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NEWS-LETTER OF THE SOUTH AFRICAN ASSOCIATION OF BOTANISTS
NUUSBRIEF VAN DIE SUID-AFRIKAANSE GENOOTSKAP VAN PLANTKUNDIGES

THE XIII INTERNATIONAL BOTANICAL CONGRESS: The XIII International Congress was held in Sydney, Australia from 21 - 28 August 1981. The Nomenclature sessions were held during the week preceding the Congress meetings, from 17 - 19 August. Twenty-one SAAB members attended the Congress:

Pretoria Univ.: Prof. N. Grobbelaar, Prof. A. Eicher, Prof. P.J. Robbertse.
Botanical Research Inst.: Dr B. de Winter, Dr D.J.B. Killick, Dr G.E. Gibbs Russell.
Univ. of the Witwatersrand: Prof. B.H. Walker, E.R. Robinson, Dr R.E. Norris.
National Univ. of Lesotho: Dr S. Talukdar.
Potchefstroomse Univ. vir C.H.O.: Prof. D.J. Botha.
Univ. of Natal: Prof. J. van Staden.
Univ. of Durban-Westville: A. Barnabas, Dr H. Baijnath.
Univ. of the Transkei: Prof. A.J. Tew.
Univ. of Fort Hare: S. Russell.
Univ. of Port Elizabeth: Dr M.C. Olivier.
Univ. of Stellenbosch: Prof. J.J.A. van der Walt, Prof. J.H. Visser.
Univ. of Cape Town: Prof. O.A.M. Lewis.
Kirstenbosch: Dr J.P. Rourke.

Nomenclature Sessions: The primary purpose of the nomenclature sessions, held in conjunction with every IBC, is to amend the International Code of Botanical Nomenclature. Three South Africans attended the 1981 sessions: Dr D.J.B. Killick (a member of the Committee for Spermatophyta), Dr G.E. Gibbs Russell and E.R. Robinson. Proposals to amend the Code were published in Taxon, and all members of IAPT had voted by mail earlier in the year. This postal vote was not binding, but was for the guidance of Congress mem= bers, but proposals heavily defeated on the postal vote were not considered unless re-submitted from the floor. SAAB members C. Stirton, L.C. Leach and D.J.B. Killick had proposals considered at the Congress.

Nine sessions were held, during seven of which the proposals to change the

Code were discussed and voted on. In order for a change to be made, a pro= posal had to be accepted by a 60% majority. A few of the many matters dis= cussed were:

Nomina Specifica Conservanda

The most interesting change adopted in the Sydney Congress was the acceptance in principle of the conservation of species names, but ONLY for species of major economic importance. Nomina specifica conservanda has been proposed and rejected at every Congress since the first one in 1906. Its acceptance this time was by a very slim margin: Yes: 257; no: 167; accepted by 60,9%.

Nomina Specifica Rejicienda

The editorial committee will work out a procedure to implement this article, (first accepted in a slightly different form at the Leningrad Congress), which provides that a species name "may be rejected if it has been widely and persistently in use for a taxon not including its type". Two mechanisms for dealing with troublesome species names now exist, but they are not the opposite of each other, for they apply in different circumstances. Nomina specifica rejicienda can be used to get rid of a name that has been incor= rectly applied and the next oldest legitimate name will be taken up in place of the rejected name. Nomina specifica conservanda will act to retain a widely used name, even if it is not the oldest legitimate name for the taxon.

Rejection Of "Phylum"

The change of the botanical term "division" to "phylum" to conform to the usage of zoologists was rejected. This issue has also been brought up and rejected at a number of previous Congresses. It was dear to the heart of many members, and a number of speeches were made both for and against the change. An attempt to bring the matter up for a second time at Sydney was made on the last day of the Nomenclature Sessions, but this too was defeated.

Hybrids

Changes were made in the way of designating hybrids, and an entirely new Appendix dealing with hybrids was accepted. A hybrid species will be known as "nothospecies", a hybrid variety will be "nothovariety", etc.

Autonyms

Clarification of priority for autonyms. It was finally (after much dis= cussion) accepted that "an autonym will automatically acquire priority over the name of equivalent rank which established it". This is a return to the position before this rule was altered at the Seattle Congress.

Generic And Family Typification

For typification of genera and families, it was accpeted that "The type of a name of a genus ..... is the type of a name of an included species". Likewise "The type of a name of a family ..... is the same as that of the generic name on which it is based". This means that (in most cases) a specimen is now the type of a genus or family, not an included species or genus, as formerly.

