratella drummondii Brenan, Zimbabwe, Mozambique.

References
COMMELINACEAE: References

Perennial, rhizomatous, non-aromatic herbs; stems terete, usually unbranched, leafy. Leaves spirally arranged; sheaths closed, tubular; petiole short; pulvinus absent; lamina narrowly to broadly elliptic; ligule often encircling stem. Inflorescence usually a subglobe, cone-like spike, either on bracteate shoots arising from rhizome or terminating leafy shoots; bracts each subtending 1 or 2 flowers. Flowers bisexual, irregular, epigynous, large. Calyx tubular, with 3 apical teeth, sometimes split to base on one side. Petals 3, basal third and base of androecium (all except the 1 fertile stamen) fused into a tube; labellum broad, petaloid, ± 3-lobed, opposite stamen, curved into a funnel-shaped structure. Stamens 1 with subterminal, 2-thecate anther dehiscing introrsely by longitudinal slits. Ovary inferior, 3-locular; ovules many, anatropous; placenta axile; style filiform, passing between anther thecae and ending in a funnel-shaped stigma with a ciliate margin and a dorsal appendage; nectaries 2, septal, embedded in top of ovary. Fruit a berry, usually covered by bracts and crowned by persistent calyx. Seeds many, aril white to yellow; endosperm poorly developed; perisperm abundant. x = 8 or 9 (fide Takhtajan 1997).

Genera 4, species ± 100, pantropical, but mainly in Central and South America. Very close to, and formerly generally included in Zingiberaceae; sthn trop. Afr.: genus 1, species ± 4.


Costus L.

Description as for family.


References

Cymodoceaceae
(Alismatidae—Najadales)
(Monocots—Alismatales)


Key to genera
1a Rhizome woody, with sympodial branching; stems elongated, arising on each 4th internode; leaves coriaceous, ± 10 mm broad; styles with 2–4 stigmatic branches; anthers subsessile, attached at same height .......................................................... Thalassodendron

1b Rhizome herbaceous, monopodial with short stems and roots arising at the nodes; leaves grass-like; leaf sheath more persistent than blade; anthers stalked:

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2a Leaves terete; flowers in inflorescences .............................................................. Syringodium
2b Leaves flat; flowers solitary:
3a Leaves 3-veined; anthers connate at different levels; style undivided ...................... Halodule
3b Leaves 7–17-veined; anthers connate at same level; style divided in 2 ..................... Cymodocea

Cymodocea K.D.Koenig
Isaac: 32 (1968); Den Hartog: 160 (1970); Kuo & McComb: 138 (1998);

Dioecious, submerged marine herbs; rhizome herbaceous,
creeping, monopodially branched, with many vascular bun-
dles, each node bearing 1–5 branched roots and a short erect
terminal shoot bearing 2–7 leaves; squamules (small scales) 10 or more
in 2 groups at each node. Leaves: blade linear, entire except
for serrate or spinulose distal part and ± toothed apex;
nerves 7–17, with perpendicular cross-veins; sheath compressed,
bi-auriculate, ligulate, persisting longer than blade,
leaving an open or closed circular scar on stem. Flowers
solitary and terminal, enclosed in a leaf similar to others; a
bud in axil of penultimate leaf lengthening to give rise to a
sympodium. Male flowers stalked, of 2 dorsally connate
anthers attached at same level, each crowned by a subulate
tip. Female flowers sessile or shortly stalked, of 2 free
ovaries each with a short style, distally bifid. Fruit with a
stony pericarp, smooth or somewhat warty with dorsal
ridges and a beak, laterally compressed, semicircular to
elliptic in outline.

Species 4, tropical to subtropical seas of Old World; sthn trop. Afr. 2, Mo-
zambique, and sthn Afr.

Halodule Endl.
Isaac: 39 (1968); Den Hartog: 146 (1970); Kuo & McComb: 138 (1998);


Syringodium Kütz.
Kützing: No. 426 (1860); Isaac: 39 (1968); Den Hartog: 176 (1970); Kuo &

Dioecious perennial marine herbs; rhizome monopodially
branched, herbaceous, creeping, with 1 or more branched
roots and short, erect, unbranched shoots at each node. Leaves 2 or
3 on each erect shoot; blade terete, with 1–several peripheral
vascular bundles and several large air lacunae; leaf scars open,
circular; leaf sheath open; 2 squamules (small scales) at each
node. Inflorescences with bracts terminating erect shoots;
branching racemose below, cymose above; male flowers with
anthers at same level, dorsally fused in their lower parts; fe-
male flowers sessile; ovaries extending into a short style di-
vided into 2 stout stigmatic lobes.

Species 2, 1 in the Indo-West Pacifie, the other in the Caribbean; sthn trop.
Afr. 1: Syringodium isoetifolium (Asch.) Dandy, Mozambique.

Thalassodendron Hartog
Den Hartog: 186 (1970); Kuo & McComb: 138 (1998); Glen: 593 (2000);

Sthn trop. Afr. 1: Thalassodendron ciliatum (Forssk.) Hartog, Mozambique,
and sthn Afr.

References
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sity Press, Johannesburg.

Cyperaceae
(Commelinidae—Cyperales)
(Commelinids—Poales)


Identification of additional genera using the key in the above reference:

Actinoschoenus runs to 2a in the Key to groups and genera because of its usually 1-flowered bisexual spikelets, but it will not
run to Group 1 because it has more than 1 empty glume or spikelet bract at the base of the spikelet. Continuing to 2b it will run to
3a because of its distichous glumes, and then to Group 4. Having no bristles it will run to 1b. Actinoschoenus generally
differs from Schoenus and Epischoenus (which does not occur in sthn trop. Afr.) by its 1-flowered (not 2- or more-flowered)
spikelets and the short rachilla internodes.

Diplacrum runs to Group 6 as all florets are unisexual, and further to 4b. It differs from Scleria in that all its spikelets are
unisexual and the female spikelet is 1-flowered; it also differs from *Scleria* in having only 2, not 3 glumes below the female floret.

**Hypolytrum** runs to *Group 3* and therein to 14a. It can be distinguished from *Scirpus* [but genus no longer recognized in sthn trop. Afr.—see Lebrun & Stork: 206 (1995)] by its large leaves which have no ligule, and by its flowers subtended by 2 lateral, ± ciliate-keeled scales, each with a single stamen, and often ± fused with each other.

**Mapania**, like *Hypolytrum* a member of the Mapanioideae, also runs to *Group 3* and therein to 14a. It can be distinguished in the same way from *Scirpus* [no longer recognised in sthn trop. Afr.] as *Hypolytrum* from which it can be distinguished by its 4–6 (not 2 or 3) lateral, ± ciliate-keeled hypogynous scales.

**Nemum** runs to *Group 3* and therein somewhat uncomfortably to 14, but it can be distinguished from both *Scirpus* [no longer recognized in sthn trop. Afr.] and *Isolepis* by the long hairs at the mouth of the leaf sheath. **Nemum** is closely related to *Bulbostylis*, and if it was not for the style base which is not enlarged, it would run straight to that genus.

**Queenslandiella** runs to *Group 2*: 1b, but it can be distinguished from *Pycreus* by its pronounced curry smell and its spikelets which fall as a unit, and from *Kyllinga* also by its spike-like, not capitate, inflorescences.

**Sphaerocyperus** runs to *Group 2*: 2b. *Cyperus*, from which it can be distinguished by its spikelets which have several sterile glumes below, not with each glume subtending a flower as in *Cyperus*.

**Abildgaardia** Vahl


**Actinoschoenus** Benth.
Bentham: 33 (1881); Raynal: 89 (1967); Goetghebeur: 174 (1998); Bingham & Smith: 150 (2002).

Tufted, erect, stoloniferous or rhizomatous perennials. **Culms** with basal nodes, triquetrous. **Leaves** ligulate; blade very short. **Inflorescence** terminal, with 2–4 sessile, erect-ascending spikelets subtended by a single short bract. **Spikelets** with 4–7 distichous, deciduous glumes, 1(2)-flowered; flower bisexual, subtended by penultimate larger glume. **Perianth** 0. **Stamens** 3. **Style** 3-fid; base thickened, deciduous. **Nutlet** trigono-ovoid, smooth to slightly reticulate.


**Alinula** J.Raynal


**Ascolepis** Nees ex Steud.

**MONOCOTYLEDONS**

**Cyperaceae: Cladium**


**Coleochloa Gilly**


**Costularia C.B.Clarke**


**Courtoisia Sojak**


**Cyperus L.**


**Anosporum Nees; Phiri (Unpublished); Juncellus C.B.Clarke; Clarke: 306 (1901/1902). Mariscus Vahl, Clarke: 377 (1901/1902); Lye: 37 (1992).**


**Diplacrum R.Br.**

Brown: 240 (1810); Clarke: 510 (1901/1902); Napper: 445 (1971); Napper: 346 (1972); Haynes & Lye: 360 (1983); Lisowski: 485 (1996); Goetghebeur: 184 (1998); Bingham (Unpublished); Phiri (Unpublished).

Small, weak, nearly glabrous annuals with minute root system; culms 30–150 mm long, leafy throughout, often purplish below. Leaves without ligule, linear, 20–40 mm long, narrowing abruptly and acuminate at tip, often with reddish brown dots; margin scabrous, especially near apex; sheath funnel-shaped. Inflorescence consisting of several shortly pedunculate to almost sessile axillary clusters of spikelets; clusters in lower leaf sheaths hardly protruding. Spikelets all unisexual, lanceolate, straw-coloured or greenish yellow; lateral spikelets usually male; terminal spikelets usually female. Male spikelets with few distichous, persistent glumes, each subtending a monandrous male flower. Female spikelets with 2 distichous, persistent glumes surrounding a single, apparently terminal female flower; pistil seated on a basal 3-lobed disc with lobes opposite the 3 main ribs; style 3-fid, style base not thickened. Achene subglobose to ovoid, bluntly apiculate, longitudinally ribbed, grey to blackish.

Species 7, pantropical; sthn trop. Afr.: 1: *Diplacrum africanum* (Benth.) C.B.Clarke, Zambia.

**Eleocharis R.Br.**

Clarke: 404 (1901/1902); Hess: 317 (1953); Goetghebeur: 166 (1998); Mapaura (Unpublished).

Eleocharis of many authors.


**Ficinia Schrad.**


Ficinia of many authors.


**Fimbristylis Vahl**

Clarke: 461 (1901/1902); Binns: 46 (1968); Goetghebeur & Coudijzer: 65 (1984); Goetghebeur: 166 (1998); Mapaura (Unpublished).

Scirpus L. in part; Binns: 47 (1968).


**Fuirena Rottb.**


**Hypolytrum Rich.**

Richard: 70 (1805); Clarke: 486 (1901/1902); Nelmes: 522 (1954); Nelmes: 63 (1955a); Raynal: 423 (1968); Hooper: 335 (1972b); Goetghebeur: 160 (1998).

Perennials, rhizomatous. Culm usually with basal nodes or more rarely with several aerial nodes. Leaves elongate, sometimes pseudopetiolate; basal leaves sometimes reduced to sheaths; cauline ones linear-lanceolate to narrowly elliptical. Inflorescence paniculate, corymbose or capitulate, with many (rarely 1) spikelets; primary bracts from small and scale-like to large and leaf-like. Spikelets with many, spirally arranged, persistent glumes, each subtending a flower. Flowers bisexual; scales 2(3), basal pair lateral, ± ciliate, keeled, each with a single stamen, scales often connate or ± fused. Style 2-fid, style base ± persistent. Nutlet (ob-)ovoid to ellipsoid, smooth to tuberculate.

Species ± 40, pantropical, mainly equatorial, in forest; sthn trop. Afr.: 5: Angola.

**Isolepis R.Br.**

Carex embryo of 3-ribbed, sometimes with a fleshy exocarp; endocarp stony; Achene not distinct, not or slightly thickened, persistent or not. very rarely only 1 stamen per flower. stamen, of the remaining 2–4 scales 0–2 with 1 stamen, 4–6, basal pair lateral, glumes, each subtending a flower. Flowers Spikelets paniculate, when on lateral culms often reduced to 1–few. Inflorescence sthn Afr. Sthn trop. Afr. 16, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr. 154 (1973).

Carex embryo of 3-ribbed, sometimes with a fleshy exocarp; endocarp stony; Achene not distinct, not or slightly thickened, persistent or not. very rarely only 1 stamen per flower. stamen, of the remaining 2–4 scales 0–2 with 1 stamen, 4–6, basal pair lateral, glumes, each subtending a flower. Flowers Spikelets paniculate, when on lateral culms often reduced to 1–few. Inflorescence sthn Afr. Sthn trop. Afr. 16, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr. 154 (1973).


Schoenoplectus (Rchb.) Palla

Scirpus L. in part: Clarke: 446 (1901/1902); Binns: 47 (1968).


Schoenoxiphium Nees


Schoenus L.


(Scirpus L.)

Scleria P.J. Bergius


Sphaerocyperus Lye

Perennials, stout; rhizome creeping, scale-covered. Culms scapose, rigid. Leaves eliquate, lower leaves reduced to sheaths. Inflorescence capitate, whitish, with 1–several indistinct dense spikes of many spikelets; primary bracts 2 or 3, leaf-like, spreading to reflexed. Spikelets with several dichotisous, persistent glumes of increasing length, largest penultimate glume subtending a bisexual flower; spikelet deciduous as a unit. Perianth 0. Stamens 3; anthers linear. Style very long, 3-fid, bise distinct, not or only slightly thickened, persistent. Nutlet narrowly obovate, beaked, densely punctulate.


Tetrapia P. Beauv.


Volkiella Merxm. & Czech


Websteria S.H. Wright
Hooper: 582 (1972a); Eiten: 181 (1976); Goetghebeur: 166 (1998).


References
Cyperaceae: References

Adansonia 19: 269–305.


Dioscoreaceae  
(Liliidae—Dioscoreales)  
(Monocots—Dioscoreales)


Dioscorea L.  


References  


Dracaenaceae
(Liliidae—Asparagales)
(Monocots—Asparagales; as optional synonym of Asparagaceae)


Dracaena L.


Sansevieria Thunb.


References


Eriocaulaceae
(Commelinidae—Eriocaulales)
(Commelinids—Poales)


Sthn trop. Afr.: genera 4, species 64.

Key to genera
[after Phillips (1998a)]

1a Stamens 6 or 4, twice as many as petals; petals usually with a black gland near or at the tip:

2a Petals of female flowers free; leaves, scapes and sheaths usually glabrous .................................................................**Eriocaulon**

2b Petals of female flowers connate into a tube, only the bases free; leaves, scapes and sheaths usually hairy ............................................. **Mesanthemum**

1b Stamens 3, as many as petals; petals usually eglanular:

3a Petals of female flowers connate in the middle, the bases and tips free; leaves, scapes and sheaths usually hairy and often glandular ... **Syngonanthus**

3b Petals of female flowers free; scapes, leaves and sheaths hairy or glabrous:

4a Leaves, scapes and sheaths glabrous (except *E. mhabelsis* S.M.Phillips); petals of male flowers with distinct free lobes ............... **Eriocaulon**

4b Leaves, scapes and sheaths hairy; petals of male flowers connate into a truncate tube lacking free lobes ......................... **Paepalanthus**

Eriocaulon L.


Mesanthemum Körn.

Tufted perennial herbs of medium size, in marshes, or totally submersed aquatics; rhizome vertical to horizontal, short in aquatic species. **Leaves** in rosettes, linear, spongy or very thin (in the aquatic *Mesanthemum reductum* Hess). **Capitula** 1–several per plant; scapes ± erect, hairy or glabrous; surrounded by a closed sheath below; longer than leaves; involucral bracts in several imbricate series, coriaceous with scarious margins; floral bracts present or absent; receptacle densely hairy. **Male flowers** with sepals (if present) basally connate or free, usually membranous; petals 3, fused into a fleshy or hyaline tube, epipetalous glands 3 or absent; stamens 6, anthers 2-thecous;
vestigial gynoecium present or absent. Female flowers with sepalas (if present) free; petals 3, free around the ovary but fused into a narrow cylindrical tube ending in 3 short, rounded lobes; epipetalous glands present or absent; ovary 3-locular; ovule 1 per locule, pendulous; style filiform; stigmas 3, ± as long as style. Capsule 3-locular. Seeds 3 per capsule, ellipsoid, brown.

Species 17, trop. Africa and Madagascar; sthn trop. Afr. 6, Angola, Zambia, Zimbabwe, Malawi, Mozambique.

**Paepalanthus Kunth**


Annual or perennial herbs; stem short or elongate. Leaves spirally arranged, narrow, thin to thick and coriaceous. Capitula single or in umbels, villous; floral bracts present; flowers 2- or 3-merous; petals eglandular. Male flowers: sepals free except at base; petals connate into a glabrous infundibular tube bearing stamens on its truncate upper margin; petal tube finally involute and enclosing stamens; rudimentary pistil present; stamens as many as petals, white. Female flowers: sepals free except at base, and usually becoming rigid at maturity; petals free; style with simple or bifid glandular appendages alternating with stigmas. Seeds variable, often with longitudinal ridges.

Species ± 500, almost entirely confined to tropical America, 2 in Africa; sthn trop. Afr. 1: Paepalanthus lamarcckii Kunth, Zambia.

**Syngonanthus Rußland**


Paepalanthus Mart. in part; Rendle: 102 (1899).


**References**


RENDLE, A.B. 1899. *Catalogue of the African plants collected by Dr. Friedrich Welwitsch in 1853–61*, vol. 2(1). Trustees, British Museum (Natural History), London.


**Eriocarpum** Jacq. ex Willd.


**References**


MANNING, J.C. 2000. Convallariaceae. A new combination in *Erio-
Flagellariaceae
(Commelinidae—Restionales)
(Commelinids—Poales)


Sthn trop. Afr.: genus 1, species 2.

Flagellaria L.


References

Hemerocallidaceae
(Liliidae—Asparagales; under Phormiaceae)
(Monocots—Asparagales)

Herbaceous to shrub-like, glabrous perennials; stem erect, usually unbranched; rhizome horizontal, sparsely branched. Leaves basal, scattered along stem or in a terminal rosette, sheathing at base and ± equitant, with sides of lamina becoming closely pressed together to form an isobilateral portion, midrib conspicuous, usually with minute serrations or prickles on lower surface. Inflorescence a loose panicle, terminal and exceeding leaves; bracts small; pedicels solitary or few, usually in axils of bracts, articulated immediately below flower. Flowers bisexual, regular. Perianth 3 + 3, lobes free, subequal, spreading, 3–7-nerved. Stamens 3 + 3, arising on receptacle; filaments filiform with a swelling (struma) below anther; anther basifixted, dehiscing extrorsely by pores becoming slits. Ovary superior, 3-locular, globose; ovules 4–8 in each locule, anatropous; placentation axile; style filiform, simple, minutely capitate. Fruit a berry, usually shiny blue. Seeds brown to black. x = 8 (fide Takhtajan 1997).

Genera 7, species 30, mainly in SE Asia and on Pacific islands, including New Zealand. Sthn trop. Afr.: 1 genus, 1 species.

Dianella Lam.

Description as for family.

Species 20–30, Indomalesia, Australia, New Zealand, S and W Pacific, Madagascar, Mascarenes; sthn trop. Afr. Afr. 1: Dianella ensifolia (L.) DC., Chimanimani Mountains in Zimbabwe and Mozambique. There is no evidence that it is a garden escape (Wild 1953).

References

Hyacinthaceae
(Liliidae—Asparagales)
(Monocots—Asparagales)

Williams, R. in Leistner: 610 (2000).

Sthn trop. Afr.: genus 10, species ± 42.

Identification of the additional genus using the key in the above reference: Schizocarphus will key out under 14a: Scilla (which is no longer considered to be represented in Africa).
**Albuca L.**


**Bowia Harv. ex Hook.f.**


**Dipcadi Medik.**


**Drimia Jacq. ex Wild.**


**Drimiopsis Lindl. & Paxton**


**Eucomis L’Hér.**

Baker: 527 (1898); Macnca & Kalk: 142 (1958); Du Plessis & Duncan: 75 (1989); Speta: 277 (1998b); Govender et al.: 52 (2000); Hartley & De Hertogh: 58 (2000); Mapaura (Unpublished); Phiri (Unpublished).


**Ledebouria Roth**


**Ornithogalum L.**


**Schizobasis Baker**


**Schizocarphus Van der Merwe**


Fairly robust geophytes. **Bulb** up to 80 mm in diameter; plate plane with a dense ring of branched roots; bulb leaves imbricate, compact, apically often fibrous; tunic fibrous. **Leaves** linear to narrowly lanceolate, glabrous. **Inflorescence**: many-flowered dense racemes on 1(2) erect pubescent scape(s); pedicels 5–14 mm long, pubescent; bracts narrow. **Tepals** free, stellate, light beige to whitish or greenish white. **Filaments** whitish, patent; anthers short, bluish green. **Ovary** bluish green, very short stipitate; locules 2(–6)-ovulate. **Capsule** globose. **Seeds** ovoid, black; cotyledon epigean.

Species ± 5, eastern tropical to sthn Afr.; sthn trop. Afr. at least 1: *Schizocarphus nervous* (Burch.) Van der Merwe, probably more, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

**References**


HYACINTHACEAE: References


RENDLE, A.B. 1899. Catalogue of the African plants collected by Dr. Friedrich Welwitsch in 1853—61. vol. 2(1). Trustees of the British Museum (Natural History), London.


STEDJE, B. 1996. Phylogenetic relationships and generic delimitation of sub-Saharan Scilla (Hyacinthaceae) and allied African genera as inferred from morphological and DNA sequence data. Plant Systematics and Evolution 211: 1—11.


Hydrocharitaceae

(Alismatinae—Alismatales)

(Monocots—Alismatales)


Sthn trop. Afr.: genera 7, species ± 22.

Key to genera

1a Marine plants; leaves distichous on creeping rhizomes; flowers submerged during anthesis; perianth segments 3 or ± reduced:

2a Leaves clearly differentiated into petiole and blade when mature, blade apparently pinnately veined, with midvein and prominent veins along margin ................................................................................................................................. Halophila

2b Leaves sessile, with parallel veins .................................................................................................................................................................................. Thalassia

1b Freshwater plants; leaves in rosettes or cauline; flowers exserted above water or floating on surface at anthesis; perianth segments 3 + 3:

3a Leaves clearly differentiated into petiole and blade when mature ...................................................................................................................... Ottelia

3b Leaves not differentiated into petiole and blade:

4a Plants forming long, leafy, submerged stems from a rhizome:

5a At least some leaves spirally arranged on the stem; leaves with 2 apical spines ........................................................................................................ Hydrilla

5b All leaves in whorls, rarely some opposite; leaves with 1 apical spine:

6a Leaves mostly shorter than 15 mm, often recurved; petals minute, as long as or shorter than the sepals; scales at nodes 2, fringed with orange-brown hairs ........................................................................................................................................................................ Egeria

6b Leaves mostly longer than 15 mm, not markedly recurved; flowers showy; petals 3 times as long as sepals; scales at nodes entire .................................................................................................................. Blyxa

4b Plants rosulate, mostly with a very short stem:

7a Leaves tapering gradually towards the tip; female flowers sessile or subsessile ....................................................................................................... Vallisneria

7b Leaves ± strap-shaped, narrowing abruptly near the tip; female flowers on long flexible peduncles ........................................................................ Blyxa

Blyxa Noronha ex Thouars


Submerged, freshwater, annual or perennial herbs, dioecious or bisexual; roots unbranched; stems corn-like and shortly erect, shortly rhizomatous or stoloniferous. Leaves radical or cauline and spirally arranged, sessile, linear to narrowly lanceolate, not differentiated into stipule, petiole and blade, flaccid, translucent, margin usually minutely toothed, midrib usually prominent. Inflorescence: spathe solitary in leaf axil, pedunculate or rarely sessile; 2–lobed at apex, containing 1 or 2(−22) flowers. Flowers unisexual or bisexual, emerging above water surface, usually one at a time from each spathe at anthesis, remaining attached to plant; male flowers long-pedicellate; female and bisexual flowers sessile or subsessile. Seeds (outer perianth segments) free but often forming a tube at anthesis. Petals filiform to lanceolate, papillose. Stamens 3 (in bisexual flowers) 6 or 9, in whorls of 3, all fertile, in female flowers staminodes minute; filaments filiform; anthers emit, latrorse or introrsely dehiscent. Ovary of 3 carpels, 1-locular, narrowly cylindrical, distally elongating into a narrowly cylindrical hypanthium in bisexual and female flowers, carrying perianth to water surface; ovules many, anatropous; styles 3; stigmas 3, simple. Fruit an elongate, irregularly dehiscent capsule. Seeds ellipsoid or ovoid, smooth, tuberculate or spiny.

Species 9, tropical Old World but naturalised in N America and Europe; sthn trop. Afr. 3: Angola, Zambia, Mozambique.

*Egeria Planch.

Obermeyer: 100 (1966); Cook: 245 (1998); Mapaura (Unpublished).
Hydrocharitaceae: *Egeria*

### Submerged, freshwater annual or perennial herbs, gynoe-dioecious; roots unbranched; stems horizontal and stoloniferous below, erect and spreading above; bulbil-like turions (hibernacula) developing underground terminally on stolons, or axillary on erect stems or their branches. **Leaves** opposite and scale-like towards base of stem or branch, otherwise linear to ovate and in whorls of 3–8 (–12), spreading or strongly recurved, flaccid, with 1 apical spine, margin denticate, venation consisting of midrib only; stipules 0; nodal scales 2 per leaf, fringed with orange-brown hairs. **Inflorescence** axillary. **Male flowers** solitary in leaf axils, sessile, abscising as buds and opening explosively on water surface; sepals and petals (outer and inner perianth segments) reflexed; stamens 3; staminodes 0. **Female flowers** solitary, submersed but carried to water surface by long thread-like hypanthium; anthesis; stamens 3–12, anthers subsessile, 2–4-thecous, latrorse dehiscent; pollen grains spherical, united into moniliform strings. **Female flowers** submersed; tepals 3, similar to those of male flowers; staminodes 0; ovary of 3 carpels; ovules 6–8 carpels, 1 (–3)-locular; ovules several, on parietal placentas; hypanthium narrowly cylindrical; styles 6–8, each with 2 filiform stigmas 2–6 times as long as style. **Fruit** a globose, fleshy capsule opening by stellate dehiscence of fleshy pericarp into a number of irregular valves. **Seeds** conical with a thickened basal portion.

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**References**

Identification of additional genus using the key in the above reference: Curculigo will run to 5a, but it differs from Hypoxis in the perianth in which the lower part is fused into an elongated narrow tube (in Hypoxis the perianth (perigone) segments are free to the base).

**Curculigo Gaertn.**


Herbaceous geophytes, acaulescent; rhizome vertical, cylindrical to conical, bearing contractile roots. Leaves tristichous, sessile, linear-elliptic or lanceolate, plicate, becoming pseudopetiolate, sheathing at base with broad hyaline margins; indumentum of 2-armed or 3–12-armed (stellate) hairs. Inflorescences 1–many, borne near base of plant. Flowers 1–many, subseisile on rhizome or spicate arranged on a short scape. Perianth with lower part fused into an elongated narrow tube; lobes spreading, acute to obtuse, yellow adaxially and sparsely pilose beneath. Stamens 3 + 3; filaments short, anthers 2-thecous, sagittate, latrorse. Ovary inferior, borne amongst leaf bases or enveloped by subtending bracts; style 1, filiform to subulate; stigmas 3 or 6. Fruit indehiscent, crowned by persistent perianth tube. Seeds ellipsoid, black and glossy, sometimes striate.


**Hypoxis L.**


**Iridaceae**

(Gilliidae—Asparagales)

(Monocots—Asparagales)

**Lapeirousia**


Sthn trop. Afr.: genera 16, species ± 104.

Identification of additional genera using the key in the above reference: Savannosiphon is probably most closely related to Lapeirousia (Goldblatt 1993b), but as its corms are globose rather than bell-shaped with a flat base, it may run on to contrast 24 in the key. It can be distinguished from Watsonia and Thereianthus (which do not grow naturally in sthn trop. Afr.) by its bifacial (not unifacial or subterete) foliage leaves.
Zygotritonia is distinct by its unbranched style.

**Aristea Aiton**

**Babiana Ker Gawl.**

**Crocosmia Planch.**

**Dierama K.Koch**

**Dietes Salisb. ex Klett**

**Ferraria Burm. ex Mill.**

**Freesia Klatt**
*Anomatheca* Ker Gawl.; Goldblatt: 52 (1993b); Bingham (Unpublished); Phiri (Unpublished).

**Gladiolus L.**

**Hesperanthes Ker Gawl.**

**Lapeirousia Pour.**

**Moraea Mill.**

**Radinosiphon N.E.Br.**

**Romulea Maratti**

**Savannosiphon Goldblatt & Marais**
*Lapeirousia* Pour., in part.
Deciduous perennials. **Rootstock** a small globose corm with membranous to fibrous tunicas. **Stem** unbranched, erect, compressed and winged above. **Leaves** few, lower 2 or 3 entirely sheathing (cataphylls); foliage leaves lanceolate, slightly plicate, lowermost ± basal, upper foliage leaves cauline and smaller. **Inflorescence** a few-flowered spike; bracts green, fairly large. **Flowers** actinomorphic, large, white, opening in evening; perianth tube long, cylindric, widening apically. **Tepals** subequal or upper tepal somewhat hooded. **Stamens** apparently symmetrically arranged; anthers with prominent acute appendages, included in perianth tube or partly exerted.
Style shortly exerted, filiform, branches deeply forked and recurved. Capsules ovoid, membranous. Seeds several per locule, globose, shiny, \( x = 7 \).


**Tritonia** Ker Gawl.


**Zygotritonia** Mildbr.


Deciduous perennials. Rootstock a globose corn with membranous to fibrous tunics. Stem terete, often with several diverging branches. Leaves few, lower 2 or 3 membranous and sheathing (cataphylls); foliage leaves 2–4, lanceolate to linear, prominently nerved to somewhat plicate. Inflorescence a simple or branched spike with many flowers spirally arranged, much longer than basal leaves; floral bracts small, subequal, unequally, upper one larger, held apart and hooded, lower 3 geniculate, channelled and forming a lip. Stamens unilaterally and arcuate. Style slender, undivided. Capsules globose-trigonal (but often with only 2 or 1 locule developed). Seeds 1(2) per locule, large, ± globose to weakly angled, smooth. \( x = 7 \).


**References**


**Juncaceae**  
(Commelinidae—Juncales)  
(Commelinids—Poales)


**Juncus L.**


**References**


**Juncaginaceae**  
(Alismatidae—Alismatales)  
(Monocots—Alismatales)


Sthn trop. Afr.: genus 1, species 3.

**Triglochin L.**


**References**


**Limnocharitaceae**  
(Alismatidae—Alismatales)  
(Monocots—Alismatales)


**Butomopsis Kunth**

Symoens: 30 (1984); Phiri (Unpublished).


**References**


**Marantaceae**  
(Zingiberidae—Zingiberales)  
(Commelinids—Zingiberales)

Rhizomatous perennial herbs, rosulate or with erect or spreading, sometimes lianescent or bamboo-like, branched or rarely simple aerial stems. **Leaves** distichous, divided into 4 distinct zones: (1) an open sheath, (2) petiole proper, (3) a pulvinus (“calloused portion of petiole”, “superior part of petiole”) and (4) blade with a strong midrib and thin, closely
set, parallel, upward-curved lateral veins fusing marginally, interconnected by closely set, parallel and closely set transverse veinlets. Inflorescence simple or complex, usually a spicate or capitulate thyrs with distichous or spiral bracts subtending flower clusters composed of 1–several 2-flowered cymes in which the 2 flowers are mirror images. Flowers bisexual, irregular. Calyx: sepals 3, free, ± similar, not petaloid. Petals 3, fused with androecium and style into a tube, one petal often hood-like and larger. Androecium in 2 whorls; outer whorl usually of 1 or 2 petaloid, showy or aciculic staminodes; inner whorl of 3 members: 1 fertile stamen with 1 theca and often with a petaloid appendage, 1 hood-shaped staminode, and 1 callose, fleshy staminode often used by insects as landing stage. Ovary inferior, 3(1)-locular with 2 locules often empty and compressed; ovules 1 per fertile locule, arising at base, anatropous; style fused basally with floral tube; in mature, untriggered flowers style enclosed in hood of hood-shaped staminode, and bent backwards under tension, when released by a pollinator snapping forward and curling up; stigmatic surface on inner side of funnel-shaped depression in apex of style. Fruit a loculicidal capsule, or carpyopsis-like. Seeds rather large; embryo horseshoe-shaped, embedded in starchy perisperm.

Genera 31, species ± 550, nearly pantropical but absent from Australia, especially numerous in America; sthn trop. Afr.: genera 10, species 21.


**Key to genera**
[after Hepper (1968)]

1a Stems simple, usually bearing 1–3 leaves and an apparently terminal inflorescence; or stem absent with petiole arising from rhizome; petiole without a distinct circular groove at the junction of petiole and calloused portion; ovary and fruit smooth, not muricate:

2a Inflorescence arising at ground level, 60–150 mm long:

3a Inflorescence arising from same axis as leaves, simple or forked; fruits 3-winged, ± 30 mm in diameter; leaves very large, up to ± 0.6 x 0.4 m .......................................................... Thaumatococcus

3b Inflorescence and leaf (leaves) arising separately on rhizome; inflorescence simple; leaves up to ± 0.35 x 0.1 m .......................................................... Afrolathea

2b Inflorescence aerial; fruits ± rounded or cylindric, not winged:

4a Leaves strongly asymmetric with one side nearly straight and the other rounded:

5a Fruit 3-seeded, ± rounded (see also 10a below) .................................................................................. Marantochloa

5b Fruit 1-seeded, cylindric; inflorescence with closely imbricated bracts and erect branches ....................................................... Halopegia

4b Leaves not strongly asymmetric, both sides rounded:

6a Ovary 1-locular with 1 erect ovule; fruit 1-seeded, the seed filling the cavity, arillate; inflorescences lax panicles; plants of open marshes ......

.......................................................... Thalia

6b Ovary 3-locular; inflorescence borne on a simple stem terminating in a single leaf; shade plants:

7a Nodes of inflorescences each with 1 cymule; each bract enclosing the part of the inflorescence above it, caducous at anthesis; each cymule with 1 fleshy bracteole; fruit with well marked sutures; seed arillate .................................................................................. Megaphrynium

7b Nodes of inflorescences each with 2–4 cymes; bracts not enclosing the part of the inflorescence above it, persistent; each cymule with 2 fleshy bracteoles; fruit without obvious sutures; seeds without an aril ............................................................................ Sarcocephrynium

1b Stems branched, sometimes repeatedly so to form a scrambling plant; leaves many; ovary and fruit 3-locular, smooth or muricate:

8a Junction of petiole with calloused portion marked by a distinct circular groove with thickening; ovary and fruit muricate .............. Hypselodelphys

8b Junction of petiole with calloused portion not marked by a circular groove, only marked by a change in texture; calloused portion uninterrupted with midrib on lower surface; fruits not muricate:

9a Bracts suborbicular; stems often prickly; leaves hardly asymmetric, both sides curved .............................................................. Haumania

9b Bracts oblong; stems not prickly; leaves strongly asymmetric with one side curved and the other almost straight; cymes without fleshy bracteoles; seeds arillate:

10a Bracts acute; flowers borne at different levels; fruit ultimately dehiscent; inflorescence erect ....................................................... Marantochloa

10b Bracts obtuse; flowers ± side by side; fruits indehiscent; inflorescence ± reflexed .............................................................. Ataenidia

**Afrolathea** K.Schum.

Acaulescent rhizomatous herbs with leaves and inflorescences on separate shoots. Leaves 1 or 2; lamina elliptic to lanceolate, glabrous; petiole up to twice as long as lamina, ± terete. Inflorescence a simple thyrs on a short peduncle arising directly on rhizome, 2-flowered cymes supported by 2-keeled bracts; bracteoles absent. Flowers sessile on a very short common axis. Corolla: tube ± equalling lobes (± 10 times longer than wide). Androecium: outer staminodes 2, slightly unequal, petaloid; hooded staminode with a short, flat appendage near base of lobe. Ovary with 3 ovulate locules. Fruit and seed unknown.


