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

CONTENTS/INHOUD

International Symposium on Speciation	1
BRI Annual Report 1985/86 (Part II)	2
Vacant Posts	14
Programme in Biological Systematics at Natal University	17

INTERNATIONAL SYMPOSIUM ON SPECIATION

The US Academy of Natural Sciences presented an International Symposium on Speciation to celebrate their 175th Anniversary. This was held in Philadelphia, Pennsylvania from 5 - 8 November 1987. Papers contributed at the Symposium will be published in a special issue of 'The Proceedings of the Academy of Natural Sciences'. The invited speakers were the following:

J. Antonovics, F. Ayala, S.B. Barrett, N. Barton, R. Butlin, B. Chernoff, J. Coyne, J. Cracraft, J. Endler, D. Futuyma, F. Ganders, D. Gill, L. Gottlieb, P. Grant, R. Harrison, G. Hewitt, K. Kaneshiro, A. Larson, G. Nelson, D. Otte, J. Patton, R. Ricklefs, J. Roughgarden, A. Templeton, R. Vrijenhoek, D. Wake.

Thought on Speciation:

I can remember the very spot in the road, whilst in my carriage, when to my joy the solution occurred to me. The solution as I believe, is that the modified offspring of all dominant and increasing forms tend to become adapted to many and highly diversified places in the economy of nature.

Charles Darwin

REVIEW OF THE WORK OF THE BOTANICAL RESEARCH INSTITUTE 1ST APRIL 1986 -
31ST MARCH 1987 - PART II
DATA SUBDIVISION

The subdivision coordinates the computer work of the Institute. Two large systems maintained on the B7900 mainframe are the taxonomic database PRECIS and the ecological database PHYTOTAB. Links are maintained to IBM mainframes for the library (SABINET), the ecological bibliography and for typesetting. Several divisions now operate their own microcomputers: the Hewlett-Packard 9845B was taken over by Vegetation Ecology; Herbarium and Flora Research share a Burroughs 26 network linked to the B7900 mainframe; Plant Structure and Function has 2 Olivetti PC's, and the Experimental Ecology Division in Cape Town and the Stellenbosch Unit each have IBM PC's.

PRECIS is managed by Mrs J.C. Mogford, and now consists of four components. Specimen-PRECIS contains herbarium specimen label data in 24 data fields for 630 000 specimens in PRE herbarium; taxon-PRECIS contains recent useful literature, synonymy, status as naturalized alien, and status of current taxonomic research for the 24 000 plant taxa in southern Africa; nomenclature-PRECIS has begun as a prototype for Poaceae, to be developed further when staff is available; and curatorial-PRECIS is to be developed on a Burroughs 26 microcomputer network to link information from specimen-PRECIS to the curatorial and administrative needs of the Herbarium Division. Mrs Mogford presented a paper at the SAAB Congress on the specimen component of PRECIS.

PHYTOTAB, managed by Mr M.D. Panagos, now includes 48 published ecological surveys and field data sets. Vegetative keys are in continuous development for plants of the Waterberg, and Miss B. Turner presented a paper at the Annual Congress of SAAB on her vegetative key to grasses of the Amersfoort area. Mrs B.C. de Wet is expanding the PHYTOTAB programs.

Smaller systems being developed further on the B7900 include the Garden Records system, developed by Mrs B.C. de Wet, for data about all the plants in the botanical garden, and PHOTOS, developed by Miss A.P. Backer to record data about photographic vegetation records for Vegetation Ecology Division.

Dr Gibbs Russell spent several weeks in October and November 1986

as a Research Fellow at the Taxonomy Unit, Research School of Biological Sciences, Australian National University, Canberra, learning the DELTA system for recording comparative descriptive characters to assist in data manipulation for classification, and for generation of descriptions, keys and online identification aids. DELTA is now in operation on the VAX 11/750 minicomputer at the Soils and Irrigation Research Institute. Keys and descriptions to all southern African grass genera, and to species in the grass tribe Ehrharteae are being developed.

PLANT STRUCTURE AND FUNCTION DIVISION

Dr R.P. Ellis attended the International Symposium on Grass Systematics and Evolution in Washington D.C. in July, 1986. He presented a paper on the contribution of grass leaf blade anatomy to the systematics of the Poaceae and co-authored a paper proposing a new arrangement of bamboo genera into tribes and subtribes.