Neotypification

The guide for neotypification was more precisely worded: "A neotype may be designated only when all of the originally cited material or material seen by the author but not cited, and its duplicates, are believed lost or des= troyed; a neotype may be selected from any material that is not the origi= nal material".

Special Committees

Special committees were set up to consider complicated topics which gene= rated much discussion:

Special committee for lectotypification
Special committee for effective publication
Special committee for valid publication
Special committee for orthography.

Many of the proposals to amend the Code were referred to the appropriate special committee. Nominations for members of these special committees are needed, and should be sent to: the General Committee for IAPT, Utrecht.

Congress Program: The Congress was divided into 13 sections, and in each section there were symposia of invited papers, sessions of contributed papers, and poster sessions. In addition, during the lunch hour each day there were general lectures by eminent botanists on topics of wide interest.

Below are listed the Congress sections, with abstracts of the papers presented in each section by SAAB members.

Section 01. Molecular Botany (66 oral papers, 41 posters).

Section 02. Metabolic Botany (129 oral papers, 58 posters).

O A M Lewis & J Withers: Assimilation of nutrient ammonium by barley. Xylem sap analysis of barley

plants fed ammonium (NH_4^+) show that this ion is assimilated entirely in the root. Enzyme assays of the roots show high glutamate dehydrogenese (GDH) activity compared to glutamine synthetase (GS) activity, suggesting the involvement of GDH in root ammonium assimilation. When $^{15}NH_4^+$ is fed to barley roots, high accumulation of ^{15}N takes place in free amino compounds, particularly glutamine and glutamate. With the addition of the GS inhibitor, methionine sulfoximine (MSO), to the $^{15}NH_4^+$ feeding medium the free amino compounds remain unlabelled while $^{15}NH_4^+$ accumulated rapidly in the roots. Root enzyme assays show that GS is completely inhibited by MSO treatment, while the activity of GDH remains unaffected. These results indicate that in barley, ammonium absorbed from the soil is assimilated entirely via the root GS - GOGAT pathway, and that GDH plays, little, if any, part in this process.

Section 03. Cellular and structural Botany (148 oral papers, 38 posters).

P J Robbertse, J V van Greuning & A Rabie: The wood anatomy of South African *Pavetta* species. The wood anatomy of ten South African *Pavetta* species has been investigated. The wood is diffuse-porous with diffuse apotrachial parenchyma. Rays are 2-5 seriate, heterogenous type 1. Fibre tracheids were found in all investigated species. The few inter= specific differences as well as the taxonomic relationship of the genus *Pavetta* based on the presence of fibre tracheids, will be discussed.

Section 04. Developmental Botany (139 oral papers, 34 posters).

J H Visser: Host contact and initial development of the root parasite *Hyobanche sanguinea* L. Shortly after exposure of the seed of *Hyobanche sanguinea* to a germination stimulant that is exuded by the roots of the host, *Metalasia muricata* R. Br., the radicle emerges and attaches to the host root. As soon as continuity with the host is established the rad= icle is transformed into a callus-like tubercle tightly ad= pressed to the host root. Conducting elements are differ= entiated in this mass of thin-walled undifferentiated paren= chyma cells towards the periphery of the tubercle where

centres of meristematic activity are formed. Rhizomes eventu= ally develop out of these meristematic centres. Results of this anatomical study indicate that the embryo seemingly only consists of a radicular pole - the plumular function appar= ently being taken over by the tubercle.

J van Staden: Transport and metabolism of 8 [^{14}C] t-zeatin in germinating maize caryopses. Labelled zeatin applied to ger= minating maize kernels is differentially metabolised by the embryonic axis and endosperm tissues. A larger number of radioactive metabolites was formed when the hormone was applied to the embryo or intact tip of the radicle than to the endosperm. When applied to the endosperm only one meta= bolite was formed. This compound which persisted in the endosperm tissue stimulated the growth of the soybean callus and appears to be an oxidation product of zeatin. Its for= mation indicates that side-chain cleavage rather than side-chain modification is the way in which zeatin is metabolised in the endosperm. This also happens in the embryonic tissue. The formation of metabolites which co-chromatographed with ribosylzeatin within this part of the germinating kernel, in= dicates that in the metabolically more active tissues, modi= fications to the adenine ring also occur. No definite evi= dence for an embryo-endosperm interaction of cytokinins during the course of germination could be detected.