**Ataenidia** Gagnep.
Gagnepain: xli (1908); Milne-Redhead: 168 (1952a); Milne-Redhead: 8 (1952b); D’Orey: 54 (1981); Dhetelhuvi & Diafouka: 445 (1993); Andersson: 287 (1998).

*Phrynium* sensu Schumann: 52 (1902), in part.
Tufted rhizomatous herbs; stems erect or spreading, branched, bearing 1 inflorescence and several leaves. **Leaves**: petiole long, part directly below blade calloused; blade elliptic, asymmetric, acuminate, ± rounded at base. **Inflorescence** terminal, much branched, congested; spathes persistent; branches with few nodes, with up to 4, 2-flowered subsessile cymes at each node, each cyme backed by a 2-nerved prophyll; bracteoles absent. **Flowers** in each cyme ± side by side but opening at different times. **Corolla**: tube ± as long as lobes. **Androecium**: outer staminodes 2, petaloid; hooded staminode without appendage near apex. **Ovary** with 3 ovulate locules, pubescent. **Fruit** with papyraceous pericarp, indehiscent, 1–3-seeded. **Seeds** arillate.


**Halopegia** K.Schum.


Rosulate marsh plants with short rhizome and simple stems. **Leaves**: petiole very long, sheathing in lower half, terete towards apex; lamina elongate-oblong. **Inflorescence** a simple or sparsely branched synflorescence; florescence consisting of a single cyme; axes conspicuously flattened and furrowed; bracts persistent, imbricate; bracteoles absent. **Sepals** markedly unequal. **Corolla**: tube very short to absent. **Androecium**: outer staminode(s) 1, or 2 very unequal; callose staminode conspicuous, with narrow petaloid margin; hooded staminode with a simple often ± obsolete appendage near top of lobe. **Ovary** 3-locular, ovulate or 2 of them poorly developed, empty and flattened. **Fruit** caryopsis-like, 1-locular and 1-seeded.


**Haumania** J.Léonard


Climbing plants with slender, flexible stems. **Leaves** ovate-oblong, lower surface ± pubescent; petiole present or not. **Inflorescence** of composite cymes arranged in spikes; spathes persistent, ± orbicular, white; cymes without bracteoles. **Flowers** large. **Sepals** 3, petaloid. **Petalas** 3; tube ± half as long as lobes. **Androecium**: stamnodes petaloid, outer staminodes 2. **Ovary** with 3 ovulate locules. **Fruit** indehiscent, globose-depressed; exocarp tuberculosis. **Seeds** exarillate.


**Hypselodelphys** (K.Schum.) Milne-Redh.


Subscendent, much branched perennials with bamboo-like shoots simple below and clothed with sheathing coriaceous cataphylls, branched and leafy above. **Leaves**: petiole jointed shortly above top of sheath; blades asymmetric. **Inflorescence** terminal, simple or sometimes branched at base, spike-like with a jointed rachis and a 2-flowered cyme at each distichous node, each flower subtended by a small fleshy bracteole. **Corolla**: tube ± one-quarter as long as lobes. **Androecium**: outer staminodes 2, petaloid; hooded staminode with a 2-branched appendage. **Ovary** 3-locular, densely muricate. **Fruit** a dehiscent, muricate, 1–3-seeded capsule. **Seed** smooth, with a basal aril.

Species 5, trop. Africa; sthn trop. Afr.: 4, Angola. Andersson (1998) notes that the only important difference between this genus and *Trachypyrhium braunianum* (K.Schum.) Baker, the only species of this genus, is in fruit structure, and that this distinction is not very convincing.

**Marantochloa** Brongn. ex Gris.


**Phrynium** sensu Schumann: 52 (1902) in part.

Glabrous or pubescent, rhizomatous perennials with ± woody, erect or spreading, usually branched stems. **Leaves** strongly asymmetric. **Inflorescence** lax or congested, each branch with ± 4 nodes, with 1 or 2, 2-flowered cymes, without fleshy bracteoles at each node. **Androecium**: outer staminodes 2, petaloid; hooded staminode with a short flat appendage near middle of lobe. **Ovary** 3-locular, often pilose. **Capsule** tardily dehiscent, smooth, ± pubescent. **Seed** with a small basal aril.


**Megaphrynum** Milne-Redh.


**Phrynium** sensu Schumann: 52 (1902) in part.

Rhizomatous, erect perennial herbs; stems simple, bearing an inflorescence and a single subtending leaf. **Leaves** arising either singly from stem or directly from rhizome; petiole sometimes up to 5 m long; blade elliptic, ± symmetric. **Inflorescence** terminal, more or less branched; branches jointed with many internodes, and a 2-flowered pedunculate cyme at each node, subtended by a caducous sheathing bract enclosing the cyme; bracteole 1(2), glandular, fleshy; spathes caducous. **Corolla**: tube ± half as long as lobes. **Androecium**: outer staminodes 2(1), often markedly uneven, subulate and erect; hooded staminode with 2-branched appendage, branches ± equal, divergent. **Ovary** with 3 ovulate locules. **Fruit** ± globose, somewhat fleshy but with 3 conspicuous sutures and dehiscent. **Seeds** with a laciniate arillus surrounded by copious muciilage.


**Sarcophyrum** K.Schum.

Schumann: 35 (1902); Gossweiler & Mendonça: 63 (1939); Milne-Redhead:

**Thalia L.**

**References**

Erect, glabrous or pubescent, rosulate rhizomatous herbs; stem simple, bearing inflorescence and a single subtending leaf surrounded by several leaves arising directly from rhizome or at base of stem. *Leaves* elliptic or oblong-elliptic, slightly asymmetric. **Inflorescence** terminal, branched; branches with few to many nodes, with up to 4, 2-flowered pedunculate cymes at each node subtended by a sheathing bract, each cyme backed by a 2-nerved phyll. *Flowers* borne at different levels, each subtended by a fleshy, glandular bracteole. **Corolla**: tube ± half as long as lobes. **Androecium**: outer staminodes 2(1), petaloid, hooded staminode with 2-branched appendage, branches ± equal, divergent. **Ovary** with 3 ovulate locules, glabrous. **Fruit** fleshy, indehiscent, without obvious sutures. **Seeds** surrounded by a mucilaginous mantle-like aril.

Species 5–7, tropical America, with 1 species, *Thalia genticulata* L. (=*T. welwitschii* Ridl.) extending to trop. Africa; sthn trop. Afr.: Angola, Zambia, Zimbabwe. Mabberley (1997) describes pollen transfer as follows: pollen deposited on style in bud, and insect proboscis touching style promotes explosive S-shaped movement; in 0.03 seconds style becomes erect, scrapes pollen from proboscis into stigmatic hollow and deposits home pollen on proboscis.

**Thaumatococcus Benth.**

Rhizomatous, rosulate perennial herbs with simple stems. *Leaves* asymmetric, ± broadly ovate-elliptic, shortly acuminate, rounded-truncate at base, with very many parallel nerves diverging from midrib at an angle of ± 45°; petiole very long, subterete. **Inflorescence** simple or very sparsely branched; spathes caducous; cymes single, very shortly pedicelled; bracteole solitary, glandular. *Sepals* 3, free, broadly linear. **Corolla**: tube very short. **Androecium**: outer staminodes absent. **Ovary** with 3 ovulate locules, silky. **Fruit** large, fleshy, indehiscent, with 3 thick wings; endocarp mucilaginous. **Seeds** with aril of membranous sheets sticking to testa.

Seed plants of southern tropical Africa: families and genera
**Mayacaceae**  
(Commelinidae—Commelinales)  
(Commelinids—Poales)

Freshwater aquatic herbs, submerged, floating or growing in swamps, with slender, densely leafy stems bearing adventitious roots. **Leaves** spirally arranged, sessile, linear to filiform, without basal sheath, bidentate at apex. **Flowers** bisexual, regular, solitary, aerial but without nectarines; pedicels long, in axils of sheathing bracts but may appear to be terminal. **Sepals** 3, free, green, valvate to subvalvate. **Petals** 3, free, shortly clawed, imbricate, white. **Stamens** 3, alternipetalous; filaments filiform, glabrous; anthers basifixied, tetrasporangiate to bisporangiate, opening by apical pores or pore-like slits, covered in young state by a dome-shaped operculum. **Ovary** superior, 1-locular, composed of 3 carpels, with 3 parietal placentas; ovules several to many, in 2 rows on each placenta, bitegmic, orthotropous; style terminal, filiform; stigma entire to slightly divided. **Fruit** a loculicidal capsule opening by 3 valves. **Seeds** ovoid to globose, striate, operculate; embryo small; endosperm copious, containing starch and aleurone.

Genus 1, species 3–9 in tropical America, 1 in tropical W Africa. Formerly widely considered to be closely related to Commelinaceae, but now thought to be closer to Xyridaceae (Stevenson 1998).


**Mayaca Aubl.**  
Aublet: 42 (1775); Brown: 525 (1902); Boutique: 1 (1971a); Boutique: 90 (1971b); Stevenson: 295 (1998).

Description as for family.


**References**


**Musaceae**  
(Zingiberidae—Zingiberales)  
(Commelinids—Zingiberales)


Sthn trop. Afr.: genus 1, species 3.

**Ensete Horan.**  


**References**


**Najadaceae**  
(Alismatidae—Najadales)  
(Monocots—Alismatales; included in Hydrocharitaceae)


**Najas L.**  

References


Orchidaceae
(Liliidae—Orchidales)
(Monocots—Asparagales)

This account is largely based on La Croix & Cribb (1995/1998).
The classification of the family into subfamilies and tribes follows Dressler (1993).

Genera ± 800, species ± 20 000, cosmopolitan but most numerous in the moist tropics and subtropics; stlan trop. Afr.: genera 67, species ± 632.

Key to the subfamilies of Orchidaceae
1a Anthers 2 or 3:
  2a Anther filaments fused to the column near the base only; staminode absent; lip petaloid or nearly so, never saccate .............. APOSTASIOIDEAE (not found in Africa)
  2b Anther filaments fused to the column stalk; staminode present, usually terminal and shield-shaped; lip deeply saccate .............. CYPREPIDIOIDEAE (not found in Africa)
1b Anther solitary, although the anther loculi can be well separated:
  3a Anther attached to the column by the base, the loculi adnate to the column, persistent; pollinia granular or sectile and two (rarely one) viscidia; mostly terrestrial with erect leafy stem, terminal inflorescence, and root-stem tuberoids .............................................. ORCHIDOIDEAE
  3b Anther attached to the column by the apex, usually at the back of the column and either operculate or erect and persistent, caudicle and viscidia then at the top:
    4a Pollinia granular, occasionally mealy, or much divided into small masses attached to a common axis; anther opening lengthwise; plants usually terrestrial ................................................................. SPIRANTHOIDEAE
    4b Pollinia waxy, entire, 2, 4 or 8, free or adhering at one end by caudicles or attached to 1 or 2 viscidia; anther operculate; plants terrestrial, epiphytic, lithophytic, or scrambling lianas .............................................. EPIDENDROIDEAE & VANDEAE

Key to the genera of Spiranthoideae
1a Plants with woody stems and rhizomes; inflorescences 1–several, branching, glabrous; flowers more than 30 mm long .......... Corymborkis
  2a Lip tapering to a blunt apex; sepal and petals 7–9 mm long ................................................................. Platyplepis
  2b Lip with a transversely oblong apical lobe; sepal and petals 6 mm long or less:
    3a Lateral sepals united for about half their length ......................................................... Cheiroystis
    3b Lateral sepals free to the base ........................................................................................................ Zeuxine

Key to the genera of Orchidoideae
1a Spur formed by the dorsal sepal, not formed by the lip or lateral sepals:
  2a Lip with lobed or deeply divided margins, appearing bearded; flowers blue, purplish blue or rarely white; leaves grass-like, tufted (=Herschelianthe) ................................................................. Disa
  2b Lip entire; flowers not blue; leaves lanceolate, elliptic or ovate:
    3a Lateral sepals appressed to the ovary; pollinia attached to a single viscidium ........................................... (=Monadenia) Disa
    3b Lateral sepals spreading; each pollinium attached to its own viscidium:
      4a Petals free from the dorsal sepal; anther erect or horizontal ......................................................................... Disa
      4b Petals united to the dorsal sepal; anther horizontal ...................................................................................... Brownelea
  1b Spur or spur or sacs, if present, formed by the lip or lateral sepals:
    5a Lip with 1 or 2 distinct, sometimes small, spurs:
      6a Spurs 2; flowers resupinate with the lip uppermost ........................................................................ Satyrium
      6b Spur single; flowers not resupinate:
        7a Lip more or less united to the column:
          8a Leaves 1 or 2, radical, orbicular or ovate .......................................................................................... Holothrix
          8b Leaves usually several, borne on the stem, not orbicular:
            9a Stigmas sessile ......................................................................................................................... Schizochilus
            9b Stigmas borne on variously lengthened stalks:
              10a Stigmatic arms divided into 2 elongated branches, the lower fertile and capitate, the upper sterile and horn-like . Centrostigma
              10b Stigmatic arms unbranched ...................................................................................................... Habenaria (in part)
    5b Lip free from the column:
Seed plants of southern tropical Africa: families and genera

Key to the genera of Epidendroideae

1a Stigmas sessile:
   1b Stigmas borne on, or forming, club-shaped processes, projecting from the front of the column, free or partly united with the lateral lobes of the rostellum:
      1a Lateral sepals and front lobe of the petals joined to the lip and to the stigmatic arms in their lower parts; tooth in mouth of spur ................................................................. Roepoercharis
      1b Lateral sepals and front lobe of petals not united at the same time; tooth absent in mouth of spur:
         1a Stigmas 2-lobed, the lobes projecting in different directions, upwards and downwards ......................................................... Bonatea
         1b Stigmas simple, not branched:
            1a Stigmatic processes partly united to the side lobes of the rostellum:
               1a Flowers pink or mauve; side lobes of lip entire ................................................................. Cynorkis
               1b Flowers green; side lobes of lip fimbriate ........................................................................... Habenaria (in part)
            1b Stigmatic processes free from the rostellum:
               1a Flowers yellow or orange; mid-lobe of rostellum concave, placed in front of the anther ......................................................... Platycoryne
               1b Flowers green or white; mid-lobe of rostellum usually flat or subulate ................................................................. Habenaria (in part)

1b Lip not spurred, sometimes boat-shaped at the base:
   18a Lip adnate to the front of the column, bearing incurled lateral appendages:
      1a Inflorescence branching; lip spurred ......................................................................................................................... (Brachycorythis (in part)
      1b Inflorescence simple; lip lacking a spur:
         1a Flowers usually purple, mauve, white or rarely yellow; sepals and petals more than 3 mm long ........................................ Brachycorythis (in part)
         1b Flowers tiny, yellow with a green lip; sepals and petals up to 2 mm long ................................................................. Oligophyton

1b Plants terrestrial, scrambling or climbing:
   1a Plants terrestrial saprophytes, lacking leaves and chlorophyll:
      2a Flowers glabrous; lip bipartite, the hypochile saccate and articulated to a fleshy epichile ................................................................. Didymoplexis
      2b Flowers pubescent; lip entire or lobed:
         2a Inflorescence appearing well before the solitary leaf emerges ......................................................................................... Habenaria (in part)
         2b Inflorescence appearing with the leaves, or sometimes after the leaves have fallen:
            2a Pollinia 8, clavate; flowers turning blue if bruised:
               2a Column short, adnate to the lip base; spur as long as or longer than the lip ................................................................. Calanthe
               2b Column elongate, not adnate to the lip except at the base; spur much shorter than the lip ................................................................. Phaius
            2b Pollinia 2 or 4; flowers not turning blue when bruised:
               2a Flowers yellow or orange; mid-lobe of rostellum concave, placed in front of the anther ......................................................... Calanthe
               2b Flowers pink or mauve; side lobes of lip entire ................................................................................................. Neobolusia

1b Plants terrestrial, epiphytic or lithophytic, usually with green leaves, rarely epiphytic and lacking green leaves but then with green roots:
   1a Stigmas 2-lobed, the lobes projecting in different directions, upwards and downwards ......................................................... Epipogium
   1b Stigmas simple, not branched:
      1a Stigmatic processes partly united to the side lobes of the rostellum:
         1a Flowers pink or mauve; side lobes of lip entire ................................................................. Cynorkis
         1b Flowers green; side lobes of lip fimbriate ........................................................................... Habenaria (in part)
      1b Stigmatic processes free from the rostellum:
         1a Flowers yellow or orange; mid-lobe of rostellum concave, placed in front of the anther ......................................................... Platycoryne
         1b Flowers green or white; mid-lobe of rostellum usually flat or subulate ................................................................. Habenaria (in part)

Key to the genera of Epidendroideae

1a Plants terrestrial saprophytes, lacking leaves and chlorophyll:
   2a Flowers usually purple, mauve, white or rarely yellow; sepals and petals more than 3 mm long ........................................ Brachycorythis (in part)
   2b Flowers tiny, yellow with a green lip; sepals and petals up to 2 mm long ................................................................. Oligophyton

1b Stigmas borne on, or forming, club-shaped processes, projecting from the front of the column, free or partly united with the lateral lobes of the rostellum:
   1a Lateral sepals and front lobe of the petals joined to the lip and to the stigmatic arms in their lower parts; tooth in mouth of spur ................................................................. Roepoercharis
   1b Lateral sepals and front lobe of petals not united at the same time; tooth absent in mouth of spur:
      1a Stigmas 2-lobed, the lobes projecting in different directions, upwards and downwards ......................................................... Bonatea
      1b Stigmas simple, not branched:
         1a Stigmatic processes partly united to the side lobes of the rostellum:
            1a Flowers pink or mauve; side lobes of lip entire ................................................................. Cynorkis
            1b Flowers green; side lobes of lip fimbriate ........................................................................... Habenaria (in part)
         1b Stigmatic processes free from the rostellum:
            1a Flowers yellow or orange; mid-lobe of rostellum concave, placed in front of the anther ......................................................... Platycoryne
            1b Flowers green or white; mid-lobe of rostellum usually flat or subulate ................................................................. Habenaria (in part)

5b Lip not spurred, sometimes boat-shaped at the base:
   18a Lip adnate to the front of the column, bearing incurled lateral appendages:
      1a Inflorescence simple; lip lacking a spur:
         1a Flowers glabrous; lip bipartite, the hypochile saccate and articulated to a fleshy epichile ................................................................. Didymoplexis
         1b Flowers pubescent; lip entire or lobed:
            1a Inflorescence appearing well before the solitary leaf emerges ......................................................................................... Habenaria (in part)
            1b Inflorescence appearing with the leaves, or sometimes after the leaves have fallen:
               1a Pollinia 8, clavate; flowers turning blue if bruised:
                  1a Column short, adnate to the lip base; spur as long as or longer than the lip ................................................................. Calanthe
                  1b Column elongate, not adnate to the lip except at the base; spur much shorter than the lip ................................................................. Phaius
               1b Pollinia 2 or 4; flowers not turning blue when bruised:
                  1a Flowers yellow or orange; mid-lobe of rostellum concave, placed in front of the anther ......................................................... Calanthe
                  1b Flowers pink or mauve; side lobes of lip entire ................................................................................................. Neobolusia

1b Plants terrestrial, epiphytic or lithophytic, usually with green leaves, rarely epiphytic and lacking green leaves but then with green roots:
   1a Stigmas 2-lobed, the lobes projecting in different directions, upwards and downwards ......................................................... Epipogium
   1b Stigmas simple, not branched:
      1a Stigmatic processes partly united to the side lobes of the rostellum:
         1a Flowers pink or mauve; side lobes of lip entire ................................................................. Cynorkis
         1b Flowers green; side lobes of lip fimbriate ........................................................................... Habenaria (in part)
      1b Stigmatic processes free from the rostellum:
         1a Flowers yellow or orange; mid-lobe of rostellum concave, placed in front of the anther ......................................................... Platycoryne
         1b Flowers green or white; mid-lobe of rostellum usually flat or subulate ................................................................. Habenaria (in part)

Key to the genera of Epidendroideae

1a Plants terrestrial saprophytes, lacking leaves and chlorophyll:
   2a Flowers usually purple, mauve, white or rarely yellow; sepals and petals more than 3 mm long ........................................ Brachycorythis (in part)
   2b Flowers tiny, yellow with a green lip; sepals and petals up to 2 mm long ................................................................. Oligophyton

1b Stigmas borne on, or forming, club-shaped processes, projecting from the front of the column, free or partly united with the lateral lobes of the rostellum:
   1a Lateral sepals and front lobe of the petals joined to the lip and to the stigmatic arms in their lower parts; tooth in mouth of spur ................................................................. Roepoercharis
   1b Lateral sepals and front lobe of petals not united at the same time; tooth absent in mouth of spur:
      1a Stigmas 2-lobed, the lobes projecting in different directions, upwards and downwards ......................................................... Bonatea
      1b Stigmas simple, not branched:
         1a Stigmatic processes partly united to the side lobes of the rostellum:
            1a Flowers pink or mauve; side lobes of lip entire ................................................................. Cynorkis
            1b Flowers green; side lobes of lip fimbriate ........................................................................... Habenaria (in part)
         1b Stigmatic processes free from the rostellum:
            1a Flowers yellow or orange; mid-lobe of rostellum concave, placed in front of the anther ......................................................... Platycoryne
            1b Flowers green or white; mid-lobe of rostellum usually flat or subulate ................................................................. Habenaria (in part)

5b Lip not spurred, sometimes boat-shaped at the base:
   18a Lip adnate to the front of the column, bearing incurled lateral appendages:
      1a Inflorescence simple; lip lacking a spur:
         1a Flowers glabrous; lip bipartite, the hypochile saccate and articulated to a fleshy epichile ................................................................. Didymoplexis
         1b Flowers pubescent; lip entire or lobed:
            1a Inflorescence appearing well before the solitary leaf emerges ......................................................................................... Habenaria (in part)
            1b Inflorescence appearing with the leaves, or sometimes after the leaves have fallen:
               1a Pollinia 8, clavate; flowers turning blue if bruised:
                  1a Column short, adnate to the lip base; spur as long as or longer than the lip ................................................................. Calanthe
                  1b Column elongate, not adnate to the lip except at the base; spur much shorter than the lip ................................................................. Phaius
               1b Pollinia 2 or 4; flowers not turning blue when bruised:
                  1a Flowers yellow or orange; mid-lobe of rostellum concave, placed in front of the anther ......................................................... Calanthe
                  1b Flowers pink or mauve; side lobes of lip entire ................................................................................................. Neobolusia

1b Plants terrestrial, epiphytic or lithophytic, usually with green leaves, rarely epiphytic and lacking green leaves but then with green roots:
   1a Stigmas 2-lobed, the lobes projecting in different directions, upwards and downwards ......................................................... Epipogium
   1b Stigmas simple, not branched:
      1a Stigmatic processes partly united to the side lobes of the rostellum:
         1a Flowers pink or mauve; side lobes of lip entire ................................................................. Cynorkis
         1b Flowers green; side lobes of lip fimbriate ........................................................................... Habenaria (in part)
      1b Stigmatic processes free from the rostellum:
         1a Flowers yellow or orange; mid-lobe of rostellum concave, placed in front of the anther ......................................................... Platycoryne
         1b Flowers green or white; mid-lobe of rostellum usually flat or subulate ................................................................. Habenaria (in part)
2-lobed at the apex; inflorescences always axillary; pollinia with stipes and viscidium. Tribe Vandeae (see key below)

17b Plants with sympodial growth, with or without pseudobulbs; leaves plicate to conduplicate or iris-like; pollinia with or without stipes and viscidium:

18a Leaves iridiform, bilaterally compressed, distichous; flowers minute, less than 2 mm across, in whorls in a tapering densely-flowered inflorescence ................................................................. Oberonia

18b Leaves flat, needle-like or terete:

19a Leaves with a ± distinct conical to cylindric mentum formed by the lateral sepals and column-foot:

20a Pollinia 8 ................................................................................................................................................. Stolzia

20b Pollinia 2 or 4:

21a Inflorescence terminal ................................................................................................................................ Polystachya

21b Inflorescences lateral, basal:

22a Leaves 1 or 2 on pseudobulb ............................................................................................................. Bulbophyllum

22b Leaves several, pine-needle-like ......................................................................................................... Chaseella

19b Flowers lacking a mentum; column-foot absent:

23a Lip lacking a spur; flowers large, yellow, distinctively spotted with maroon on sepals and petals; pseudobulbs elongate-fusiform ....

................................................. Ansellia

23b Lip spurred at the base; flowers small, yellow, flushed but not spotted with maroon-brown on sepals and petals ........ Graphorkis

**Key to the genera of Vandeae**

1a Leaves reduced to chlorophyllous scales, or absent:

2a Stems elongate; roots scattered along the stem ................................................................................. Solenangis (in part)

2b Stems very short; roots clustered:

3a Flowers orange; sepals and petals united into a tube in lower part; lip with a hooded apex; pollinia 4 .................................................. Taeniophyllum

3b Flowers usually white; sepals and petals free; lip apex not hooded; pollinia 2 ................................................................. Microcodia

1b Leaves present, with chlorophyll:

4a Sepals and petals pale yellow, blotched or marked with reddish-brown; lip fleshy; pollinia 4 in 2 pairs ........................................................................... Acampe

4b Sepals and petals unicoloured; pollinia 2:

5a Flowers borne in a capitulate head; rostellum distinctively reflexed in apical half to lie parallel to the basal part ................ Ancistrorhynchus

5b Flowers solitary or in a lax to dense raceme; rostellum not as above:

6a Leaves iris-like:

7a Spur shorter than 5 mm, cylindric to conical; inflorescence axis as long as or longer than the leaves ........................................... Bolusia

7b Spur longer than 8 mm, conical, broad at base, constricted in middle and inflated into 2 sacs or lobules at apex; inflorescence axis shorter than leaves ................................................................. Podangis

6b Leaves flat, semi-terete or terete:

8a Rostellum retuse, not projecting beyond the column apex; stipes obscure or apparently absent:

9a Column-foot saccate, spurred, the lip articulated below the spur at the apex of the column-foot ............................................. Aeranthes

9b Column lacking a foot; lip spurred:

10a Lip ovate to cordate with the base enfolding the column .............................................................................. Angraecum

10b Lip lanceolate or subandurate, the base not enfolding the column ......................................................... Jumellea

8b Rostellum projecting beyond the column apex, often pendent; stipes 1 or 2, elongate, attached to 1 or 2 viscidia:

11a Flowers borne in whorls at the nodes of the inflorescence:

12a Lip obscurely 3-lobed, 10 mm or longer, fringed ...................................................................................... Diaphananthe (in part)

12b Lip entire; 4 mm long or less, margins entire .............................................................................................. Chamaeangis

11b Flowers borne singly at the inflorescence nodes:

13a Spur abruptly geniculate in middle and dilated at the apex:

14a Lip 3-long; rachis markedly zigzag; stem elongate .................................................................................. Calyptrochilum

14b Lip entire; rachis ± straight; stem very short ................................................................................................. Eurychone

13b Spur saccate to cylindric, not as above:

15a Pollinia attached by a single stipes to a viscidium:

16a Lip cordate .............................................................................................................................................. Cardiochilos

16b Lip not cordate:

17a Lip uppermost in flower; viscidium shoe-shaped .................................................................................. Summerhayesia

17b Lip lowermost in flower:

18a Stipes Y-shaped ...................................................................................................................................... Ypsilopus

18b Stipes linear or oblanceolate:

19a Lip 2- or 3-lobed in apical half, sometimes obscurely so:

20a Lip 3-lobed in apical part, lobes triangular, tapering or fimbriate ......................................................................... Tridactyle

20b Lip broadly 2-lobed in apical half .............................................................................................................. Nephrangis

19b Lip entire, not lobed in apical half:

21a Flowers stellate, white, sometimes variously tinged with green or pink on spur; stem usually short; leaves oblanceolate or obovate, flat ................................................................................. Aerangis
Acampe Lindl.

(Epipendroideae—Vandeae)


**Aerangis** Rchb.f.

(Epipendroideae—Vandeae)


**Aeranthes** Lindl.

(Epipendroideae—Vandeae)


Epiphytic, monopodial herbs with short stems. **Inflorescence** (floral axis) axillary, branched or unbranched, usually slender and pendant, rarely erect. **Flowers** translucent, green or white; lateral sepals adnate at base to column; lip entire, spur arising from column foot. **Column** long or short; side lobes of rostellum always longer than mid-lobe; pollinia 2, each with its own stipe and viscidium; stipes usually long, often geniculate. **Ovary** often articulated to pedicel.

Species ± 30, Madagascar, Comoro Islands and Mascarene Islands, 2 known from mainland Africa, both in Zimbabwe.

**Ancistrorhynchus** Finet

(Epipendroideae—Vandeae)

Finet: 44 (1907); Schlechter: 137 (1918); Summerhayes: 203 (1944); La Croix & Cribb: 393 (1995/1998).

Epiphytic monopodial herbs. **Stems** short, covered with older sheathing leaf bases; roots clustered at base of stem. **Leaves** imbricate, ligulate or tapering, unequally 2-lobed at apex, lobes sometimes dentate. **Inflorescences** axillary, from leaf bases or lower leaves, ± sessile, usually in globose or ellipsoid heads; bracts papery, usually as long as flowers. **Flowers** white, sometimes with green on lip. **Sepals** and petals free, subisimilar; lip oblong or orbicular, entire or 3-lobed, echinate, spurred at base; spur straight, sigmoid or geniculate, sometimes swollen at apex and/or mouth. **Column** short; rostellum projecting down and then abruptly upcurved in apical half; 2-lobed, each lobe falcate and acute; anther cap hemispherical, with a short, truncate appendage in front; pollinia 2, globose; stipes either 2 and subspathulate, or 1 and bifid; viscidium 1.


**Angraecopsis** Kraenzl.

(Epipendroideae—Vandeae)

Kraenzlin: 171 (1900); Schlechter: 600 (1914); Perrier: 80 (1941); Summerhayes: 242 (1951); Schelpe: 393 (1976); La Croix & Cribb: 395 (1995/1998); Mapaura & Timberlake: 166 (2002).

Small, epiphytic, monopodial herbs. **Leaves** distichous, ligulate to oblanceolate, often falcate, unequally 2-lobed at apex. **Inflorescences** axillary, racemose, few- to many-flowered. **Flow-
ers small, white, green or yellow, with a relatively long pedicel.

**Bracts** small, sheathing at base. **Lateral sepals** often oblanceolate and asymmetric at base, usually longer than dorsal sepal. **Petals** usually smaller, triangular, often adnate to lateral sepals at base. **Lip** entire or 3-lobed, ecallose, spurred. **Column** short; rostellum 3-lobed or bifid; pollinia 2, stipes 2; viscidia 2, rarely 1.


**Angraecum Bory**

(Epidendroideae—Cymbidieae)


**Ansellia Lindl.**

(Epidendroideae—Cymbidieae)


**Bonatea Willd.**

(Orchidoideae—Orchideae)


**Brownleea Harv. ex Lindl.**

(Orchidoideae—Diseaseae)


**Bulbophyllum Thouars**

(Epidendroideae—Dendrobieae)


**Calanthe R.Br.**

(Epidendroideae—Arethuseae)


**Calypetrochilum Kraenzl.**

(Epidendroideae—Vandeae)


Monopodial, epiphytic herbs with long woody stems. **Leaves** alternate, fleshy, twisted at base to lie in one plane. **Inflorescences** short; flowers resupinate, white. **Sepals** and **petals** free, similar, spreading, petals slightly shorter than sepals. **Lip** 3-lobed, spurred, spur inflated at apex. **Column** short and stout with a small foot. **Rostellum** prominent; anther apiculate; pollinia 2, globose, joined to a long linear caudicle; viscidium 1, large, triangular, grooved at base to clasping the rostellum.


**Cardiochilos P.J.Cribb**

(Epidendroideae—Vandeae)


Small, monopodial, epiphytic herbs. **Stems** short, rooting at base. **Leaves** several, distichous, linear. **Inflorescences** arising at base of plant and in axils of lower leaves. **Flowers** non-resupinate, green to straw-coloured, scabrid on outside. **Sepals** and petals subsimilar; lip obscurely 3-lobed, concave, ecallose, spurred at base. **Column** short; rostellum narrow, bifid, truncate. **Pollinia** 2, globose; stipe 1, linear; viscidium 1, reniform.

Monotypic genus: *Cardiochilos williamsonii* P.J.Cribb, known only from Malawi and southern Tanzania.

**Centrostigma Schlr.**

(Orchidoideae—Orchideae)


**Chamaeangis Schlr.**

(Epidendroideae—Vandeae)


Monopodial, epiphytic herbs, erect or pendent. **Stem** long or short, covered with old sheathing leaf bases. **Leaves** distichous, linear to oblanceolate, unequally 2-lobed at apex, fleshy or coriaceous. **Inflorescence** densely many-flowered, often with 2–4 flowers in a whorl at each node. **Flowers** small, cream, green, yellowish or orange-coloured. **Sepals** and **petals** free, subsimilar, spreading; lip more or less entire, ecallose, spurred at base; spur cylindrical, sometimes much swollen at the apex. **Column** short, fleshy, without a foot; rostellum short, bifid; pollinia 2, globose; stipes 2; viscidium 1, ovate or round.

Dwarf epiphytic herbs. **Pseudobulbs** small, spaced out along a slender creeping rhizome. **Leaves** 6–12, narrowly cylindric, fleshy, acute. **Inflorescence** 1(2)-flowered; peduncle very short. **Flowers** small, resupinate, somewhat campanulate; pedicel and ovary with some short black hairs. **Sepals**: dorsal one ovate; lateral ones obliquely ovate, acute, recurved at apex, forming a rounded mentum. **Petals** obliquely elliptic; lip mobile, somewhat recurved, broadly ovate, rounded at apex, slightly cordate at base, ± channelled. **Pollinia** 2, triangular.


**Cheirostylis** Blume
(Spiranthoideae—Cranichideae)


**Corycium** Sw.
(Orchidoideae—Diseae)


**Corymborkis** Thouars
(Spiranthoideae—Tropidieae)


**Cribbia** Senghas
(Epidendroideae—Vandeae)

Small epiphytic or lithophytic monopodial herbs with slender roots. **Leaves** distichous, twisted at base to lie in one plane, articulated at base to persistent, imbricate leaf sheaths. **Inflorescences** racemose, laxly few- to many-flowered. **Flowers** small to medium-sized, translucent, white, greenish or straw-orange in colour. **Sepals** and **petals** free, lip entire, ecallose, spurred at base. **Column** terete; rostellum short, 3-lobed, mid-lobe slightly longer than side lobes, pendent; **pollinia** 2, subglobose; **stipes** 2, linear; **viscidia** 2, very small.


**Cynorkis** Thouars
(Orchidoideae—Orchideae)


**Cyrtorchis** Schltr.
(Epidendroideae—Vandeae)


**Diapahanthe** Schltr.
(Epipendroideae—Vandeae)

**Listrostachys** Rechb. in part.


**Didymoplexis** Griff.
(Epipendroideae—Gastrodieae)


**Disperis** Sw.
(Orchidoideae—Diseae)


**Diaphananthe** Schltr.
(Epipendroideae—Vandeae)

**Eggelingia** Summerh.
(Epipendroideae—Vandeae)

Epiphytic, monopodial herbs with long, slender, leafy stems. **Leaves** distichous, linear or ligulate, articulated at base to persistent leaf sheaths. **Inflorescences** axillary, short, few-flowered. **Flowers** small, white. **Sepals** and **petals** free, lip entire, ecallose, spurred. **Column** short, fleshy. **Pollinia** 2, ovoid; **stipe** 1, ligulate or Y-shaped; **viscidium** 1, large, rectangular, almost as long as stipe. **Rostellum** deflexed, triangular, bifid.


