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Status of Botany in South Africa

An exploratory meeting on: the status of botanical sciences in South Africa held in 1998.

The meeting emanated from correspondence and discussions between Prof. J Grobbelaar and members of the Foundation for Research Development (FRD). Concerns were expressed about the proportion of rated scientists in the field of Botany and that there had been no leaders in the field for many years. The South African Association of Botanists (SAAB) had discussed the status of Botanical Sciences in South Africa. Prof. Grobbelaar was requested to facilitate initial discussions with the FRD in his capacity as the then President of SAAB.

It was decided to include members of the FRD Assessment Committee for Plant Sciences, a person outside the higher education institutions at the first exploratory meeting, (hence the presence of Prof. GF Smith of the National Botanical Institute (NBI)), as well as programme management responsible for FRD funding of most of the South African botanists.

Introductory statements by Prof. J Grobbelaar

The botanical heritage was one of the most important assets South Africa had. The quality of life depended on the biota of this planet. Most of the biota in southern Africa was unique and South Africa had about 6% of the floral species found on earth. As stated in documentation of the FRD:

"South Africa has a unique flora and fauna, making it potentially one of the most competitive countries in the world. It is thus of strategic importance that the country supports the necessary research and expertise base to maintain the status."

and

"One of South Africa's greatest strengths is the abundance of indigenous plants, some (many) with an as yet unknown potential for food and horticultural production."

Following discussions at the Annual General Meeting of SAAB in 1998, concern was expressed regarding the status of Botany, the support that Botanical Sciences received, the continued maintenance of technical competence and the delivery of trained expertise for the country's needs.

Using the FRD Programme Report Series no 33, where amongst others, the rating of scientists in the various disciplines were given, and calculating ratios normalised to one A-rated scientist the following was found:

Subject	# Rated Scientists			Rank
	A	B	C	
Microbiology	1	3	7	1
Earth Sciences	1	4	9	2
Chemistry	1	5	9	3
Physics	1	7	7	4
Animal Sciences	1	5	24	-
Plant Sciences	1	17	36	last

Various statistical analyses had been done on the rating of scientists and the following were excerpts:

1985 (from report by Prof. DM Hawkins)

"A discrepancy existed within the plant sciences."

"It is striking that the plant scientists, with 12 B rated individuals, have none rated A while overall A's make up 20% of the combined A + B total."

1987 (from report by Prof. JH Venter)

"Opvallende groot verskille is: Lae aantal A's by Plantkunde".

1998 (from report by Prof. F Lombard)

"In respect to Plant Sciences, the situation seems now to have righted itself"

The last statement could still lead to much debate, especially in view of the status of Botany and Zoology in a country with such rich diversity.

Consequences of the rating system

Possible consequences of the historical rating of botanists were:

- Plant Sciences received a small portion of the research budget for both running and capital expenses since the inception of the rating system.

- Fewer student bursaries and other bursaries were available to Plant Sciences, compared to e.g. microbiology, chemistry or physics. This had impacted severely on the expertise available in the country.
- South Africa's biota had not received the research input it warranted.
- Overseas concerns and researchers exploited the indigenous flora.

Current evaluation and rating system of the FRD portrayed by the Chairperson

In terms of the criteria used for the rating and evaluation of scientists, the process had not discriminated against plant scientists. Contrary to the few As, Plant Sciences had produced seven President Awardees since 1994, the most for any discipline. After a lengthy discussion it was accepted by the meeting that under the present system, the Plant Sciences were not disadvantaged and that the FRD evaluation and rating system were fair and objective.

It was also shown that botanists were not discriminated against in terms of funding although the funding criteria had changed.

An important change in the allocation of funding from the FRD was that the ratings of scientists had a weight of only 50% and that the research plan and capacity building were equally important. For 1999 botanical projects within the Marine Programme received significantly more funds compared to the rest and also higher bursary allocations were made. To a lesser degree this also applied to the Terrestrial Programme. Of possible concern, however, was that only 10% of the projects supported by the Marine Program were botanical.

The way forward

Many questions could be asked, such as:

- How should we get Botany within the average grading ratio of sciences in South Africa, i.e. to about an A: B: C ratio of 1:5:10? (It was pointed out that the recent placement of a second botanist in the A category significantly altered the figures in item 2.)
 - Was the standard of Botany in South Africa up to standard?
- Was Botany as a subject still relevant?
 - What should the main emphasis be over the next two decades?
 - What roles could SAAB and the NBI play?

- How should the problem of attracting black students into postgraduate programmes be addressed?
- What did legislation and developments in tertiary education hold for Botany for the future?