Section 05. Environmental Botany (170 oral papers, 63 posters).

Section 06. Community Botany (144 oral papers, 44 posters).

B H Walker: Changes in African savannas under the impact of fire, browsing and grazing. Savannas are here defined as mixtures of woody vegetation (W) and grass (G) which, in the absence of fire, have insufficient rainfall to develop into closed woodland. It is hypothesised that under any particu= lar rainfall regime vegetation structure is determined by soil depth and texture as a result of competition between G and W for water (primarily) and nutrients. Where soil depth enables tree roots to penetrate below the grass root-zone a stable equilibrium of G and W can occur.

Grazers, browsers and fire affect this equilibrium combination

directly (by reducing one component and allowing the other to increase) and indirectly (mainly by changing the distribution and amounts of soil water and nutrients). On sandy soils W is dominant and changes in G have little effect. Changes in W lead to much increased G, and usually a different species composition. On soils prone to surface capping, reduced G leads to reduced rainfall infiltration and a change in the ratio of top-soil (T) to sub-soil (S) water. With reduced roots of G, movement of water through T to S leads to nutri= ent displacement in favour of W. These indirect effects can give rise to two stable equilibria, one of G and W, the other of W alone.

S Talukdar: The spread of Australian tree species and their displacement of the indigenous flora of Lesotho. The spread of Australian tree species of the genera *Eucalyptus* and *Acacia* in Lesotho has been chronicled from records, maps and aerial photographs. Both genera since their in= troduction in the 1860s have in some localities displaced the indigenous woody species, and the evidence is that the acacias are spreading readily into habitats formerly occu= pied by shrubs and small trees. The indigenous species have survived in areas that are too steep or too remote to be disturbed by domestic animals.

Section 07. Genetic Botany (45 oral papers, 40 posters).

Section 08. Systematic & evolutionary Botany (163 oral papers, 61 posters).

D J Botha: The taxonomy of southern African Menispermaceae.

With the exception of the two deciduous *Tinospora* species and the shrubby *Antizoma miersiana*, the rest of the family consists of evergreen, woody or herbaceous lianes or suffrutex with winding branches. All the species are dioecious, with the exception of *Cocculus hirsutus* where the male flowers sometimes contain rudimentary carpels. In exceptional cases these carpels may be fertile. The external morphology and anatomy of the lamina of the various species differ to such an extent that it was possible to compile keys by means of which the various

species could be distinguished. Anatomically a close re= lationship is shown in the similarity of the stem and the petiole of the various species. A study of the pollen mor= phology has proved the family to be eurypalynous. The *Antizoma/Cissampelos* complex, however, is stenopalynous. These taxa can thus be regarded as closely related.

H Baijnath: Leaf surface structures of some parents and hybrids in the Liliiflorae. In this study leaf surface structures of several parents and their hybrids (inter= specific and bigeneric) were examined using both light and scanning electron microscopy. The species belong to the families Liliaceae, Amaryllidaceae and Iridaceae, and the hybrids originated from artificial crosses undertaken for horticultural purposes. It is found that for a particular species, ornamentation may be similar or different on the adaxial and abaxial leaf surfaces. In crosses involving one parent with similar and another with different struc= tures on both leaf surfaces, the hybrid shows characters which are dissimilar on both surfaces. In general, the hybrids inherit some characters from each parent. Sometimes the expression of characters from one parent is more marked than that of the other parent. In crosses involving ex= amples with smooth and sculptured surfaces, it is found that the latter condition appears in the hybrid. In the transmission of leaf characters from parents to hybrids there may either be a loss of detail, the appearance of a new char= acter state, the accentuation of an existing feature, or the transference of a character from a particular leaf surface of the parents to the opposite surface of the hybrid.

G E Gibbs Russell: Computerized register of names and types for Poaceae in southern Africa. The recording of all names published for or based on southern African specimens of Poaceae will streamline the slow process of accumulating original descriptions and locating type specimens. For each entry, the name, author, place and date of publication, basionym, cross-reference to other genera, and type specimens are recorded in a data file. The data can be sorted in four

ways, each with a different application: 1. Alphabetically by name, to allow checking against additional references to find omitted names. 2. Alphabetically by place of publi= cation, to allow systematic search of specific publications for all original descriptions and type specimens. 3. All entries in a genus, whether by name, basionym, or cross-reference, sorted alphabetically either by name of by place of publication, to give monographers access to data needed to work in a particular genus. 4. By type specimens, so that all type specimens of each collector may be listed and located.