**Epipactis** Zinn
(Epipendroideae—Neottieae)
Terrestrial herb, occasionally saprophytic, with very short rhizomes, numerous fleshy roots and simple erect leafy stems. **Leaves** ovate or lanceolate, plicate. **Inflorescence** racemose; flowers usually dull reddish or greenish, pedicelled. **Sepals** and **petals** free. **Lip** with no spur, but with hypochile forming a nectar-containing cup; hypochile articulated to epichile by a narrow joint. **Column** short, flat or concave in front, with a shallow cup at apex; anther free, 2-celled, hinged at back of column apex, behind stigma and rostellum; pollinia 2, attached near rostellum apex, each longitudinally divided, caudicles absent; pollen grains in friable lum; pollinia 2, attached near rostellum apex, each longitudinally divided, caudicles absent; pollen grains in friable masses loosely bound by fine threads. **Stigma** broad, with large, globular rostellum placed centrally above it.

Species ± 25, mostly north temperate regions; sthn trop. Afr.: 1: *Eupipactis africana* Rendle, Malawi.

**Epipogium** Borkh.
*(Epidendroideae—Gastrodieae)*

Leafless, saprophytic herb lacking chlorophyll; rhizome tuberous. **Scape** erect with a few basal sheaths; inflorescence terminal. **Tepals** free, subequal; lip spurred, concave with verrucose crests. **Column** and anther short; rostellum absent. **Capsule** ovoid, developing quickly.

Species 2, 1 in temperate Eurasia, 1 in Old World tropics: *Epipogium roseum* (D.Don) Lindl., Angola, Malawi.

**Eulophia** R.Br. ex Lindl.
*(Epidendroideae—Cymbidieae)*

**Acrolophia** Pfitzer in part; Williamson: 147 (1977).  

**Eurychone** Schltr.
*(Epidendroideae—Vandeae)*

Epiphytic, monopodial, short-stemmed herbs. **Leaves** broadly oblong-elliptic, obovate or ligulate, unequally bilobed at apex. **Inflorescence** pendent, 2–12-flowered, often shorter than leaves. **Flowers** large, thin-textured, ± translucent, scented. **Sepals** and **petals** subisimilar, erect or spreading. **Lip** funnel-shaped, tapering into a wide-mouthed spur sharply constricted in middle, then recurved and swollen at apex. **Column** short and broad, lacking a foot; rostellum elongated, ligulate; anther cucullate, retuse; pollinia 2, ellipsoid; stipe 1, linear; viscidium 1, oblong or ovate, relatively large. (After La Croix: 156; 2001).


**Graphorkis** Thouars  
*(Epidendroideae—Cymbidieae)*

Epiphytic, sympodial herbs. **Pseudobulbs** clustered, conical-ovoid to cylindrical-fusiform, with several nodes, partly covered by fibrous leaf bases; roots of two types, some attached to substrate and some aerial, erect. **Leaves** developing after flowering, petiolate, narrowly elliptic, acute or acuminate, thin-textured, plicate. **Inflorescence** paniculate, many-flowered; flowers resupinate, yellowish, marked with brown or purple. **Sepals** and **petals** free; lip 3-lobed, spurred at base; disc with 2 keels. **Column** with hisurate basal auricles; rostellum elongate; pollinia 2, waxy, sessile, attached to a solitary viscidium.

Species 5, 4 in Madagascar, 1 in trop. Africa: *Graphorkis lurida* (Sw.) Kantze, Zambia.

**Habenaria** Willd.
*(Orchidoideae—Orchideae)*

**Kryptostoma** Summerh.; Phiri (Unpublished).

Sthn trop. Afr. ± 120, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

**Holothrix** Rich. ex Lindl.
*(Orchidoideae—Orchideae)*


**Jumellea** Schltr.
*(Epidendroideae—Vandeae)*


**Liparis** Rich.  
*(Epidendroideae—Malaxideae)*


**Malaxis** Sol. ex Sw.  
*(Epidendroideae—Malaxideae)*

**Microstylis** Nutt.

Dwarf terrestrial, lithophytic or epiphytic herbs with creeping rhizomes or fusiform tuberous roots. **Stems** leafy, ± swollen at base; leaves thin-textured, plicate. **Inflorescence** erect, terminal, racemose or subumbellate, few- to many-flowered. **Flowers** small, resupinate, green, yellow-green, buff, orange or purple. **Sepals** and **petals** free, similar or dissimilar,
lip larger than tepals, entire or lobed, often ± auriculate at base; often with dentate margins. Column short; stigma ventral; anther terminal; pollinia ovoid, 4 in 2 pairs joined at base.

Species ± 300, cosmopolitan but mainly tropical Asia, 7 known from Africa; sthn trop. Afr. 5, Zambia, Zimbabwe, Malawi, Mozambique.

**Microcoelia Lindl.**
(Epipendroideae—Vandeae)


**Mystacidium Lindl.**
(Epipendroideae—Vandeae)


**Oberonia Lindl.**
(Epipendroideae—Malaxideae)


**Oeceoclades Lindl.**
(Epipendroideae—Cymbidieae)


**Oligophyton H.P.Linder**
(Orchidoideae—Orchideae)

Terrestrial herb perennating by testicular tubers. Leaves dimorphic, with ovate spreading basal leaves and loosely convoluted cauleine leaves. Inflorescence an erect lax spike; bracts half as long as ovaries, green to somewhat chartaceous. Flowers small, more or less resupinate, with sepals and petals not spreading; ovary twisted. Sepals free, entire, 1-nerved. Petals more or less enclosed by sepals, 3-nerved, slightly shorter than sepals. Lip shorter than sepals and petals and enclosed by them, 3-lobed and 3-nerved; side lobes blunt and shorter than mid-lobe; spur short, straight or curved. Column short; rostellum square with a very small mid-lobe; viscidia separate and held in shallow notches in rostellum side lobes; staminodes minute; anther erect, 2-celled; stigma 2-lobed, lobes sessile, slightly convex, diverging from base.

Monotypic: *Oligophyton drummondii* H.P.Linder & G.Will., endemic to E Zimbabwe.

**Orestias Ridl.**
(Epipendroideae—Malaxideae)
Ridley: 197 (1887) as *Orestia*; Rolfe: 18, 578 (1897/1898); Williamson: 115 (1977); Geerinck: 281 (1984); Phiri (Unpublished).

Small, inconspicuous, erect, terrestrial herbs with usually simple stem often rooting at lower nodes; rhizome simple; tubers present. Leaves small, more or less resupinate, with sepals and petals not spreading; ovary twisted. Inflorescence a simple terminal raceme of 8–many minute, inconspicuous flowers; bracts often longer than perianths. Flowers resupinate, maroon to greenish. Sepals free, ovate, up to 2 mm long, partly reflexed. Petals free, linear, ± as long as sepals, partly reflexed. Lip free, simple, rounded, papillose. Column long and thin; rostellum flat, rounded with slight lateral lobes, similar to that of *Malaxis*; pollinia partly covered with blunt anther cap.


**Phaius Lour.**
(Epipendroideae—Arethuseae)

Terrestrial (rarely epiphytic) herb with fibrous roots, sometimes with pseudobulbs. Leaves arising from a pseudobulb or spaced along stem, petiolate, plicate. Inflorescence 1- to few-flowered. Sepals and petals free, subequal; lip erect, entire or...
3-lobed, spurred or saccate, with longitudinal ridges on upper surface. **Column** long, clavate; anther operculate, incumbent, 2-celled. **Pollinia** 8, in 2 groups of 4 with caudicles but no viscidia. **Stigma** near apex of column.


**Platycoryne** Rchb.f.

(Orchidoideae—Orchideae)


Terrestrial herbs with fleshy or tuberous roots and leafy, unbranched stems. **Flowers** resupinate, usually yellow, orange or greenish, rarely white, often in short, dense heads. **Sepals** free, dorsal sepal forming a hood with petals. **Lip** entire or 3-lobed, spurred. **Column** erect; anther erect with parallel locules, canals adnate to side lobes of rostellum. **Rostellum** large, usually placed in front of anther which is often overtopped by mid-lobe; lateral lobes porrect, usually projecting beyond hood but sometimes short and shoulder-like. **Stigmatic processes** thickened with rounded ends.


**Platylepis** A.Rich.

(Spirantheroideae—Cranichidae)


**Podangis** Schltr.

(Epidendroideae—Vandeae)


Epiphytic, entirely glabrous herbs; stem usually abbreviated, erect. **Leaves** iris-like, equitant, fleshy, with imbricate bases. **Inflorescence** an axillary, open, subumbellate raceme shorter than leaves; bracts small, scarious. **Flowers** resupinate, narrow, medium-sized. **Ovary** narrowly long-pedicellate. **Sepals** and **petals** free, spreading; petals slightly shorter. **Lip** orbicular, with a long narrowly conical spur inflated and often bilobed at apex. **Gynostemium** short, with a foot; rostellum narrow, bifid; anther terminal; pollinia 2, globose, each with a narrow stipe; viscidium solitary, relatively large.


**Polystachya** Hook.

(Epidendroideae—Epidendreae)


**Pteroglossaspis** Rchb.f.

(Epidendroideae—Cymbidieae)


Terrestrial, sympodial herbs. Stem subterranean, made up of a chain of fleshy, lobed tubers. **Leaves** 1–3, petiolate, linear-lanceolate, plicate, enclosed in sheaths towards base. **Scape** arising with leaves from current year’s growth, covered with subscasious tubular sheaths. **Inflorescence** a short terminal raceme, usually with conspicuous bracts exceeding flowers. **Flowers** medium sized, resupinate or nonresupinate. **Sepals** and **petals** free, spreading, petals usually slightly shorter than sepals but otherwise similar. **Lip** lacking a claw, usually 3-lobed but sometimes entire, not spurred or saccate, flat, with either disc entirely tuberculate or nerves tuberculate, verrucose or keeled; mid-vein of side lobes often raised into a ridge at base. **Column** short, broad, curved, with 2 auricles at base, lacking a foot or with a very rudimentary foot; anther terminal, ovate, obtuse, apiculate, unilocular; pollinia 2, subglobose; stipe 1, short and broad; viscidium 1, scale-like.


**Rangaeris** (Schltr.) Summervh.

(Epidendroideae—Vandeae)


**Roeperocharis** Rchb.f.

(Orchidoideae—Orchideae)


Terrestrial herbs with tuberous roots, leafy stem and terminal inflorescence. **Flowers** green; sepals and petals free. **Lip** free, 3-lobed (rarely entire), with cylindrical spur. **Column** erect; anther thecae divergent, separated by a broad connective; canals hardly developed; pollinaria 2, each with a seicle pollinium, long caudicle and small viscidium. **Stigmatic processes** each 2-lobed with one lobe projecting down in front of lip-base, the other lobe upright in front of anther connective. **Rostellum** 3-lobed, mid-lobe low, rounded or emarginate, adnate to connective; side lobes spreading, narrowed towards apex.

Species 5, eastern Africa; sthn trop. Afr. 2, Zambia, Malawi.

**Satyrium** Sw.

(Orchidoideae—Diseae)


**Schizochilus** Sund.

(Orchidoideae—Orchideae)


Schwartzkopfia Kraenzl.
(Orchidoideae—Orchideae)

Terrestrial herbs only a few centimeters tall, leafless and lacking in chlorophyll. Roots thick, fleshy. Stem short, covered with imbricate sheaths. Flowers 1–5, relatively large, pedicellate. Sepals free; petals joined to column in lower part. Lip with a cup-like hypochile, and an epichile 3-lobed near apex. Column erect; anther locules parallel, canals scarcely developed; pollinia caudicles short, viscidia naked; stigma cushion-like; rostellum mid-lobe small, erect, cucullate, side lobes auriculate, surrounding column.


Solenangis Schltr.
(Epidendroideae—Vandeae)

Dwarf, mat-forming epiphytic herbs, rarely lithophytic; stems creeping, bearing pseudobulbs. Pseudobulbs asymmetrical ovoid, fusiform or clavate, 1- or 2-leaved at apex. Leaves fleshy or leathery, spreading or erect. Inflorescence terminal on pseudobulb, erect, 1- to many-flowered. Flowers ± secund, somewhat campanulate, green, yellow, orange, brown or red, sometimes striped. Lateral sepals joined at base, forming a mentum with column foot. Lip entire, recurved, V-shaped in cross-section, not spurred. Column foot at least three times as long as column; pollinia 8, comprising 4 large and 4 small pollinia; stigma concave, with a flap-shaped rostellum in front.


Stolzia Schltr.
(Epidendroideae—Podochileae)

Dwarf, mat-forming epiphytic herbs, rarely lithophytic; stems creeping, bearing pseudobulbs. Pseudobulbs asymmetrical ovoid, fusiform or clavate, 1- or 2-leaved at apex. Leaves fleshy or leathery, spreading or erect. Inflorescence terminal on pseudobulb, erect, 1- to many-flowered. Flowers ± secund, somewhat campanulate, green, yellow, orange, brown or red, sometimes striped. Lateral sepals joined at base, forming a mentum with column foot. Lip entire, recurved, V-shaped in cross-section, not spurred. Column foot at least three times as long as column; pollinia 8, comprising 4 large and 4 small pollinia; stigma concave, with a flap-shaped rostellum in front.


Summerhayesia P.J.Cribb
(Epidendroideae—Vandeae)

Epiphytic monopodial herbs; stems short, leafy; roots arising at stem base. Leaves distichous, conduplicate, linear or ligulate. Inflorescences arising in leaf axils, many-flowered. Flowers rather fleshy, white or creamy-yellow. Sepals and petals subsimilar. Lip entire, concave, clasping column, spurred at base. Column short, stout; androclinium transverse; anther convex; pollinia 2; stipe 1, short; viscidium slipper-shaped; rostellum 3-lobed, mid-lobe acute, lateral lobes obscure.


Taeniophyllum Blume
(Epidendroideae—Vandeae)

Very small leafless epiphytic herbs with short, simple stems; roots abundant, photosynthetic. Inflorescence axillary, racemose. Flowers resupinate, ± erect, tubular. Sepals joined ± halfway; sepal and petals similar, but sepals slightly darker; lip free, spurred. Column very short; anther erect with 4 pollinia in 2 unequal pairs; stipe and viscidium 1; rostellum minutely 3-lobed.

Species ± 170, Asia, Australasia, 1 in trop. Africa: Taeniophyllum coxii (Summerh.) Summerh., Zimbabwe, Malawi, Malawi.

Tridactyle Schltr.
(Epidendroideae—Vandeae)

Listrostachys Reichb. in part.

Species 12, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Vanilla Mill.
(Epidendroideae—Vanilleae)


Ypsilopus Summerh.
(Epidendroideae—Vandeae)


Zeuxine Lindl.
(Spiranthoideae—Cranichideae)


References


BLUME, C.L. 1825. Bijdragen tot de Flora van Nederlandsch Indie, part 6: t. 3, fig. 176.
Trees or shrubs, dioecious, usually sympodially branched, with leaves crowded towards ends of branches, and often with proproots at base; stems with annulate leaf scars. Leaves in 3 ranks appearing as spirals (therefore the common name screw pines), simple, glabrous, base sheathing, blade linear-ensiform, entire but armed on margins, and on adaxial face of midrib with prickles. Inflorescences terminal, sometimes lateral or axillary, usually unisexual, many-flowered, spicate or capitulate spadices subtended by foliaceous bracts. Flowers unisexual, very small, sessile, without or with a rudimentary perianth. Male flowers: stamens many; filaments free or connate; anthers 2-thecous, longitudinally dehiscent. Female flowers consisting of 1 or several free or fused carpels; 1-locular; containing 1 or several anatropous, bitegmic ovules; stigma sessile. Infructescence composed of many monodrupes (from 1-carpellate flowers) or polydrupes (from several-carpellate flowers) crowded into a large subglobose to ellipsoid structure. Seeds straight, with membranous seed coat; embryo small, straight; endosperm copious, oily. x = usually 30.


**Pandanaceae**
(Arecidae—Pandanales)
(Monocots—Pandanales)

**Pandanus Parkinson**
Parkinson: 46 (1773); Rendle: 84 (1899); Gossweiler & Mendonça: 115 (1939); White: 431 (1962); Huynh: 3 (1986); Huynh: 17 (1988); Huynh: 21 (1989); Beentje: 1 (1993); Huynh: 91 (1997); Stone et al.: 402 (1998); Bingham (Unpublished); Phiri (Unpublished).

Description as for family.

Species ± 600, palaeotropics and subtropics, ± 50 in Africa; sthn trop. Afr.: 8, Angola, Zambia, ?Zimbabwe (at least very close to Mozambique border), Mozambique.

**References**
PARKINSON, S. 1773. *A journey of a voyage to the South Seas*. Published by the author, London.

**Poaceae**
(Gramineae)
(Commelinidae—Cyperales/Poales)
(Commelinids—Poales)

Fish, L. in Leistner: 659 (2000).
The classification of genera is according to Clayton & Renvoize (1986). The main reference for this account is *Flora zambesiaca* 10(1–4).

Sthn trop. Afr.: genera 189 (10 exotic), species 870.

**Key to tribes**
The characters used in this and the following keys are not all applicable to Poaceae outside the area covered by this work. Although morphologically incorrect, in accordance with common usage in agrostological literature the term pedicelled is applied to a stalked spikelet. This key and the subsequent keys are based on the following works: Launert (1971), Clayton & Renvoize (1986), Clayton (1989), Cope (1999), Fish (2000) and Clayton (2002).
Seed plants of southern tropical Africa: families and genera

Seed plants of southern tropical Africa: families and genera

1a Arborescent or shrubby plants, flowering erratically. Culms woody, usually very tall (up to 25 m, 50–125 mm in diameter), hollow but often thick-walled. Leaf lamina finally disarticulating from the sheath, usually constricted at the base into a pseudo-petiole ................................................................. 1. BAMBUSOIDEAE—1. BAMBUSEAE (p. 424)

1b Perennial or annual herbs, rarely shrubby, flowering annually. Culms herbaceous, if woody then never more than 25 mm in diameter. Leaf lamina not disarticulating from the sheath, usually sessile, if with pseudopetiole then the other characters not applicable:

2a Spikelets unisexual, different in size and shape; the sexes in different inflorescences, in different parts of the same inflorescence or mixed.

3. SPIKELET ARRANGEMENT:

3a Spikelets 2-flowered:

4a Rachis of the inflorescence leaf-like, with the margins folding over short racemes inserted along its midrib ................................................................. 1. BAMBUSOIDEAE—5. PHYLLORHACHIDEAE (p. 425)

4b Rachis of the inflorescence triquetrous or cylindric, but not leaf-like .............. 6. PANICOIDEAE—4. ANDROPOGONINEAE (MAYDEAE) (p. 430)

3b Spikelets 1-flowered:

5a Female spikelets sessile or shortly pedicelled; glumes shorter than the floret, acute or apiculate; lemmas chartaceous, inflated, utriculate-urceolate, closed but for a small circular pore through which the stigmas emerge, covered with hooked hairs. Leaf lamina with the lateral nerves slanting ................................................................. 1. BAMBUSOIDEAE—2. PHAREAE (p. 425)

5b Female spikelets on long, clavate pedicels; glumes much longer than the floret, long-caudate; lemma coriaceous, whitish, glossy, glabrous, open. Leaf lamina with the lateral nerves running parallel to the midrib ................................................................. 1. BAMBUSOIDEAE—3. OLYREAE (p. 425)

2b Spikelets with all the florets bisexual or with some male or sterile and the rest bisexual (the male or sterile floret(s) either above or below the bisexual one(s)). Spikelets 1–many-flowered:

6a Spikelets 1–many-flowered, disintegrating at maturity above the usually persistent glumes, if falling entire then not 2-flowered with the superior floret bisexual and the inferior male or sterile. Spikelets usually laterally compressed to a varying degree:

7a Lemmas either 9-awned or with 4–6 apical hyaline lobes alternating with 5 awns .............. 5. CHLORIDOIDEAE—1. PAPPOPHOREAE (p. 426)

7b Lemmas 1–3-awned, entire or 2-lobed:

8a Leaf lamina with distinct transverse veinlets (usually best observed on the lower surface):

9a Ovary glabrous. Spikelets usually more than 4-flowered, if 1–3-flowered then leaves with pseudopetiole. Lemmas 5–7-nerved ......................... 3. CENTOTHICEAE—CENTOTHICEAE (p. 425)

9b Ovary with the apex distinctly pilose. Spikelets 1–4-flowered. Lemma 3–5-nerved (rarely fully 5-nerved) ................................................................. 2. POEAE in part (p. 425)

8b Leaf lamina without transverse veinlets:

10a Rachilla internodes densely penicillate near the apex; the hairs 4–10 mm long, obscuring the lemma. Robust reedy perennials with bamboo-like culms up to 8 m tall. Panicles large, plumose .................... 4. ARUNDINOIDEAE—1. ARUNDINEAE (p. 426)

10b Rachilla internodes glabrous or pilose, if pilose then hairs not longer than 3 mm. Plants much smaller, not reedy-like:

11a Spikelets falling off entire at maturity, 1-flowered, arranged solitarily or in groups along the rigid persistent axis of a raceme or spike-like panicel; glumes either covered with 3 conspicuously thickened straight or hooked hairs or drawn out into a long slender awn which is several times as long as the body of the glume ........................ ................................................................. 5. CHLORIDOIDEAE—4. CYNODONTEAE (ZOYSIEAE) (p. 427)

11b Spikelets breaking up at maturity leaving the glumes behind, 1–many-flowered, if falling entire then arranged in panicles:

12a Spikelets arranged in spikes or racemes, these either solitary, digitate or scattered along a common axis:

13a Spikelets sunk into cavities on alternate sides of the rachis of a solitary spike:

14a Rachis of the spike fragile, disarticulating between the spikelets .......... 5. CHLORIDOIDEAE—3. LEPTUREAE (p. 427)

14b Rachis of the spike persistent or disarticulating irregularly .......................... 5. CHLORIDOIDEAE—4. CYNODONTEAE (CHLORIDEAE) in part (Oropetium) (p. 427)

13b Spikelets not sunk into cavities of the rachis:

15a Spikelets arranged on opposite sides of the rachis and facing it laterally. Ovary with the apex pilose:

16a Spikelets sessile or 1-flowered .................................................. 2. POOEAE—5. TRITICEAE (p. 425)

16b Spikelets shortly pedicelled, many-flowered .............. 2. POOEAE—5. TRITICEAE (BRACHYPODIEAE) (p. 425)

15b Spikelets in second spikes or racemes, if (rarely) on opposite sides then arranged edgeway towards the rachis:

17a Spikelets with 1 bisexual floret only, with or without male or sterile florets beneath or above it ................................................................. 5. CHLORIDOIDEAE—4. CYNODONTEAE (CHLORIDEAE) (p. 427)

17b Spikelets with 2–many bisexual florets:

18a Spikes or racemes solitary or scattered along a common axis .................................................. 5. CHLORIDOIDEAE—2. ERAGROSTIDAE (p. 426)

18b Spikes or racemes digitate:

19a Ligule a membrane, glabrous. Spikelets with 2 or 3 (rarely 4) florets usually followed by 2 to several sterile ones ................................................................. 5. CHLORIDOIDEAE—4. CYNODONTEAE (CHLORIDEAE) in part (Tetrapogon) (p. 427)

19b Ligule a rim of hairs or a short ciliate membrane .............. 5. CHLORIDOIDEAE—2. ERAGROSTIDAE (p. 426)

12b Spikelets arranged in open or contracted panicles, or in globose clusters:

20a Glumes reduced to minute scales or just represented by a tiny collar at the apex of the pedicel. Stamens 6. Spikelets strongly laterally compressed .................................................. 1. BAMBUSOIDEAE—4. ORYZIEAE (p. 425)

20b Glumes, or at least 1 of them, fully developed. Stamens usually 3:

21a Spikelets strictly 1-flowered, but sometimes with the rachilla extended beyond the floret:
1b Inflorescence indeterminate (iterauctant): a cluster of pseudospikelets; stigmas 1 or 3:  

2a Shrubs or small trees; anthers 3 ................................................................. 4. ARUNDINOIDEAE—2. ARISTIDEAE (p. 426) 
2b Perennial herbs; anthers 6 ..........................................................................................................................................................................

6b Spikelets typically 2-flowered, falling entire at maturity, usually with the superior floret bisexual and the inferior one male or sterile, if sterile then often greatly reduced. Spikelets frequently dorsally compressed: 
34a Spikelets usually solitary, sometimes paired, ± similar. Glumes usually membranous; the lower one usually smaller or sometimes absent. 
   Lemma of the lower floret usually similar to the upper glume in texture; lemma of the upper floret hardened, chartaceous, coriaceous or crustaceous, awnless or rarely with a straight awn ................................................................. 6. PANICOIDEAE—1. PANICEAE (p. 428) 
34b Spikelets typically paired, with 1 sessile and the other pedicelled, those of each pair similar or more often dissimilar (the pedicelled sometimes much reduced), rarely with the spikelets all similar. Glumes usually as long as the spikelets and enclosing the florets, somewhat rigid and firmer than the hyaline or membranous lemmas. Lemma of the upper floret often awned; the awn usually geniculate ................................................................................................................................. 6. PANICOIDEAE—4. ANDROPOGONEAE (p. 430)

1. Subfamily Bambusoideae 

1. BAMBUSOIDEAE—

   1a Inflorescence determinate (semelautant): a panicle or reduced to a raceme; stigmas 2: 
   2a Shrubs or small trees; anthers 3 ................................................................. Sinarundinaria 
   2b Perennial herbs; anthers 6 .............................................................................. Guaduella 

   1b Inflorescence indeterminate (iterauctant): a cluster of pseudospikelets; stigmas 1 or 3: 
   3a Inflorescence a cluster of 1–many pseudospikelets sessile on a node; culm sheath blade very broad; lodicules 2 or 3 ......................... *Bambusa 
   3b Inflorescence a globose or cup-shaped cluster of pseudospikelets on bare branches; culm sheath blade narrow, apex of leaves pungent; lodicules absent:
POACEAE: Key to genera

2. Pharae
Tribe represented only by Leptispis

3. Olyreae
Tribe represented only by *Olyra

4. Oryzeae
Spikelets with 2 greatly reduced sterile lemmas beneath the fertile floret ................................................................. Oryza
Spikelets without sterile lemmas beneath the floret .................................................................................................................. Leersia

5. Phyllorhachideae
Tribe represented only by Phyllorhachis

6. Ehrharteae
Tribe represented by its only genus: Ehrharta

2. Subfamily Pooideae

1. Poeae
1a Inflorescence a spike, with the spikelets arranged in 2 rows on alternate sides of the rachis ........................................................... *Lolium
1b Inflorescence a panicle:
   2a Lemmas very broad from a distinctly cordate base, not awned; spikelets 3–14 mm wide; annual plants *Briza
   2b Lemmas lanceolate or ovate-lanceolate, never cordate at the base; spikelets usually smaller than above; perennial plants (except Poa annua):
      3a Leaf blade with transverse veinlets .................................................................................................................. (=Pseudobromus) Festuca
      3b Leaf blade without transverse veinlets:
         4a Lemmas dorsally rounded (rarely slightly keeled towards the apex), awned or awnless .............................................. Festuca
         4b Lemmas keeled, laterally compressed, not awned:
            5a Spikelets solitary with pedicels swollen at apex ................................................................................................. Poa
            5b Spikelets crowded in dense shortly pedicelled clusters at ends of short main branches .................................................. *Dactylis

2. Meliceae
Tribe represented only by Streblochaete

3. Aveeneae
1a Inflorescence a dense spike-like panicle ............................................................................................................................... *Phalaris
1b Inflorescence an open or contracted panicle or raceme:
   2a Floret 1 per spikelet:
      3a Spikelet falling with glumes; lemma awnless or awned, central awn arising at or near apex ...................................................... Agrostis
      3b Spikelet disarticulating above the glumes; lemma awnless or awned, central awn arising well below the apex or at the base .......... Anthoxanthum
   2b Florets 2 or more per spikelet:
      4a Lemmas awnless, sometimes mucronate; rachis of the (usually contracted) panicle conspicuously tomentose or densely pubescent ...... Koeleria
      4b Lemmas all, or at least one in a spikelet, awned; rachis of the panicle glabrous or scabrous, if pilose than neither tomentose nor densely pubescent:
         5a Lower lemma awnless; upper lemma with short hooked awn from back near apex; spikelets falling with glumes .................. *Holcus
         5b All lemmas awned; spikelets disarticulating above the glumes:
            6a Spikelets strictly 2-flowered, 2.0–4.5 mm long, with both florets bisexual; plants annual ................................................. *Aira
            6b Spikelets at least 2–6-flowered, always longer than 5.5 mm; plants perennial or annual:
               7a Spikelets with 3 florets; the first and second sterile, reduced to dorsally awned lemmas; the third bisexual, enveloped by the preceding sterile ones ........................................................................ Anthoxanthum
               7b Spikelets with 2–6 florets (the first 3 reduced), with all lemmas awned:
                  8a Glumes 7–11-nerved, often slightly cross-veined; weak annuals ............................................................................... *Avena
                  8b Glumes 1–3-nerved, never cross-veined; perennials .................................................................................. Helictotrichon

4. Bromieae
Tribe represented only by Bromus

5. Triticeae
Tribe represented only by Brachypodium

3. Subfamily Centothecoideae

Centotheceae
1a Lemmas awned .................................................................................................................................................. Bromuniola
1b Lemmas awnless:
   2a Rachilla internodes fused to keels of adjacent palea; robust perennials .................................................................................. Orthoclada
   2b Rachilla internodes free; annuals or short-lived perennials:
      3a Spikelets 8–20-flowered, the apical florets similar but smaller .................................................................................... Megastachya
      3b Spikelets 1–4-flowered, the terminal floret rudimentary .......................................................................................... Centotheca

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4. Subfamily Arundinoideae

1. Arundineae

1a Plants reed-like with distichous cauline leaves ................................................................. Phragmites

1b Plants growing in tufts with basal leaves, not reed-like:

2a Lemma 5- or more-nerved:

3a Lemma often pilose on the back or flanks, but hairs not in tufts or lines, sometimes glabrous:

4a Inferior glume longer than the lowermost lemma ................................................................. Pentaschistis

4b Inferior glume shorter than the lowermost lemma:

5a Awn much longer than lemma ............................................................................................. Piptophyllum

5b Awn shorter than lemma ...................................................................................................... Styppeiochloa

3b Lemma with hairs in tufts or lines, rarely with a transverse band of longer hairs:

6a Floret callus pungent; lemma hairs in longitudinal lines ....................................................... Centropodia

6b Floret callus obtuse; lemma hairs not in longitudinal lines:

7a Lowermost floret different from the rest, persisting with the glumes and resembling the upper floret, usually imperfect ............. Allocoeaete

7b Lowermost floret similar to the rest, different from the glumes ........................................ (=Rytmidosperma in part) Merxmuelleria

2b Lemma 1–3-nerved:

8a Inflorescence strongly condensed, the spikelets in dense globular clusters ........................................... Elytrophorus

8b Inflorescence open or loosely contracted, the spikelets not in clusters:

9a Awn shorter than the lemma ................................................................................................ Styppeiochloa

9b Awn longer than the lemma ................................................................................................ Nematopoa

2. Aristideae

1a Awns on lemma all, or only middle one, plumose; palea indurated ............................................................................ Stipagrostis

1b Awns on lemma all glabrous, smooth or scabrid; palea not indurated:

2a Upper glume 3–5-nerved; lower glume usually 3-nerved; glumes rounded on back; awns spirally contorted at base; caryopsis deeply grooved ventrally ............................................................................ Sartidia

2b Upper glume 1(3)-nerved; lower glume nearly always 1-nerved; glumes 1-keeled to middle or below; awns not spirally contorted at base; caryopsis not deeply grooved .............................................. Aristida

5. Subfamily Chloridoideae

1. Pappophoreae

1a Lemma with 2(–4) awns ................................................................. Kaokochloa (presence in Angola unconfirmed)

1b Lemma with 7–11 awns or lobes:

2a Lemma 9-awned, with awns emerging from the apex of 9 hyaline lobes .............................................. Enneapogon

2b Lemma 5-awned, with the awns alternating with 4 hyaline lobes ......................................................... Schmidtia

2. Eragrostideae

1a Lemmas with 5–11-nerved in the upper part, the nerves disappearing or confluent below:

2a Spikelets disarticulating above the glumes but not between the florets .............................................. Lintonia (Cynodonteae)

2b Spikelets falling entire:

3a Lower florets sterile ............................................................................................................ Entoplocamia

3b Lower florets bisexual ........................................................................................................ Fingerhuthia

1b Lemmas 1–3-nerved throughout (rarely up to 7-nerved but then the spikelets disarticulating between the florets):

4a Spikelets with 1 fertile floret embedded in the rachis of a solitary raceme and covered by the upper glume; lower glume small or suppressed ......... Oropetium

4b Spikelets 1–many-flowered, if 1-flowered then not as above:

5a Spikelets strictly 1-flowered or occasionally with a rachilla extension; inflorescence a panicle:

6a Lemma with a long awn ........................................................................................................ Hubbardochloa

6b Lemma awnless:

7a Spikelets fusiform; glumes and lemma rounded on the back ........................................................................ Sporobolus

7b Spikelets strongly laterally compressed; glumes and lemmas keeled .................................................. *Crypsis

5b Spikelets 2- or more-flowered (if 1-flowered then the inflorescence composed of racemes):

8a Tip of lemma emarginate to 2- or 3-lobed, or flanks hairy between the lateral nerves and the margin, or nerves ciliate, or florets conspicuously bearded from the callus:

9a Leaf lamina rigid and pungent .............................................................................................. Odyssea

9b Leaf lamina not conspicuously pungent though often rather stiff:

10a Inflorescence an open or contracted panicle:

11a Plants tall, with large plumose panicles:

12a Lemma long-ciliate on the lateral nerves .............................................................................. Neyraudia

12b Lemma glabrous or pilose on the back ................................................................................... Phragmites

11b Plants shorter and without large plumose panicles:

13a Lemma 3-awned ................................................................................................................. Triraphis

13b Lemma without or with a single awn, rarely the lateral awns curendent to a macro:

14a Lemma awnless ................................................................................................................ Eragrostis
14b Lemma awned:
  15a Awn shorter than the lemma ................................................................. Tridens
  15b Awn longer than the lemma:
    16a Glumes as long as the spikelet; floret callus square ......................... Habrochloa
    16b Glumes shorter than the spikelet, rarely longer but then floret callus linear .... see ARUNDINAE (p. 426)

10b Inflorescence composed of distinct racemes, these crowded in Leptocarydion, sometimes with short secondary branchlets in Dinebra:

17a Inflorescence of single racemes, these not deciduous ............................................................ Tripogon

17b Inflorescence of 2–many racemes:

18a Racemes not deciduous:

19a Inferior glume not or only slightly exceeding the lowermost lemma:
  20a Spikelets disarticulating above the glumes but not between the florets:
    21a Lemmas awned from near the apex .................................................. Tetrapogon (Cynodonteae)
    21b Lemmas awned from the back ........................................................... Bewsia
  20b Spikelets disarticulating between the florets, or rachilla persistent:
    22a Uppermost floret or rudiment with a substantial terminal awn:
      23a Inflorescence of digitate racemes ................................................. Lophacme
      23b Inflorescence a dense feathery head of numerous crowded racemes .......... Leptocarydion
    22b Uppermost floret awnless, rarely submucronate or very shortly awned:
      24a Florets conspicuously bearded from the callus .................................. Halopyrum
      24b Florets not bearded from the callus:
        25a Rachilla persistent, or upper part of spikelet shed as a whole; pericarp free ................. Acrachne
        25b Rachilla disarticulating between the florets:
          26a Raceme rachis terminating in a fertile spikelet:
            27a Lemmas 3-nerved ............................................................... Leptochloa
            27b Lemmas 5–7-nerved ......................................................... Brachychloa
          26b Raceme rachis terminating in a naked bristle:
            28a Spikelets pedicelled, loose; lemma 3-nerved ............................ Eragrostis
            28b Spikelets sessile, imbricate; lemma 1-nerved ......................... Richardsiella
    19b Inferior glume much longer than the lowermost lemma, often as long as the spikelet:
      29a Lateral nerves of the lemma appressed-pubescent or rarely glabrous ............ Dinebra
      29b Lateral nerves of the lemma conspicuously ciliate or villous .................... Trichoneura
  18b Racemes (or secondary branchlets) deciduous:
    30a Glumes as long as the spikelet, enclosing the florets ............................. Dinebra
    30b Glumes not or scarcely exceeding the adjacent lemmas ......................... Brachychloa