Comparative anatomy

For the proceedings of the Grass Systematics and Evolution meeting Dr Ellis prepared a review, with an extensive bibliography on the contribution of comparative leaf blade anatomy to the systematics of the Poaceae over the past twenty-five years. This paper highlights those taxonomic groups most in need of anatomical study and shows that priority should be given to the core Bambusoideae, the Paniceae, the Centothecae and the Ehrharteae.

Cytogenetics

The cytogenetical studies on the South African grasses being undertaken by Dr J.J. Spies are progressing well with chromosome numbers of over 100 plants having been determined. He has also shown that the genus Hyparrhenia has a lower basic chromosome number than is generally accepted and that hybridization occurs on a large scale in this genus. These results once again emphasize the importance of cytogenetics as a basic requirement for taxonomy, breeding and other applied studies.

Wood anatomy

Mr P.P.J. Herman continued with his wood anatomical studies and paid

particular attention to the Proteaceae. This work is still in the initial stages but early indications are that the vessels and paratracheal parenchyma may prove to be useful taxonomically.

Mary Gunn Library

Mrs E. Potgieter and Mrs B.F. Lategan have had a very busy year as the demand for services from the Mary Gunn Library continues to increase. A total of 1 743 books and journals were borrowed, 2 136 inter library loans were handled, 2 645 enquiries dealt with, 20 671 photocopies made and 390 volumes were bound. About 60 old and valuable reference volumes were re-bound in leather with money made available from the Flowering Plants of Africa Fund. During the year, 202 new books were acquired in addition to the 364 journal titles to which the Institute subscribes. An important event was the linking of the library computer to the South African Bibliographic and Information Network (SABINET) system which has streamlined many administrative tasks such as the cataloguing of new accessions.

VEGETATION ECOLOGY DIVISION

The functions of the Vegetation Ecology Division under Dr J.C. Scheepers are to study the vegetation of South Africa and its ecological relations. This work involves three main aspects: the identification, description, classification and mapping of the various kinds of vegetation; study of the ecological relationships between different kinds of vegetation — with one another and with the environment — and of the various processes and mechanisms that determine the behaviour of plant communities; and the application of such ecological knowledge to the management and utilization of vegetational resources.

Transvaal bushveld and forest studies

Mr R.H. Westfall is studying the vegetation ecology of the Sour Bushveld in the Transvaal Waterberg. Thirty-two stands representing six different vegetation types have been sampled. Initial results indicate that the main environmental gradient responsible for the differentiation is moisture availability which correlates with parameters such as soil depth, soil texture, slope, aspect and exposure in combination for a given rainfall. The results also indicate sites best suited for cultivation in terms of available moisture.

The investigation of the implications and applications of Mr G.B. Deall's research on the vegetation of the Sabie area of the eastern escarpment are continuing: Ordination of Land Type-labelled vegetation samples reveals that floristic differentiation is often not correlated with Land Type delineation. Therefore, the use of Land Type per se for vegetation delineation is inappropriate. Land Types may be useful, however, for delineating broad Landscape classes derived in conjunction with an a priori floristic classification. Field testing of such a scheme showed it to be approximately 65 and 75 per cent accurate with respect to interpolation and extrapolation respectively. Land Types thus offer considerable potential for the mapping of extensive areas at the Landscape level, where biotic and abiotic criteria can be considered together.

Coastal studies

The conservation priorities in the Kosi Bay - Sodwana area were provisionally mapped and a report on conservation priorities was written up by Dr P.J. Weisser. Areas worthy of protection are mainly situated along the coast, near the Sibayi Lake and north of Sodwana. Other manuscripts are in various stages of preparation and finality.

Mr M.G. O'Callaghan is rounding off follow-up work on Cape estuaries and publication of results is continuing. The sampling of dominant plants around 53 Cape estuaries was completed this year. Two basic salt marsh communities were found, with salinity and regularity of tidal inundation as major controlling factors. The first is dominated by perennial herbs and shrubs, mainly Chenopodiaceae and Juncaginaceae. The second is dominated by sedges, usually Juncus with numerous ephemerals and annual herbs (mostly Asteraceae) appearing at various times. Two further vegetation types were recognized, although they are not salt marshes: submerged aquatics (Ruppiaceae, Zosteraceae and Potamogetonaceae) and emergents (Scirpus and Phragmites).