J J A van der Walt: Phylogenetic trends in *Pelargonium* L'Herit. The more than 200 species of *Pelargonium* are grouped into 16 sections. The sections show different degrees of specialization, especially as far as habit, leaf, floral and pollen structure are concerned. Sections *Eumorpha* and *Pelargonium* with a shrubby habit, simple leaves and relatively actinomorphic flowers with seven fertile stamens and reticulate pollen, are considered as the most primitive sections. Representatives of the sections *Hoarea* and *Seymouria* exhibit the most advanced characteristics of the genus. They are geophytes with compound leaves and extremely zygomorphic flowers with a reduced number of fertile stamens and striate pollen. Evolutionary tendencies from the primitive sections *Eumorpha* and *Pelargonium* to the advanced sections *Hoarea* and *Seymouria* are suggested.

Section 8A. Bryology (62 oral papers, 21 posters).

S Russell: Humidity gradients and bryophyte zonation in the Afromontane forests of the Eastern Cape, South Africa. A brief account is given of the Eastern Cape Forest bryo= flora, with comments on its biogeographical affinities and community structure.

Distribution of Bryophyte communities is controlled by light-climate effects throughout the range of physiognomic forest types represented in the Eastern Cape. Super= imposed on this pattern is a distinctive vertical zonation of Epiphytes correlated with sub-canopy humidity gradients.

This paper focusses on the latter aspect, with particular attention being paid to characterization of the forest microclimate and investigations into the water relations of several Bryophyte species of value as zonal indicators.

Section 09. Fungal Botany (76 oral papers, 30 posters).

Section 10. Marine & freshwater Botany (175 oral papers, 34 posters).

A J Tew: Factors that determine mangrove community structure. In the Umgazana estuary, earmarked for a harbour development, six different community structures are identified associated with flood profiles. It is evident that lowering of the tidal flood reduces the community to mature *A. marina* trees which from tagging data have a very low regeneration potential. The effect of a raised tidal flood or altered salinity on the survival of seedlings is assessed in the short term by measurements of leaf stomatal resistance as an indicator of carbon dioxide exchange potential. At low radiation loads all three species studied are equally adapted to the normal saline flood profile but at high radiation loads the seedling of *A. marina* is more tolerant which correlates with measured production rates in open areas. Probably the broad canopy of *A. marina* establishes first to form the more sciophytic environment in which the seedlings of other species establish. Raising the flood profile significantly increases the leaf stomatal resistance of all species and lowering of the salinity accentuated this effect particularly in the two species *B. gymnorrhiza* and *R. mucronata*. This correlates with a reduced frequency in the upper reaches of the river of these two species. From these data it may be predicted that changes in the tidal flood and salinity due to development will reduce the forest to mature *A. marina* individuals prior to eventual loss.

R E Norris: Examples of new directions in the study of microalgae.

Section 11. Historical Botany (148 oral papers, 10 posters).

Section 12. Applied Botany (135 oral papers, 24 posters).

A V Hall, B de Winter & T H Arnold: Threatened plants in southern Africa. An account of the present state of knowledge of threatened plant taxa for Southern Africa, which includes the territories of South Africa, Swaziland, Lesotho, Botswana, Namibia, Transkei, Venda and Bophutatswana, is given. Angiospermae, Gymnospermae and Pteridophytes are included but not the Bryophytes, Algae and Fungi for which information is still very incomplete. Over 2 300 taxa have been included in the lists compiled. Of these the large majority occur in the Cape Floristic Kingdom, which in the southern subcontinent is the major crisis zone for the loss of genetic diversity. The conservation status of the various taxa included is presently being investigated and many adjustments to the lists will have to be made in the light of newer information.

Other Congress Functions:

Opening Ceremony: The concert hall of the Sydney Opera House was the venue for the opening of the Congress by the Governor General of Australia. The ceremony was preceded by an organ recital and ended with a short concert. Following this there was a reception in the foyer of the Opera House.

Sunday Excursions: A number of excursions were led by Australian botanists to give visitors a glimpse of the flora of the Sydney area. One could choose to visit the Blue Mountains, mangrove swamps, Botany Bay, fossil deposits, a tidal reef, or two National Parks.