8b Tip of lemma entire, the nerves and flanks glabrous (rarely the lemma ciliolate on the margin itself), florets not conspicuously bearded from the callus:

31a Inflorescence a panicle ............................................................. Eragrostis

31b Inflorescence composed of 1 or more racemes:

32a Raceme a single “bottle brush” with reflexed spikelets .................................. Harpachne

32b Racemes 2 or more:

33a Inflorescence digitate or ± whorled; fruit with free pericarp (otherwise see Leptochloa)
  34a Racemes terminating in a fertile spikelet ........................................... Eleusine
  34b Racemes terminating in an abortive spikelet or naked point:
    35a Paleas, or some of them, remaining on the rachilla ............................. Acrachne
    35b Paleas falling with the lemmas:
      36a Rachis terminating in abortive spikelets; leaf lamina terete ...................... Sclerodactylon
      36b Rachis terminating in a naked point; leaf lamina flat or involute ............. Dactyloctenium
  33b Inflorescence of racemes disposed singly along a central axis:
    37a Racemes deciduous (if glumes longer than florets see Dinebra) .................. Pogonarthria
    37b Racemes persistent .............................................................. Eragrostis

3. Leptureae
Tribe represented only by Lepturus

4. Cynodonteae

1a Spikelet containing 2–5 fertile florets:
  2a Body of lemma 5–11-nerved ............................................................... Lintonia
  2b Body of lemma 3-nerved .................................................................... Tetrapogon

1b Spikelets containing 1 fertile floret:
  3a Racemes persistent; spikelets breaking up at maturity:
    4a Lemma exposed; one or both glumes shorter than the florets:
      5a Upper glume with an oblique dorsal awn:
        6a Fertile floret without sterile lemmas below it ...................................... Kampochloa
6b Fertile floret with 2 sterile lemmas below it .......................................................... Ctenium

5b Upper glume awnless or awned from near the apex:

7a Lemma sinuously awned ......................................................................................... Schoenefeldia

7b Lemma awnless or with a straight awn:

8a Spikelets 2–several-flowered:

9a Lemma and caryopsis dorsally compressed .......................................................... Enteropogon

9b Lemma laterally compressed; caryopsis trigonous to subterete:

10a Racemes solitary ......................................................................................... Harpochloa

10b Racemes digitate:

11a Lemma awned, palis; upper glume acute to 2-toothed ....................................... Chloris

11b Lemma awnless, dark brown; upper glume obtuse to 2-lobed ......................... Eustachys

8b Spikelets 1-flowered:

12a Spikelets dorsally compressed ........................................................................ Willkommia

12b Spikelets laterally compressed:

13a Lemmas usually awned; glumes acute to truncate, erose ................................. Daknopholis

13b Lemmas awnless; glumes acute ........................................................................ Cynodon

4b Lemma concealed; both glumes exceeding and closed around the florets:

14a Spikelets subterete to dorsally compressed:

15a Raceme 1 (rarely 2); rachis semiterete ................................................................ Microchloa

15b Raceme several; rachis flat .............................................................................. Craspedorhachis

14b Spikelets laterally compressed:

16a Racemes borne upon an axis and crowded into a spiciform head ..................... Pogonochloa

16b Racemes single or digitate:

17a Glumes thinner in texture than the lemma ...................................................... Chrysochloa

17b Glumes firmer in texture than the lemma ....................................................... Brachychacne

3b Racemes deciduous or spikelets falling entire:

18a Lower glume very small or suppressed; upper glume with the nerves forming raised ribs:

19a Upper glume awned; ribs on upper glume scaberulous ..................................... Moneyltrum

19b Upper glume awnless; ribs on upper glume spinose ......................................... Tragus

18b Lower glume well-developed; upper glume not ribbed as above:

20a Racemelets comprising 2 or 3 spikelets separated by short rachis internodes .............. Dignathia

20b Racemelets comprising a single spikelet ....................................................... Perotis

6. Subfamily Panicoideae

1. Paniceae

1a Spikelets, at least some, subtended by 1 to many bristles, spines or scales:

2a Bristles persisting on the axis after spikelets have fallen .................................... Setaria

2b Bristles or scales falling with the spikelets:

3a Spikelets subtended by a single bristle and supported on a slender stipe ................ Paratheria

3b Spikelet surrounded by an involucre of bristles or scales, or bristle single and spikelet sessile:

4a Involucre composed of glumaceous bracts .................................................... Anthophora

4b Involucre composed of bristles or spines:

5a Bristles free throughout, ± filiform ................................................................ Pennisetum

5b Bristles flattened and connate below:

6a Inflorescence spiciform ..................................................................................... Cenchrus

6b Inflorescence with distant to ± crowded raceme-like branches ......................... Streptolophus

1b Spikelets not subtended by bristles or scales:

7a Leaf surface raised into sinuous lamellae; plant aquatic ...................................... Hydrothauma

7b Leaf surface not lamellate:

8a Spikelets supported on a globular bead-like callus .............................................. Eriochloa

8b Spikelets without a basal bead, though sometimes with a short cylindric stipe:

9a Inflorescence a panicle, occasionally ± condensed about the primary branches:

10a Panicle cylindric, spiciform .......................................................................... Sacciolepis

10b Panicle open or contracted:

11a Spikelets dorsally compressed, rarely slightly gibbous:

12a Lower lemma awnless (if upper lemma tipped with a dark green spot or crest see Acroceras) ................. Panicum

12b Lower lemma awned:

13a Awn over 5 mm long ................................................................................... Oryzidium

13b Awn up to 1 mm long ..................................................................................... Hylebates

11b Spikelets laterally compressed; lower glume absent or minute (up to 0.5 mm in Sacciolepis)

14a Upper lemma laterally compressed:

15a Lower glume reduced to a minute scale or rim or absent ..................................... Melinis

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15b Lower glume well-developed, acute ................................................................. Cyrtococcum
14b Upper lemma dorsally compressed:
16a Upper glume gibbous, distinctly ribbed ......................................................... Sacciolepis
16b Upper glume neither gibbous nor ribbed .......................................................... Tricholaena

9b Inflorescence consisting of 1-sided racemes, these either digitate or scattered along a central axis, rarely solitary; the racemes sometimes with short secondary branchlets (especially Echinochloa crus-pavonis and Brachiaria malacodes) or with the spikelets long-pedicelled and distant (Brachiaria deflexa):
17a Racemes very short, of 1–8 spikelets, ± impressed in a thickened axis ..................... Stenotaphrum
17b Racemes free, appressed or divergent:
18a Upper lemma with a tiny green crest at the tip; upper glume and lower lemma ± thickened at the apex ............... Acroceras
18b Upper lemma not crested (sometimes mucronate or awned):
19a Spikelets laterally compressed or the lower glume awned:
20a Upper lemma dorsally compressed; lower glume awned ......................................... Opismenus
20b Upper lemma laterally compressed; lower glume usually awnless:
21a Upper glume neither gibbous nor armed with hooks; inferior glume shorter than the spikelet .......... Poochischachys
21b Upper glume gibbous, armed with hooks at maturity; lower glume ± as long as the spikelet ............ Pseudechinolaena

19b Spikelets dorsally compressed, the lower glume at most with a short awn-point:
20a Upper lemma coriaceous to crustaceous, with narrow inrolled margins clasping only edges of palea; sometimes thinner but then margins inrolled:
23a Lower glume absent (rarely represented by a tiny triangular scale on some of the spikelets):
24a Back of upper lemma facing the rachis; spikelets strongly plano-convex and often obovicular .................. Poa
24b Back of upper lemma turned away from the rachis .............................................. Anonos

23b Lower glume present:
25a Upper lemma hairy .............................................................................................. Entolasia
25b Upper lemma glabrous:
26a Upper lemma awned, crisply chartaceous .......................................................... Alloteropsis
26b Upper lemma at most mucronate, coriaceous to crustaceous:
27a Spikelets paired or in racemelets:
28a Tip of upper palea reflexed and slightly protuberant; spikelets cuspitate to awned, usually in 4 rows ....... Echinochloa
28b Tip of upper palea not reflexed:
29a Upper lemma as long as the spikelet, acute, obtuse or rarely mucronulate; spikelets plum, obtuse to acute ......................................................................................................................... Brachiaria
29b Upper lemma shorter than the spikelet, broadly obtuse with a macro 0.5–1.0 mm long; spikelets plano-convex, cuspitate ............................................................... Urochloa

27b Spikelets borne singly:
30a Lower glume turned towards the rachis:
31a Upper floret sessile ......................................................................................... Brachiaria
31b Upper floret stipitate; upper glume and lower lemma resembling woven fabric .............. Eccoptocarpha

30b Lower glume turned away from the rachis:
32a Upper lemma shorter than the spikelet, broadly obtuse, nearly always mucronate .............. Urochloa
32b Upper lemma as long as the spikelet, acute ................................................................ Paspalidium

22b Upper lemma cartilaginous, with flat, thin margins covering most of the palea and often overlapping:
33a Spikelets awned:
34a Racemes digitate ............................................................................................... Stereochlaena
34b Racemes single or borne along a central axis:
35a Racemes single ................................................................................................. Batorrhachis
35b Racemes borne along a central axis ..................................................................... Acritoachete

33b Spikelets awnless:
36a Lower glume as long as the spikelet ..................................................................... Megaloprotachne
36b Lower glume shorter than the spikelet or suppressed ........................................ Digitaria

2. Isachneae
1a Inflorescence of racemes .................................................................................... Heteranthoecia
1b Inflorescence a panicule:
2a Upper lemma becoming crisply chartaceous to crustaceous; glumes deciduous ...................... Isachne
2b Upper lemma remaining membranous, thinner than the lower one; glumes persistent ............. Coelachne

3. Arundinelleae
1a Ligule shortly membranous; hilum round ............................................................ Arundinella
1b Ligule a line of hairs; hilum linear; upper lemma hairy or quite smooth:
2a Lower lemma 3-nerved:
3a Lobes of upper lemma awned, with a tuft of hairs below each lobe ....................... Trichopteryx
3b Lobes of upper lemma awnless (if with hair tufts see Danthoniopsis):
4a Spikelets paired or single, rarely in loose groups of three with long pedicels ................................................................. Loudetia
4b Spikelets in close triads ....................................................................................................................................................... Loudetiposis
2b Lower lemma 5–9-nerved:
5a Spikelets in groups of 3 with connate pedicels; if upper lemma hairy then hairs not in tufts:
6a Callus of upper floret conical, pungent ......................................................................................................................... Tristachya
6b Callus of upper floret short, broadly rounded ................................................................................................................ Zonotrice
5b Spikelets with free pedicels; upper lemma with tufts of hair across the back:
7a Pala of inferior floret woody at maturity; inferior glume awned .................................................................................. Gilgiochloa
7b Pala of inferior floret membranous; inferior glume obtuse to acuminate; hair tufts on upper lemma 6–8 ...................... Danthoniopsis

4. Andropogoneae

1a Inflorescence branches each subtended by a smooth ivory-like bead or cupule enclosing female spikelets; male spikelets on a tassel exserted from the bead; annuals ....................................................................................................................................................................... *Coix
1b Inflorescence branches not subtended by a smooth ivory-like bead or cupule; annuals or perennials:
2a Rachis internodes and pedicels slender, filiform or linear, rarely thickening upwards and then the upper lemma awned or the callus fulviously barbate:
3a Upper lemma awned from low down on the back .................................................................................................................. Arthraxon
3b Upper lemma awnless or awned from the apex or from the sinus of a bilobed apex:
4a Spikelets all alike or nearly so:
5a Inflorescence a panicle with elongated central axis:
6a Panicle branches distally fragile; one spikelet of each pair sessile:
7a Callus hairs fusicolor or tawny; racemes short, dense .................................................................................................. Eriochrysis
7b Callus hairs silvery; racemes long, loose:
8a Callus hairs much longer than the spikelet ..................................................................................................................... Saccharum
8b Callus hairs shorter than the spikelet ......................................................................................................................... Sorghastrum
6b Panicle branches tough; all spikelets pedicelled:
9a Callus pubescent, the hairs less than 1/4 the length of the spikelet .............................................................................. Cleistachne
9b Callus conspicuously barbate, the hairs at least 1/4 the length of the spikelet:
10a Panicle loose, the component racemes distinct ......................................................................................................... Miscanthus
10b Panicle spiciform ......................................................................................................................................................... Imperata
5b Inflorescence of 1–many subdigitate racemes:
11a Callus acutely conical to pungent; rachis fragile (if tough see Trachypogon) ................................................................. Homoezegos
11b Callus obtuse:
12a Lower glume convex or concave, often villous .............................................................................................................. Eulalia
12b Lower glume medianly grooved, glabrous or ciliate only at the apex ........................................................................ Microstegeum
4b Spikelets of each pair significantly different, sometimes the pedicelled spikelet rudimentary or represented only by its pedicel:
13a Sessile spikelet male or sterile, the pedicelled spikelet fertile .................................................................................... Trachypogon
13b Sessile spikelet fertile, the pedicelled spikelet male, sterile or suppressed:
14a Inflorescence a panicle with an elongated central axis, not supported by spatheoles:
15a Sessile spikelets laterally compressed or terece ............................................................................................................. Chrysochopogon
15b Sessile spikelets dorsally compressed:
16a Pedicels sterile ......................................................................................................................................................... Sorghastrum
16b Pedicels all bearing spikelets:
17a Rachis internodes and pedicels solid ............................................................................................................................ Sorghum
17b Rachis internodes and pedicels with a translucent or balsamiferous, sometimes purple-tinted, median line:
18a Racemes composed of 1 or 2 sessile spikelets ........................................................................................................... Capillipedium
18b Racemes composed of 10 or more sessile spikelets ................................................................................................. Bothriochloa
14b Inflorescence of single, paired or subdigitate racemes, often supported by spatheoles:
19a Fertile lemma awned from its entire apex:
20a Racemes composed of a single awned sessile spikelet and 2 pedicelled spikelets, enclosed by an involucre of 4 sterile spikelets ........................................................................................................................................ Themedea
20b Racemes composed of many pairs of spikelets:
21a Callus pungent ......................................................................................................................................................... Heteropogon
21b Callus obtuse (but if inflorescence a dense spatheate head see Cymbopogeton densiflorae):
22a Rachis internodes and pedicels solid ............................................................................................................................ Dichanthium
22b Rachis internodes and pedicels with a translucent or balsamiferous, sometimes purple-tinted, median line:
23a Racemes erect or divergent, without homogamous pairs ......................................................................................... Bothriochloa
23b Racemes nodding, with 1–3 homogamous pairs at the base ..................................................................................... Euclasta
19b Fertile lemma awned from the sinus of its bilobed apex, rarely awnless (lemma entire in Andropogon bruzzae and Schizachyrium lopollense):
24a Lower glume of sessile spikelet transversely rugose; pedicelled spikelet represented only by a narrow curved pedicel ....... Thelepegon
24b Lower glume of sessile spikelet smooth, rarely rugose and then the pedicelled spikelet well-developed:
25a Callus of sessile spikelet inserted into the crateriform or cupuliform apex of the internode, at least the rim of the internode lapping over and concealing the tip of the callus; lower glume of sessile spikelet 2-keeled or with the margins sharply inflexed and usually depressed between the keels, rarely the flanks abruptly rounded but then deeply grooved between them:
26a Lower floret of sessile spikelet male, with a well-developed palea:
  27a Racemes paired or digitate (rarely single but than the upper glume neither awned nor crested) ........ Ischaemum
  27b Racemes single:
    28a Glumes inconspicuously winged, the upper one awned ................................................................. Schima
    28b Glumes with a prominent wing-like crest, muticus ................................................................. Andropterum
26b Lower floret of sessile spikelet sterile and reduced to a lemma:
  29a Callus of sessile spikelet acute to pungent, 1–5 mm long ............................................................... Diheteropogon
  29b Callus of sessile spikelet obtuse, usually very short:
    30a Racemes single; lower glume of sessile spikelet with several intercarinal nerves ................ Schizachyrium
    30b Racemes paired or digitate, rarely single and then the lower glume of the sessile spikelet nerveless between the keels:
      31a Racemes not deflexed, borne on unequal terete raceme-bases; leaves not aromatic ........ Andropogon
      31b Racemes deflexed at maturity, borne on subequal flattened raceme-bases, seldom longer than the spatheole; rachis internodes and pedicels linear; leaves aromatic; panicle dense, decompound ................................................................. Cymbopogon
 25 Callus of sessile spikelet applied obliquely to the apex of the internode with its tip free, usually acute to pungent; lower glume of sessile spikelet convexly rounded on the back without keels (rarely with a median groove); internodes and pedicels linear:
  32a Racemes paired, rarely single, but then the pedicelled spikelet without a callus:
    33a Lower glume of sessile spikelet with a median groove ................................................................. Hyperthelia
    33b Lower glume of sessile spikelet convex on the back:
      34a Upper glume of sessile spikelet awned ..................................................................................... Elymandra
      34b Upper glume of sessile spikelet awnless:
        35a Upper raceme-base up to 10 mm long, but usually much shorter ........................................ Hyparrhenia
        35b Upper raceme-base 15–25 mm long; homogamous pairs 2 at the base of each raceme, forming an involucre ......................................................................................................................... Exotheca
    36a Spatheoles linear to narrowly lanceolate; racemes loose, the internode visible ........................ Anadelphia
    36b Spatheoles boat-shaped; racemes dense, the internodes concealed ........................................ Monocymbium
2b Rachis internodes and pedicels stout, thickening upwards; upper lemma awnless:
37a Pedicels distinct:
  38a Lower glume of sessile spikelet produced into a long flattened tail; spikelets similar ................................................................. Vossia
  38b Lower glume of sessile spikelet without a herbaceous tail:
    39a Pedicelled spikelet long-awned (10–120 mm) from the lower glume, rarely awnless; racemes obliquely jointed and callus without a central peg ................................................................................................. Urelytrum
    39b Pedicelled spikelet awnless or with an awnlet up to 5 mm long:
      40a Racemes many, on a short common axis; callus with a short central peg ........................................ Phacelurus
      40b Racemes single:
        41a Jointing of racemes oblique:
          42a Callus inserted in the crateriform internode, the node fringed with a ring of hairs; lower glume of sessile spikelet usually longitudinally ridged, entire .................................................................................. Loxodera
          42b Callus not inserted in the internode; lower glume of sessile spikelet not ridged, often bifid ........ Elionurus
        41b Jointing of racemes transverse:
          43a Ligule a fringe of hairs; inflorescence axillary; lower floret male ................................................... Chasmopodium
          43b Ligule membranous:
            44a Lower glume of sessile spikelet not (or rarely very obscurely) winged ........................................... Rhytachne
            44b Lower glume of sessile spikelet conspicuously winged ........................................................... Coelorchis
 37b Pedicels fused to the internode, rarely absent:
  45a Lower glume of sessile spikelet smooth:
    46a Raceme dorsally compressed, tough ......................................................................................... Hemarthria
    46b Raceme cylindric, fragile:
      47a Pedicelled spikelet present ........................................................................................................... Rotboellia
      47b Pedicelled spikelet absent ........................................................................................................... Oxyrhachis
  45b Lower glume of sessile spikelet rough:
    48a Sessile spikelet broadly elliptic ..................................................................................................... Heteropholis
    48b Sessile spikelet globose .............................................................................................................. Hackelochloa
Acrachne Wight & Am. ex Chiov.
(Cladoridioideae—Eragrostidoideae—Eulobininae)


Acritochea Pilg.
(Panicoideae—Paniceae—Digitariinae)

Straggling annuals, decumbent at base and rooting at lower nodes; culms weak. Leaf blades broadly linear to narrowly lanceolate; ligule membranous. Inflorescence composed of racemes borne along a central axis; rachis triquetrous, bearing solitary pedicellate spikelets. Spikelets narrowly lanceolate, dorsally compressed; lower glume adaxial, ovate, ± 1/2 as long as spikelet; upper glume slightly shorter than spikelet, awned. Lower floret sterile, represented by a membranous lemma as long as spikelet and terminating in a flexuose awn; upper lemma chartaceous, acuminate to aristulate, its flat thin margins enfolding and concealing the palea. Caryopsis narrowly oblong.


Acroceras Stapf
(Panicoideae—Paniceae—Setariinae)


Acroneaes L.
(Pooideae—Aveneae—Alopecurinae)


*Aira L.
(Pooideae—Aveneae—Aveninae)


Alloeochea C.E.Hubb.
(Arundinoideae—Arundininae)
Hubbard: t. 3418 (1940a); Renvoize & Kabuye: 569 (1975); Clayton & Renvoize: 176 (1986); Watson & Dallwitz: 88 (1993); Cope: 9 (1999); Strugnell: 18 (2002).

Cæspitose to tall tussocky perennials. Leaves: sheaths often lanate, or striate and breaking up into fibres; lamina flat, involute or convolute. Inflorescence an open or contracted panicle. Spikelets (4)5–10-flowered; glumes unequal, shorter than the lowermost lemma, acute, acuminate or 2-obosed and shortly awned; lowermost floret male and if with a rudimentary or rarely a perfect ovary, persisting on panicle with the glumes, lemma resembling upper glume or deeply 2-lobed with aristate lobes and awned from the sinus; floret callus oblong; fertile lemma dorsally rounded, 5-nerved, glabrous or pilose above, with a tuft of hairs on each margin below, 2-lobed at apex, lobes aristae, with a geniculate awn in sinus; palea ± as long as body of lemma, keels narrowly winged, ciliolate.

Species 6, trop. Africa; sthn trop. Afr. 5, Angola, Malawi, Mozambique.

Alloteropsis J.Presl
(Panicoideae—Paniceae—Setariaeae)


Anadelphyla Hack.
(Panicoideae—Andropogoneae—Anthistirioneae)
Hackel: 240 (1885); Clayton: 275 (1966a); Clayton & Renvoize: 358 (1986); Watson & Dallwitz: 103 (1994); Cope: 141 (2002).


Annuals or perennials. Leaf blade linear; ligule a short ciliolate membrane. Inflorescence a solitary raceme, exserted from or enclosed by a narrow spatheole and gathered into a scantly or copious false panicle; raceme loose, with few spikelets (sometimes only 1), without homogamous spikelet pairs; internodes and pedicels long and slender. Sessile spikelet slightly dorsally compressed to subterete; callus usually pungent, applied obliquely to apex of internode with its tip free. Glumes: inferior one grooved on back or not; superior one usually awned. Lower floret reduced to a hyaline lemma; upper lemma bilobed, passing between lobes into a glabrous to pubescent awn. Caryopsis narrowly ellipsoid to subcylinrical. Pedicelled spikelet as long as sessile one, linear-lanceolate, acuminate, usually glabrous, with narrowly oblong to linear callus, sometimes spikelet much reduced or quite absent and its pedicel likewise much reduced.


Andropogon L.
(Panicoideae—Andropogoneae—Andropogoninae)


Andropterum Stapf
(Panicoideae—Andropogoneae—Ischaeminae)

Rambling perennials, rooting at nodes. Leaf blade broadly linear, flat, acuminate to a fine pungent apex; ligule a line of hairs. Inflorescence of solitary, terminal and axillary racemes; rachis internodes and pedicels swollen, ± clavate, ciliate. Sessile spikelet laterally compressed; callus obtuse and fitting concave top of internode; lower glume cartilaginous, 2-keeled, keels dorsal, almost contiguous, separated by a narrow groove,
not winged; upper glume strongly laterally compressed, conspicuously winged on keel towards apex; lower floret male, with hyaline lemma and well-developed palea; upper lemma bifid, passing between teeth into a glabrous awn. Caryopsis narrowly ellipsoid. Pedicelled spikelet larger than sessile one, glabrous, asymmetrically winged, awnless, conspicuous.


**Anthephora** Schreb.  
(Panicoideae—Panicaceae—Cenchrinae)  


**Anthoxanthum** L.  
(Pooideae—Aveneae—Phalaridinae)  


**Aristida** L.  
(Arundinoideae—Aristidinae)  


**Arthraxon** P.Beauv.  
(Panicoideae—Andropogoneae—Andropogoninae)  


**Arundinella** Raddi  
(Panicoideae—Arundinellinae)  


**Axonopus** P.Beauv.  
(Panicoideae—Panicaceae—Setariinae)  

Sthn trop. Afr. 3 or more, introduced, ± cosmopolitan weeds, Zambia, Zimbabwe, and sthn Afr.

**Bambusa** Schreb.  
(Bambusoideae—Bambuseae—Bambusinae)  


**Baptorhachis** Clayton & Renvoize  
(Panicoideae—Panicaceae—Digitariinae)  


Laxly caespitose annuals with ascending culms. Leaf blade flat, sparsely pilose. Inflorescence of 1 (or 2(3) digitately arranged) raceme(s) with broad, colourful, foliaceous rachis, bearing paired spikelets. Spikelets elliptic-oblong, glabrous; upper glume and lower lemma as long as spikelet, 3-nerved, the laterals thickened and bearing a tuft of hair near base, bilobed with an awn from the sinus; lower lemma cartilaginous, acute, with flat, thin margins enfolding and concealing palea.

Monotypic genus: *Baptorhachis foliacea* (Clayton) Clayton, only known from Mozambique.

**Bewsia** Gooss.  
(Chloridoideae—Eragrostideae—Eleusininae)  


**Bothriochloa** Kuntze  
(Panicoideae—Andropogoneae—Sorghinae)  

Amphilophis Nash; Stapf: 171 (1917).


**Brachiaria** (Trin.) Griseb.  
(Panicoideae—Panicaceae—Setariinae)  

Leucophrys Rendle; Fish: 702 (2000).


**Brachyachne** (Benth.) Stapf  
(Chloridoideae—Cynodonteae—Chloridinae)  

**Brachychloa** S.M. Phillips

(Chloridoideae—Eragrostideae—Eleusininae)


**Brachypodium** P. Beauv.

(Pooideae—Triticeae)


*Briza L.*

(Pooideae—Poaceae)

Launert: 45 (1971); Simon: 36 (1971).


**Bromuniola** Stapf & C.E. Hubb.

(Centotheceideae—Centotheceae)


Caesiptose perennials from a creeping rhizome. **Leaf blade** expanded, constricted at base, lanceolate or lanceolate-elliptic, tapering to an acute apex. **Inflorescences** of large panicles with spreading, lax, delicate branches. **Spikelets** long-pedicelled, solitary, laterally compressed, loosely imbricate, 3–7-flowered, awned. **Florets** all fertile, bisexual except for reduced terminal one; rachilla disarticulating above glumes and beneath florets; **glumes** subequal, persistent, keeled, membranous, acute, prominently 5-nerved, with transverse veinlets between nerves, scaberulous along keels, glabrous, often mucronate; **lemmas** similar to glumes, 7-nerved, acute and shortly awned, keeled, glabrous and smooth except for scaberulous keels and awns, membranous with hyaline margins, glabrous, lowermost one sterile; **pales** slightly shorter than lemmas, 2-keeled, hyaline, compressed, apex obtuse, base bulging out from lemma, ciliolate along keels. **Lodicules** 2, broadly cuneate. **Stamens** 3. **Ovary** elliptic, glabrous; styles distinct, short, stigmas plumose, laterally exerted. **Caryopsis** free, obliquely ovate in outline, laterally compressed; embryo very small; hilum basal.


**Bromus L.**

(Pooideae—Bromeae)


Sthn trop. Afr. 6, of which 4 are introduced, Zimbabwe, Malawi, and sthn Afr.

**Capillipedium** Stapf

(Panicoideae—Andropogoneae—Sorghinae)


Caesiptose perennials, mostly rambling; culms mostly with barbate nodes. **Leaf blade** erect and straight, linear, flat, scabrid on margins, finely pointed at apex; sheath tight or eventually slipping from culm, ± covered in tubercule-based hairs and frequently villous on collar; **ligule** a very short, truncate, ciliolate membrane. **Inflorescence** a delicate loose panicle bearing short, 1–5(8)-jointed racemes at ends of capillary branches and branchlets; rachis internodes and pedicels filiform with a translucent longitudinal groove; racemes mostly reduced to a single sessile spikelet. **Sessile spikelet** with obtuse **callus**; **lower glume** cartilaginous, broadly convex to slightly concave, acute or obtuse; **upper lemma** forming the hyaline base to its own, entire; **awn** glabrous. **Pedicelled spikelet** male or neuter.

Species ± 14, in eastern Africa through tropical Asia to Australia; sthn trop. Afr. 1: *Capillipedium parviflorum* (R. Br.) Stapf, Zambia, Zimbabwe, Malawi, Mozambique.

**Cenchrus L.**

(Panicoideae—Paniceae—Cenchrinae)


**Cenotheca Desv.**

(Centotheceideae—Centotheceae)

Desvaux: 189 (1810); Clayton: 381 (1972); Clayton & Renvoize: 160 (1986); Phiri (Unpublished).

Annuals. **Leaves**; blades broadly linear to lanceolate, narrowed at base. **Inflorescence** a panicle, or primary branches reduced to racemes. **Spikelets** 1–4-flowered, plus rachilla extension bearing a rudimentary floret, breaking up at maturity; upper florets decreasing in size; lemmas emarginate and apiculate, lowest glabrous, upper one with reflexed, tubercule-based bristles serving as dispersal device. **Stamens** 2.


**Centropodia Rchb.**

(Arundinoideae—Arundineae)


**Astenatherum** Nevski.


**Chasmospodium** Stapf

(Andropogoneae—Rottoellinae)

Stapf: 76 (1917); Clayton: 509 (1972); Clayton: 49 (1973b); Scholz: 5 (1977); Dujardin: 373 (1978); Clayton & Renvoize: 365 (1986).

**Rottoellia** L.f., in part; **Robynsiachloea** Jac.-Fél.

Robust annuals or perennials, sparingly branched. **Leaves**; blades lanceolate-linear, broad; **ligule** a fringe of hairs. **Inflorescence** axillary, a single subcylindrical dorsiventral raceme.
with paired spikelets; internodes squarly clavate, shorter than spikelets. **Sessile spikelet**: callus truncate, with large central knob; lower glume oblong-ovate, crustaceous, smooth, pellid, narrowly winged on keels above; lower floret male, with palea; embryo 4/5 as long as caryopsis. **Pedicelled spikelet** well-developed; pedicel free, stout.


**Chloris Sw.**
(Chloridoideae—Cynodonteae—Chloridinae)


**Chrysochloa Swallen**
(Chloridoideae—Cynodonteae—Chloridinae)

Stoloniferous annuals, sometimes caespitose, erect or geniculate. **Leaves**: sheaths strongly keeled; lamina flat, broadly obtuse at apex and with a reflexed muro. **Inflorescence** of 1–many digitate, 1-sided racemes bearing imbricate spikelets on a flat rachis. **Spikelets** 2-flowered, strongly laterally compressed, sessile, 1 row on a tough axis, disarticulating above glumes; **glumes** subequal, membranous, keeled, enclosing florets, acute to acuminate at apex, upper glume deciduous, sometimes with a short awn; **fertile lemma** coriaceous, keeled, mucronate or with a short subapical awn; **distal floret** well-developed but male or sterile and smaller than the fertile one. **Caryopsis** ellipsoid, trigonous.


**Chrysoopogon Trin.**
(Panicoideae—Andropogoneae—Sorghinae)


**Cleistachne Benth.**
(Panicoideae—Andropogoneae—Sorghinae)


**Coelachne R.Br.**
(Panicoideae—Isachneae)

Mat-forming perennials; culms up to 0.2 m high, ascending from a creeping base and rooting at nodes. **Leaf blades** narrowly lanceolate; **ligule** a line of hairs or absent. **Inflorescence** a sparse panicle, sometimes spike-like. **Spikelet** 2-flowered. **Florets** dissimilar, the lower bisexual, the upper female, gaping at maturity, separated by a slender internode. **Glumes** persistent, subequal, 1/3–2/3 as long as spikelet, obtuse. **Lemma**: lower one firmly cartilaginous; upper one remaining membranous at maturity, 1/3 to almost as long as lower one. **Stamens** 2 or 3. **Caryopsis** ovoid.


**Coelorachis Brongn.**
(Panicoideae—Andropogoneae—Rottboellinae)


***Coix L.***
(Panicoideae—Andropogoneae—Coicinae)

Sthn trop. Afr. 1: *Coix lacryma-jobi L.*, an Asiatic species now widely distributed throughout the region. Also naturalised in sthn Afr.

**Craspedorachis Benth.**
(Chloridoideae—Cynodonteae—Chloridinae)


**Crypsis Aiton**
(Chloridoideae—Eragrostideae—Sporobolinae)

Annuals with culms profusely branched from base, at first prostrate, finally ascending. **Leaves**: sheath margins glabrous or pilose; lamina glaucous, tapering to an acuminate point. **Inflorescence** a hemispherical to ovoid head, or a cylindrical spiciform panicle, embraced below by 1 or 2 inflated bract-like leaf sheaths bearing a reduced lamina, or sometimes exerted. **Spikelets** 1-flowered, strongly laterally compressed and keeled, disarticulating below the floret, sometimes tardily so or rarely falling entire, awned or awnless. **Glumes** subequal or unequal, 1-nerved, membranous, equal to or shorter than spikelet, or rarely falling entire, awned or awnless. **Spikelets** 2 or 3. **Caryopsis** elliptic; pericarp free and sometimes swelling when wet.

Species 8, centred on the Mediterranean region and southwest Asia, but extending eastwards to China and southwards to trop. Africa; naturalised in America and with 2 species in sthn trop. Afr.: Malawi, Mozambique.
Ctenium Panz.
(Chloridoideae—Cynodonteae—Chloridinae)


Cymbopogon Spreng.
(Panicoidae—Andropogoneae—Andropogoninae)


Cynodon Rich.
(Chloridoideae—Cynodonteae—Chloridinae)


Cyrtococcum Stapf
(Panicoideae—Paniceae—Setariinae)
Koechlin: 76 (1962); Clayton & Renvoize: 499 (1982); Clayton & Renvoize: 279 (1986); Van der Zon: 239 (2002); Phiri (Unpublished).

Sthn trop. Afr. 1: Cyrtococcum chaetophoron (Roem. & Schult.) Dandy, Angola.

*Dactylis L.
(Pooideae—Poaeae)

Sthn trop. Afr. 1: *Dactylis glomerata L., cultivated and sometimes occurring as an escape, also in sthn Afr.

Dactyloctenium Willd.
(Chloridoideae—Eragrostideae—Eleusininae)


Daknopholis Clayton
(Chloridoideae—Cynodonteae—Chloridinae)
Clayton: 102 (1967b); Clayton: 321 (1974); Clayton & Renvoize: 242 (1986);

Prostrate stoloniferous annuals forming loose mats; flowering culms ascending. Leaf blades flat; ligule a line of hairs. Inflorescence of digitate, 1-sided racemes. Spikelets 1-flowered with minute rachilla-extension, strongly laterally compressed, sessile, alternate in 2 rows on a tough axis, disarticulating above glumes. Glumes subequal, thinly membranous, shorter than the floret, 1-nerved, upper one broader than lower one; lemma membranous, keeled, acute, long-awned. Caryopsis narrowly lanceolate, triquetrous.


Danthioniopsis Stapf
(Panicoidae—Arundinelleae)


Dichanthium Willenmet
(Panicoideae—Andropogoneae—Sorghinae)


Digitaria Haller
(Panicoideae—Paniceae—Digitariinae)


Dignathia Stapf
(Chloridoideae—Cynodonteae—Zoysiinae)

Wiry, erect annuals. Leaf blades lanceolate-linear. Inflorescence a cylindrical false raceme; racemeslets shortly pedunculate, deciduous, comprising 1 or 2 spikelets plus a rudiment separated by the internodes of a short curvaceous rachis. Spikelets 1-flowered, narrowly ovate to orbicular, laterally compressed; glumes well-developed, longer than the floret, thickly indurated, ± gibbous, scaberulous to lanose, upper one longer than lower one and caudate to a stiff point or awn; lemma membranous, keeled, shortly awned. Caryopsis ellipsoid, gibbous, laterally compressed.