Cape fynbos studies

Research on the mountain fynbos in the Cederberg by Mr H.C. Taylor is well under way. In this field phase of the programme, 84 relevés in the northern sector revealed 14 or 15 putative community types, and a further four or five types were found in 22 relevés in the central sector. A series of nested quadrats in thicket showed that a plot size of

200 m² will record 57% of the species predicted to occur on 1 ha in this coarser-patterned vegetation. Two hundred and eighty herbarium specimens were collected and a check list of the total flora of the Cederberg is halfway to completion.

In the ecological study of mountain fynbos and other vegetation of the Langeberg, Mr D.J. McDonald has completed 124 relevés along the first transect. Of these 119 sampled Mountain Fynbos vegetation and five Afromontane Forest vegetation. Preliminary classification of 72 relevés using the computer program TWINSpan has resulted in 13 distinct 'groups'. Further analysis using the program DECORANA shows that the 'groups' are distributed along the transect primarily in response to moisture regime and secondarily to changes in geology.

Grassland studies

Field sampling of the grassland vegetation of the Amersfoort area of the eastern Transvaal Highveld by Miss B.J. Turner is nearing completion. The data will be used to classify the vegetation into different communities with a view to establishing a predictive system of vegetation-environment relationships of wide extrapolatability.

EXPERIMENTAL ECOLOGY DIVISION

The division, under Dr M.C. Rutherford, moved into its new consolidated quarters in the Botany Building of the University of Cape Town in 1986. Nursery facilities were also expanded by members of the division to satisfy the need to test a greater range of field-generated hypotheses under more controlled conditions. Various members of the division have participated and contributed to several symposia, workshops and conferences within the co-operative Fynbos and Karoo Biome Projects. The division's research has continued to concentrate on the disturbance of indigenous plants through alien invasive plant competition and by substrate disturbance in the Fynbos Biome and on plant-water relations in the Succulent Karoo Biome. Within the context of the study of alien-indigenous plant interactions, three members of the division contributed a chapter on growth rates and resource use efficiency in alien plant-invaded ecosystems to the important synthesis volume on the ecology and management of biological invasions in southern Africa. Also, on a subcontinental scale, the research on the determination of southern African biomes cul-

minated in the publication of the results as Memoirs of the Botanical Survey of South Africa No. 54 (1986).

Fynbos reproductive ecology

Dr C.F. Musil has found a higher species diversity and density of buried viable seeds in soils taken from recently burnt than from unburnt fynbos communities. However, species richness of buried, viable seed was low compared with that of the aboveground plants. Laboratory studies confirmed that exposure of some fynbos seeds to heat enhanced their subsequent germination. An increase in heat intensity had a greater effect on subsequent germination than duration of exposure at a given intensity. Viable seed distribution in fynbos soils studied has been found to be highly clumped, possibly indicating restricted seed dispersal.

Miss F.M. Pressinger has completed her studies on the germination of Protea repens and a paper on the results is being prepared for publication.

Fynbos - alien invasive plant interactions

Dr M.C. Rutherford, together with Mr J. de W. Bösenberg, have established that the effect of the alien invasive Acacia cyclops in the western Cape is markedly species dependent. Statistical analyses show that, although many indigenous species are negatively associated (amensal, for example, Eriocephalus racemosus) with solitary, well established Acacia cyclops individuals, many are relatively neutral (for example, Euclea racemosa) and some are even positively associated (commensal) with this level of Acacia cyclops infestation. Several of these commensals are annual species, for example, Cysticapnos vesicarius. Water stress response (in terms of xylem pressure potentials) to the Acacia cyclops areas varies and may depend on the age of the alien plant. For example, water stress in Euclea racemosa appears reduced under younger Acacia cyclops but increased under older A. cyclops. The effects of changes in radiation, nutrients, and various ecophysiological parameters on the presence, abundance and certain morphological aspects of the indigenous plants is being further investigated.