Meetings & Social Program: A number of societies had meetings and dinners in conjunction with the Congress: IAPT, Int. Group for study of Mimosoideae, Biosciences Information Service, IUBS, Int. Assoc. of Bryologists, Int. Assoc. for Lichenology, Int. Commission for Palynology, Soc. Int. de Plantarum Demographia, IAPP, Int. Org. for Paleobotany, Int. Soc. of Plant Morphologists, Int. Assoc. of Aquatic Vascular Plant Biologists, Int. Mycological Assoc., Int. Phycological Soc., Linnean Soc. of NSW with Swedish Linnean Soc. & Linnean Soc. of London, Int. Assoc. of Wood Anatomists (50th anniversary).

SAAB members met for dinner one evening, and were invited beforehand to the official residence of the Consul General, Mr Smith. Mr & Mrs Smith

joined us for dinner, and very kindly contributed South African wine for the occasion.

Closing Ceremony: The Sydney Town Hall was the venue for the final plenary session, at which a number of resolutions were adopted, and the Closing Ceremony. Prof. J Barran (Nat. Museum of Natural History, Paris) spoke on the topic "Plants and Man on the threshold of the 21st century".

Prof. N Grobbelaar was chairman of the Congress Invitations Committee, and sat on the platform during this final Congress session so that he could announce that the next International Botanical Congress will be held in West Berlin in 1987.

S.A.A.B. E.CAPE REGION, CHAIRMAN'S REPORT - 1980: The Committee of this branch has not been extremely active in E. Cape matters during the past year. Probably the two main reasons for this are the 1981 S.A.A.B. Congress and the present critical staff position in the Botany Department at the University of Port Elizabeth.

As you are aware the 1981 S.A.A.B. Congress is to be housed by U.P.E. All the U.P.E. members of the E.C. Committee have been extremely busy in arrang= ing and preparing for this event. I am happy to report that arrangements are progressing well. We have to date collected over R3 000 for Congress; most of the abstracts have been received and planning of the excursion is well under way. Arrangements for the visit to South Africa by Professor William Jensen from California have been finalized. Professor Jensen will be the guest speaker at Congress and will then undertake a lecture tour of a few S.A. Universities. Here in the Eastern Cape he will lecture at U.P.E. and you are all cordially invited to attend.

The E. Cape branch has unfortunately lost two prominent members viz. Professors Small and Downing. We wish them well in their respective new posts. Fortunately though three new members have joined and Professor Bate will join us in January. (B. Robertson)

UNIVERSITEIT VAN DIE ORANJE-VRYSTAAT, BLOEMFONTEIN: Dr Johan Grobbelaar van die Instituut vir Omgewingswetenskappe het 'n boekprys ontvang vir die beste referaat tydens the Limnologie Kongres van die Limnologiese Vereniging van Suider Afrika te Bloemfontein (7 - 10 Julie 1981) met 'n referaat getiteld: "Carbon flow within the pelagic zone of Wuras dam".

Dr Grobbelaar is ook genooi om 'n referaat oor algproduksie en bio-energetiese

omskakeling te lewer tydens die Biosolar energy conversion kongres. Die kongres word deur die Weissmann vereniging vir die eerste week in September 1981 in die Kruger Wildtuin gereël.

Prof. Kobus Eloff van die Departement Plantkunde is met studieverlof tot Desember 1981. Hy is werksaam in New York aan die Brookhaven Laborato= ries waar hy saam met dr Bill Siegelmann werk op die isolering van toksien uit *Microcystis* en die opklaring van die struktuur daarvan.

Dr Pieter Keulder van die Department Plantkunde is genooi om 'n referaat te lewer tydens die "2nd International Symposium on the interactions be= tween sediments and freshwater" (14 - 18 Junie 1981) te Queen's University, Kingston, Ontario, Kanada. Die titel van die referaat was: Particle size distribution and chemical parameters of the sediments of a shallow turbid impoundment. Die simposium is deur 90 persone uit baie lande by= gewoon en was 'n baie suksesvolle byeenkoms.

SHOT IN THE "EYE" FOR BOTANISTS: The following occurred in an article in a Pretoria daily dealing with one of the plush houses of Waterkloof — "The immaculately kept garden comprises mainly sprawling lawn and indige= nous trees and shrubs. A feature is one of the largest collections of cycads in South Africa which includes a Woody Eye — one of the rarest — and all other South African varieties." (Note: A sucker of "Woody Eye", now extinct in the wild, was reported to have been sold a few years ago in U S A for $68 000 !).

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