Species 5, NE trop. Africa, Arabian Peninsula and India; one species, Dignathia gracilis Stapf, extending to Mozambique.
Diheteropogon (Hack.) Stapf
(Panicoideae—Andropogoneae—Andropogoninae)


Dinebra Jacq.
(Chloridoideae—Eragrostideae—Eleusininae)


Eccoptocarpha Launert
(Panicoideae—Paniceae—Setariinae)

Annuals up to ± 0.75 m high. Leaf blades linear to lanceolate; ligule represented by a line of hairs. Inflorescence composed of racemes borne on a common axis; rachis triquetrous, bearing single adaxial spikelets. Spikelets obovate-elliptic. Glumes: lower glume adaxial, 1/4 as long as spikelet; upper glume as long as spikelet, with prominent cross-nerves and resembling woven fabric; lower floret sterile, its lemma resembling upper glume; upper floret crustaceous, shorter than spikelet, stipitate, stipe at first S-shaped, straightening at maturity to extrude floret; upper palea obtuse, only its margins clasped by lemma, its tip tucked in. Caryopsis elliptic, dorsally compressed.

Monotypic genus: *Eccoptocarpha obconiciventris* Launert, Tanzania and Zambia.

Echinochloa P. Beauv.
(Panicoideae—Paniceae—Setariinae)


Ehrharta Thunb.
(Bambusoideae—Ehrharteae)


Eleusine Gaertn.
(Chloridoideae—Eragrostideae—Eleusininae)


Elionurus Kunth ex Wild.
(Panicoideae—Andropogoneae—Rottboellinae)


Elyandra Stapf
(Panicoideae—Andropogoneae—Anthistiriinae)


Elytrphorus P. Beauv.
(Arundinoideae—Arundineae)


Enneapogon Desv. ex P. Beauv.
(Chloridoideae—Pappophoreae)


Enteropogon Nees
(Chloridoideae—Cynodontaeae—Chloridinae)


Entolasia Stapf
(Panicoideae—Paniceae—Setariinae)


Entoplocamia Stapf
(Chloridoideae—Eragrostideae—Uniolinae)


Eragrostis Wolf
(Chloridoideae—Eragrostideae—Eleusininae)


**Eriochloa Kunth**
(Panicoideae—Paniceae—Setariinae)
Sthn trop. Aftr. 6, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

**Eriochrysis P.Beauv.**
(Panicoideae—Andropogoneae—Saccharinae)

**Euclasta Franch.**
(Panicoideae—Andropogoneae—Sorghinae)

**Eulalia Kunth**
(Panicoideae—Andropogoneae—Saccharinae)

**Eustachys Desv.**
(Chloridoideae—Cynodonteae—Chloridinae)

**Exotheca Andersson**
(Panicoideae—Andropogoneae—Anthistiriinae)
Densely caespitose perennials. Leaves linear; sheath produced at mouth into narrow auricles; ligule scarious, adnate to sheath-auricles. Inflorescence composed of paired racemes, pairs each subtended by a spatheole and gathered into a scantly false panicle; racemes short, upper raceme borne on a very long rachis-base, its basal spikelets at ± same level as apex of lower raceme, the two thus appearing to be arranged end-to-end, each raceme with 2 homogamous spikelet pairs; pedicels linear. Sessile spikelet terete; calyx pungent, applied obliquely. Glumes: lower glume subcoriaceous with a herbaceous beard 2–3 mm long, rounded on back and sides; upper glume awnless. Lower floret reduced to a hyaline lemma; upper lemma hyaline, bidentate, passing between teeth into an awn with pubescent column. Caryopsis narrowly oblong. Pedicelled spikelet male, without distinct callus.

Species 2, tropical America, India, trop. Africa; sthn trop. Aftr.: 1: Exotheca conyloptricha (Hochst. ex Steud.) Stapf, Angola, Zambia, Zimbabwe, Malawi, Mozambique.

**Festuca L.**
(Pooidae—Poaceae)
Clayton: 56 (1970); Launert: 54 (1971); Simon: 36, 71 (1971); Clayton & Renvoize: 93 (1986); Gibbs Russell: 168 (1990); Chapaman: 3 (2002).

**Fingerhuthia Nees**
(Chloridoideae—Eragrostideae—Uniolinae)

**Gilgiochloa Pilg.**
(Panicoideae—Arundinellaeae)

**Guaduella Franch.**
(Bambusoideae—Bambuseae—Arundinariinae)
Herbaceous perennials with creeping rhizomes and with culms either bearing leaves and inflorescences on same culm, or culms either sterile and bearing leaves mainly in upper part, or fertile and leafless except for leaf sheaths near base. **Leaves**: sheaths strongly striate; blades ovate-lanceolate to oblong-elliptic, narrowing abruptly near base into a lowestepiole. **Inflorescence** terminal, racemose or paniculate. **Spikelets** linear, bearing up to 25 florets, the lower 1–3 male, the others bisexual. **Glumes** 2, ovate to broadly so, usually pubescent; lower one usually shorter than upper. **Palea** membranous, oblong, bicornate, obtuse. **Lodicules** 3, hyaline, oblong-cuneate, truncate. **Stamens** 6, with free filaments. **Ovary** oblong, pubescent; styles 2, free, with papillode stigmas.


**Habrochloa** C.E.Hubb.
(Chloridoideae—Eragrostideae—Eleusininae)

Delicate, very slender, erect or ascending annuals. **Leaf blade** flat, flaccid, glabrous or loosely pilose. **Inflorescence** a delicate panicle. **Spikelets** 3–5-flowered, laterally compressed; **florets** loosely exserted from glumes, dissociating above glumes and between florets; **glumes** membranous, narrowly lanceolate, slightly unequal, 1-nerved, keeled, acuminate; **lemmas** keeled, thinly membranous, 3-nerved, ciliate on margins, shortly and bluntly 2-lobed at apex, with a filiform, slightly recurved awn from the sinus. **Caryopsis** linear.


**Hackelochloa** Kuntze
(Panicoideae—Andropogoneae—Rottboellinae)

**Manisuris** L.F.; Stapf: 57 (1917).


**Halopyrum** Stapf
(Chloridoideae—Eragrostideae—Eleusininae)

Tough, stoloniferous perennials; stolons rooting to form dense tussocks; culms rigid, woody, branching to form fascicles at nodes. **Leaf blades** narrowly linear to setaceous, flat or involu- lute, stiff, glaucous. **Inflorescence** of short racemes scattered along and appressed to an elongated central axis. **Spikelets** several-flowered, shortly pedicelled, laterally compressed, dissociating above glumes and between florets; **callus** conspicuously barbate with hairs ± half as long as lemma; **glumes** persistent, subequal, lower one 3–5-nerved, upper one 5–7-nerved; **lemmas** exserted from glumes, 3-nerved, coriaceous, dorsally rounded or keeled only above middle, acute or subacute at apex, entire or bidenticate, shortly mucronate. **Caryopsis** oblong, concavo-concave.


**Harpochloa** Kunth
(Chloridoideae—Cynodonteae—Chloridinae)

**Rendlia** Chiov. in part; Simon: 59 (1971).


**Helicotrichon** Besser
(Pooideae—Aveneae—Aveninae)


**Hemarthria** R.Br.
(Panicoideae—Andropogoneae—Rottboellinae)


**Heteranthoea** Stapf
(Panicoideae—Isachneae)

Trailing, mat-forming annuals in swamps or shallow water; culms up to 0.3 m high, base decumbent and rooting at nodes. **Leaves** up to ± 30 mm long, narrowly lanceolate. **Inflorescence** of short unilateral racemes along a central axis, rameome rachis spreading or eventually reflexed, terminating in a point.
Florets dissimilar; both fertile. Spikelets gaping; glumes persistent, subequal, \( \frac{1}{3} - \frac{1}{2} \) as long as spikelet; lower lemma firmly membranous, acuminate; upper lemma crispily chartaceous, \( \frac{1}{3} \) as long as lower one, obtuse to subacute, densely and minutely pubescent. Stanium 3. Caryopsis subglobose, slightly dorsally flattened.


**Heterophilis** C.E. Hubb.

(Panicoideae—Andropogoneae—Rottboellinae)


Perennials arising from a short scaly rhizome. Leaf blade flat, gradually tapering to a flexuose apex; ligule shortly membranous. Inflorescence a single axillary raceme; racemes cylindric or slightly dorsally compressed; internodes thickened, clavate, fixed to adjacent pedicel. Sessile spikelet ± embedded in internode; callus truncate, with prominent central boss or peg; lower glume crustaceous, broadly convex, 2-keeled or sharply involute along sides, back smooth, cancellate or areolate, winged at apex. Lower floret reduced to a hyaline lemma or sometimes with a palea; upper lemma entire and awnless. Caryopsis ellipsoid, dorsally flattened. Pedicelled spikelet thinly coriaceous, ± as big as sessile one or smaller; pedicel oblong, flattened.


**Heteropogon** Pers.

(Panicoideae—Andropogoneae—Anthistiriinae)


**Holcus** L.

(Pooideae—Aveneae—Aveninae)


**Homoezegos** Stapf

(Panicoideae—Andropogoneae—Saccharinae)


Cespitose perennials; culms 1–2 m high. Leaves: sheaths with auricles 4–25 mm long. Inflorescence of 1–several digitate racemes; racemes fragile, white-villous, with linear internodes. Spikelets alike, one sessile, one pedicelled; callus acutely conical to pungent and obliquely attached to internode; lower glume coriaceous, convex, obtuse at apex. Lower floret reduced to a hyaline lemma. Upper lemma linear, bidentate, with a pilose awn.

Species 6, central Africa; sthn trop. Afr. 6, Angola, Zambia, Malawi.

**Hubbardcholea** Auquier

(Chloridoideae—Eragrostideae—Sporobolinae)


Annuals, purplish, loosely caespitose; culms erect or geniculately ascending, very slender, usually branched from lower nodes. Leaf blade linear-lanceolate, flat, abruptly contracted at base, apex acute. Inflorescence a delicate open panicle, lower branches subverticillate. Spikelets 1-flowered, fusiform, disarticulating below floret; glumes 1-nerved, thinly membranous, longer than floret, persistent; lemma 1-nerved, hyaline, thinner than glumes, entire at apex and with a long flexuous terminal awn; palea absent. Caryopsis fusiform; pericarp free.


**Hydrothauma** C.E. Hubb.

(Panicoideae—Panicae—Setariinae)


Aquatic annuals; culms branched from base and geniculate or prostrate-ascending with culms and false petioles containing air canals. Leaves: lamina floating; lower leaves on long false petioles; upper surface raised into sinuous longitudinal lamellae; ligule membranous. Inflorescence a slender spiciform panicule, sometimes reduced to a unilateral raceme with paired spikelets. Spikelets dorsally compressed; lower glume half as long as spikelet, hyaline, truncate; upper glume equalling spikelet and gibbous; upper lemma cartilaginous with flat margins. Lodicles 2, minute. Stanium 3; anthers oblong. Ovary glabrous; style free, terminal.

Monotypic genus: *Hydrothauma manicatum* C.E. Hubb., from Zaire and Zambia. Related to *Sacciolepis*.

**Hylalebas** Chippindall.

(Panicoideae—Panicae—Digitariinae)


Straggling annuals, rooting at lower nodes; culms up to 1.5 m high. Leaves: lamina broadly linear to narrowly lanceolate, cordate and amplexicaule at base; ligule a very short hairy membrane. Inflorescence a panicle with some or all branches whorled. Spikelets elliptic, dorsally compressed; lower glume ovate, up to \( \frac{1}{3} \) as long as spikelet and clasping its base; upper glume ± as long as spikelet; lower floret sterile, represented by a membranous lemma as long as spikelet and abruptly terminating in a short awn; upper lemma thinly chartaceous, acute, dull, its flat, thin margins enfolding and concealing the palea. Caryopsis subglobose.


**Hyprarrhena** E. Fourn.

(Panicoideae—Andropogoneae—Anthistiriinae)

Clayton & Renvoize: 788 (1982); Gibbs Russell et al.: 182 (1990); Chapano:
POACEAE: Hyparrhenia

Seed plants of southern tropical Africa: families and genera

16 (2002); Cope: 95 (2002).


**Hyperthelia** Clayton
(Panicoideae—Andropogoneae—Anthistirinae)


**Imperata** Cirillo
(Panicoideae—Andropogoneae—Saccharinae)


**Isachne** R.Br.

Rambling perennials; culms up to 0.6 m high, geniculately rooting at nodes. Leaves linear to lanceolate; ligule a line of hairs. Inflorescence a panicle. Spikelets 2-flowered. Florets similar or dissimilar, separated by an abbreviated internode, lower floret sometimes male; rachilla disarticulating below each floret. Glumes subequal, \( \frac{3}{4} \) to as long as spikelet, 5–9-nerved, membranous, falling soon after florets. Lemmas elliptic-oblong to orbicular, obscurely 5–7-nerved, obtuse; lower one membranous to coriaceous; upper one crisply chartaceous to crustaceous. Stamens 3. Caryopsis ellipsoid to suborbicular, dorsally flattened on one side.

Species ± 100, throughout the tropics, but mainly Asia; sthn trop. Afr. 3, Angola, Zambia, Zimbabwe, Malawi, Mozambique.

**Ischaemum** L.
(Panicoideae—Andropogoneae—Ischaeminae)


**Kampochloa** Clayton
(Chloridoideae—Cynodonteae—Chloridinae)

Densely caespitose perennials. Leaf blade usually involute, sometimes flat. Inflorescence a solitary raceme bearing pectinate spikelets on a puberulous rachis. Spikelets 2-flowered, laterally compressed, sessile, alternate in 2 rows on a tough axis, tardily disarticulating above glumes but not between florets. Glumes dissimilar, subequal in length, inferior one 1–2-nerved, minutely 2-toothed at apex with an awnlet in the sinus; upper one nerveless, with an oblique dorsal awn. Lower floret fertile; fertile lemma hyaline, pilose on keel and ciliate on lateral nerves, 2-toothed at apex and mucronulate. Upper floret male, its lemma glabrous, awned from the back; rachilla terminated by a cluster of sterile awns usually accompanied by a very reduced lemma.

Monotypic genus: *Kampochloa brachyphylla* Clayton, only known from Angola and Zambia.

**?Koakochloa** De Winter
(Chloridoideae—Pappophoreae)

Monotypic genus: *Koakochloa nigrirostris* De Winter, ?Angola, and sthn Afr.; no confirmed record from Angola seen.

**Koeleria** Pers.
(Pooideae—Aveneae—Aveninae)

**Leersia** Sw.
(Bambusoideae—Oryzeae)


**Leptaspis** R.Br.
(Bambusoideae—Phareae)

Perennial rhizomatous bamboo-like grasses. Leaf blade large, asymmetric, with a typical slanting venation, tessellate, borne on a twisted (180°) pseudopetiole; ligule scarious, often fringed. Inflorescence a loose panicle, usually terminal, containing male and female spikelets, with females in a group at base and male or males terminal on branchlets. Spikelets 1-flowered, monoecious, heteromorphous, unisexual; male spikelets usually much smaller and less conspicuous than female ones; glumes 2, much smaller than spikelet, subequal, membranous, ovate, 5–7-nerved, usually spreading; lemma similar to glumes but with more nerves, cymbiform; palea shorter than lemma, membranous, distinctively 2-keeled, 2-ribbed, narrowly oblong, with apex bidentate. Stamens 6; filaments rather short; anthers linear. Bisexual spikelets subsessile, rather conspicuous, ovoid or conchiform, inflated; glumes 2, subequal, much shorter than spikelet; lemma with margins connate (thus utricle-like) with an apical or lateral porus, inflated, prominently nerved and usually longitudinally ribbed, ± densely covered with stiff, short, hooked hairs; palea completely enclosed by lemma, longer than utricle and often appearing at porus, very delicate, linear, 2-keeled, with apex bidentate. Lodicules very small to nil. Ovary small, narrowly ovoid, gibbous; style
simple; stigmas 3, rather long, filiform, plumeous, exserted through porus of lemma. **Caryopsis** free from lemma, oblong in outline, compressed; hilum linear, within a longitudinal groove; embryo very small.

Species 5–7, palaeotropical, represented by only **Leptaspis cochleata** Thwaites in trop. Africa and Madagascar; sthn trop. Afr.: Zimbabwe, Mozambique, and sthn Afr.

**Leptocarydion** Stapf
(Cloridioideae—Eragrostideae—Eleusininae)


**Leptochloa** P.Beauv.
(Cloridioideae—Eragrostideae—Eleusininae)

Monotypic genus:


**Linpopsis** C.E.Hubb.
(Panicoideae—Arundinelleae)
Launert: 277 (1957); Clayton: 122 (1967c); Clayton: 414 (1972); Clayton & Renvoize: 319 (1986); Watson & Dallwitz: 958 (1994).

Erect perennials, rarely annual; culms slender, usually unbranched. **Leaf blade** linear to linear-lanceolate, acuminate; **ligule** a dense row of hairs. **Inflorescence** an open to contracted panicle. **Spikelets** linear-lanceolate, brown, borne in dense triads with short pedicels; peduncle often developing a fragile hook. **Leaves** lower one 3(5–7)-nerved; upper one glabrescent to pubescent, bidentate; **callus** square to oblong, truncate to 2-toothed. **Palea** keels thickened or not, wingless. **Lodicules** 2, glabrous, cuneate. **Stamens** 3(4); anthers linear. **Ovary** glabrous; styles terminal. **Caryopsis** elongate; hilum linear.

Species 11, South America and W trop. Africa; sthn trop. Afr. 1: **Linpopsis ambiens** (K.Schum.) Conert, Angola.

**Megaloprotachne** P.Beauv.
(Panicoideae—Andropogoneae—Rottboellinae)

**Megastachya** P.Beauv.
(Centothecoideae—Centotheceae)

Melinis P.Beauv.
(Panicoideae—Panicae—Melinidinae)


Merxmuellera Conert
(Arundinoideae—Arundininae)


Microchloa R.Br.
(Chloridoideae—Cynodonteae—Chloridinae)


Microstegium Nees
(Panicoideae—Andropogoneae—Saccharinae)


Miscanthus Andersson
(Panicoideae—Andropogoneae—Saccharinae)

Miscanthidium Stapf, Bennett: 188 (1980).


Moneleytrum Hack. ex Schinz
(Chloridoideae—Cynodonteae—Zoysiinae)


Monocymbium Stapf
(Panicoideae—Andropogoneae—Anthistiriinae)
Stapf: 386 (1919); Clayton & Renvoize: 358 (1986); Cope: 143 (2002).


Nematoopa C.E.Hubb.
(Androginoidae—Arundinae)
Hubbard: 51 (1957a); Clayton & Renvoize: 175 (1986); Watson & Dallwitz: 639 (1994); Cope: 12 (1999).

Loosely caespitose perennials arising from a slender rhizome and forming tufts; culms erect, slender. **Leaf blade** filiform, flexuose, firm but not pungent, glabrous. **Inflorescence** an open panicle with capillary branches. **Spikelets** 4–7-flowered; **glumes** very unequal, shorter than lowermost lemma; **callus** of floret short, oblong; **lemmas** dorsally rounded, 3-nerved, pilose on back and margins, shortly and setaceously 2-lobed at apex, with a long slender flexuous **awn** in sinus; **palea** ± 4/5 as long as lemma, keels glabrous, wingless.

Monotypic genus: *Nematoopa longipes* (Stapf & C.E.Hubb.) C.E.Hubb., known only from Zambia and Zimbabwe.

Neyraudia Hook.f.
(Chloridoideae—Eragrostideae—Eleusininae)

Tall, reed-like perennials with short, scaly rhizome; culms up to 4 m high and up to 10 mm in diameter, somewhat woody. **Leaf blade** mostly involute, filiform at apex. **Inflorescence** a large plumose panicle. **Spikelets** 2–7-flowered; florets well exserted from glumes, disarticulating above glumes and between florets, all **florets** bisexual or lowermost sterile and lacking a palea; **glumes** membranous, lanceolate, unequal, 1–3-nerved, acuminate or drawn out into a short awn-point; **lemmas** keeled, scarious-membranous, 3-nerved, long-ciliate on lateral nerves, usually shortly 2-toothed at apex and with a recurved **awn** from sinus. **Caryopsis** linear, suberetic.

Species 2, Old World tropics; sthn trop. Afr. 1: *Neyraudia arundinacea* (L.) Henr., Malawi.

Odyssea Stapf
(Chloridoideae—Eragrostideae—Eleusininae)

Diplachne sensu Rendle: 227 (1899).


*Olyra L.*
(Bambusoideae—Olyreae)

Sthn trop. Afr. 1: *Olyra latifolia* L., Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr. Soderstrom & Zuloaga: 29 (1989) state that the species is found essentially throughout the Neotropics and has become naturalised in Africa, including Madagascar.

Oplismenus P.Beauv.
(Panicoideae—Panicae—Setariinae)
Rendle: 184 (1989); Koechlin: 56 (1962); Clayton & Renvoize: 541 (1982);
Tall woody bamboos. **Leaf blade** lanceolate to oblong-lanceolate, usually glabrous, finally disarticulating from sheath. **Inflorescence** narrow, slender, large, composed of clusters of spikelets on opposite sides of its branches; each cluster borne in axil of a deciduous sheath which is usually without a lamina. **Spikelets** sessile, 2-flowered, terete or somewhat laterally compressed, muticous subtended by a pseudo-involucre of broad coriaceous bracts; florets both bisexual; rachilla disarticulating beneath upper glume, produced as a fine bristle beyond upper floret; **lower glume** absent; **upper glume** 11–18-nerved, dorsally rounded, chartaceous to coriaceous, with margins involute; **lemmas** exceeding glumes, many-nerved (11–23), with transverse veinlets, imbricate, dorsally rounded, chartaceous to chartaceous-coriaceous; paleas slightly shorter than corresponding lemmas, 5–11-nerved, 2-keeled, flat between keels. **Locules** absent. **Stamens** 6; filaments free, anthers distinctly mucronate. **Ovary** pilose at apex; stigma 1. **Caryopsis** crustaceous, with a free pericarp, with a pilose apical appendage.


**Oryza** L.

(Bambusoideae—Oryzeae)


**Oryzium** C.E.Hubb. & Schweick.

(Paniocoideae—Panicaceae—Setariaeae)


**Oxyrhachis** Pilg.

(Paniocoideae—Andropogoneae—Rottboellieae)


**Oxytenanthera** Munro

(Bambusoideae—Bambuseae—Melocanninae)

Rendle: 256 (1899); Burtt Davy et al.: 56 (1958); White: 11 (1962); Launert: 17 (1971); Fanshawe: 157 (1972); Clayton & Renvoize: 56 (1986); Gibbs Russell et al.: 232 (1990); Chapano: 3 (2002); Coates Palgrave: 96 (2002).


**Panicum** L.

(Paniocoideae—Panicaceae—Setariaeae)


**Polyneura** Peter; Chapano: 10 (2002) as synonym.


**Paratheria** Griseb.

(Paniocoideae—Panicaceae—Cenchrineae)


POACEAE: Paspalidium

(Panicoideae—Panicaceae—Setariae)


Paspalum L.

(Panicoideae—Panicaceae—Setariae)


Phragmites Retz. recorded from Zimbabwe and sthn Afr.

Chapano: 3 (2002).

Launert: 81 (1971); Simon: 36 (1971); Clayton & Renvoize: 133 (1986); (Pooideae—Aveneae—Aveninae)

Jardinea (Panicoideae—Andropogoneae—Rottboelliae)

Phacelurus sthn Afr.


(Panicoideae—Panicaceae—Cenchrineae)

Pennisetum Rich.

(Panicoideae—Panicaceae—Cenchrineae)


Beckeropsis Fig. & De Not.; Simon: 29, 64 (1971).


Pentaschistis (Nees) Spach

(Arundinoideae—Arundineae)


Perotis Aiton

(Arundinoideae—Arundineae)


Phyllostachys (Nees) Griseb.

(Arundinoideae—Arundineae—Bambusoideae—Phyllorachideae)


Piptophyllum C.E.Hubb.

(Arundinoideae—Arundineae)

Hubbard: 53 (1957b); Clayton & Renvoize: 171 (1986); Watson & Dallwitz: 737 (1994).

Caespitose perennials with very slender, erect, simple culms densely covered at base with woolly fibrous remains of old leaf sheaths. Leaf blade filiform, involute, rigid, at length disarticulating from sheath; ligule reduced to a series of short cilia. Inflorescence a lanceolate-oblong to narrowly oblong panicle with capillary branches. Spikelets oblong to cuneate, laterally compressed, aristate; rachillae disarticulating above glumes and between florets. Florets 2, bisexual; callus very short, obtuse, densely bearded with short hairs. Glumes persistent, slightly unequal, lanceolate to oblong, acute or minutely toothed at apex, membranous, 1-nerved; lemmas longer than glumes, usually 5–9-nerved, narrowly ovate to ovate-oblong with bilobed apex, with a slightly twisted awn between lobes; palea about as long as lemmas, lanceolate-oblong, obtuse or minutely bifid, 2-keeled, membranous. Lodicules 2, cuneate, minute. Stamens 3; anthers linear-oblong. Ovary glabrous; styles free, terminal, short; stigmas plumose.

Monospecific: Piptophyllum welwitschii (Rendle) C.E.Hubb., known only from Angola.

Poa L.

(Pooidae—Poeae)


Phyllorachis Trimen

(Bambusoideae—Phyllorachideae)

Trimen: 353 (1879); Launert: 37 (1971); Simon: 36 (1971); Clayton & Renvoize: 75 (1986); Watson & Dallwitz: 731 (1994).

Perennial grasses, sometimes of shrubby habit, with branched slender culms. Leaf blade lanceolate, narrowly elliptic to oblong-lanceolate; ligule small, ciliate. Inflorescence spike-like, terminal, consisting of short racemes inserted along a leaf-like rachis; axillary inflorescences all bisexual; racemes short, usually not more than 1 or 2; spikelets longer than those of terminal inflorescences, with elongated stigmas protruding from subtending leaf sheaths; terminal inflorescences bisexual, lowermost spikelet of each raceme female, the following male, sometimes reduced spikelets present; rachilla not extended. Male spikelets: lower glume rather narrow, almost subulate, acute; upper one 1-nerved, ovate-oblong, up to 2/3 as long as spikelet; lemma of inferior floret 3-nerved, coriaceous; lemma of upper floret 5–7-nerved, thinly coriaceous, keeled, its palea 2-nerved; stamens 6. Female spikelets: lower glume subulate or even setaceous; upper one narrowly ovate to oblong, up to half as long as spikelet, 5–9-nerved; lemma of lower floret embracing upper floret, dorsally with a longitudinal furrow, rather rigid, many-nerved; lemma of upper floret 11–many-nerved, membranous to thinly coriaceous, its palea 8–12-nerved. Caryopsis free, elliptic-oblong in outline, with a rather shallow longitudinal furrow; embryo minute; hilum linear, almost as long as caryopsis.


**Poecilostachys** Hack.
*(Panioidae—Paniacea—Satarinae)*
Hackel: 131 (1884); Clayton & Renvoize: 268 (1986); Clayton: 3 (1989); Van der Zon: 188 (1993); Watson & Dallwitz: 754 (1994).

*Poecilostachys* spp. have long-linear leaves. They are perennials with short, oblique rhizomes. The inflorescence is a flat, linear-lanceolate spikelet. The spikelet is laterally compressed, lanceolate, 6–8 mm long, with glumes 1/3–3/4 as long as spikelet, lower one acute to acuminate, upper one armed with stiff bristles based on yellowish tubercles. The florets 2: lower floret sterile, proximal lemma awnless, 7–9-nerved; upper floret bisexual, upper lemma strongly laterally compressed, membranous to cartilaginous with flat or involute margins. Lodicules 2, fleshy, joined. Stamens 3. Ovary glabrous; stigmas 2. Caryopsis not noticeably compressed; hilum long-linear.

Species ± 20, all but one confined to Madagascar; sthn trop. Afr. 1: *Poecilostachys opilsonoides* (Hackel) Clayton, Zambia, Zimbabwe, Malawi, Mozambique.

**Pogonarthria** Stapf
*(Chloridoideae—Eragrostideae—Eleusininae)*


**Pogonochloa** C.E.Hubb.
*(Chloridoideae—Cynodonteae—Chloridinae)*
Hubbard: t. 3421 (1940b); Simon: 25, 59 (1971); Clayton & Renvoize: 244 (1986); Watson & Dallwitz: 759 (1994); Cope: 244 (1999); Chapano: 9 (2002).

Perennials with short, oblique rhizome; culms usually erect with leaves confined to lower 1/3. Leaves: lowestmost sheaths densely imbricate, loose, persistent, irregularly splitting; leaf blades flat, linear-lanceolate, glaucous, rigid, narrowed at apex into a hard blunt point. Inflorescence a spiciform head of numerous short, closely spaced racemes on an elongated axis. Spikelets 2- or 3-flowered; second floret male or sterile; third floret reduced to an awn, laterally compressed, alternate in 2 rows on a tough axis, shortly pedicellate, disarticulating above glumes; glumes subequal, 1-nerved, membranous, keeled, as long as spikelet and enclosing florets, shortly awned; fertile lemma much shorter than glumes, membranous, entire and acute at apex, with a long flexuous terminal awn. Caryopsis fusiform.

Monotypic genus: *Pogonochloa greenwayi* C.E.Hubb., known only from Zambia and Zimbabwe.

**Polypogon** Desf.
*(Pooideae—Aveneae—Alopecurinae)*

Sthn trop. Afr. 3 (2 exotic), Angola, Zimbabwe, and sthn Afr.

**Pseudochinolaena** Stapf
*(Panioidae—Paniacea—Satarinae)*


**Rhytachne** Desv.
*(Panioidae—Andropogoneae—Rottboelliniae)*


**Richardiella** Elffers & Kenn.-O’Byrne
*(Chloridoideae—Eragrostideae—Eleusininae)*

Delicate, low annuals; culms erect, stiff. Leaf blade flat or involute on drying. Inflorescence comprising several distichously arranged racemes on an elongated central axis, this with a naked filiform apex; racemes delicately incurved when dry, terminating in a naked bristle; spikelets subsessile, contiguous, biseriate, spreading at right angles. Spikelets 6–12-flowered, laterally compressed, disarticulating above glumes and between florets; glumes 1-nerved, membranous, lightly keeled, shortly awned at apex, lower glume shorter than spikelet, upper glume as long as spikelet; lemma 1-nerved, membranous, dorsally rounded, ciliate on margins, obtuse to obscurely emarginate at apex, sometimes mucronate; palea keels pectinate-ciliate. Caryopsis ellipsoid, with free pericarp.

Monotypic: *Richardiella eruciformis* Elffers & Kenn.-O’Byrne, southern Democratic Republic of the Congo and Zambia.

**Rottboellia** L.f.
*(Panioidae—Andropogoneae—Rottboelliniae)*
Rendle: 139 (1899); Clayton & Renvoize: 399 (1986); Veldkamp et al.: 281 (1986); Cope: 174 (2002).


**Saccharum** L.
*(Panioidae—Andropogoneae—Saccharinae)*

Rhizomatous perennials; culms 2–4 m high or more. Inflorescence a panicle, often large and plumose, bearing numerous racemes on its branches; racemes loose, fragile, with slender internodes. Spikelets alike, paired, one sessile, one pedicelled, lanceolate, enveloped in long silky hairs from cal-
POACEAE: Saccharum MONOCOTYLEDONS

lvs. Lower glume membranous or sometimes sub-coriaceous below, flat or rounded on back. Lower floret represented by a short hyaline lemma. Upper lemma entire or bidentate, awned or awnless, sometimes almost suppressed. Stamens 2.


Sacciolepis Nash
(Panicoideae—Panicae—Setariinae)


Sartidia De Winter
(Arundinoideae—Aristiidae)


Schizachyrium Nees
(Panicoideae—Andropogoninae—Andropogoneae)


Schmidtia Steud. ex J.A.Schmidt
(Chloridoideae—Pappophoreae)


Schoenefeldia Kunth
(Chloridoideae—Cynodontiidae—Chloridinae)


Sclerodactylon Stapf
(Chloridoideae—Eragrostideae—Eleusininae)

Densely caespitose glaucous perennials, sometimes with creeping stolons; culms erect, straight and usually simple. Leaves all basal; blade subulate, cylindric or ± compressed and elliptic in section, glabrous, pungent. Inflorescence of paired or digitate racemes; racemes with imbricate, biseriate, sessile or subsessile spikelets and terminating in an abortive spikelet. Spikelets several-flowered, laterally compressed, disarticulating between florets or several florets falling together, glabrous; glumes 1-nerved, unequal, keeled, coriaceous, shorter than lemmas; lemmas 3-nerved, keeled, coriaceous, acute and muticous or mucronulate at apex; palea with winged keels. Caryopsis elliptic, smooth; pericarp free.

Monotypic genus: Sclerodactylon macrostachyum (Benth.) A.Camus, Ocean islands and the adjacent coast of E Africa; sthn trop. Afr.: Mozambique.

Sehima Forssk.
(Panicoideae—Andropogoneae—Ischaeminae)


Setaria P.Beauv.
(Panicoideae—Panicinae—Setariinae)

Cymbosetaria Schweick.; Simon: 30, 65 (1971).


Sinarundinaria Nakai
(Bambusoideae—Bambuseae)


Fruticose or arborescent gregarious bamboos 2–20 m tall with stout creeping woody rhizomes; culms woody with many prominent nodes. Leaves usually with tesselate venation; laminae finally disarticulating from sheaths. Inflorescence terminal and/or lateral, variable, paniculate or racemose. Spikelets pedicelled, 1–several-flowered, all bisexual or often uppermost one reduced, linear in outline, cylindrical or laterally compressed, usually somewhat loose; rachilla disarticulating between florets, with joints thickened towards apex; glumes 2 (more rarely 1), slightly unequal, much shorter than florets, persistent, few- to many-nerved, membranous; lemmas large, membranous, chartaceous or coriaceous, dorsally rounded, 5–13-nerved, usually with transverse veinlets, with apex acute, acuminate or mucronate; palea several-nerved, 2-keeled, only little shorter than lemma, often ciliate along keels, embraced by lemma. Lodicles 3, relatively large, ovate-lanceolate, ciliate, with nerves in lower part. Stamens 3 (very rarely 6). Ovary subglobular; styles 2 or rarely 3. Caryopsis narrowly oblong in outline, indurate, dorsally rounded, ventrally with a longitudinal furrow; scutellum circular.

Species ± 50: 2 in Central America, 1 in Africa, 2 in Madagascar, the rest in Asia; sthn trop. Afr. 1. Sinarundinaria alpina (K.Schum.) Chao & Renvoize, Malawi. Many species have been cultivated for ornamental purposes.

Sorghastrum Nash
(Panicoideae—Andropogoneae—Sorghinae)

Sorghastrum nudum (L.) Nash, 1867; S. nutans (L.) Nash, 1867; S. halepense (L.) Nash, 1867; S. parviflorum (L.) Nash, 1867; S. concolor (L.) Nash, 1867; S. spicata (L.) Nash, 1867. There are many species and cultivars of this genus used for agricultural purposes.

Miscanthidium Stapf; Watson & Dallwitz: 609 (1994).