Miss Pressinger's studies have confirmed that at the seedling stage, the presence of Acacia saligna grown in close proximity to the in-

digenous Protea repens did not affect the growth or mortality rate of P. repens. Further work will investigate this interaction with older plants in their natural habitat.

Fynbos transformation studies

Mountain fynbos soil which had been cleared by burning and then re-activated, has been monitored by Mr G.W. Davis together with Mr A.P. Flynn with regard to re-establishment of the natural plant community. The abundance of the species most frequently found on the study site, as well as the overall species richness, was shown to be reduced by the treatment. On the other hand, above-ground biomass production of the dominant species was found to increase with the treatment, and summer measurement of water status of these species indicated that they experienced less stress on disturbed soil than on undisturbed soil.

Plant water relations in Karoo

Mr G.F. Midgley has concentrated on studying soil water availability relative to aspects of water relations and growth in several Karoo plant growth forms. Low soil moisture levels during summer correlated with measures of plant water stress, leaf shedding and shoot dormancy in non-succulent growth forms. Leaf production occurred during winter and spring when soil water availability and shoot water potentials increased. Growth patterns of succulents were similar. During summer, the leaf succulent Ruschia caroli experienced heat stress. However, the vertical orientation of the succulent stems of Euphorbia mauritanica and E. burmannii appear to minimize heat stress and consequent water loss by minimizing light interception.

PLANT EXPLORATION DIVISION

The division, under Mr M.J. Wells, continued to concentrate on weeds, plant invaders and food plant research, but also co-operated in research on plant causes of dermatitis. Mr. T.H. Arnold continued to lead the food plant research team from his position as head of the Herbarium Division. Highlights were the publication of the Catalogue of problem plants of southern Africa and the development of the garden utilization activity.

Conservation of germ plasm

This was a year of consolidation for technicians Miss A.E. Swane-

poel and Mrs L.D. Jacobs. Only one collecting trip was made and 15 seed samples collected but 3 000 samples of previously collected material were split for distribution, labelled, packaged, indexed and stored in two newly acquired chest freezers. Primitive crop seed samples, 704 in all, were distributed to researchers and seed banks in Argentina, South Africa and the USA. Seed of food plants from the veld went to a number of development agencies in South Africa and to Israel. About 170 seed samples as well as vegetative material of indigenous species, were collected in the garden by Mrs H. Joffe, to encourage their use and further propagation by local nurserymen. A chest freezer has also been acquired for storage of garden seed. Whilst chest freezers can be used to extend the life of seeds this is still a relatively short term solution to the problem of safeguarding germ plasm. However, unless seed is regrown on a regular basis the future of taxa cannot be assured.

Indigenous food plants

Mr A.A. Balsinhas abstracted information from 48 publications, bringing the references consulted for the national food plants data bank to a total of 217. The newly consulted references contributed information about 602 species and resulted in the addition of 20 new names to the list of food plants, which now includes 1 609 species.

Miss S.E. Chadwick has compiled dossiers on 14 priority food plants of the veld, including 18 more references, bringing the total to 634. She completed reports synthesizing the contents of dossiers on Cucumis metuliferus, Acanthosicyos horridus and Cucumis kalahariensis, to add to the two previously completed (Bauhinia petersiana and Coccinia adoensis). The report on Guibourtia coleosperma is nearly complete. A separate report entitled 'The cucurbitacins' has also been prepared, to bring all the relevant information together and to obviate repetition in the 10 cucurbit dossiers. It is of interest that only 5% of certain cucurbit fruits encountered in the central Kalahari were bitter, whereas the same species tested in South West Africa/Namibia yielded 81% bitter fruits. Some of the species being researched are obvious candidates for development and there is widespread interest in their potentials.

Primitive crop plants of African origin

The morphological characteristics of 753 Sorghum collections were analysed, bringing the total number analysed to 1 277. Seed colour

measurements were carried out on 687 collections, bringing the total measured to 1 837. The chlorox test for tannin content was applied to 760 samples, bringing the total to 1 010 samples tested. The technical work was carried out firstly by Miss Swanepoel and later by Mrs Jacobs, under the direction of Mr Arnold. 90% of the Sorghum material so far collected has now been processed. The next stage of the work will involve collecting in Kwa Ndebele, computer analysis of the Sorghum data, and a start on recording data from the large number of Pennisetum collections that have already been made.

