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

BOTANICAL RESEARCH INSTITUTE (continued):

ECOLOGY SECTION:

Transvaal bushveld studies: A pilot study on the Sour Bushveld (Veld Type 20) has been completed by Mr. R.H. Westfall who has submitted his final report. The vegetation has been classified and mapped. Plant communities were subjected to ordination to determine environmental gradients and layer diagrams were used to illustrate community structure. Suggestions for the application of veld-condition assessments in respect of grazing potential in bushveld vegetation include the use of the quadrat method with the Domin-Krajina cover-abundance scale for estimating canopy cover.

Transvaal forest survey: The field work on the lower section of the transect study of the Sabie area has been completed by Mr. G.B. Deall, who is preparing the data for processing. The usefulness of the land-type map for stratification of the area for stratified random sampling will also be assessed.

Coastal studies: Dr. P.J. Weisser has completed his tabulation of the field data of the Mlalazi Estuary - Richards Bay dune area. Twenty-two mapping units have been established and described, fourteen vegetation maps (scale 1:10 000) drawn and twenty-five pages of manuscript completed. The vegetation changes of part of the future Kwa Zulu Botanical Garden were monitored and quantified using aerial photographs. When protected, the dune vegetation recovers rapidly.

The aquatic, semi-aquatic and adjoining terrestrial vegetation of 38 Cape estuaries was studied and mapped by Miss R.J. Parsons using air-photo and field data. For eight estuaries the information has been published in C.S.I.R. reports. Literature search reveals a dearth of botanical information on Cape estuaries. In most situations studied, the vegetation is badly degraded or is threatened, owing mainly to over-exploitation or other mismanagement.

Cape fynbos studies:

(a) Vegetation survey of the Cape of Good Hope Nature Reserve: Reports on this survey are being prepared by Mr. H.C. Taylor as papers for publication. From

the results of the trial of methods reported in the first paper it is concluded that, with the type of sampling used, the synthetic phytosociological Braun-Blanquet method provides a more natural classification of communities of the Reserve than does the monothetic, divisive association-analysis method. In the second paper the habitat and vegetation of the Reserve is described. Ten fynbos and two scrub-forest communities are recognized.

(b) The vegetation of Swartboskloof, Jonkershoek: Mr. D.J. McDonald is making good progress on a semi-detailed study of the fynbos and forest communities of the Swartboskloof catchment. This area is the Fynbos Biome Project's Mountain Fynbos intensive study site. Phytosociological approach and methods are being used for this survey and to date 158 plots have been sampled. Data from 97 sample plots have been edited, coded and placed on computer file for processing. Preliminary phytosociological tabulation is well advanced.

(c) A study of the vegetation along transects through the Western Cape forelands: Mr. C. Boucher has distinguished and mapped (at a scale of 1:10 000) nine plant communities, representing subdivisions of two veld types, namely West Coast Strandveld (Veld Type 34) and Coastal Fynbos (Veld Type 47), at the Fynbos Biome Project's Coastal Fynbos intensive study site near Pella, Atlantis.

A preliminary check-list of flowering plants and ferns has been compiled. The check-list includes information about the periodicity of the 402 species collected in this 269 ha site. Seven species recorded here were found to be listed in the threatened plants of southern Africa report.

Four major vegetation units have been identified in the western forelands from the analysis of 338 sample plots and 778 species. The three veld types, West Coast Strandveld, Coastal Renosterveld and Coastal Fynbos, have now been identified more accurately while an additional category of wetland vegetation must still be described.

Aquatic ecology

An ecophysiological study of water hyacinth in Natal: The report by Mr. C.F. Musil on the kinetics of nitrogen- and phosphorus-limited growth rates of Eichhornia crassipes in the laboratory and in the field has been revised and rewritten. Growth rates of E. crassipes in the field have been shown to be fairly accurately predicted from the nitrogen and phosphorus growth rate limiting concentrations in the water and from those in the plant tissues using a refined predictive model generated as a result of this investigation. Mr. Musil has demonstrated the manner in which the refined predictive model can be used to calculate yields, growth rates and amounts and frequencies of harvest

for E. crassipes growing in polluted waters to control nutrient enrichment, as well as excessive growth of this plant.

Ecological literature indexing: An ecological bibliography for southern Africa is currently being compiled, especially by Mrs A.J. Engelbrecht and Mr. R.H. Wesfall. References recorded by researchers at the Botanical Research Institute are being expanded and incorporated into a computer data base. All references are being annotated with codes, key words, biomes and regions where applicable. The IBM/STAIRS programme package is used for retrieving references by means of author and subject headings as well as by alphabetical sorting.