Sorghum Moench
(Panicoideae—Andropogoneae—Sorghinae)
Sthn trop. Afr. 3 or 4 (plus hybrids and cultivated species), Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Sporobolus R.Br.
(Chloridoideae—Eragrostideae—Sporobolinae)

Stenotaphrum Trin.
(Panicoideae—Paniceae—Setariinae)

Stereochna Hack.
(Panicoideae—Paniceae—Setariinae)

Stereochlaena Hack.
(Panicoideae—Paniceae—Digitariinae)

Stereogrostis Nees
(Arundinoideae—Aristideae)

Striblochaete Pilg.
(Pooideae—Meliceae)

Streptolophus Hughes
(Panicoideae—Paniceae—Cenchrinae)
Rambling annuals with weak, decumbent to geniculate-ascending, branching culms. Leaves sagittate-lanceolate, long-attenuate, prominently narrowed, slightly retrorse-sabrid, with a slender petiolo densely pubescent at apex, standing out at an angle and holding leaf blade well away from sheath. Inflorescence a narrow panicle with primary branches bearing pedunculate clusters of spikelets in which branchlets are reduced to slightly flattened bristles which become ± fused at base. Spikelets sessile or sub sessile, crowded in clusters becoming reflexed and finally disarticulating from main axis. Glumes subequal, rounded, papillosse at apex, hyaline, few-nerved, much shorter than spikelet. Florets: lower one reduced to a glume as long as spikelet; upper one bisexual. Lodicules 2, minute. Stamens 3. Ovary glabrous; styles long, terminal; stigmas plumose.
Monotypic genus: Streptolophus sagittifolius Hughes, known only from Angola.

Stypeochoila De Winter
(Arundinoideae—Aristideae)

Tetrapogon Desf.
(Chloridoideae—Cynodonteae—Chloridinae)

Thelepepa Roth ex Roem. & Schult.
(Panicoideae—Andropogoneae—Ischaeminae)
Stapf: 34 (1917); Simon: 19, 52 (1971); Clayton & Renvoize: 744 (1982); Cope: 54 (2002).

Themeda Forssk.
(Panicoideae—Andropogoneae—Anithistiriinae)

Trachypropo Nees
(Panicoideae—Andropogoneae—Germainininae)

Tragus Haller
(Chloridoideae—Cynodonteae—Zoysiinae)

Tricholaena Schrad. ex Schult.
(Panicoideae—Paniceae—Melinidinae)

Trichoneura Andersson
(Chloridoideae—Eragrostideae—Eleusininae)

Trichopteryx Nees
(Panicoideae—Arundinelleae)
Dorsally compressed, dull brown. Lemma produced into a short, straight, antrorsely scabrid ovate-oblong, membranous, obtuse, 3-nerved, middle nerve pubescent below, glabrous above, emarginated to bidentate, upper ones male, all exserted from the glumes. Spikelets 4–6-flowered, suffused with purple, slightly laterally compressed, plump; lower florets bisexual, open panicle. Tufted perennials. Leaves: sheaths shiny, persistent; blades linear; ligule a line of short hairs. Inflorescence a delicate open panicle. Spikelets 4–6-flowered, suffused with purple, slightly laterally compressed, plump; lower florets bisexual, open panicle. Tufted perennials up to 1.5 m high; culms slender, erect or ascending. Inflorescence a panicule bearing spikelets in triads with connate pedicels; peduncle developing a fragile hook-like awn; spikelet brown, upper florets eventually disarticulating; lower glume 2/3 to as long as spikelet, villose with tubercle-based white or golden hairs; lower lemma 5-nerved; upper lemma with or without hair tufts, bilobed, with a persistent geniculate awn; callus short, broadly rounded; palea keels with or without narrow wings, but these not clasped by the lemma.

Species 18, all in Eastern USA to Argentina except 1: (Tridens) Gossweilerochloa delicatula

Tufted perennials. Leaves: sheaths shiny, persistent; blades linear; ligule a line of short hairs. Inflorescence a delicate open panicle. Spikelets 4–6-flowered, suffused with purple, slightly laterally compressed, plump; lower florets bisexual, open panicle. Tufted perennials up to 1.5 m high; culms slender, erect or ascending. Inflorescence a panicule bearing spikelets in triads with connate pedicels; peduncle developing a fragile hook-like awn; spikelet brown, upper florets eventually disarticulating; lower glume 2/3 to as long as spikelet, villose with tubercle-based white or golden hairs; lower lemma 5-nerved; upper lemma with or without hair tufts, bilobed, with a persistent geniculate awn; callus short, broadly rounded; palea keels with or without narrow wings, but these not clasped by the lemma.


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**Pontederiaceae**

*(Liliidae—Haemodorales)*

*(Commelinids—Commelinales)*

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**Eichhornia Kunth**


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**Heteranthera Ruiz & Pav.**


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**Monochoria C.Presl**


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**Potamogetonaceae**

*(Alismatidae—Najadales)*

*(Monocots—Alismatales)*

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Sthn trop. Afr.: genus 1, species 7.

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**Potamogeton L.**


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**References**


RENDLE, A.B. 1899. *Catalogue of the African plants collected by Dr. Friedrich Welwitsch in 1853–61*, vol. 2(1). Trustees of the British Museum (Natural History), London.


Potamogetonaceae: References


Restionaceae

(Commelinidae—Restionales)
(Commelinids—Poales)


References


Ruppiaceae

(Alismatidae—Najudales)
(Monocots—Alismatales)


Ruppius L.


Species 7 or 8, cosmopolitan, mainly in temperate regions; sthn trop. Afr.: 1; Ruppius maritima L. var. maritima, Angola, and sthn Afr. Sometimes placed under Potamogetonaceae (Brummitt 1992).

References


Smilacaceae

(Liliidae—Dioscoreales)
(Monocots—Liliales)


Smilax L.

Baker: 423 (1898); Burtt Davy et al.: 95 (1958); White: 15 (1962); Hepper: 111 (1968); Cowley: 1 (1989); Conran: 417 (1998); White et al.: 109 (2001); Mapaura (Unpublished).

Species 2, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

References


Strelitziaceae
(Zingiberidae—Zingiberales)
(Commelinids—Zingiberales)


Sthn trop. Afr.: genus 1, species 2.

Strelitzia Aiton
Dyer: t. 997 (1946); Manning & Goldblatt: 932 (1989); Andersson: 454 (1998); Coates Palgrave: 118 (2002); Mapaura (Unpublished).


References

Taccaceae
(Liliidae—Haemodorales)
(Monocots—Dioscoreales; included in Dioscoreaceae)

Perennial herbs with a tuberous or elongated rhizome and 1–3 basal leaves. Leaves large, long-petiolate, 3-partite, each part 1–3-pinnatisect; petiole up to 1 m long, longitudinally ridged. Inflorescence terminal, usually on a solitary flowering stem, umbellate, surrounded by 4–12 large involucral bracts and by many filiform floral bracts. Flowers bisexual, regular, epigynous. Tepals 6, petaloid, connate at base, persistent. Stamens 6, in 2 whorls, adnate to base of tepals; filaments short, flat, somewhat petaloid, forming together with the broad connective a hood-like structure over the solitary anther; anther 2-thecous, introrse, opening by longitudinal slits. Ovary inferior, 1-locular, 3-carpellate, 6-ribbed, with 3 parietal placentas, each with many anatropous to campylotropous ovules. Fruit a berry. Seeds longitudinally ridged, surrounded by a thin fleshy aril when fresh; embryo small, in copious starchless endosperm rich in fat and protein. $x = 15$.

Genus 1, species 10, pantropical Old World, with 1 or more in New World; sthn trop. Afr.: genus 1, species 1.


Tecophilaeaceae
(Liliidae—Asparagales)
(Monocots—Asparagales)


Additional family characters: Tubers or corms often superposed to form a vertical series. Roots emerging from sides of tubers. Seeds containing chalazosperm (nutrient tissue developing at chalazal end).

Emended family notes: Genera 8, species 26, Chile, California and tropical and southern Africa; sthn trop. Afr.: genera 3, species 4.
Key to genera

1a Plants with leafy stems; flowers ± solitary in leaf axils; plants perennating by 1–several irregular tubers ................................................. Walleria

1b Plants without stems; flowers in terminal scapose inflorescences; plants perennating by corms often superposed one on top of the other:

2a Leaves ± 4, with bases surrounding the lower part of the scape, attenuate into ± indistinctly defined petiole; tepals white; anthers dehiscing by a short, clavate, intorse slit ...................................................................................................................................................................... Kabuyea

2b Leaves solitary on upper surface of corm, not surrounding the base of the scape, distinctly petioled; tepals blue; anthers dehiscing by an apical pore ......................................................................................................................................................................................... Cyanastrum

Cyanastrum

Olivia

Geophytes with annual aerial parts; tubers depressed-globose to disc-like, superposed to forming a vertical series, not tunicately; roots emerging from sides of tuber. Leaves basal, petiolate to subsessile, rolled in bud, ovate to ovate-orbicular, decurrent to cordate, with schizogenous oil channels. Inflorescence racemose, terminating a flowering stem, sometimes appearing before leaves; bracts and bracteoles present or absent. Perianth: segments forming a very short tube at base, blue or white. Stamens all perfect and similar, arising on perianth at throat of tube. Seeds containing chalazosperm (nutrient tissue developing at chalazal end); embryo subglobose, containing starch.


Kabuyea

Brummitt

Perennial acaulescent herbs; corms several, superposed one above the other. Leaves basal, ± 4, closely enfolding base of scape, sheathed by 1 or more outer cataphylls; inner cataphylls present or absent, not sheathing; lamina long-attenuate at base into an indistinctly defined petiole. Inflorescence scapose with flowers racemously arranged. Tepals white, ± free to base. Stamens: anther thecae oblong, opening intorsely by an apical pore. Ovary half-inferior; ovules 2 per carpel, only 1 developing into a seed. Capsule with only 1(2) carpels developing a seed; fertile carpel globose, dehiscing by a complete longitudinal split. Seeds globose; endosperm present; chalazosperm lacking.


Walleria

J.Kirk


References


Velloziaceae
(Liliidae—Liliales)
(Monocots—Pandanales)


Sthn trop. Afr.: genus 1, species 19.

Xerophyta Juss.


Vellozia Vand., in part; Burtt Davy et al.: 100 (1958); White: 17 (1962).


References


Xyridaceae
(Commelinidae—Commelinales)
(Commelinids—Poales)


Sthn trop. Afr.: genus 1, species ± 40.

Xyris L.

Rendle: 67 (1899); Lock: 883; (1998); Lock: 301 (1999a); Lock: 1 (1999b); Rudall & Sajo: 795 (1999); Lisowski et al.: 1 (2001).


References


Zannichelliaceae
(Alismatidae—Alismatales)
(Monocots—Alismatales; included in Potamogetonaceae)


Zannichellia L.


Sthn trop. Afr. ?1: Zannichellia palustris L., no firm record for the region was seen. Recorded from sthn Afr.

References

ZANNICHELLIACEAE: References


Zingiberaceae
(Zingiberidae—Zingiberales)
(Commelinids—Zingiberales)


Sthn trop. Afr.: genera 4, species ± 16.

Key to genera

1a Style exerted well beyond the anther; the long, subulate anther crest is wrapped around the style ................................................................................................. 1b
1b Style not exerted beyond the anther; crest, if present, not wrapped around the style:

2a Inflorescence a many-flowered panicle with an elongated axis; flowers, including the pedicel, shorter than 25 mm ................................................................. 2b
2b Inflorescence condensed, without an elongated axis or, if the axis is elongated, then each bract subtends only 1 flower, which, with its pedicel, is longer than 25 mm:

3a Apex of stamen petaloid, at least twice as long as the basal anther; small plants, often flowering before the leaves are fully developed; leaf sheaths usually not forming a pseudostem, at least at time of flowering ........................................................................................................................... 3b
3b Apex of stamen 2- or 3-lobed or truncate, shorter than the anther; large plants with leafy shoots fully developed at flowering time; leaf sheaths always forming a distinct pseudostem ................................................................................................................................. 4b

4b Style not exserted beyond the anther; anther crest, if present, not wrapped around the style:

5a Apex of stamen petaloid, at least twice as long as the basal anther; small plants, often flowering before the leaves are fully developed; leaf sheaths usually not forming a pseudostem, at least at time of flowering ................................................................................................. 5b
5b Inflorescence a many-flowered panicle with an elongated axis; flowers, including the pedicel, shorter than 25 mm...............................

Perennial herbs with erect leafy stems and extensive rhizome system. Leaves with long sheathing bases forming a pseudostem; base of lamina contracted into a pseudopetiole; ligule very small. Corolla: tube split down one side. Calyx: tube split down one side. Corolla: tube narrow, ± as long as calyx; lateral petals narrow; ciliate margins; stylostyles at base of style subtulate or contorted. Fruit: a capsule, fleshy at first, later dehiscent around style. Seeds: many, white, lacerate arill.


Siphonochilus J.M. Wood & Franks


*Zingiber Boehm.
Boehmer: 89 (1760), name conserved; Schumann: 165 (1904); Loesener: 586 (1930); Larsen et al.: 488 (1998).

Perennial herbs with creeping, aromatic, fleshy rhizome; leafy stems usually separate from flowering ones. Inflorescence cylindrical to ovoid; peduncle long; bracts closely imbricate or with free apices, often brightly coloured, each enclosing a 1(2–4)-flowered cincinnus. Calyx tubular, 3-denticulate at apex, split down one side. Corolla: tube ± as long as bracts, lateral lobes connate and fused to centre of labellum in lower third; labellum 3-lobed. Stamen: with short filament connective apically produced into a long, subulate appendage wrapped around style. Fruit: a capsule, fleshy at first, later leathery and dehiscent. Seeds: many, with white, lacerate arill. x = 11.

Species 60, Indomalesia to E Asia and tropical Australia. *Zingiber officinale Roscoe (Ginger) and *Z. zerumbet (L.) Sm. are cultivated and may persist as relics of cultivation.
References


LINNAEUS, C. FILIUS. 1782 (‘1781’). Supplementum plantarum. Orphanto-trophium, Braunschweig.


Zosteraceae

(Alismatidae—Alismatales)
(Monocots—Alismatales)


Sthn trop. Afr.: genus 1, species 1.

Zostera L.
Bennett: 225 (1901); Obermeyer: 58 (1966); Isaac: 30 (1968); Cook: 224 (1990); Bandeira: 191 (2002).


References


This list is based on the glossary in Retief & Herman (1997, Plants of the northern provinces of South Africa: keys and diagnostic characters. *Strelitzia* 6) which was compiled mainly from Jackson (1928, *A glossary of botanic terms*, edn 4); Exell & Wild (1960, *Flora zambesiaca* 1, 1: 42–54); Radford et al. (1974, *Vascular plant systematics*) and Little & Jones (1980, *A dictionary of botany*). Much additional material was gained, chiefly from Orchard (1999, *Species plantarum: Flora of the world. Introduction to the series*).

Abbreviations: *adj.*, adjective; *pl.*, plural; *sing.*, singular; *syn.*, synonym; *vb.*, verb.

**A**

*a-*(prefix): without, lacking.

abaxial: applied to the side or surface facing away from the axis or stem (compare *abaxial*).

abortion: suppression of parts which are usually present.

abscission: the normal shedding from a plant of an organ that is mature or aged.

acarodematium (*pl.* acarodomatia): a small cavity of very varying form, found on almost any vegetative part of the plant, which is inhabited, or thought to be inhabited, by mites; commonest types are small pockets or pits in axes of main veins with midrib on lower leaf surface.

acaulent/acauline: stemless or seemingly so.

accrecent: increasing in size, e.g. the calyx of some plants in the fruiting stage.

accumbent: lying against, as the *cotyledons* (in some Brassicaceae) with their edges against the radicle.

achen: a small dry fruit, not splitting when ripe, formed from a *superior* ovary of one *carpel* and containing a single seed, with the seed coat free from the fruit wall, as in *Clematis* (Ranunculaceae) (compare *cypsela*).

acicular: very narrow, stiff and pointed, needle-like.

acinciform: scimitar-shaped; shaped like a short, curved, single-edged sword.

acropetal: arising or developing in a longitudinal sequence towards the apex.

actinomorphic: applied to flowers which are radially symmetrical, i.e. capable of being bisected into similar halves in more than one vertical plane, forming mirror images (= *regular*) (compare *irregular*, *zygomorphic*).

acute: with *prickles*, as distinct from *spines*.

aculeate: with small *prickles*.

acumen: a long, tapering point.

acuminated: having a long, slender, sharp point with a terminal angle less than 45°, with margins straight to convex.

acute: sharp-pointed, with a terminal angle between 45° and 90° with margins straight to convex.

adaxial: applied to the side facing the stem or axis (compare *abaxial*).

adnate: fused to an organ of a different kind, e.g. an ovary to the calyx tube.

adpressed: see *appressed*.

adventitious: applied to plant organs produced in an unusual or irregular position or at an unusual time of development, as in adventitious buds, roots or shoots.

adventive: introduced recently by chance to an area (compare *introduced*, *naturalised*).

aerenchyma (*adj.* aerenchymatous): tissue of thin-walled cells and large intercellular spaces, found especially in water- and marsh plants.

astivation: the manner in which sepals and petals are arranged in a bud (compare *vernation*).

aggregate fruit: a cluster of fruits formed from the *free* carpels of one flower, e.g. the many small drupes in the 'fruit' of *Rubus* (Rosaceae) (compare *syncarp*).

alate: winged, as in certain stems or seeds; having wing-like extensions.

albumen (*adj.* albuminous): starchy or other nutritive material within the embryo; an older term largely replaced by the term *endosperm*.

allopatric (of two or more taxa): having different ranges of distribution (compare *sympatric*).

alternate: applied to leaves and other organs inserted singly at different levels along the axis.

alternipetalous: applied to floral parts arising alternately with the petals.

alternisepalous: applied to floral parts arising alternately with the sepals.

alveola (*pl.* alveolae): small pits on the surface, as on the receptacle of many of the Asteraceae (see *alveolate*).

alveolate: honeycombed; having deep angular sides, like the cavities of a honeycomb.

amphistomatic/amphistomatous: with stomata on both upper and lower leaf surfaces.

amphitropous ovule: an ovule which is attached near its middle and is bent in the form of a U, so that the ovule tip and stalk base are near each other.

amplexicaul: stem-clasping, as when the base of the leaf is dilated and embraces the stem.

ampullaceous: swollen out in flask-shape.

anacampylotropous: applied to an *ovule* intermediate in structure between *anatropous* and *campylotropous*.

anamphotherous: of a filament without anther.

anastomosis (*vb.* anastomose): union of one vein with another, the connections forming a network.

anatropous: applied to an *ovule* that is inverted, so that the funicle is basally attached near the adjoining *micropyte* area, and the *chala* is at the opposite end.

ancipitous: two-edged; flattened or compressed, as in stems of certain Poaceae.

androceium: the *stamens* and accessories of one flower.

androgyrophore: a stalk supporting both *androceium* and *gynoceium* of a flower above the level of insertion of the *perianth*.

androphore: a stalk bearing the *androceium*.

androspodium: the structure on which the stamens arise (in some
GLOSSARY

Podostemaceae).  
anomocytic: of a stoma surrounded by a limited number of cells that are indistinguishable from those of the remainder of the epidermis.  
antepetalous (e.g. of stamens): opposite the petals.  
antepepalous (e.g. of stamens): opposite the sepals.  
anterior (applied to floral organs): in a position most remote from the axis (compare posterior/posticus).  
anthela (adj. anthelate): a panicle in which the lateral axes overlap the main axis.  
anther: the part of the stamen which contains the pollen, usually comprising four microsporangia or pollen sacs, two in each half or lobe of the anther; the tissue separating the two sacs in each half usually disintegrates before anthesis, resulting in a 2-thecous/bithecous/2-locular/2-celled anther.  
anther canal (in orchids): the narrow basal portion of a pollinium.  
antherode: a sterile anther, often rudimentary.  
anther slits: see gynostegial grooves.  
anther wings (in Asclepiadoideae—Apocynaceae): see gynostegial grooves.  
anthesis: period during which the flower is open.  
anthocarp: a false fruit formed by the union of floral parts with the fruit (as in Nyctaginaceae).  
anthophore: a short stalk between calyx and petals (e.g. in Dianthus—Caryophyllaceae).  
anticous/antical: applied to that which is most remote or turned away from the axis; occasionally employed for introrse, as applied to anthers (compare posticus).  
antrorse: bent or directed towards the apex or forward (compare retrorse).  
apex (pl. apices): tip; topmost part or terminal end.  
aphehia: stipular outgrowths which occur on the rachis.  
apicule/apiculum/apiculus (adj. apiculate): a short point.  
apocarpous: with carpels free from one another.  
apophysis (pl. apophyses): the rounded, exposed thickening on the free from one another.  
apopores: of an anatropous ovule with ventral raphe.  
appendiculate/appended: with small appendages; hanging in small fragments.  
appressed: lying close to and flat along the surface.  
aquatic: living in water.  
arachnoid: cobwebby by soft and fine entangled hairs which are longer than in tomentose.  
araneose/araneous: see arachnoid.  
arborescent: having the shape or characteristic of a tree.  
arcuate: curved like a bow.  
arculate: divided into distinct spaces.  
aride: a small pit or raised spot, often bearing a tuft of hairs or spines; a space marked out on a surface; a small area in a leaf between small veins.  
aril: an appendage covering or partly enclosing the seed and arising from the funicle (stalk) of the seed.  
arilode: a false aril; a fleshy coat derived from the orifice or micro-pylar rim of the outer integument instead of the stalk of an ovule.  
arillus (pl. arilli, adj. arillate): see aril.  
arista (pl. aristae): a bristle-like appendage as on glumes of many Poaceae; a bristly awn.  
aristate: with a long, bristle-like point.  
article: one of the segments of a jointed fruit, such as a loment, or internodes of the branchlets of e.g. *Casuarinaceae or Salicorniae—Chenopodiaceae.  
ariculate(d): jointed or separating at a certain point and leaving a clean scar.  
ariculation: a joint, e.g. between the column and the lower part of the lemma in *Aristida* (Poaceae).  
ascendent/ascending: growing erect after an oblique or ± horizontal beginning.  
ascending (of aestivation): sepals or petals arranged in the bud so that the upper margins of the lowest member overlap the lower margin of the member above it.  
asperous: rough, harsh to the touch.  
asperulate/asperulous: slightly rough to the touch.  
ategmic (of a seed): without covering.  
atrocastaneous: dark chestnut-coloured; dark brown.  
atenuate: tapering gradually.  
aulacospermous (of seeds): furrowed.  
auricle (adj. auricled/auriculate): an ear-like lobe or appendage at the base of a leaf or other organ.  
autogamous: self-fertilising.  
avn: a fine bristle usually terminating an organ, as at the tip of the glumes and lemmas of many Poaceae.  
avil: the angle between leaf or bract and the axis bearing it.  
avire placation: placation with the ovules borne on the axis or the inner angle of the locules of a syncarpous ovary (see also marginal and parietal placation).  
axill: arising from the axil.  
axis (of an inflorescence): that part of the stem or branch on which the individual flowers are borne.  

B  
baccate: berry-like.  
baculate (of pollen grains): covered with rods that are higher than wide and not constricted at their base.  
barbate: bearded.  
barbed: with rigid points or lateral bristles pointing backwards.  
barbellate: shortly barbed.  
basal: at the base.  
basifixed: fixed by its base, e.g. of an anther (compare dorsifixed, medifixed, versatile).  
basiscopic: toward the basal or proximal (as opposed to distal) end; facing basally.  
B-chromosomes (accessory chromosomes): supernumery chromosomes occurring in addition to the normal diploid complement.  
beak: a prominent terminal projection, especially of a carpel or fruit; a slight narrowing of the lemma below the awns, as distinct from a longer straight column, e.g. in *Aristida* (Poaceae).
buttress: a flange of tissue protruding from the base of the main trunk of a tree.

berry: a juicy fruit with soft pericarp, the seeds immersed in pulp (compare drupe, pyrene).

bi- (prefix): twice; two; having two.
bicallose: with two calli.
 bicarpellate: of an ovary: with two carpels.
bicolorous: two-coloured.
bifacial: of a leaf: dorsiventral, having a distinct upper and lower surface.
bifarious: see distichous. bifid: eft into two parts for ± half the length.
bifoliate: having two leaves.
bifoliate: having two leaflets.
 bilabiate: 2-lipped, as when two or three lobes of a calyx or corolla stand separate as an upper lip from the others forming a lower lip.
bilocular: with two locules or compartments.
binate: in pairs.
bipinnate: when the primary divisions (pinnae) of a pinnate leaf are themselves pinnate.
biramous: with two branches.
biseriate: arranged in two rows or whorls.
bisexual: having both sexes in the same flower or inflorescence.
bitegmic: of an ovule having two integuments.
biteminate: of a leaf: with two orders of leaflets, each ternately compound.
bithcate: of an anther: with two thecae.
bivalved: having two valves.
blade: the expanded part of a leaf or petal (see also lamina, limb).
bostrychoid: having the form of a bostryx.
 bostryx (helicoid cyme): a spiral inflorescence, with axes on different planes, branching always in the same direction.
bothypospernum (of seeds): pitted.
botryoid: like a cluster of grapes.
brachyblast: a spur shoot or short branch.
 bract: a leaf-like structure, different in form from the foliage leaves and without an axillary bud, associated with an inflorescence or a flower.
bracteal cup: cup-shaped structure formed by fused bracts (e.g. in Viscaceae).
bracteate: possessing or bearing bracts.
bracteole (adj. bracteolate): small bract borne on the pedicel or calyx of a flower.
bractiform: looking like a bract.
bristle: a stiff, strong trichome, similar to a pig’s bristle, as in the perianth of some Cyperaceae.
bruchidodromous: of a leaf: with a single primary vein, the secondary veins not terminating at the margin but joined together in a series of prominent upward arches or marginal loops on each side of the primary vein.
bud: an undeveloped shoot that can give rise to a branch or flower.
bulb: a storage organ, usually underground, made up of a usually much abbreviated stem and fleshy leaf bases.
bulbils: a small deciduous bulb (or tuber) formed around the mother bulb or in the axil of a leaf, and functioning to propagate the plant vegetatively.
bulbous-based: with an inflated base.
bullate: having a blistered or puckered surface; of a leaf surface: prominently raised, like a bubble, between the veins.
burr: a rough or prickly propagule consisting of a seed or fruit and associated floral parts or bracts.
buttock: a flap of tissue protruding from the base of the main trunk of a tree.

C
caducous: falling off early.
caesipose: growing in tufts.
calcarate: having a spur.
calciiform: shaped like a slipper.
callous: hard and thick in texture; bearing calli.
callosities: a leathery or hard thickening of part of an organ.
callus: a dense, often pendulous spike of small unisexual flowers which have no conspicuous perianth.
caudate: abruptly ending in a long tail-like tip or appendage.
caudex: a short, thickened, often woody, vertical or branched perennial stem, usually subterranean or at ground level (e.g. in some

calycine: belonging to the calyx.
calyculus: of an ovule: resembling an outer calyx (see also epicalyx).
calyx (pl. calyces): the outer envelope of the flower, consisting of free or united sepals.
calyx tube: when the sepals are partly united, the lower portion is referred to as the tube and the upper free part as the limb usually divided into calyx teeth, lobes or segments (see also hypanthium).
campanulate: bell-shaped.
campylotropous: of an ovule: orientated transversely (i.e. with its axis at right angles to its stalk and with a curved embryo sac).
canaliculate: channelled.
canescence: ± grey-pubescent or hoary.
can(-prefix): greyish white (usually applied to hair covering).
capillary: resembling a hair; very slender.
capitate: (1) like the head of a pin, as the stigma of some flowers; (2) collected into compact head-like clusters, as the inflorescences of Asteraceae.
capitiform: shaped like a capitulum.
capitulum: (pl. capitula): a dense head-like inflorescence usually of sessile flowers (see also head).
capsule: a dry fruit composed of two or more united carpels and either splitting when ripe into flaps called valves or opening by slits or pores.
carina (adj. carinal): a keel; the two partially united anterior (lowest) petals of a papilionaceous flower, or the single, similar-shaped, anterior petal in many Polygalaceae.
carine: keeled.
carnose: fleshy.
carpel: an organ (generally believed to be a modified foliar unit) at the centre of a flower, bearing one or more ovules and having its margins fused together or fused with other carpels to enclose the ovule(s) in an ovary, and consisting also of a stigma and usually a style (see also suture).
carpellate: possessing carpels.
carpophore: the stalk of a carpel or of a mericarp. carrier: see corpuscle.
carpopodium: the stalk of a fruit.
cartilaginous: hard and tough, as the skin of an apple-pip.
caruncle (adj. caruncular): outgrowth from integuments at or near the hilum of certain seeds (see also strophiole).
caryopsis: a 1-seeded, dry, indehiscent fruit with the seedcoat adnate to the fruit wall, derived from a 1-loculed superior ovary (characteristic of Poaceae) (compare achene).
castaneous: chestnut-coloured; dark brown.
cataphyll: small scale leaf, e.g. on rhizomes of flowering plants.
catkin: a dense, often pendulous spike of small unisexual flowers which have no conspicuous perianth.
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spp. of *Encephalartos*—*Zamiaceae*).
caudicle: the stalk of a pollen mass connecting it to the corpuscle, in Asclepiadaceae and Orchidaceae (also known as translator arm).
caulescent: with an obvious leafy stem; having an evident stem above ground.
cauliflorous: producing flowers from old wood (compare ramiflorous).
cauline: arising from or inserted on the stem.
centric (of a leaf): filiform to cylindrical with a ± continuous pali-sade layer (see also unifacial).
centrifugal: as inflorescences, blooming from the outside inward or from the base upward.
chalaza (adj. chalazal): basal region of the ovule where it joins the funicle; region of a seed opposite the micropyte.
chamaephyte: a perennial plant, generally woody or partly woody, with the mean height of the renewal buds less than or equal to 0.7 m from the ground.
chartaceous: papery in texture, opaque and thin.
chasmosymous: pollinated when the flower is open (compare cleistosymous).
chasmosphyte: plant growing in rock crevices.
chlorenchyma: parenchyma cells containing chloroplasts.
choripetalous: having separate and distinct petals (= polypetalous) (compare gamopetalous, sympetalalous).
ciliate (sing. cilium): short epidermal outgrowths, such as hairs or scales ± confined to the margins of an organ.
ciliata: with a fringe of hairs along the edge.
ciliolate: minutely ciliate.
cinnamomus (pl. cinnimi, adj. cincinnate): a tight, unilateral scorporid cyme.
cincinni: spirally coiled, with the tip innermost, as the leaves of *Drosera*—*Drosieraceae*.
circumcissile: applied to an organ opening as if cut circularly around the upper part, which then comes off like a lid.
cirrhiferous: producing tendrils.
cirrhose: having tendrils.
cistolith: see cystolith.
cladode: a flattened, folicaceous stem having the form and function of a leaf, but arising in the axil of a minute, bract-like caducous, true leaf (compare phylode).
cleistograph: a modified, condensed inflorescence, as found in *Eucalyptus*—*Myrtaceae*.
clathrate (of a pollen grain): having elongate, longitudinal apertures.
colporate (of a pollen grain): having compound apertures (adj. colporate).
colporous (of a pollen grain): a compound aperture consisting of an ecotocolp with one or more endopores.
colpus (pl. coli): (of a pollen grain): a usually longitudinal, ± distinct aperture (compare sulcus).
column: (1) the adnate stamen and style forming a solid central body, as in orchids; (2) the tube of connate filaments, as in Malvaceae; (3) a straight structure between the apex of the lemma and the branching point of the awns, as in *Aristida* and *Stipagrostis* (Poaceae) (see beak).
coma: a tuft of hairs at the end of some seeds; a terminal crown of leaves or bracts, e.g. in *Eucomis* (Hyacinthaceae).
commisural: of a joint or seam, such as that between two adhering sepals.
commisural: the faces of cohering carpels (e.g. in Apiaceae); the place of joining or meeting.
comose: bearing a tuft of trichomes, usually apically.
compilate: flattened; compressed.
complicate: folded on itself.
compound: the opposite of simple; composed of several similar parts, as a leaf of several leaflets; compound fruit: the fruits of separate flowers becoming united into a mass; compound umbel: each ray again bearing an umbel.
compressed: flattened lengthwise from side to side or from front to back.
concolor/concolorous: of uniform colour (e.g. upper and lower leaf surface with the same colour) (compare discolorous).
concrecent: growing/grown together.
conduplicate: folded together lengthwise.
condyle: an intrusion of the placenta which forms grooves or cavi-ties in the endocarp of the developing fruit (e.g. in Menisper-maceae).
confervoid: composed of threads; (of pollen): united in strings.
confloraceous: a modified, condensed inflorescence, as found in *Eucalyptus*—*Myrtaceae*.
connate: applied to parts of the same series which are united so closely that they cannot be separated without tearing.
connective: the part of an anther which connects its two thecae.
connivent: applied to parts converging so as to be nearer together above than below.
conoidal: ± conical.
conservation (of a name): the decision of an International Botanical Congress that a validly published name shall be used even though to do so is contrary to the International Code of Botanical Nomenclature (I.C.B.N.).
contorted (of sepals and petals): twisted in the bud so that each overlaps the adjoining one on one side and is overlapped by the other adjoining one on the other side, like a furled umbrella; spirally twisted.
contractile roots: a specialised type of root, often found in bulbous plants, that undergoes contraction and thereby pulls the bulb or shoot parts deeper into the soil.
convexity: the condition of being convex or having a curvature that bulges towards the point of observation.
convoluted: rolled up lengthwise (also used in the sense of contorted).
cordate: applied to the base of a leaf when it is ± deeply notched.
coriaceous: firm, tough, of the consistence of leather.
corm: a tuberous bulb-like rootstock.
cormous: possessing a corm.
corneous: bearing a horn.
corinicate: bearing or terminating in a small horn-like protuberance or process.
cornuate: bearing a horn.
corolla: the inner envelope of the flower, consisting of free or united petals.
corona: a crown; (in the flower of some Apocynaceae and Passifloraceae and others); a circle of appendages between the corolla and stamens, often united in a ring or crown; in some members of the Asclepiadoideae—Apocynaceae the corona consists of one or two (sometimes three) alternating rows different in size and shape, the outer row nearest to the corolla lobes, the inner row nearest to the staminal column.
coroniform: shaped like a crown.
corpuscle/corpusculum (pl. corpuscula): a small, ± spherical, slightly 2-parted, hard, usually brown to black, sticky body with two flexible arms (caudicles), each carrying one pollinium, in Asclepiadoideae—Apocynaceae.
cortex: the unspecialised tissue in stems and roots between the vascular bundles and the epidermis.
corymb (adj. corymbose): a ± flat-topped racemose inflorescence in which the branches or pedicels start from different points but all reach to about the same level.
costa (pl. costae): the midvein of a single leaf or the rachis of a pinnately compound leaf.
costule: the midrib of a pinnule or pinna segment.
cotyledon: the primary leaf of an embryo.
craspedodromous venation: leaf venation characterised by a single primary vein, with the lateral veins terminating at the margin.
crassate: coarse, gross, dense, thick.
crenate (noun crenation) (of a margin): notched with regular blunt or rounded teeth; scallloped.
crenulate: crenate with very small teeth; minutely scallloped.
crescentic/crescentiform: biconcave, resembling the shape of the moon in its first or last quarters.
crested: having a crest, elevated appendage or ridge on the summit of an organ.
crinite: bearded with long, weak hairs.
crispate: curled.
crista (adj. cristate): a crest or ridge.
cruciform: cross-shaped.
crustaceous: of brittle texture.
cucculate: hooded or hoop-shaped.
culm: the stem of Cyperaceae and Poaceae.
culturate/cultiform: shaped like a knife blade.
cuneate (of the base of a leaf): tapering gradually, i.e. wedge-shaped.
cuneiform: wedge-shaped; triangular, with the narrow part at the point of attachment.
cupule/cupulum (pl. cupula): a cup-shaped structure at the base of some fruits formed by the fusion of involucral bracts at their bases, e.g. the acorn of oaks, a structure at the base of the fruits of some palms, the cup-shaped involucule of some Asteraceae; a series of free trichomes apically on achenes of Asteraceae which become fused with age.
cupular/cupuliform: applied to a shallow, open structure, as the involucre of an acorn.
cusp: an abrupt, sharp, often rigid point.
cuspitate: abruptly tipped with a sharp rigid point.
cuticle: a noncellular layer of waxy or fatty materials on the outer wall of epidermal cells.
cutin (adj. cutinous): a waxy, waterproof substance that is the main constituent of the plant cuticle.
cythidiform: cup-shaped.
cythium: an inflorescence resembling a single flower, composed of unisexual flowers surrounded by bracts and often by glands, typical of Euphorbia—Euphorbiaceae.
cymbiform: boat-shaped.
cyme (adj. cymose): a determinate inflorescence in which each flower, in turn, is formed at the tip of a growing axis, and further flowers are formed on branches arising below it (compare indeterminate inflorescence).
cymule: a small cyme or portion of one, usually few-flowered.
cypsela (pl. cypsela): an achene derived from a 1-loculed, inferior ovary; as in the indehiscent fruits of Asteraceae (compare achene).
cystolith: mineral concretion, usually of calcium carbonate, in the epidermis of e.g. Acanthaceae and Urticaceae, showing up as streaks or protuberances, particularly in dried material.