Barrier plants

The survey of barrier plants by Miss L. Henderson, who is on the staff of the Plant Protection Research Institute, is in press, and will appear shortly as Memoirs of the Botanical Survey of South Africa No. 55.

Woody invaders

The popular version of Miss Henderson's survey of woody plant invaders of the Transvaal is in press. She and Mr Wells also completed a chapter on alien plant invasions in the grassland and savanna biomes.

Catalogue of problem plants

The catalogue appeared as No. 53 in the Memoirs of the Botanical Survey of South Africa series. It is hoped that its appearance will not only aid in the planning of research, control and legislation, but that it will also generate interest in problem plants and result in more data being gathered. It appears to be having this effect, and since its appearance 50—60 'new' or newly recognized alien invader plants have been brought to our attention.

Data collected for the catalogue have also been used in the compilation of a chapter on the history of introduction of alien plant invaders, for 'the Ecology and management of biological invasions in Southern Africa', which appeared recently. Mr Wells is continuing to research this subject and would value any early references to plant introductions.

Declared weeds and invader plants

A publication on declared weeds and invader plants, prepared by

Mrs D.M.C. Fourie and co-workers is in press. It will enable members of the public and law enforcement officers to identify species covered by the latest legislation. The Directorate of Soil Protection who are responsible for the act (No. 43 of 1983) have also been provided with new records of species that should be considered for proclamation.

Water conservation gardening

Public interest in gardening under drought conditions continues, and Mrs Fourie is in demand to lecture on the subject.

Garden utilization

In addition to seed for propagative purposes, Mrs Joffe also collected 30 seed samples and 190 samples of vegetative material requested by various researchers, for illustration, educational or display purposes. Sixty seed and fruit collections were cleaned and prepared for the herbarium carpological collection. In all, 1 095 colour slides were taken of various parts or developmental stages of plants in the garden. These were supported by 180 herbarium specimens. Research staff were assisted with finding or monitoring progress of garden collections. Garden staff were also assisted with germination experiments and garden records staff with identification of unlabelled specimens. Utilization of the garden by the public also received attention in the form of a new map and brochure which are nearing completion.

Scientific information service

Mrs Fourie handled 263 written and 299 telephonic requests for material and information, and dealt with 49 individual visitors and 8 groups. She also obtained collecting permits from various authorities for both visitors and Institute staff.

Liaison service

In the absence of a liaison officer, no facilities could be offered to touring school groups but Mrs Fourie provided or arranged lectures and/or tours for teachers, trainee teachers and a few special interest groups.

PRETORIA NATIONAL BOTANICAL GARDEN

The accent in garden development, under the direction of Mr D.H. Dry, was on the provision of service facilities and public amenities. Mr L.C. Steenkamp, a stalwart despite his 71 years, supervised the paving of 858 metres of service roads and 413 metres of pathways. The pathways are an expansion of the system of nature trails that enjoys ever increasing popularity with the public. Trees alongside the nature trails have been provided with additional labels that include the national tree number and common name. Fourteen new benches have been placed at strategic points. Major repairs and improvements included re-sealing a large garden pond as well as the roof of the main glasshouse, and refurbishing an outhouse to provide an under-cover research facility in the experimental garden.

Mrs K. Clarke accessioned 439 additions to the living plant collection, of which over 100 were collected by garden staff during an expedition to Namaqualand in late September 1986. Mr D.S. Hardy completed planting and landscaping the SWA/Namibia house, and continued to assist Dr H. Glen with a taxonomic revision of the genus Aloe.

BIOSYSTEMATICS DIVISION

At present this division, with an effective staff of three, devotes itself largely to the scientific and technical editing of the publications of the Institute. Dr O.A. Leistner is in control of the division, Mrs E.P. du Plessis assists with the editing of Flora of southern Africa and Flowering Plants of Africa and does most of the translations from English to Afrikaans required by the Institute, and Mrs B.A. Momberg is responsible for the technical editing of Bothalia and Memoirs of the Botanical Survey of South Africa. Camera-ready copy of certain publications was produced and it is hoped to increase activities in this field in future.