National Conservation Plan: Since a full-time co-ordinator and staff for the NAKOR National Plan for Nature Conservation are now being provided by the Department of Environment Affairs, the co-ordination and data-processing services rendered on a part-time basis by the Ecology Section are being transferred to that Department. The data base has begun to firm sufficiently to provide a more solid basis for scientific conservation planning.

PLANT EXPLORATION SECTION: During 1980/81 it was decided that the section's weed research activities should be phased out in favour of plant utilization research.

This year the process was taken a step further with the decision that we should further concentrate our efforts on food plants, phasing out work on other facets such as barrier plants and wood utilization. Mr. M.J. Wells the head of section is personally supervising the rounding off of facets that are being phased out, whilst Mr. T.H. Arnold is leading the research on food plants.

Conservation of Germ Plasm: Mrs. K.J. Musil reports that seed collections of primitive crops (mainly forms of Sorghum, Pennisetum, Citrullus and Lagenaria) numbered 576. Some material went to the germ plasm bank for future breeding programmes, the rest being retained for research on crop diversity.

Eighty-eight black families were interviewed regarding crop preferences, to establish which crops are liable to be lost. Factors determining preferences range from diversity of use to susceptibility to bird and insect attack. Traditional grain crops are losing ground to modern maize cultivars, and there is little concern, at local level, for their conservation.

Crop diversity: Origin and Classification of Sorghum: As a result of Mr. Arnold's work all five races of primitive crop sorghums (Bicolor, Guinea,

Caffra, Caudatum and Durra) have now been recorded from South Africa, typical forms of the latter two races being recorded for the first time. Seven intermediate races have also been recorded, collectively exhibiting an almost continuous range of variation, and constituting an important source of germ plasm.

A new taxonomic character, a zone of weakness and groove which facilitate separation of the grain at threshing, has selective advantages. Its differentiation provides new evidence regarding the evolution and movement of sorghum races in Africa.

This project is in co-operation with the Summer-grain centre and the Sorghum Beer Research Institute, C.S.I.R.

Crop diversity: Other primitive crops: Primitive forms of six other crops of African origin (Pennisetum americanum, Vigna unguiculata, Voandzeia subterranea, Citrullus lanatus, Lagenaria siceraria and Hibiscus esculentus) and four of extra-African origin (Zea mays, Arachis hypogaea, Cucurbita pepo and Phaseolus radiatus) were collected by Mr. Arnold and Mrs. Musil for investigation. Of these only Hibiscus and Phaseolus showed little variability. The other crops were very variable. Vigna unguiculata (cowpea) variants with cream, beige, orange, red, mauve, purple and black fruits, either plain or speckled, kidney-shaped or diminutive and angular, were found. Crop diversity studies are continuing.

Tribal plant uses: A study of ethno-botany in southern Africa as reflected in publications, unpublished manuscripts, museum and herbarium holding (including 300 references) was completed by Miss C.A. Liengme. The state of knowledge was reviewed in terms of each tribal group and each plant use. It was found that relatively little is known of plant use by the Swazi, Transvaal Ndebele, Mpukushu (of the Okavango Delta) and the Khoi. Food and medicinal uses have received most attention whilst the many and diverse uses of woods are least well documented.

Food Plant List: A start has been made with the compilation of a National Food Plant List, along the same lines as the National Weed List. To date the list includes the names of 985 edible, indigenous plants, culled from ethnobotanical and other literature by Mrs Musil and Miss Liengme.

Wood use by the Tsonga: In a study area covering 18 000 hectares and housing 978 Tsonga families in Gazankulu it was found that firewood use averaged 15 kg per family per day (5 399 tons p.a. for the whole area). This consisted almost

entirely of dead wood. The demand for building timber totalled only 28 tons p.a. but accounted for many living trees. Both firewood collection and timber cutting for hut-building were highly selective with a few species such as Colophospermum mopane providing almost all the wood. This study is now being written up by Miss Liengme.

Tree distribution in the Transvaal: Dr. John Anderson reports that most of the field work has been completed, and the accent this year was towards plotting field distribution data, preparation of a leaf catalogue, and line drawings for each species.

A high proportion of the distribution data has now been plotted on a set of draft maps. This work was continued by Miss A. Jooste and 200 A4 cards, with leaf-vouchers, supporting the field observation data, have been prepared. Line drawings of 263 of the woody species have been completed by Miss J. van Gogh.

Field data has been contributed in the S.E. Transvaal (10 1/16 degree square units) by Mr. P. Venter and in the N.E. Transvaal (15 units) by Mrs. M. Amm.