D
deciduous: falling off at the end of the season of growth (compare evergreen).
decimate: angled downwards or forwards (compare decurved).
decompound: applied to leaves that are several times divided or compound.
decurrent: decreasing, gradually growing less.
decumbent: spreading horizontally at first but then growing upwards.
decurrent: as when the edges of the leaf are continued down the stem or petiole as raised lines or narrow wings.
decurved: angled downwards and curved or curled.
decussate: in opposite pairs, with each pair at right angles to the one above and below it.
deflexed: bent abruptly downwards or outwards (compare inflexed).
dehiscent/dehiscing (noun dehiscence): opening spontaneously when ripe as in capsules and anthers.
deliquescent: dissolving or melting away.
deltate: shaped like an equal-sided triangle.
deltoid: shaped ± like an equal-sided triangle.
dendritic/dendroid: tree-like; resembling the shape of a tree; having a branched appearance.
dentate (of a margin): prominently toothed, the teeth directed outwards.
denticulate: finely toothed/dentate.
depressed: ± flattened from above downwards or at least at the top.
determinate (of an inflorescence): with a bud or flower terminating the growth of the main axis (compare indeterminate).
dextrorse: turned toward the right (compare sinistrose).
di- (prefix): two-.
diad (of a pollen grain): two fused together (compare monad, tetrad).
diadelphous: having the stamens united into two groups, or all but one united in a group and one free (e.g. many Fabaceae) (compare monadelphous).
diadem: a crown.
diaphanous: very thin and transparent.
dichasium (adj. dichasial): a determinate type of cymose inflorescence having a central, older flower which develops first and a pair of opposite lateral branches bearing younger flowers (compare monochasium).
dichlamydeous: said of a flower having two whorls of perianth parts.
dichotomous: forking regularly into two equal branches.
dicotyledon: a flowering plant having two cotyledons in the seed (compare monocotyledon).
GLOSSARY

dictyostelic: with vascular bundles concentrically arranged with large overlapping leaf gaps, in the trunk.
didymous: 2-lobed; (of anthers): distinctly 2-lobed but with almost no connective.
didynamous (of stamens): with four in two pairs of unequal length, e.g. in Acanthaceae and Lamiaceae.
diffuse: loosely and openly branching or spreading.
digitate: like the fingers of a hand, with the members arising from the same point.
digitiform: shaped like a finger.
dimidiate: having one of two sides or parts more developed than the other.
dimorphic/dimorphous: of two forms.
dioecious: with unisexual flowers, the male and the female flowers on separate plants (compare monoeocious).
diploid: having two of the basic sets of chromosomes in the nucleus (compare haploid).
disarticulate: breaking apart at the joints.
disc: (1) an enlargement of the receptacle within the calyx or within the corolla or stamens, usually in the form of a ring, cup or cushion, often lobed or even cut up into so-called (nectary) glands; (2) disc floret: the central florets as compared with the ray florets in a head of the Asteraceae.
disciform/discoid: (of heads of Asteraceae): with central flowers perfect with disciform/discoid duplicate.
druse: an aggregate of crystals within a cavity.
duplicate: folded twice.
ed- (prefix): often implying absence of something, e.g. in ebracteate, eglandular.
ebracteate: without bracts.
ecalcarate: without a spur.
ecallose: without callus/callu.
ecalyculate: without a calyx/ulus.
ecaudate: without a tail-like tip or appendage.
echinate: covered with prickles like a hedgehog.
echinolophate (of a pollen grain): lophate with echinate ridges.
echinulate: covered with small, pointed spines.
emarginate: notched at the extremity.
embryo: the rudimentary plant still enclosed in the seed, consisting of the radicle from which the root develops, the cotyledons (one, two, rarely more), which become the earliest leaves, and the plumule, the bud from which the stem and further leaves develop.
emerger/erased: with part of the plant aerial and the rest submerged; with part extending out of the water.
endemic: having a natural distribution confined to a particular geographical region.
endocarp (adj. endocarpal): the innermost layer of the wall of a fruit.
endosperm: formerly called albumen, the nutritive material (mealy, oily, fleshy or horny), formed in the embryo sac after fertilisation and stored within the seed and often surrounding the embryo (compare perisperm).
endothecium (adj. endothelial): the inner lining of the theca of an anther.
enervate: without nerves.
ensiform: sword-shaped.
etire: with an even margin without teeth, lobes, etc.
entomophilous (of pollination): effected by insects (compare anemophilous, hydrophilous, ornithophilous).
epaleate: without paleae.
epapillate: without papillae.
epappose: without a pappus.
epi- (prefix): on, upon, above, over.
epipalcalyx: an involucre of bracts arising below the flower, resembling an extra calyx, as in some Malvaceae (see also calyculus).
epicarp: the outer layer of the wall of a fruit (see also pericarp).
epichile (of an orchid flower): apical portion of a longitudinally two- or three-partite lip.
epidermis (adj. epidermal): the outermost layer of cells of an organ, usually only one cell thick.
epigean: describing seed germination in which the cotyledons emerge from the seed and are elevated above the soil surface (compare hypogeal).
epignous: applied to the flower when the sepals, petals and stamens are apparently borne above the ovary, the latter being en-
GLOSSARY

closed in an adnate receptacle or calyx tube (compare hypogynous, perigynous).
epilithic: living on rocks (= lithophytic).
epipetalous: borne on the petals.
epiphyte (adj. epiphytic): a plant that grows on another plant but without deriving nourishment from it, i.e. not parasitic, as some ferns and orchids growing on trees.
episepalous or episepallous (of stamens): borne on the sepals.
epipetalous (of an anatorpous ovule): with its raphe facing the placenta when pendulous, facing away from it when ascending.
equitant (literally riding, astride); (of leaves): folded sharply in half along the midline so that the adaxial surface is hidden and the margins overlap both margins of a similarly folded leaf on the opposite side of the stem, thus creating a 2-ranked arrangement typically found in Iridaceae (compare obvolute).
ericoid: resembling plants of the family Ericaceae, especially their small, tough leaves.
erose: applied to a margin which is irregularly eroded, gnawed or jagged.
estipitate: having no stipe.
estrophiophyte: having no strophiole.
evagination: something that is inside out.
biganous: disappearing quickly.
ex- (prefix): often implying absence of something, e.g. extipulate.
exalbuminous: without albumen/endosperm.
examinate: without an annulus or other ring-like structure.
excessence: an outgrowth or protuberance, e.g. on the stem of a tree.
extraverse: extending beyond the apex or margin of a leaf into a macro or awn.
exfoliate: peeling off in layers or shreds.
eximbricate: not imbricate.
exine: outer wall of spores and grains, usually divided into different layers.
exocarp: the outer layer of the pericarp.
exserted: projecting beyond, as the stamens from the tube of the corolla (compare included).
exstipulate: without stipules.
extra-axillary: beyond or outside the axil.
extra-floral (of nectaries): not within the flower.
extrastaminal (e.g. of the corona): outside the stamen whorl.
extrorse: of an anther which opens outwardly towards the circumference of the flower (compare introrse).

f
facultative (of parasites): optional (compare obligate).
falcate: curved like a scythe.
family: a group of one to many genera believed to be related phylogenetically, usually clearly separable from other such groups; the major taxonomic group between genus and order.
farinos: covered with mealy powder resembling flour.
fascicle (adj. fascicled/fasciculate): a cluster of flowers, leaves, etc. arising at about the same point.
fastigate: strictly erect and ± parallel to other members, e.g. with reference to stems or branches.
fauca: of the throat of a gamopetalous corolla.
fenestrated: having openings or translucent areas (‘windows’).
ferruginous: rust-coloured.
fetid: see foetid.

fibrit: submicroscopic thread or fibre that constitutes the form in which cellulose occurs in the cell wall.
fibrillose: covered with small fibres.
-fid (suffix): indicating number of parts into which an organ is cleft (divided up to ± the middle).
 filament: the stalk of a stamen supporting the anther; a thin thread.
filamentous: thread-like.
filiform: slender, thread-like.
finibrilate: with the margin bordered by long, slender, hair-like processes.
finbrillate/fimbriiferous: minutely finibrilate.

fistular: hollow throughout its length, like a pipe but closed at the ends.
flagellate: fan-like.
flagelliferous: flagellate.
flagellum: style, the filamentous part of a stamen.
flagellum: filamentous part of a stamen.
flagelliform: flagellate, leafy.
flagellum in seed: the flagellum in the seed; a small scale.
flabellate: having a thin, thread-like leaf; with the margin bordered by long, slender, hair-like processes.
flaccid: weak, limp, lax or flabby, tending to wilt.
flaccid: weak, limp, lax or flabby, tending to wilt (compare turgid).

floccose: covered with woolly hairs which tend to rub off and adhere in small masses.
floral: belonging to or associated with a flower.
florescence: inflorescence with a cluster of flowers terminating the main axis, but not terminating with a flower and hence apex of florescence remaining indeterminate forming exclusively lateral flowers.
floral: a flowering and fruiting stem, especially of brambles (Rubus spp.—Rosaceae).
flora: the sexual reproductive structure of angiosperms, typically consisting of gynoecium, androecium and perianth and the axis/receptacle bearing these parts.
foetid/foetid: having a disagreeable odour.
folioscious: leaf-like.
foliar: of or relating to a leaf.
foliolate: having leaflets.
follicle (adj. follicular): a fruit formed from a single carpel opening usually only along the inner (i.e. ventral) suture to which the seeds are attached.
forb: a non-woody plant other than a grass, sedge, rush, etc. (compare herb).
-form (suffix): superficially resembling; e.g. an umbelliform inflorescence is one that resembles, but is not a true umbel.
fruit: a non-woody plant other than a grass, sedge, rush, etc. (compare herb).
fruit: fruit, the ovary of a flower.
fructescent: becoming shrub-like (woody).
fruticos: shrub-like.
fruitle: not a true umbel.
frutaceous: lasting only for a short time.
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GLOSSARY

fuscos: of a brownish grey colour.

fusiform: spindle-shaped, thick but tapering towards each end.

G

galea: a petal shaped like a helmet; the strongly concave upper lip (petal) of some bilabiate corollas.
galeate: helmet-shaped; having a galea.
gamate: a haploid cell or nucleus that fuses with another, of opposite sex, in sexual reproduction.
gametophyte: a plant, or phase of a plant’s life cycle, that bears gametes.
gamopetalous: with the petals united, either entirely or at the base into a tube, cup or ring (see also choripetalous, sympetalous; compare polypetalous).
gamospermous: with united stamens.
gametophalous: with united tepals.
gasteriform: shaped like a belly; (of a perianth tube, e.g. in Gasteria—Asphodelaceae): basally inflated.
gemma (pl. gemmae): an adventitious bud capable of reproducing the plant; a process found on pollen grains.
gemmiferous: bearing gemmae.
geniculate: bent like a knee.
genome: a complete haploid set of chromosomes, as present in a gamete.
genotype: the total complement of hereditary factors (genes) acquired by an organism from its parents and available for transmission to its offspring (compare phenotype).
genus (pl. genera): a group of species believed to be related phylogenetically and usually clearly separable from other such groups, or a single species without close relatives; the major taxonomic rank between species and family.
geocarpic/geocarpous: referring to the development of fruits in the ground originating from flowers which developed and were pollinated above ground.
geophyte: a perennial plant, usually herbaceous, with renewal buds located on the plant below the soil surface, as on bulbs or rhizomes.
geoxylic: of a woody plant with numerous stems arising from a subterranean rhizome.
gibbosity (usually of a calyx or corolla): a pouche-like swelling or hump.
gibbous: with a gibbosity.
glabrate: glabrous, but obviously having previously had an indumentum.
glabrescent: becoming glabrous or nearly so.
glabrous: devoid of hairs.
gland (adj. glandular/glandulose): (1) secreting structure on the surface or embedded in the substance of a leaf, flower, etc., or raised on a stalk (glandular hairs or stipitate glands); (2) a warty protuberance or fleshy excescence (often on petiole; inflorescence, or within the flower); (3) (see corpuscle).
glaucous: pale bluish green or with a pale bloom.
globose: ± spherical or rounded.
glochidioglochidium (pl. glochidia; adj. glochidiate): barbed bristle or hooked hair.
glomerate: compactly clustered.
glomerule (adj. glomerulate): a small compact cluster.
glumaceous: resembling the glumes of Poaceae.
glume: a bract, usually chaffy, in the spikelets of Cyperaceae, Poaceae and similar plants.
glutinous: with a sticky exudate.
granulose/granulate: finely covered with very small granules.
gregarious: growing in groups or colonies.
guide rails: see gynostegial grooves.
gynomonoecious: having bisexual flowers and female flowers on separate plants (compare gynodioecious).
gynobasic: of the ovary, style and stigma; also called pistil.
gynodioecious: having bisexual and female flowers on the same plant (compare gynodioecious).
gynophore: a stalk supporting the gynoecium and formed by an elongation of the receptacle.
gynostegial corona: collective term for the staminal and interstaminal coronas, both of which are associated with the gynostegium.
gynostegial grooves: the grooves between the lateral margins of adjacent anthers fused to the style head, in Apocynaceae (also known as anther slits, anther wings or guide rails) (see also gynostegium).
gynostegium (pl. gynostegia): a structure formed by the union of the stamens with part of the pistil, as in Apocynaceae.
gynostemium (pl. gynostemia): the column in the centre of flowers of Orchidaceae formed by the union of the stamen with part of the gynoecium.

H

habitat: the environment in which a plant lives.

hair type B (in tribe Gnaphalieae—Asteraceae): with one basal cell and a very long terminal cell.

half-inferior (of an ovary): partly below and partly above the level of attachment of perianth and stamens.

halophilous: salt-loving.

halophyte: a plant that grows in very salty soil.

haploid: having a single set of unpaired chromosomes, as in the nucleus of one of the gametes.

hapteron (pl. haptera): flattened organ, without vascular tissue, attaching the thalli of Podostemaceae to the substrate by a cement-like substance.

haustate: applied to the base of a leaf when it has two or more triangular lobes diverging laterally.

haustula (in palms with palmate leaves): the outgrowth from the top of the leaf stalk (rachis).

haustorium (pl. haustoria): a specialised root of parasitic plants capable of penetrating host tissue and thus absorbing nutrients.

head: a dense inflorescence of sessile or nearly sessile flowers on a compound receptacle (see also capitulum).

helical: shaped like a helix/spiral.

helicoid: coiled; (of a cymose inflorescence): branching repeatedly on the same side.

heliophilous: sun-loving.

helophytic: growing in marshes.

herb: any vascular plant that never produces a woody stem (compare forb).

herbaceous: not woody; soft in texture.

hermaphroditic: an organism or structure possessing both male and female reproductive organs, e.g. a flower with both stamens and pistil (= bisexual).
GLOSSARY

heteroblastic: having the adult parts of the plant (especially the leaves) distinctly different in form from the juvenile parts.
heterocarpic/heterocarpous: having carpels or fruit of more than one kind.
heterocarpy: having two kinds of fruit.
heterodistylious: said of a species in which two kinds of plants occur, those with long styles and those with short styles.
heterogamous: of different sexes; (of a flowerhead, as in some Asteraceae): having two kinds of florets, those of the ray florets being neuter or unisexual and those of the disc florets bisexual; of spikelet pairs in Poacea: consisting of a sterile and a female-fertile spikelet (compare homogamous).
heteromorphic: of different forms (compare homomorphic).
heterophyllous: having leaves of different forms.
heterosporous: having two types of haploid spores (compare homosporous).
heterostyly: applied to a species which has flowers with styles differing in length or shape (compare homostyly).
heterothetic (of a compound raceme): composed of a terminal as well as lateral racemes.
hilum (adj. hilar): the scar left on the seed where it was attached to the funicle or placenta.
hippocratesiform: see salveriform.
hypogeal: growing or remaining below ground; describing seed germination in which the cotyledons remain below the soil surface (compare epigeal).
hypogynium: the part of the stem of an embryo or young seedling below the cotyledonary node.
hypogynous: having the flower parts attached below the base of the ovary and free from it; flowers with this arrangement have a superior ovary (compare epigynous, perigynous).
hypsophyll: leaf borne at the upper level of a plant, as with various floral bracts; some possibly have a protective function.
hysteroanthous (of leaves): appearing after the flowers (compare synanthous).

I
idioblast: a cell that differs from those around it in the same tissue.
illegitimate (of a validly published name): contrary to one or more articles of the I.C.B.N.
imbricate: (1) overlapping like tiles; (2) applied to parts in a flower bud where one sepal or petal is wholly internal and one wholly external and the others are overlapping at the edge only.
immaculate: without spot or stain; pure, unblemished, undefiled.
immarginate: not margined or bordered.
imparipinnate: having an uneven number of pinnae, by virtue of having one terminal pinna.
imperforate: not perforated.
inaperturate (of a pollen grain): without germinal pores.
icised: margin cut rather deeply and sharply.
incised: not projecting (compare exserted).
incrassate: thickened.
icumbent: resting or lying (on); (of the orientation of an embryo): with the cotyledons lying face to face and folded downwards beside the radicle (as in some Brassicaceae); (of anthers): lying against the inner face of the filament.
incurved: bent or curved inwards or upwards; (of leaf margins): curved towards the adaxial surface.
indefinite: variable in number; numerous; many; (of stamens): more than twice as many as the petals or sepals; (of an inflorescence): not terminating in a flower, i.e. having a continuing terminal growing point.
indehiscent: not opening when ripe.
indeterminate: (1) (of an inflorescence): the lateral or lower flowers mature first while the primary axis continues to grow, hence the terminal flower is the last to open, therefore a racemose inflorescence (compare cyme) (2) (of growth): (= monopodial) the condition in which the terminal bud persists and produces successive lateral branches.
indumentum: any covering of a surface such as hairs, wool, scales.
induplicate: with margins of petals or sepals folded inwards but not overlapping.
indurated: hardened.
indusium (pl. indusia): a cup covering the stigma, as in
GLOSSARY

Goodeniaceae.

inferior: beneath or below, as in a calyx which is below the ovary,
the latter then being superior, as in an ovary which appears to
be below the calyx, the latter being adherent to the ovary.

inflected: bent sharply inwards, upwards or forwards (compare
deflected).

inflorescence: the arrangement of the flowers.
infra- (prefix): beneath.

infructescence: the arrangement of fruits on a plant.
influ-dibular/influ-diform: funnel-shaped.
inrolled: see involute.
insectivorous: catching, and presumably feeding on, insects.
inserted: attached, included.

insertion: place of attachment.

integument: one of the outer layers of tissue of an ovule.

intercalary (of growth): between apex and base, not apical.

internode: the portion of a stem between two nodes (compare node).

interpetiolar: applied to stipules placed between the petioles of
opposite leaves (often connate).

intersepalar: between the sepals.

interstaminal corona: fleshy lobes, often connate into a tube, at-
tached to the base of the staminal column in the interstaminal
areas (compare gynostegial corona, staminal corona).

interstitie: space between structures.

interstitial: situated in intersticies or spaces between structures; in-
terstitial growth: a type of growth occurring in organs that do
not have specific or localised meristematic regions; all-over
growth, as in some fruits.

intrapetiolar: between the petiole and the stem (compare
interpetiolar).

infrastaminal: between the stamens.

introduced: not indigenous; not native to the area in which it now
occurs (compare adventive, naturalised).

introflexed: see inflexed.

introrse: applied to an anther opening towards the centre of the
flower.

intruse: projecting or pushed out, in or forward.

invested: covered tightly; the focus is on the tight fit, e.g. an integu-
ment invests a seed.

involute: involucre of bracteoles surrounding a secondary inflo-
rescence such as the base of an umbellule.

involutate: having an involucre of some kind.

involuture/involucrum (adj. involucral): a number of bracts, e.g.
those surrounding the base of a flowerhead/capitulum or of an
umbel.

involute: having the edges of the leaves rolled towards the adaxial
surface (compare revolute).

irregular (of a flower, calyx or corolla): bilaterally symmetrical,
symmetrical about one plane only, usually the plane that bisec-
tes the flower vertically along the longitudinal axis; (= zygomorphic)
(compare actinomorphic, regular).

isobilateral (= isosilateral) (of a leaf): having structurally similar upper
and lower surfaces.

isopolar (of a pollen grain): with the equatorial plane dividing the
grain into similar halves, i.e. the proximal and distal faces are
similar.

isthmus (pl. isthmi): a narrow part or organ connecting two larger
parts.

J

jugate: coupled or yoked together, applied especially to the leaflets
of a pinnate leaf.

K

keel: (syn. carina): a ridge like the keel of a boat; in Fabaceae a
boat-shaped structure formed by the fusion of the two anterior
petals.

keeled: ridged along the middle of a flat or convex surface.

kneed: having a knee-like joint.

L

labellum: a lip (see there).

lacerate: cut irregularly; appearing torn, as in certain leaves and
lignes.

lacinia (pl. laciniae): a slender lobe.

laciniate: cut into slender, pointed lobes.

lacinulate: finely laciniate.

lacuna (pl. lacunae): (1) an internal air space or chamber, usually
between cells, as in leaf, stem and root tissues; also any space
within a cell; (2) a leaf gap as viewed in cross sections of stem
nodes.

lacunar: referring to or arising from lacunae.

lacunose: full of lacunae, having air-cells.

laevigate: see levigate.

lageniform: shaped like a Florence flask.

lamella (pl. lamellae; adj. lamellate): a thin plate or layer.

lamina (pl. lami-nae): the limb, blade or expanded part of a leaf,
sepal or petal.

lanate: woolly.

laceolate: lance-shaped; about four times as long as broad, broad-
est in the lower half and tapering toward the apex.

lanuginose: cottony, similar to lanate, but with shorter trichomes
(hairs).

latex: a viscous fluid exuded from the cut surfaces of leaves and
stems of certain plants.

latesepitate: with broad partitions (compare angustisepitate).

latrorse (of anthers): opening laterally, i.e. towards adjacent an-
thers.

leaf gap: gap left in the vascular system at the node of a stem at the
point where the vascular element supplying the leaf, branches
off.

leaflet: the ultimate member of a compound leaf.

legume: a simple fruit, consisting of a single carpel, usually dry and
usually opening along both sutures into two halves, e.g. in the
Fabaceae; any member of the Fabaceae.

lemma: the lower of two bracts enclosing the florets of Poaceae.

lenticels (adj. lenticellate): corky spots on the bark through which
gaseous exchange occurs.

lenticular: shaped like a biconvex lens.

lepidote: clothed with small, scurfy scales.

levigate: having a smooth, polished surface.

liana/liane: a woody climber with rope-like stems.

 ligneous: of or resembling wood.

linified: woody, due to the deposition of lignin in cell walls.

lignotuber (adj. lignotuberosus): a woody swelling at the base of
the shoot system below or just above the ground, containing
adventitious buds from which new shoots develop if the top of
the plant is cut off or burned.

ligulate: strap-shaped, applied e.g. to the ray florets in many
Asteraceae.

ligule: (1) a thin, membranous and/or hairy appendage at the top of
the leaf sheath as in Poaceae; (2) the limb of ray florets in
Asteraceae.

limb: the upper, usually expanded part of the calyx or corolla above
the tube, throat or claw.
linear: long and very narrow in relation to the length and with parallel edges (compare loricate).
lineolate: marked with fine lines.
lingulate: tongue-shaped.
lip: (1) one of two divisions of a gamosepalous calyx or a gamopetalous corolla when it is cleft into an upper (posterior) and a lower (anterior) portion (see bilabiate); (2) of an orchid: the lowest petal (the inner median perianth lobe), usually enlarged and different in form from the two lateral ones (= labellum).
lithophyte (adj. lithophytic): a plant that grows on rocks (= epilithic).
lobe: any division or segment of an organ (usually rounded); specifically a part of a leaf, petal or calyx cut less than halfway to the centre.
lobulate/lobuloid: having small lobes.
lollules: small lobes.
local (noun): divided into small secondary compartments.
local: having chambers; thus: unilocular = one-chambered; bicarpelar = two-chambered, etc.
locular (of a organ): a chamber or cell of an ovary or fruit or anther containing ovules or seeds or pollen grains.
locularicidal: referring to the dehiscence of a fruit which splits down the middle of the cells or locules (i.e. the midrib or dorsal suture) and not at the line of junction of the carpels, e.g. in most Liliaceae (in wide sense) (compare septicidal).
lodicule/lodicula (pl. lodiculae): a small scale outside the stamens in flowers of the Poaceae.
loment/lomentum: modified legume fruit with constrictions between the seeds, which at maturity separates at the constrictions into 1-seeded segments.
lophate (of a pollen grain): with the outer exine raised in a pattern of ridges.
lophomorphic: crested.
lorate (syn. liriform): strap-shaped; moderately long with parallel sides (compare linear).
lumen: the cavity of a plant cell.
lunate/luniform: shaped like the waxing moon.
lunulate: finely lunate.
lunate: applied to a leaf which is pinnately lobed or cut into small segments below, but with a much larger terminal lobe.
lysigenous: originating by dissolution of cells.

M
maculate (nuov. maculation): spotted or blotched.
mallee: scrub vegetation composed mainly of *Eucalyptus* spp. (Myrtaceae) about 2–10 m high in dry, subtropical parts of south-west and southeast Australia.
mam(m)illate: having small nipple-shaped projections.
maccrescent: withering without falling off.
marginal: occurring at or very close to the margin.
marginal placentation: the type of placentation found in a gynoeicum consisting of a single carpel or of two or more free carpels and where the margins of the carpel(s) have become united to form a suture along which the ovules are borne (see also axile and parietal placentation).
marginate/margined: having a margin of distinct colour or texture.
marmorate: marbled, having coloured veins.
medial/median: of or situated in the middle.
medifixed: fixed by the middle, e.g. of an anther (compare basifixed, dorsifixed, versatile); (of a hair): ± T-shaped with the stem much shorter than the cross-bar.
medulla: the pith of a stem.
megaspor: the larger of the two kinds of spores produced in the sexual life cycle of a heterosporous plant, giving rise to the female gametophyte.
membraneous/membranous: of thin, translucent texture.
mentum: an extension of the base of the column in the flower of some Orchidaceae.
mericarp: one segment of a fruit that breaks at maturity into units derived from the individual carpels, e.g. in Apiaceae or Malvaceae (see also schizocarp).
meridional: running in a north-south direction, from apex to base.
meristem (adj. meristematic): growing region of a plant in which the cells which have retained their embryonic characteristics, or have reverted to them secondarily, divide to produce new cells.
-merous (suffix): indicating number of parts, e.g. flowers 5-merous where floral organs are present in 5s.
mesosepal: the fleshy portion of the wall of a succulent fruit inside the skin and outside the stony layer, if any, surrounding the seed(s) (see also pericarp).
mesochile (of flowers of certain Orchidaceae): the middle portion of a longitudinally two- or three-partite lip.
mesomorphic: having characteristics suited to growing in environments that are neither very dry nor very wet.
mesophyll: photosynthetic tissue of a green plant.
mesophyte (adj. mesophytic): plants which grow in environments that are neither very wet nor very dry; plants intermediate in moisture requirements between hydrophytes and xerophytes.
micropyle: a minute canal through the integument(s) of an ovule through which the pollen tube enters and which persists as a pore in the seed coat.
microsporangium (pl. microsporangia) (in an anther): the chamber in which the pollen is formed (= pollen sac) (see anther).
microspore: the smaller of the two kinds of spores produced in the sexual life cycle of a heterosporous plant, giving rise to the male gametophyte.
midrib: the principal, usually central nerve of a leaf or leaf-like part.
mitre-shaped/mitriform: shaped like a bishop’s cap.
monad (of pollen grains): single, not fused to others (compare diad, tetrad).
monadelphous (of stamens): in one bundle, e.g. in certain Fabaceae and Malvaceae.
moniliform: like a string of beads.
mono- (prefix): one; single.
monocarpic: applied to a plant which flowers and fruits only once and then dies (compare polycarpic).
monochasium (pl. monochasias; adj. monochasial): a cyme reduced to single flowers on each axis (the laterals of the dichasium having been lost by reduction).
monochlamydeous: with a perianth of a single whorl of similar parts (tepals).
monocotyledon: a flowering plant having a single cotyledon in the seed (compare dicotyledon).
monocious: with male and female flowers separate but borne on the same individual plant.
monolete: with the dehiscence line unbranched, as in bilateral spores.
monomeric: formed of a single member.
monomorphic/monomorphous: of one form only.
monophyletic: derived from a single ancestral line (compare polyphyletic).
monopodial (of growth): with a persistent terminal growing point producing many lateral organs successively (compare sympodial).
monosulcate (of a pollen grain): having a single longitudinal groove
GLOSSARY

or sulcus.

monotheceous (of an anther): having one theca.

monovalent/univalent: a single, unpaired chromosome during meiosis.

morchelliform: shaped like a morel (a fungus of the genus Morchella which has a pitted cap).

mucilage (adj. mucilaginous): a gelatinous substance which absorbs water and increases in bulk.

mucous: slimy.

mucronate: ending abruptly in a short stilt point which is a continuation of the midrib.

mucronulate: finely mucronate.

multid: divided into many lobes or segments.

muricate: rough, with short hard tubercles or pointed protuberances.

muriculate: finely muriculate.

muticus: blunt, without a point.

mycorrhiza: a symbiotic union between a fungus and a plant root.

mycotrophic: of a plant possessing mycorrhiza.

myxogenie: capable of forming mucous (when wetted).

naked (of seeds): exposed on the surface of a sporophyll (not enclosed within an ovary); (of flowers): without perianth.

-nate (suffix): indicating number of parts in a group, e.g. leaves 3-nate = three leaves in a group or cluster.

naturalised: introduced and reproducing itself without human assistance (compare adventive, introduced).

navicular/naviculate/naviciform: boat-shaped.

nectar guides: floral orientation cues directing a pollinator to the nectar.

nectary/nectarium (adj. nectariferous): any structure that secretes nectar.

nerves: the principal or more conspicuous veins or ribs of a leaf or other organ.

net-veined: with the smaller veins connected like meshes of a net; reticulate.

nigropunctate: with black dots.

nitid: glossy, lustrous, smooth and clear.

nitrophilous: of a plant that grows well in soil rich in nitrogen.

node: the point on the stem at which a leaf or leaves and accompanying organs arise (compare internode).

nodose: having knots or being knobby, usually in reference to roots, especially in the legumes (Fabaceae).

nucellus: the female sporangium (megasporangium) within the ovule.

nut: a one-seeded indehiscent fruit, with a hard, dry pericarp (the shell).

nutlet: a little nut.

ob-(prefix): inverse or inversely, e.g. obovate = inversely ovate.

obconic: inversely conical, with the point of attachment at the small end.

obcordate: more or less heart-shaped but with the narrow end below, and the broad end deeply notched.

obdiplostemonous (of a flower): with the stamens in two alternating whorls, the outer whorl opposite the petals and the inner opposite the sepals.

oblanceolate: inversely lanceolate; with the broadest portion nearest the apex and tapering toward the base.

oblote: transversely broadly elliptic.

obligate (of parasites): unable to survive without the host (compare facultative).

oblique: of unequal sides, e.g. applied to a leaf with the two sides of the blade unequal at the base.

obloid: a solid, near elliptic shape depressed at the poles.

oblong: much longer than broad, with nearly parallel sides.

obovate: ovate with the broadest part above.

obovoid: solid shape of obovate outline.

obsolete: reduced to a rudiment, or completely lacking (compare rudimentary, vestigial).

obtrullate: inversely trullate; angular-obovate, i.e. shaped like an inverted trowel, broadest above the middle with two equal sides meeting at base and two shorter straight sides meeting at apex.

obturator: a small protuberance, generally of placental origin, which grows into the space between nucellus and integument, or between the ovule and the ovary wall.

obtuse: blunt or rounded at the end.

obvolute: of a leaf folded along the midline with one margin overlapping one margin of a similarly folded leaf on the opposite side, i.e. half-equitant.

occulte: with a small eye; marked with two-coloured spots having a centre of one colour surrounded by a broad ring of another.

ocrea (pl. ocreae; adj. ocreate): a tubular stipule sheathing the stem (e.g. in Polygonum—Polygonaceae).