Bothalia

Numbers 1 and 2 of Vol. 16 and the index to Vol. 15 were produced. This pattern of publication will be continued in future and the two numbers produced each year will be considered as constituting one volume.

Flora of southern Africa (FSA)

One volume and one part were published (See Flora Research Division).

The volume Bryophyta 1,2 is in press. The fascicle on the genus Aspalathus by the late Prof. Rolf Dahlgren (Vol. 16,3,6) is being prepared for publication.

The Flowering Plants of Africa (FPA)/Die Blomplante van Afrika

Vol. 49,1 & 2 was published and 49,3 & 4 is in press. Translations for the Afrikaans version were checked or done by Mrs E.P. du Plessis.

Memoirs of the Botanical Survey of South Africa

All numbers of this series were again produced in camera-ready form. The following were published:

No. 52 A plant ecological bibliography and thesaurus for southern Africa up to 1975 (A.P. Backer et al).

No. 53 A catalogue of problem plants in southern Africa incorporating the National Weed List of South Africa (M.J. Wells et al).

No. 54 Biomes of southern Africa - an objective categorization (M.C. Rutherford & R.H. Westfall).

No. 55 Barrier plants of southern Africa (L. Henderson) is expected from the printer any day, and No. 56 List of species of southern African plants edn 2, part 2 is in press. No. 57, a third edition of Acocks's Veld types of South Africa, is at an advanced stage of preparation.

Palaeoflora of southern Africa

Most of the text of Volume 2 of the Molteno Formation series has been prepared in camera-ready form.

The National List of Trees

The third, revised and enlarged edition of this work by B. de Winter, J. Vahrmeijer and F. von Breitenbach was checked.

VACANT POSTS

SENIOR FYNBOS ECOLOGIST : SAASVELD FORESTRY RESEARCH CENTRE

Requirements:

Recognised, appropriate, 4 year B degree or appropriate 3 year B degree plus Hons. Appropriate fields are forest science/nature conservation, botany/zoology, ecological or biological sciences. An M.Sc. degree will be a strong recommendation.

Duties:

The Forestry Branch of the Dept. of Environment Affairs maintains an active research programme in the fynbos and associated vegetation in the Southern and Eastern Cape. Current research focus is on conservation biology, population processes as determinants of successional change, fire ecology, plant-animal interactions and invasions by exotic species. The appointee would join a small team of scientists and technicians. There is ample opportunity for collaboration with scientists in indigenous forest and forest site research programmes.

General:

Salaries are dependant on qualification and experience. Appropriate field research experience and training in statistical methods will be an added recommendation. Proven ability to communicate research results through the written and the spoken word is most important.

Application:

Enquiries and applications on a Z83 (accompanied by a Z27), along with the names of three referees and a complete Curriculum Vitae, should be directed to:

The Director
South African Forestry Research Institute
P.O. Box 727
PRETORIA
0001

Telephone:

(012) 28-7120 (Mr P.A. Kirkman)

Closing date: 5 February 1988.

PLANT ECOLOGIST, SOUTH AFRICAN FORESTRY RESEARCH INSTITUTE, D.R. DE WET
FRC, SABIE

Duties:

A position is available at the D.R. de Wet Forestry Research Centre outside Sabie for a plant ecologist who would join a team of researchers involved with the silviculture of plantation forests. The successful applicant would work on the biology and regulation of vegetation competing with crop trees, especially at the establishment phase, and the quantification of competition effects. He or she would collaborate with colleagues who are studying the processes of competition. The appointee would complement this programme by studying geographic and ecological variation in the phenomenon, and interspecific variation in responses to management.

Requirements:

Any person with a recognised, appropriate, 4 year B degree or appropriate 3 year B degree plus Hons. Appropriate fields are forest science/nature conservation, botany/zoology, ecological or biological sciences. An M.Sc. degree will be a strong recommendation.

General:

Salaries are dependant on qualification and experience. Appropriate field research experience and training in statistical and ecophysiological methods will be an added recommendation. Proven ability to communicate research results through the written and the spoken word is most important.