Barrier Plants: An exploratory survey of potential barrier plants has been completed and is being written up by Miss L. Henderson. The literature survey yielded the names of 294 exotic species and 120 indigenous species that have been used as barrier plants in South Africa. To this list have been added the names of a further 180 indigenous species with potential as barrier plants. They have been classified as decorative hedges, windbreaks or security hedges and data forms have been completed for 70 recommended species.

Scientific Information Service: The Institute's head office in Pretoria received 1658 visitors seeking information. Of these 730 visited the herbarium, 310 the data section, 310 ecology, 203 the library, 71 plant exploration, 20 structure and function, 19 flora and 279 unspecified. Our Scientific Information Officer, Mrs. D.M.C. Fourie assisted by Mrs. B. Pienaar, dealt with 22 visitors, 138 telephonic enquiries, 334 postal enquiries and identified 250 cultivated plants. The most substantial reports produced on request were on the status of Prosopis in South Africa, and a bibliography of references on aquatic and terrestrial plant invaders.

Educational Information Service: The educational service run by Mrs. B.J. Pienaar hosted 21 groups of scholars or students and 16 adult groups: a total of 1 556 visitors. Regular foyer exhibits were prepared, including named thematic exhibits of flowering or fruiting material from the garden. An

up-to-date brochure on the Institute was prepared, and 17 radio talks on Institution activities were organized.

A highlight was the visit of many prominent overseas botanists attending the AETFAT congress. Many returned to make use of our research collections and expressed great appreciation of the work done and the facilities available.

Photographic Collection: Over 5 000 colour slides and 1 500 black and white prints and negatives were acquired from the estate of the late Mr. Hans-Joachim Schlieben, a noted plant collector. They include coverage of Madagascar, the Comoro Islands, the Mascarenes, Seychelles and southern Africa, as well as an historic collection of black and white slides of an expedition of Mt. Kilimanjaro in 1933. Mr. A.A. Balsinhas has annotated and filed most of the collection.

National Weed List: Mrs V.M. Engelbrecht who is on the staff of the Plant Protection Research Institute, but seconded to us, completed data sheets for all listed species. She also completed 75% of the weed family summaries and prepared an index. Analysis of the weed data revealed: a few large plant families provide over 50% of our weeds; Monocotyledons are twice as likely to be weeds as are Dicotyledons; exotic weeds are more versatile than indigenous species in their home environment; the major invasive weed groupings are herbs from Europe and Asia and trees from Australia but South America probably has the greatest potential to provide us with new weeds. This and other data was presented in three papers to A.E.T.F.A.T.

Lantana camara: A total of 51 variants belonging to five colour races of Lantana camara have been described and photographed by Mr. C.H. Stirton but it is clear that many other variants exist, and that we are dealing with a hybrid swarm. Collecting and cytogenetic evaluation of the material is continuing, but no further variants are being described until those already described have been screened for susceptibility to biological control agents. Mr. Stirton has prepared several papers in conjunction with Mr. J.J. Spies who is handling the cytogenetic aspects. Mr. Stirton has now left our service and the Lantana facet is being completed by Mr. Spies of the Structure and Function Section.

Woody Invaders: Miss Henderson and Mrs Musil have now sampled a total of 54% of the quarter degree squares in the Transvaal (12% this year) for exotic woody invaders. The number of invader species recorded has risen to 53, of which five were recorded for the first time this year.

BOTANICAL GARDEN: The garden is still without a curator, and Mr. H.J. de Villiers (garden) and Mr. D.S. Hardy (nursery) continued in charge of their respective sections.

The garden records section consisting of Mrs. B.C. de Wet, Mrs. K.P. Clarke and Miss K. Behr handled 1 580 accessions, including 750 general research collections and 830 experimental collections.

A large part of the unique collection of Madagascan plants built up by Mr. Hardy was successfully transferred to a newly roofed shade house, whilst the main display house was renovated. Landscaping of the Karoo biome area and the water garden in the general planting area continued under the direction of Mr. de Villiers.

The garden and the Institute suffered a very sad loss on 5 February 1982 with the death of Mr. Jan Erens. He was the first horticulturalist associated with the establishment of the garden under Dr. R.A. Dyer. At the time of his death he was responsible for the mass propagation of plants for display purposes.