-oid (suffix): indicates likeness, resemblance or similarity; or something having the form or nature of something else; e.g. racemoid: resembling a raceme; petaloid: resembling a petal.

opaque: not transparent; dull, not shining.

operculate: with a cap or lid.

operculum: (1) a lid, cap or cover; (2) the thickened tips of integuments of certain angiosperm ovules.

opposite: (1) pertaining to leaves or branches when two are borne at the same node on opposite sides of the stem; (2) one part before another, as a stamen in front of a petal.

orbicular: flat with a circular outline.

orifice: opening.

ornithophilous (of pollination): effected by birds.

orthotropous (of an ovule): erect so that the micropyyle points away from the placenta.

osseous: bony.

ostiole: an opening or pore, e.g. at the apex of the figs of Ficus (Moraceae).

oval: broadly elliptic.

ovary: that part of the pistil (the usually enlarged base) which contains the ovules and eventually becomes the fruit.

ovate: with the outline of an egg: scarcely twice as long as broad, with the broader end below the middle.

oviform: egg-shaped.

ovoid: solid shape of ovate outline.

ovule: the immature seed in the ovary before fertilisation.

ovulode: a sterile ovule.

palate: in sympetalous corollas, the raised projection of the lower lip which closes or very nearly closes the throat.

palea (pl. paleae; adj. paleate): (1) one of the chaffy scales or thin colourless bracts amongst the flowers on the receptacle, in Asteraceae; (2) the inner of two bracts enclosing the floret, in Poaceae.

paleaceous: with small membranous scales; chaffy.

palpal: pale in colour.

palmate (of a leaf): shaped like the palm and fingers of a hand (see digitate).

palmatifid (of a leaf): with the margin palmately cleft to less than
pedate to the base.
palmatepalmolated (of a leaf): palmately divided to about halfway to the midrib.
palmatipartite (of a leaf): palmately divided almost to the midrib.
palmatisect (of a leaf): palmately divided down to the midrib.
pandurate/panduriform: fiddle-shaped.
pandurate/panduriform: fiddle-shaped.
panicle (adj. paniculate): a compound raceme; an indeterminate inflorescence in which the flowers are borne on branches of the main axis or on further branches of these.
pantophorate (of a pollen grain): with apertures scattered over the whole surface.
papilionaceous/papilionoid: applied to flowers with a ‘butterfly-like’ appearance, as in many Papilionoideae—Fabaceae and Polygalaceae.
papilla (pl. papillae): a soft, nipple-shaped protuberance; a type of trichome.
papillate: having papillae.
papillate: having papillae.
papillose: covered with minute, nipple-like protuberances.
pannus: the ring of hairs or scales around the top of the fruit (as in Asteraceae) and perhaps representing the calyx limb.
papule: a pimple or small pustule.
papuliform: shaped like a knee-cap.
parenchyma: plant tissue consisting of mature living cells that are relatively specialised in function.
partially placental: placenta with the ovules borne on the inner surface of the wall of the ovary or on intrusions of the wall that form incomplete partitions or false septa (compare axile and marginal placental).
paripinnate: of a pinnate leaf without an odd terminal leaflet.
-particle (suffix): cleft nearly but not quite to the base.
patelliform: shaped like a knee-cap.
patent: spreading out widely.
paternate: like skin or leather.
paternity: like a comb.
parasite: an organism living on or in another organism and deriving nourishment from it (compare epiphyte, saprophyte).
pellucide: translucent.
peltate: applied to a leaf, or sometimes some other organ with a stalk, of which the stalk is attached to its undersurface instead of to its edge.
pendant/pendulous (of ovules): arising on and hanging down from an apical placenta.
penicillate: with a tuft of hairs at the end.
penni-parallel-veined: pinnately parallel-veined.
penninerved: pinnately nervet.
pentameric: covered with, or divided into, five units; having parts in fives or multiples of five.
perennial: a plant whose life span extends over more than two growing seasons.
perfoliate (of a sessile leaf or bract): having its base completely wrapped around the stem.
perforate (of a pollen grain): with holes less than 1 µm in diameter and generally situated in the tectum.
perianth: the floral envelope, consisting of calyx or corolla or both.
pericarp: the wall of the ripened ovary; its layers may be fused into one, or ± divisible into epicarp, mesocarp and endocarp.
periderm: secondary protective tissue derived from the phellogen, and replacing the epidermis.
perigone (adj. perigonal): see perianth.
perigynous (pl. perigynia): the hypogynous setae of Cyperaceae; the flower or utricle of Carex (Cyperaceae); any hypogynous disc.
perigynous: applied to the flower when the sepals, petals and stamens arise on and hang down from an open receptacle surrounding the ovary but are not adnate to it (compare epigynous, hypogynous). 
peripetiocarpous: nutritive tissue in an angiosperm seed, formed from the nucellus (compare endosperm).
persistent: remaining attached to the plant beyond the expected time of falling.
personate (of a flower, e.g. in Scrophulariaceae): with a two-lipped corolla in the form of a face, with an arched upper lip and a lower lip that protrudes into and nearly closes the throat of the corolla.
petal: see corolla.
petaloid/petaline: resembling petals.
petiolate: having a petiole.
petiole (adj. petiolar): leaf stalk.
petioled: having a petiole.
petiolate: having a petiole.
petiolate: having a petiole.
petiolate/epipetiolate: the stalk of a leaflet.
phalloid: resembling a phallus.
phellem: cork.
phellogen: cork cambium.
phenoype: the physical characteristics of an organism; the outward expression of characteristics conferred on an organism by its genotype.
photonastic: one-sided growth in length of an organ due to the unrestricted action of light.
phyllar: an individual bract of the involucrum, e.g. in the inflorescence of Asteraceae.
phyllocad (syn. cladode): a flattened foliaceous stem having the form and function of a leaf but arising in the axil of a minute, bract-like, often caducous, true leaf.
phylloclade: a flattened foliaceous stem having the form and function of a leaf (compare cladode).
phyllotaxy: the arrangement of leaves on a stem.
phytomelanous (especially in seeds): black.
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-particle (suffix): cleft nearly but not quite to the base.
patelliform: shaped like a knee-cap.
patent: spreading out widely, e.g. patent branches.
paucicrate: sparsely serrate.
pectinate: like a comb.
pedate: resembling palmate, but the side lobes further divided.
pedicel (adj. pedicellate/pedicelled): the stalk of an individual flower.
peduncle (adj. pedunculate/ peduncled/ peduncular): the stalk of an inflorescence; the common stalk (rachis or axis) of several pedicellate or sessile flowers.
pellucid: translucent.
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phylloclade: a flattened foliaceous stem having the form and function of a leaf (compare cladode).
phyllotaxy: the arrangement of leaves on a stem.
phytomelanous (especially in seeds): black.
philotose: hairy with rather long, soft, simple hairs.
pin flower: in heterostylos plants, the flower type having the longer style (compare thrum flower).
pinna (pl. pinnae): a primary division of a pinnate leaf.
pinnate: like a feather in appearance; (of a compound leaf): with the leaflets arranged along each side of a common rachis; (of the venation of a leaf): with a middle vein and secondary veins arising from it on each side.
pinnate-parallel: of the venation of a leaf): pinnate with the secondary veins running parallel to each other.
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pinnatifid: with the margin pinnately cleft but not to the midrib.
pinnatilobate/pinnatilobed: pinnately divided to about halfway to the midrib.
pinnatifid pinnate: pinnately divided almost to the midrib.
pinnatifid pinnate: pinnately divided down to the midrib.
pinnule: the secondary or tertiary division of a leaf which is twice or thrice pinnate.
pistil: see gynoecium.
pistil head: see style head.
pistillate: pertaining to a flower with one or more carpels but no functional stamens; unisexual and female.
pistillode: a sterile pistil, often rudimentary.
pitted: marked with small depressions, punctate.
placenta: the part of the ovary, sometimes but not always thickened or raised, to which the ovules are attached (see also free).
placentation: the arrangement of placentas, and hence of ovules, within an ovary.
placentiferous: bearing a placenta.
plesiomorphic (of a character): common to the group under discussion and its ancestors.
plicate: folded back and forth longitudinally like a fan.
pluriseriate: in several to many rows.
pod: see legume.
polarised (of endothecial tissue of Asteraceae): with thickening restricted to the horizontal cell walls.
pollen: the microspores of seed plants shed from anthers.
pollen carrier: see corpuscle.
pollen mass: pollen grains cohering into a single body; (= pollinium).
pollen presenter: a structural modification, usually a swelling, of the style around or below the stigma which enables pollen, shed from anthers, to be retained (e.g. in Proteaceae and Rubiaceae).
pollen sac: the chamber in an anther in which pollen is formed (see anther).
pollinarian (pl. pollinarium): the complex structure found in the flowers of many Apocynaceae where the pollen masses of two adjacent thecae are united for dispersal as a unit. The pollinarian consists of a small, ± globose, sticky body, the corpuscle which has two thin, elastic arms, the caudicles, each bearing one pollinium.
pollinium (pl. pollinia): a cohesive mass of pollen grains which are shed together and transported as a unit during pollination (e.g. in Apocynaceae and Orchidaceae).
polycarpic: applied to a plant which flowers and fruits often (compare monocarpic).
polyorate (of a pollen grain): with rounded apertures (compare colpate, colporate).
polyrate (of a pollen grain): with rounded apertures (compare colpate, colporate).
pore: small, ± round aperture, e.g. on pollen grains.
potamandrous: having more than two distinct morphological variants.
polygamo-dioecious: with bisexual and male flowers on the same plant, and bisexual and female flowers on others.
polygamo-monoeccious: with bisexual flowers and unisexual flowers of both sexes on the same plant.
polygamous: having unisexual and bisexual flowers on the same or on different individuals.
polytomous: having more than two distinct morphological variants.
polyepetalous: of flowers with petals free from each other (compare gamopetalous).
polyphylectic: composed of members that originated independently from more than one evolutionary line (compare monophyletic).
polyplody: having more than two of the basic sets of chromosomes in the nucleus (compare diploid, haploid).
pome: a fleshy (false) fruit, formed from an inferior ovary in which the receptacle or hypanthium has enlarged to enclose the true fruit.
portate: with a stalk or peduncle (compare geniculate or sessile).
poricidal: opening by pores.
poriferous: having many pores.
porrect: directed outward and forward; perpendicular to the surface.
posterior: in position nearest to the axis (compare anterior/anticous).
posticus: on the posterior side, next to the axis (compare anticus).
pouch: a bag, sack or receptacle of moderate size.
praeornise: apparently bitten off at the end.
precocious: appearing or developing early; often used of flowers which appear before the leaves.
prehensile: adapted for grasping, especially by wrapping around a support.
prickle: a sharp outgrowth from the bark or surface layer containing no conducting tissue.
primocane: the first season's shoot or cane of a biennial woody stem, as in many brambles (Rubus spp.—Rosaceae).
procumbent: trailing or lying on the ground without rooting at the nodes.
prolate (of a pollen grain): having a polar axis of greater length than the equatorial diameter.
proliferous: bearing adventitious buds on the leaves or in the flowers, capable of rooting and forming separate plants.
propagule: a structure with the capacity to give rise to a new plant.
prophyll: a leaf formed at the base of a shoot, usually smaller than those formed subsequently.
prostrate (syn. procumbent): trailing or lying on the ground without rooting at the nodes.
protandrous/proterandrous: with the anthers ripening before the stigmas (compare protogynous).
protogynous: see protogynous.
protogynous: having the female sex organs maturing before the male ones (compare protandrous).
protrusion: something that projects or thrusts outwards or forwards.
protuberance (adj. protuberant): a bulge or swelling.
proximal: nearer to the point of attachment or origin; the converse of distal.
prunose: having a whitish, waxy, powdery bloom on the surface.
psammophilous: sand-loving.
psammophyte: a plant which grows in sand or sandy soil.
pseud-/pseudo- (prefix): false, not genuine, not the true or typical.
pseudanthem: an inflorescence resembling a single flower (e.g. a cyathium).
pseudo-aril: false aril; see arilode.
pseudocolpus (of a pollen grain): a colpus-like streak.
pseudo-indsium: false indusium.
pseudobulb: a solid, above-ground, thickened or bulbiform stem, characteristic of some orchids.
pseudopetiolate: subsessile.
puberulent: minutely pubescent.
puberulous: slightly pubescent.
pubescent: covered with soft, short, erect hairs.
pulverulent: powdery.
pulvinate: cushion-shaped.
pulvinus: a swollen base or apex of the petiole or petiolule, often
glandular or responsive to touch; a cushion.

punctate: marked with dots or translucent glands.

punctulate: very finely punctate.

punctiform: reduced to a mere point.

pungent: ending in a sharp, rigid point.

pusticulate: finely pustulate.

pustule (adj. pustulate): a slight elevation like a pimple or blister.

putamen: the shell of a nut; the hardened endocarp of a drupe.

pyrene: a nutlet or kernel, the stone (endocarp plus seed) of a drupe or similar fruit (compare berry, drupe).

pyriform: pear-shaped.

pyrophyte: a plant adapted to survive severe fires.

Q

quadri-quadra-quadri- (prefix): four-.

quincuncial (applied to calyx or corolla lobes in the bud); a variant of imbricate aestivalion with two lobes outside, two lobes inside, and one lobe which is overlapped on one side only.

R

raceme (adj. racemose): an indeterminate inflorescence in which the flowers are borne on pedicels along an unbranched axis or peduncle, the terminal flowers being the youngest and last to open (centripetal development).

racemiform: having the shape of a raceme.

rachilla (pl. rachillae): (1) the rachis (axis) of the spikelet in Cyperaceae and Poaceae; (2) a secondary axis, as in a compound leaf.

rachis (pl. rachises or rachidia) (= rachis): (1) the axis of an inflorescence in which flower stalks occur at short intervals from each other, as in Poaceae; (2) the axis of a pinnately compound leaf, corresponding to the midrib of a simple leaf.

radial (of endotheial tissue of Asteraeae): with thickening ± evenly distributed in the walls of the cells, particularly in the radial walls.

radiate: applied to flowerheads of Asteraeae with ray florets.

radical: applied to leaves which arise so close to the base of the stem as to appear to arise on the root.

radicant: rooting, in particular of a stem which produces adventitious roots.

radicle: see embryo.

radicular: related to the radicle.

ramification: the scheme of branching or separation into branches.

ramiflorous (of flowers and fruits): borne below the current leaves on recently formed woody branches (compare cauliflorous).

raphe (adj. raphal): the part of a stalk of an anatropous ovule that is fused along the side of the ovule.

raphides: mineral substances in the form of needle-shaped crystals, within the cells of plants.

ray: (1) the florets of the margin of a flowerhead of the Asteraeae when different from those of the centre or disc; (2) one of the radiating branches of an umbel.

recaulescence (adj. recaulescent): a condition where the bract subtending a flower is not situated on the main axis on which the flower arises but on the pedicel.

receptacle (adj. receptacular; syn. torus): the extremity of the axis on which the sepalas, petals, stamens and pistil, arise.

recurved: curved or curled downwards or backwards.

reduplicate (of sepals or petals): with margins valvate and reflexed.

reflexed: bent downwards or backwards.

regular (= actinomorphic) (of a flower, calyx or corolla): radially symmetrical, i.e. capable of being dissected into similar halves in more than one vertical plane forming mirror images (compare irregular, zygomorphic).

reniform: kidney-shaped.

repand: with the margin uneven or wavy, with shallow undulations; not as deep as sinuate.

repetent: lying or creeping along the ground.

replicate: folded abaxially along the middle, as along the midrib of a leaf.

replum: a longitudinal partition in an ovary, formed between parietal placentas (e.g. in Brassicaceae).

resin: (adj. resinous): plant exudate, often sticky, insoluble in water.

resinous: yielding resin.

resupinate: upside down because the pedicel or ovary is twisted through 180° (as in flowers of Orchidaceae and Lobelialeae).

reticulate: having a network-like pattern; net-veined, with the smallest veins of a leaf connected together like the meshes of a net.

retinaculum (pl. retinacula), retinacle: (1) the persistent, hook-like funicle, as in the fruits of the Acanthaceae; (2) the structure to which the pollinium is attached, as in the Asclepiadaceae and Orchidaceae (see corpuscle).

retrofracted: bent abruptly backwards.

retorse: bent abruptly backwards, away from the apex (compare antorse).

retuse: notched.

revolute: rolled back from the margin (compare involute).

rhabdial: see rachis.

rhizodipidium (pl. rhizididia; adj. rhizidial): a ± fan-shaped cyme with the lateral branches developed alternately on one side and then on the other.

rhizome (adj. rhizomatous): a rootstock or root-like stem prostrate on or under the ground, sending rootlets downwards, and branches, leaves or flowering shoots upwards, always distinguished from a true root by the presence of buds, leaves or scales.

rhombic/rhomboidal: ± diamond-shaped; having straight margins and being widest in the middle.

riparian: of, inhabiting or situated on the bank of a river or stream.

rootstock: a short swollen structure at the junction of the root and the shoot system of a plant.

rosette: a crowded, circular cluster of leaves or other organs.

rostellum (in Orchidaceae): a projection of the upper edge of the stigma in front of the anthers; a small beak.

rostrate: beaked (see beak).

rostrum: any beak-like extension.

rosulate: with the leaves in a circle or rosette.

rotate: wheel-shaped; of a corolla with a short tube and spreading limb.

rotund: with a shape between orbicular and broadly elliptic.

rounded: margins and apex forming a smooth arc.

ruderal: a plant that grows on waste ground.

rudimentary: poorly developed and not functional (compare obsolete, vestigial).

rufescent: becoming reddish.

rufous: rusty or brownish red.

rugose: wrinkled; covered with coarse reticulate lines.

rugula (pl. rugulae): a fine wrinkle or fold, e.g. in the upper lip of some Acanthaceae.

rugulose: finely wrinkled.

ruminate: mottled in appearance, e.g. of bark, or of the food reserves in a seed.

runcinate: pinnatifid with the lobes pointing towards the base.

runner: a slender, prostrate or trailing stem which produces roots
GLOSSARY

and sometimes erect shoots at its nodes (compare stolon).

S

saccate: pouched.
sagittate: applied to the base of a leaf or an anther with two acute, straight lobes directed downwards like in an arrow-head.
saliciform, salicoid: like the genus Salix (Salicaceae); willow-like.
salverform/salver-shaped: shaped like a trumpet, e.g. of a sympetalous corolla, with a slender tube and an abruptly spreading limb.
samara: an indehiscent, 1-seeded fruit or mericarp with wings (e.g. Securidaca (Polygalaceae) and Malpighiaceae).
samaroid: applied to a fruit resembling a samara.
saponins: a group of soap-like, toxic substances.
saprophytic: an organism deriving its nourishment from dead organic matter and usually lacking chlorophyll (compare epiphyte, parasite).
saprophytie: obtaining food from nonliving organic matter.
sarcostema: the fleshy outer coat of a seed.
saxicolous: living or growing among or on rocks.
saberdous/sabre: minutely scabrous, slightly rough to the touch.
sabrid/sabrous: rough to the touch, usually from the presence of very short harsh hairs.
sabridous/sabridulous: somewhat rough to the touch.
sclariform: having a ladder-like pattern.
scale: (1) reduced or rudimentary leaf, usually sessile and scarious and seldom green; (2) a kind of indumentum in the form of small, flat discs attached by the centre; (3) any thin, usually small and dry structure.
scaled: see crenate.
scandent: climbing.
scape: a naked flower stalk arising from the ground with radical or rosulate leaves.
scapeful: possessing a scape.
scapeose: bearing one or more flowers on a scape; in the form of a scape.
scarious: thin and dry, not green.
schizocarp (adj. schizocarpic/schizocarpous): a dry, dehiscent fruit which splits into two or more separate carpels (mericarps) at maturity, found e.g. in Apiaceae and Malvaceae.
schizogenous: originating by separation of cell walls along the mid-schizogenous line.
schizocarpous: a dry, dehiscent fruit where the carpel walls are incompletely fused, especially in monocotyledons.
scepticate: divided by one or more partitions.
scepticidal: referring to the dehiscence of a ripe capsule which splits open through the septa or carpel margins (compare loculicidal).
sceptifragal: referring to the dehiscence of a ripe capsule where the valves or backs of the carpels break away leaving the septa intact.
sceptum (pl. septa; adj. septal): dividing cross wall or partition; an internal partition of an ovary or fruit.
serrate: in rows or whorls.
sereous: silky, with closely appressed, soft, straight hairs.
serrate: toothed like a saw, with regular, pointed teeth.
serrature: the toothing of a serrate leaf.
serrulate: serrate with minute teeth.
sessile: without a stalk; (of a stigma): the style is absent and the stigma is therefore sessile on the ovary.
seta (pl. setae): a bristle or stiff hair.
setaceous: having bristle-like hairs; bristly.
setiferous: bearing setae.
setiform: looking like a seta.
setose: beset with bristles.
setulose: a diminutive of setose.
sexine: the outer and/or sculptured layer of the exine of a pollen grain.
sheath: the (lower) portion of the leaf clasping the stem.
sigmoid/sigmoidal: double-curved in opposite directions, like the letter S.
silicous: containing silica.
silicula (pl. siliculae): a short siliqua, not much longer than broad.
siliqua/silique (pl. siliquae/siliques): a dry, dehiscent fruit formed from a superior ovary of two carpels, with two parietal placents, divided into two compartments by a thin partition (replum), opening by two valves which fall away from a frame on which the seeds are borne (e.g. in Brassicaceae).
simple: of one piece or series, the opposite of compound, e.g. simple leaf: not divided into leaflets; (of a hair or inflorescence): not branched.
sinistrose: turned towards the left (compare dextrorse).
sinate/sinus: with the margin uneven, with rather deep undulations (compare undulate).
sinus (pl. sinuses): (1) a curve; (2) a recess between the teeth or lobes on a margin; (3) the recess formed by the basal lobes of a leaf or other organ.
siphonostele (adj. siphonostelous): (in a dicotyledonous stem): the cylinder of conducting tissue surrounding the central pith.
sobole: a shoot, especially from the ground.
soboliferous: bearing soboles.
solitary: borne singly or alone.
sorus (pl. sori; adj. soral): a cluster of spores and/or sporangia.
spadix (pl. spadices): a flower spike with a fleshy or thickened axis, e.g. in Araceae and some palms (Arecaceae).
spathe (adj. spathaceous/spatheate): a large bract enclosing a spadix, or one or more bracts enclosing a flower or inflorescence.
spathella (pl. spathellae): (1) a capsule-like structure enclosing the flower buds in some Podostemaceae, rupturing irregularly as the pedicel elongates at anthesis; (2) formerly used term for the glumes of Poaceae; (3) small bracts as found in the inflorescences of Restionaceae.
spatheole: a secondary spathe within a compound inflorescence in the Andropogonaceae—Poaceae.
spathulate: spoon-shaped, broadly rounded above and long and narrow below.
spatulate: see spathulate.
species: a taxon comprising one or more populations of individuals capable of interbreeding to produce fertile offspring.
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spheroid/spheroidal: approximately spherical.
spicate: arranged in a spike.
spiciform raceme: spike-like raceme.
spiculate: having a surface covered with fine points or crystals.
spicule: a small spike.
spike: an inflorescence with the flowers sessile along a simple undivided axis or rachis.
spikellet: a small spike composed of one or more flowers enclosed by glumes, in Cyperaceae and Poaceae.
spine: a sharp-pointed, hardened structure modified from another organ (leaf, branch, stipule, etc.), or from part of an organ.
spine shield: in some Euphorbiaceae—Euphorbiaceae, the hardened bases along the angles of the stems and branches, from which the spines of certain species are produced.
spinescent: spine-tipped, having spines.
spino: spiny or having spines.
spiral (of leaves or floral organs): borne at different levels on the spiral.
spiraperturate (of a pollen grain): with one or more spiral apertures.
sporangiate (of an anther): containing a given number of microsporangia/pollen sacs (e.g. 4-sporangiate: containing four pollen sacs, as commonly found in 2-thecate anthers) (see anther).
sporangium (pl. sporangia): a hollow, unicellular or multicellular, sac-like, spore-producing structure.
sporophore: any structure bearing spores.
sporophyll: a modified leaf or leaf-like structure which bears sporangia.
spur: a slender, usually hollow extension of some part of the flower.
spurious: not genuine or real, false.
spur shoot: a (very) short lateral branch (= brachyblast).
squam(a) (pl. squamae): a scale, usually derived from a leaf.
squamella: diminutive of squama, a scale of the second order or reduced in size, as in the disc of Asteraceae.
squamiform: scale-like.
squarros(a) (adj. squarrosa): spreading or recurved at some point above the base, e.g. as in the phyllaries of some Asteraceae which are sharply curved downward or outward.
stamen (adj. staminal): in angiosperms, the pollen-producing structure in a flower usually consisting of an anther and a filament.
staminal column: see androphore.
staminal corona: fleshy outgrowth of tissue, attached dorsally to the staminal column at the base of the filament or on the backs of the anthers (compare gynostegial corona, interstaminal corona).
stamate: having stamens (usually implying that carpels are absent).
staminode (adj. staminodial): an abortive or vestigial stamen without a perfect anther.
staminophore: a structure bearing stamens.
standard: the large posterior petal (outside in the bud) of a papilionaceous corolla (= vexillum).
stele: the portion of the plant body which comprises the vascular system (xylem and phloem) and its associated ground tissue (e.g. pericycle, interfascicular regions and pith).
stellidium (pl. stelidia): lateral horn- or tooth-like appendages of the gynostemium of some Orchidaceae (e.g. Bulbophyllum spp.).
stellate: resembling a star in shape; (of hairs): with several arms radiating horizontally.
sterile (of involucral bracts of some Asteraceae): the thickened region in the lower part.

stigma (adj. stigmatic/stigmatose): the point or surface of the pistil which receives the pollen, either sessile (when there is no style) or on the top or surface of the style or its branches.
stipe/stipes (pl. stipites): the stalk supporting a carpel or gynoecium, or (in Orchidaceae) the stalk connecting the viscidium with the caudicles of the pollinia.
stipel/stipella (pl. stipellae): small secondary stipule at the base of a leaflet.
stipitate: supported on a special stalk, or stipe, e.g. an ovary (e.g. in Capparaceae).
stipit(t)iform: looking like a stipe.
stipule (adj. stipular): leaf-like or scale-like appendage of a leaf, usually at the base of the petiole.
stipuloid: stipule-like.
stolon: a runner which roots.
stoloniferous: having stolons; trailing over the soil surface and rooting at the nodes.
stoma (pl. stomata): a minute pore in the epidermis of leaves, providing for gaseous exchange between the tissues and the atmosphere.

stomatose: possessing stomata.
stone cell: a ± isodiametric sclereid.
stramineous: straw-like or straw-coloured.
stria (pl. striae): see striation.
stiation (adj. striate): one of a number of parallel longitudinal lines, grooves or ridges.
strigillose: finely strigose.
strigose: with short stiff hairs appressed to the surface.
strigulose: minutely strigose.
strobiliform: resembling a strobilus.
strobilus (pl. strobili): a cone-like structure containing the reproductive organs of one or both sexes, as in gymnosperms.
strophiole: an appendage to the hilum of some seeds (see also carpel).
strumose: with a swelling.
strut: a rod or bar connecting parts of a structure.
style: narrow upper part of an ovary supporting the stigma.
style head/pistil head (of a flower): the large posterior petal (outside in the bud) of a staminophore.
stylidium/stylodium: a style-like stigma.
stylodium: a disc-like enlargement of the base of the style (e.g. in some Brassicaceae).
sub- (prefix): implying ‘almost’, e.g. subacute: almost acute; subentire: having a very slightly uneven margin.
suberous: corky.
subtend: to have a bud or similar part growing in its axil.
subulate: awl-shaped: narrow and tapering gradually to a fine point.
succulent: a plant which accumulates water in fleshy, water-storing stems, leaves or roots; juicy, fleshy in reference to texture or appearance.
suffrutescent: like a suffrutex.

suffrutex: a perennial plant which is slightly woody only at the base.
suffruticosc: shrubby.
sulcate: grooved, furrowed.
sulculus (pl. sulculi; adj. sulcate) (of a pollen grain): an elongated latitudinal ectoaperture not situated at a pole (compare sulcus).
sulcus (pl. sulci) (of a pollen grain): an elongated latitudinal ectoaperture situated at the distal or proximal pole of a pollen grain (compare colpus, which is usually a longitudinal aperture; compare sulculus, which is not situated at a pole).
superior: applied to an ovary when the sepals, petals and stamens...
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are inserted below it (hypogynous); also when the receptacle bearing the calyx, corolla and stamens is prolonged so as to be separate from the ovary, but forms a cup surrounding it (perigynous) (compare inferior)
supra (prefix): above, on the upper side.
suture: the line of junction or seam of union, commonly used of the line of opening of a carpel; the dorsal (outer or anterior) suture of a carpel represents the midrib of the carpellary leaf; the ventral (inner) suture represents the united margins on which the ovules and placentas are borne.
sward: lawn; continuous grass cover produced by stoloniferous species.
syconium: a multiple fruit, or syncarp, with a hollow centre, e.g. the figs of *Ficus* (Moraceae).
sympetalous: having petals which are partly or completely fused (syn. choripetalous, gamopetalous) (compare polypetalous)
sympatric: (of two or more taxa): having coincident or overlapping ranges of distribution (compare allopatric)
sympodial (of growth): without a single persisting growing point; changing direction by frequent replacement of the growing apex by a lateral growing point below it (compare monopodial)
synandrium: an androecium of a male flower with united anthers.
synanthous (of leaves): appearing together with the flowers (compare hysteranthous)
syncarp: syncarpium: a structure consisting of several united, usually fleshy fruits; (compare aggregate fruit).
syncarpous: composed of two or more united carpels.
synflorescence: a compound inflorescence.
synthecate (of anthers): with the two thecae having merged into one, e.g. in some Scrophulariaceae.

T
tannin: a complex yellowish or brownish aromatic compound found in many plants.
tanniferous: producing tannins.
taproot: the main, descending root of a plant that has a single dominant root axis.
taxon (pl. taxa): a group or category, at any level, in a system for classifying organisms.
tectum (of a pollen grain): the outermost closed layer of the sexine, formed by union of the heads of the bacula.
tendrilliform/tendriloid: resembling a tendril.
tenui- (prefix): slender, thin.
tenuous: thin or slender in form.
tepal: any of the members of a perianth that is not clearly differentiated into calyx and corolla.
terete: cylindrical, circular in transverse section.
terminal: at the apex or distal end.
ternate: arranged in a whorl or cluster of three.
ternately compound (of a leaf): with leaflets in threes.
terrestrial: on or in the ground.
tessellate: having a checkered pattern, e.g. with depressions.
testa: the outer coat of a seed.
tetra- (prefix): four-
tetrad: a group of four spores or pollen grains derived from a spore mother cell or pollen grain mother cell as a result of meiosis, and remaining fused at maturity, e.g. in Ericaceae (compare monad).
tetradynamous: having six stamens, two of which are shorter than the others, as in most Brassicaceae.
tetragonal: 4-angled.
tetramerous: having four members in a whorl.
tetrandraous: having four stamens.
tetrasporangiate (of an anther): having four microsporangia or pollen sacs.
thalloid: resembling or shaped like a thallus.
thallus: a single plant body not differentiated into stem and leaves, e.g. *Lemna* spp. (Lemnaceae).
theca (pl. thecae; adj. thecosous/thecate): one half of an anther, usually containing two pollen sacs/microsporangia.
thorn: a modified plant organ, especially a stem, that is stiffened and ends in a pungent point.
throat (of a tubular corolla): the top of the tube, where the lobes arise from the tube.
thrum flower: in heterostyly plants, the flower type having the shorter style (compare pin flower).
thyrs: a panicle with the secondary and ultimate axes cymose, i.e. the main axis is indeterminate and the lateral branches are determinate in their growth.
thyrsoid: like a thyrs.
tiller: a shoot growing from the base of a grass (*Poaceae*) stem; to produce tillers.
tomentellous/tomentose: minutely tomentose.
tomentellum: a fine, short tomentum.
tomentose: densely covered with short, soft, felted hairs.
tomentum: a covering of woolly, densely matted hairs; wool.
toothed: see dentate.
tortuous: irregularly twisted or twining.
torulose: cylindrical with contractions or swellings at intervals.
torus: see receptacle.
trabeculate: cross-barred.
trace: a strand of vascular tissue connecting the stem with a leaf or reproductive organ.
translator: see corpuscle.
translator arm: see caudicle.
trapезнiform: a figure of four straight, unequal sides.
tri- (prefix): three, thrice.
triad: a group of three.
trichome: an epidermal outgrowth, such as a hair or scale.
trichotomous: forking regularly into three.
trilobed: deeply divided into three parts.
trilobate: having three leaves.
trilobulose: having three leaflets.
trigonous: triangular in cross section and with obtuse angles (compare triquetrous).
trilobed: having three leaflets.
trilobate: having three scars lines forming a ‘Y’, or basically tetrahedral.
trimerous: in threes, e.g. of a flower with three sepals, three petals, etc.
tripartite: divided into three parts.
tripinate (of leaves): thrice pinnately divided.
triporate: with three pores.
triquetrous: triangular in cross section and with acute angles, therefore with three distinct longitudinal ridges (compare trigonous).
tristichous (of leaves on a stem): arranged in three vertical rows.
tristylous (said of a heterostyly species): having three style lengths (short, mid, long); the flowers of any one plant having styles of the same length.
trullate/trulliform: trowel-shaped; having its widest axis below the middle and with straight margins.
truncate: cut off ± squarely at the end. 476

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undulate: wavy on the margin.

uncinate: terminating in a hooked point.

tuber: (1) a thickened branch of an underground stem which produces buds; (2) a swollen root or branch of a root acting as a storage organ.

tuberous: (of roots): tuber-like.

tuft (adj. tufted): clump, cluster.

tuft domatium: a domatium supplied with or consisting of hairs.

tumid: swollen, enlarged.

tumulus (pl. tumuli): a small mound.

tunic (adj. tunicate) (of a bulb or corm): a loose membranous or fibrous outer skin which does not develop from the epidermis.

turbinate/turbiniform: shaped like a top; obconical.

turgid: swollen due to a high water content (compare flaccid).

turion: (1) a young shoot or sucker which is produced from an underground stem; (2) a perennating winter bud which is separated from the parent and gives rise to a new plant in spring.

tussocky: tufted as in some grasses or grass-like plants.

umbel (adj. umbellate): a racemose inflorescence in which all the divergent pedicels or rays arise in a cluster at the top of the peduncle and are of about equal length; compound umbel: each ray bears an umbel, each of the latter called a partial umbel; simple umbel: each umbel terminates in a flower.

umbellule: a secondary umbel in a compound umbellate inflorescence.

umbo (adj. umbonate): a blunt or rounded projection arising from a surface, as on a pine-cone scale.

uncinate: terminating in a hooked point.

undulate: wavy on the margin (compare sinuate).

unguiculate (of petals): having a narrow claw-like base.

uni- (prefix): one-.

unifacial: one-faced; (of leaves): folded sharply in half along the midline so that the adaxial surface is hidden; or filiform to ally terminal, style.

vestigial: having a clearly defined and removed with the pollinia agent.

ventral (of a lateral organ): the upper or inner face or the surface facing the axis; (of a thallus): the surface facing the substrate (compare dorsal).

ventricidal: of the dehiscence of a fruit which splits down the ventral (axile) side of the locules.

ventricose: swollen or bulging on one side; unequally inflated.

vermiciform: shaped like a worm.

vernation: the arrangement of unexpanded leaves in a bud (compare aestivation).

verruciform: resembling a wart.

verrucose: warty.

vaccose: finely warty.

versatile (of an anther): swinging freely about the point of attachment to the filament which is ± in the middle of the back (compare basifixed, dorsifixed, medifixed).

verticil: a whorl or circular arrangement of similar parts around an axis, at the same level.

verticillaster: a false whorl of opposed dense cymes, especially in Lamiaceae.

verticillate: arranged in one or more whorls.

vesicle: a small sac or cavity; a spherical body.

vesicular: pertaining to, having, or composed of, vesicles.

dental: of an organ now degenerate and of little or no utility (compare obsolete, rudimentary).

dentition: any covering on a surface, e.g. plant trichomes.

dentil: of or denoting something with teeth, e.g. the teeth of a leaf.

venation: the arrangement of veins of a leaf or other organ.

vascular: specialised for the conduction of fluids; vascular plant: plant containing specialised conducting tissues.

vascular: specialised for the conduction of fluids; vascular plant: plant containing specialised conducting tissues.

vegetative (of plant organs or parts): having non-reproductive functions, e.g. leaves, roots, stems, etc.

veins: strands of vascular tissue (compare nerves).

velamen: water-retaining outer layer of the aerial roots of some epiphytes, especially Orchidaceae.

velum: a veil; a membranous covering.

velutinous: velvety.

velvety: with a coating of fine soft hairs.

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flange of tissue extended beyond the normal outline of a stem or petiole; (3) one of the two lateral petals of a papilionaceous flower; (4) one of the petaloid sepals of the flower in Polygalaceae.

X
x/basic chromosome number: the number of chromosomes in the original genome (haploid set) from which a polyploid or a group of polyploid forms or species is known or postulated to have arisen.

xeromorphic (of plants or plant parts): having characteristics that serve as protection against excessive loss of moisture.

xerophyte (adj. xerophytic): a plant that is adapted to dry or arid habitats.

Z
zonasulculate (of a pollen grain): with a ring-like sulcus around the equator.

zonatriporate (of a pollen grain): with three pores equatorially.

zygomorphic: applied to flowers which are bilaterally symmetrical, i.e. capable of being bisected into identical halves in one plane only, forming mirror images; (= irregular) (compare actinomorphic, regular).
Current names of local families are in capital letters; synonyms are in italic type. Exotic taxa are marked with an asterisk.

The following symbols and the order are given for current families to indicate their placing in the classification system according to APG II (2002, *Botanical Journal of the Linnean Society* 141: 399–436) outlined on pp. 3–4: A—asterids; Ce—core eudicots; com—commelinids; E—eudicots; Ea—euasterids (I and II); Eur—eurosids (I and II); G—gymnosperms; M—monocots; mag—magnoliids; ?—position uncertain; unplaced families are listed after asterids on p. 4.

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This publication is a product of the Southern African Botanical Diversity Network (SABONET), a programme aimed at strengthening the level of botanical expertise, expanding and improving herbarium and botanic garden collections, and fostering closer collaborative links among botanists in the southern African subcontinent.

The main objective of SABONET is to develop a strong core of professional botanists, taxonomists, horticulturists, and plant diversity specialists within the ten countries of southern Africa (Angola, Botswana, Lesotho, Malawi, Mozambique, Namibia, South Africa, Swaziland, Zambia, and Zimbabwe). This core group will be competent to inventory, monitor, evaluate, and conserve the botanical diversity of the region in the face of specific development challenges, and to respond to the technical and scientific needs of the Convention on Biological Diversity.

To enhance the human resource capacity and infrastructure available in the region, SABONET offers training courses, workshops, and collaborative expeditions in under-collected areas. The programme produces a newsletter, SABONET News, and a series of occasional publications, the Southern African Botanical Diversity Network Report Series, of which this publication is part.

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