Application:

Enquiries and applications on a Z83 (accompanied by a Z27), along with the names of three referees and a complete Curriculum Vitae, should be directed to:

The Director
South African Forestry Research Institute
P.O. Box 727
PRETORIA
0001

Telephone: (012) 28-7120 (Mr P.A. Kirkman)

Closing date:

5 February 1988.

UNIVERSITY OF NAMIBIA, DEPARTMENT OF BOTANY (WINDHOEK)

JUNIOR LECTURER/LECTURER IN PLANT TAXONOMY (HIGHER PLANTS) - (Contract appointment)

Requirements:

Minimum qualification B.Sc-Hons (Plant Taxonomy)

Job Description:

The successful candidate will be expected to lecture Taxonomy (Higher plants) on a senior level as well as other divisions (e.g. Anatomy).

LABORATORY TECHNICIAN/SENIOR LABORATORY TECHNICIAN (Contract appointment)

Requirements:

This post requires initiative and experience with laboratory work and apparatus.

Job Description:

Preparing of practicals

Buying and maintenance of chemicals and equipment.

The University of Namibia is a young, dynamic institution which is expanding rapidly. Initially these will be contract appointments, but the prospects of obtaining permanent positions for the correct persons are good.

Date of commencement:

January 1988.

Contact person:

Mrs E. Maass, Tel. (061) 3072078/3072345.

UNIVERSITY OF NATAL

INTERDISCIPLINARY POSTGRADUATE PROGRAMME IN BIOLOGICAL SYSTEMATICS

All biological investigations rest on a base provided by systematics (which includes all aspects of the interrelationships amongst organisms, their classification and nomenclature), since accurate knowledge of the identities and relationships of the organisms involved is essential for the formulation of testable hypotheses. This is particularly true for ecological studies which are becoming increasingly important in attempts to promote conservation and minimise environmental degradation, and even for applied fields such as pest control where biological agents are increasingly being used. Despite this fundamental importance of systematics (also termed taxonomy by many), the training of systematists in southern Africa has been accorded a low priority and what has been undertaken has relied almost entirely on a sort of osmosis whereby concepts, procedures and techniques were absorbed at the feet of a practising authority. As in many fields of science, advances in systematic theory and practice have recently occurred at a greatly accelerated pace, and the field is filled with lively controversy. This means that the traditional informal training is no longer adequate.

In an attempt to address the situation, the University of Natal offers a unique interdisciplinary programme leading to the specialised degree of Master of Science in the field of Biological Systematics. This comprises formal course work in addition to a research project. Since 1980, academic staff members in five departments, students working on problems in Arachnology, Carcinology, Entomology, Ichthyology, Malacology, Mammalogy and Ornithology, and four museums, have been associated with the programme to varying degrees. It must be emphasised that such broad participation is considered important because each discipline within the biological sciences is able to provide a slightly different perspective in looking at particular problems, so that both staff and students are enriched by considering all points of view. This contrasts with the opinion that an interdisciplinary approach in systematics is not useful because different sorts of characters and techniques are used in the different fields; such differences are actually somewhat superficial matters of detail, and the philosophy behind the research is common throughout. Indeed, the differences in approach which are encountered in an interdisciplinary situation are extremely valuable because such ex-

posure to new ideas can provide new perspectives and new avenues for solution of problems which were perhaps intractable previously, and a varied base of expertise in a wide variety of techniques and approaches is also available. Furthermore, any student enrolled in the programme is supervised by someone who is a specialist in the particular field of interest; should there be particular techniques which are applicable in that field only, they are dealt with by the supervisor. The programme has operated on an informal basis in the past, and is offered as a formal course from January 1988.

PROGRAMME AND COURSE STRUCTURE

The structure includes dual components of formal coursework and a research project. By its very nature, the coursework component requires that all students be physically present in Pietermaritzburg or vicinity while it is being undertaken, but the research component may be carried out at some other centre where the necessary facilities (e.g., collections) are available.