UNIVERSITEIT VAN WES-KAAPLAND, BELLVILLE: Die personeel bestaan uit-

Departementshoof: Prof. K J Pienaar

Senior Lektore: Mnr J Aalbers, R O Moffett en L M Raitt

Lektore: Mnr F M Weitz en Mev A T Botha

Sen. Tegn. Assistentente: Mnr P M McLaren en K G Smith

Tegniese Assistentente: Mnr L Cyster en Mej. S McLaren

Sekretaresse: Mej. U Dammert

Prof. Pienaar is sedert 1975 hoof en is voorafgegaan deur Prof. J B Gouws (1960-1974).

Die studentegetalle vir 1982 was soos volg: Plantkunde I - 105; II - 30; III - 12. Honneurs - 2; M.Sc - 7 (slegs 1 voltyds).

Honneurskandidate kies een hoofstudierigting uit: Anatomie, Ekologie en Plantgeografie, Fisiologie, Sistematiek en individuele programme word so uitgewerk dat dit ook 'n bystudierigting(s) uit die vermelde studierigtings insluit. Vir eksamendoeleindes word ook 'n mini-tesis vereis. Vir M.- en D.-grade word 'n verhandeling en 'n mondelinge eksamen vereis.

Personeelaktiwiteite in 1982

1. Prof. Kristo Pienaar.(Anatomie en Taksonomie van die Pteridophyta en Gymnospermae)
 - 1.1 Het die afgelope jaar aan 52 "Hoe Verkaar U dit?"programme vir die SAUK deelgeneem as plantkundige op die paneel en ook 52 praatjies met die Jongspanmaats gehou. Vir Springbokradioluisteraars is reeds bykans 300 praatjies oor die afgelope 5½ jaar oor ons inheemse tuinplante uitgesaai - vanjaar 52.
 - 1.2 Die volgende 7 boeke is vir óf die SAUK óf "Veld & Flora" óf "Journal of S A Botany" geresenseer:
"South African Parasitic Flowering Plants" (J Visser). 1981.

"Pelargoniums of Southern Africa", Vol. 2 (J J A v.d. Walt & P J Vorster). 1981.

"Succulent Flora of Southern Africa" (D Court). 1981.

"Plant Science - An introduction to world crops" (J Janick et al). 1981.

"Namakwaland en Clanwilliam - Veldblomgids van SA" (A le Roux en E A C L E Schelpe). 1981.

"Trees & Shrubs of the Cape Peninsula" - (E Moll & L Scott). 1981.

"Gifplante van Suider-Afrika" - (J Vahrmeijer). 1981.

- 1.3 Opgetree as konsultant vir die komprehensiewe tuinboek "A to Z of gardening in South Africa" (Bill Sheat). 1982.
- 1.4 Voorsitter van die Senaatskomitees vir "Navorsingstoekennings en Studieverlof" en "Studentebeurse" en lid van die "Navorsingsvoertuie"-komitee van die UWK.
- 1.5 Voorsitter van die Kommissie vir Natuurwetenskappe van die Dept. Nasionale Opvoeding.
- 1.6 Lid van die Beheerraad van die Sitgting vir Onderwys, Wetenskap en Tegnologie, Pretoria.
- 1.7 Agt skyfiesings oor die inheemse blommeskat van ons land gegee aan buite-instansies.
- 1.8 Op uitnodiging 'n lesing oor die bekendstelling van Plantkunde in SA gegee by die Jaarvergadering van die SA Akademie vir Wetenskap en Kuns (Tak Biologie) te RAU, in Junie 1982.
- 1.9 Is Burgermeester van Bellville, SA se jongste stad.
2. Mnr J Aalbers (Fisiologie): Hy gaan voort met sy navorsing oor eet- en nie-eetbare variëteite van Atriplex nummularia, met die oog op sy doktorsgraad.
3. Mnr R O Moffett (Blomplanttaksonomie en Ekonomiese Plantkunde en Kurator van die UWK-herbarium).
 - 3.1 Vir sy doktorsgraad is hy besig met "The phytogeography and taxonomy of Rhus (Anacardiaceae) in Southern Africa". Hiervoor is hy met 'n jaar studieverlof waarvan drie maande gebruik is om herbaria in Europa te besoek en aan Kew te werk.
 - 3.2 Die fitogeografie van Sarcocaulon (Geraniaceae).
4. Mnr L M Raitt (Voortplantingsfisiologie): He is involved with a long term seed bank study at the Fynbosbiome site at Pella. He is also continuing his research on the ecophysiology of Didelta L'Herit.
5. Mnr F M Weitz (Morfologie, Ekologie en Plantgeografie, Taksonomie van die Laere Plante): Hy is, met die oog op sy M.Sc, reeds ver gevorder met die anatomie, morfologie en taksonomie van Corymbium (Asteraceae).