Pre- and Co-requisites: For admission to the programme, a candidate must normally hold a four-year degree (B.Sc. Honours or equivalent) in any biological science, except by special arrangement. In addition, supplementary reading and courses in basic evolutionary theory, population biology and genetics, biometry or statistics, computer literacy, translation of significant foreign languages or other necessary topics may be required of candidates with insufficient training in these areas.

Time Scale: Prospective candidates will usually apply towards the end of a calendar year and will be screened by the Board of Studies; successful applicants will commence early the following year. No time limits other than those normally enforced by the University apply, but 18 months will usually be the minimum required for successful completion of the programme and 24 months will probably be more usual. The very nature of systematic research, where the accumulation of sufficient specimens from local and often also overseas sources is involved, necessitates a fairly long period. Where a candidate has already started research on a suitable problem when joining the programme, the course may be completed sooner, the minimum allowable period being 12 months (full-time, 24 months part-time).

Coursework: The first six to nine months are devoted to an intensive study of the theoretical and philosophical bases of systematics, as well as the methods used in any systematic investigation. Class meetings are held weekly and take the form of discussion sessions based on reading lists provided in advance; they are attended by all students and participating staff members. Topics include the following: Species concepts; speciation; infraspecific variation; macroevolution; purposes, functions and forms of classifications; philosophical problems of higher classification; methods of classification - classical intuitive, phenetic, cladistic and phyletic (evolutionary); nomenclature; classification of fossils; historical biogeography. The working out of examples using both hand and computer methods is done. Student progress is monitored continuously by means of reports. The coursework is examined at the end of the period by means of one three-hour paper which is subject to external examination. In addition, specialised techniques, including approaches which are applicable only to particular groups of organisms, such as methods of collection, specimen preservation and preparation for study, curation, microscopy, cytology, biochemical analyses, data recording, etc., are imparted by the staff familiar with the relevant techniques. These technical aspects are examined in a second three-hour paper which is tailored to take into account the requirements of each student.

Research Project: After successful completion of the coursework, each candidate devotes his or her time to the investigation of a problem involving the systematics of a particular group of organisms under the supervision of the relevant staff member. (The initiation of such an investigation and accumulation of specimens can, of course, commence earlier, but the meaningful analysis of the data can be done only after the candidate has acquired the necessary basic knowledge). The investigation leads to the production of a thesis in a publishable form. This is of sufficient extent to demonstrate that the candidate is able to apply the knowledge gained from the coursework, but is of lesser scope than that required of an M.Sc. thesis where no coursework is involved. Publication of the thesis is strongly encouraged since work of this type is especially significant in the southern African context and it is highly likely that even a small project will produce new and valuable results.

Degree Awarded: The normal degree awarded upon successful completion of the programme is Master of Science, with its interdisciplinary nature be-

ing indicated by use of the term 'Biological Systematics' instead of the usual departmental affiliation, where appropriate.

Administration: The programme is administered by a Board of Studies comprising one or more representatives of each of the participating departments.

Expansion of Research and Subsequent Degrees: If the research (thesis) component becomes significantly more extensive and innovative than that usually required, upgrading of registration to candidature for the degree of Doctor of Philosophy may be considered under the usual conditions applicable in the Faculty of Science, Pietermaritzburg. Such a Ph.D., as well as any such programme undertaken subsequent to obtaining the M.Sc. in the field of Biological Systematics, will be pursued and awarded within the appropriate participating department and not on an interdisciplinary basis.

PARTICIPANTS

The following departments of the University of Natal participate in the programme (members of the Board of Studies indicated):

Department of Biochemistry - DR M.F. Dutton
Department of Biology (Durban) - Prof. J. Meester
Department of Botany - (appointment awaited)
Department of Microbiology & Plant Pathology - Prof. F.M. Wallis
Department of Zoology & Entomology - Prof. D.J. Brothers

In addition, the Institute of Natural Resources (University of Natal), the Albany Museum (Grahamstown), the Durban Museum, the Natal Museum (Pietermaritzburg), the Transvaal Museum (Pretoria), and other similar institutions, provide resources and expertise.

Further information may be obtained from the Chairman of the Board of Studies:

Prof. D.J. Brothers, Department of Zoology & Entomology, University of Natal, P.O. Box 375, Pietermaritzburg, 3200 South Africa.

REDAKTRISE/EDITOR

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