6. Mev A T Botha (Fisiologie): Sy was die afgelope jaar met studieverlof in die VSA en het aan die Virginia Polytechnic Institute and State University te Blacksburg gewerk i.v.m. die invloed van lugbesoedeling op sekere plante.

M.Sc-projekte

- Mnr P M McLaren: "Die invloed van stikstof- en fosfaatbemesting op die groei en chemiese samestelling van Avena fatua en Briza maxima".
- Mnr K R Jacobs: "'n Fisiologiese ondersoek van die invloed van molibdeen en verskillende stikstofbronne op die groei en ontwikkeling van Atriplex nummularia en A. canescens".
- Mnr N Lewack: "Die invloed van stikstof en fosfaatbemesting op die groei en chemiese samestelling van Atriplex nummularia en A. canescens".
- Mnr L F Cyster: "'n Vergelykende fisiologiese studie van die invloed van verskillende natriumchloriedkonsentrasies op Atriplex lentiformis en A. lentiformis subsp. brewerii".
- Mnr C Arons: "'n Fisiologies-biochemiese ondersoek van die veroudering by die halofiet Atriplex nummularia".
- Mnr K G Smith: "A revision of the genus Ozoroa".

Deur die jaar was ons bevoorreg om deur prof. R Dahlgren van Copenhagen op 8 Januarie en prof. F Wightman van Carleton Universiteit, Ottawa op 24 September besoek te word. Hulle het tydens die besoeke ook elkeen 'n lesing aan senior studente en personeel gegee.

Al die personeellede is ywerige SAGP-lede en Rodney Moffett was die vorige voorsitter van die Wes-Kaaptak en Lincoln Raitt is tans die sekretaris.

Die UWK is bevoorreg om sy eie Natuureservaat (20 Ha) van Kaapse Duineflora op sy kampus te hê. Die dept. Plantkunde is intens betrokke by die bestuur en uitbou van die reservaat. Omdat die reservaat enig van sy soort in die wêreld is, is dit ook tot Nasionale Gedenkwaardigheid verklaar en is die toekoms daarvan verseker. Dit het ook reeds puik TV-dekking geniet. Die UWK het ook pas 'n eie Plantpatoloog in die persoon van prof. F N Matthee, aangestel om veral siektenavorsing op die Kaapse Fynbosflora te onderneem 'n aspek wat dringend aandag verg en vir die verre toekoms onontbeerlik sal blyk.

Bepanning van die tuine en aanplantings op die kampus word in oorleg met die departement Plantkunde gedoen en is daar uitstekende samewerking tussen die Hortulanus en ons.

UNIVERSITEIT VAN PRETORIA: Mev. Emsie du Plessis van die Departement Plantkunde het die Margaretha Mes-prys vir Plantkunde vir 1981 ontvang. Hierdie boekprys word jaarliks toegeken aan die beste senior student in Plantkunde aan U.P. Dit

word deur die S.A. Vereniging van Universiteitsvroue (Pretoria-tak) beskikbaar gestel. Mev. du Plessis het verlede jaar die B.Sc-Honneurs-graad in Plantkunde met sukses afgelê. Sy is Senior Tegniese Assistent in beheer van die H.G.W.J. Schweickerdt-herbarium van die U.P.

SOUTHERN AFRICAN BRYOPHYTES: Prof. E.A. Schelpe of the Bolus Herbarium, University of Cape Town, has recently produced an artificial key to the genera of the Hornworts and non-leafy liverworts of southern Africa. This key is being sent out as an addendum to Forum Botanicum in the hope that members, particularly those at the universities, will find it useful. Prof. Schelpe would welcome any comments or suggestions.

TOWARDS AN ENVIRONMENTAL PLAN FOR THE EASTERN CAPE - A CONFERENCE

(13 - 15 July 1983, Rhodes University, Grahamstown):

The Cape Department of Nature and Environmental Conservation, Rhodes University, Albany Museum and the J.L.B. Smith Institute of Ichthyology are organizing a multidisciplinary conference on the environment of the Eastern Cape with the aim of bringing together specialists in various disciplines in order to - review existing knowledge through a series of invited addresses and contributed poster papers; use this knowledge as the basis for drafting an environmental plan for the region; and publish the proceedings as a guideline for future researchers and planners.

The programme will include a series of invited papers, reviewing knowledge in particular fields, synthesis poster papers and research papers. Topics to be included will be the physical environment, vegetation, fauna, applied aspects, environmental impact, case studies and environmental planning.

Further information is obtainable from The Secretary, East Cape Symposium Organizing Committee, Albany Museum, Grahamstown 6140 (Tel. 2243).

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