Concerns expressed in terms of related aspects that were also impacting on Botanical Sciences:

- The loss of research capacity within government and conservation agencies.
- The loss of forestry research.
- The diminishing research capacity within the Agricultural Research Council (ARC).
- The change within the Council for Scientific and Industrial Research (CSIR) from a research orientated organisation to a consulting agency.
- Very limited scientific links and networks within disciplines. The FRD or a neutral facilitator should become involved.
- Difficulties of recruiting overseas expertise because of poor salaries, crime and a lack of human capacity.
- Constant erosion of available research time due to the increasing non-academic demands on researchers.
- Researchers were reluctant to share information and international links.
- The expansion and increased capacity building within the NBI were some of the few positive things that had taken place over the past few years.
- The status of university education programmes and possibility of some universities being closed down.
- The loss of opportunities in terms of biodiversity because of the commercialisation of research programmes/projects that was taking place.

Possible solutions/opportunities to improve the status of Botanical Sciences:

- Learn from countries where similar problems were experienced, e.g. Australia where the situation had been turned around and science was flourishing.
 - Establish networking systems (forums) to improve the exchange of ideas, information, international contacts, opportunities, etc.

- Establish post-doctoral programmes to draw young promising scientists to South Africa and *vice versa*.
- Improve the quality of research proposals and the standard of research done.
- Commercialise products and research.
- Support international contacts and co-operations.
- The National Research Foundation (NRF) should be able to address some of the concerns raised and could be seen as an opportunity

Concluding remarks

The following were comments made that needed to be considered:

- It was up to the botanists to improve their FRD ratings by changing the emphasis from largely descriptive to more ground-breaking science.
- The FRD would be replaced by the NRF, the objectives of which were substantially different from those of the FRD. In essence the NRF would, apart from the development, also facilitate the creation, dissemination and application of knowledge, as well as innovation and development in all areas of science.
- The NRF should play a facilitating role to improve the status of botanical research in future. The SAAB and the NBI should be involved and perhaps the ARC too. There might also be others. The needs and motivation should, however, come from the botanists.

The following were suggested in terms of getting a better understanding to clarify the problems:

- A number of workshops to address the various problems and to facilitate the way forward.
- The South African Network for Terrestrial and Aquatic Sciences (SANTAS) initiative, once it got off the ground could involve the broader Plant Sciences communities.
- Task teams, which could focus on specific aspects, e.g. the status of Plant Sciences, feasibility studies of identified interventions etc, and to report back.
- A follow-up meeting in about six months time.
- SAAB members to take note of the comments made and to position themselves with respect to the objectives of the NRF.
- Possibly someone from the FRD to address SAAB members about the NRF at a future meeting.

In Memoriam

Dr Hugh Colla Taylor, one of our members passed away on the 6th of July after a short illness. His wife Dulcie and children, Jenny and Linden remember him. We share their grief.

Letters to the editor

Thank you SAAB

Dear SAAB Council
I am currently a student member of the SAAB and have been since 1997. I will be converting to ordinary membership at the end of 1999. I intend staying a permanent member of the SAAB since I feel that the SAAB is an important and essential voice for Botanists and the profession of Botany. I have just received Vol. 36:1 of *Forum Botanicum* and I am pleased that the 1999 Council intends to communicate more with its members - this keeps us up to date with important events. I will continue to support the SAAB as I feel we have an important and exciting future in Botany. A suggestion: maybe begin a forum or discussion article where students can ask career related questions and professionals can answer. Good luck for 1999 and may the SAAB grow from strength to strength.
Mr CJ Hin
Helderkruin

Dear Mr Hin, thank you for your letter. You may want to consider life membership once you finished your studies. The fees are a once off amount of R2200. To all students: fire away those career related or any other questions, we will find the professionals to answer them. - Ed.

Aloe Breeder's Association

SAAB Members,
Could anyone perhaps help me; I am looking for a contact at the Aloe Breeders' Association. There is no answer at the address we have and I don't know where to search for a contact. It is quite important that contact be established, as they are the International Registration Authority for Aloes.

It'll be appreciated if you could help or suggest possible contacts.

Best wishes
Mrs Joan Sadie
Directorate Genetic Resources
Private Bag X5044
Stellenbosch 7599
South Africa
Tel. +27-21-809 1648
Fax: +27-21-887 2264

Hats off to the retired members!

26 April 1999

Dear Sir
Please find a cheque for the renewal of my Father's membership. My father is nearly 93 and now is in the Frail Care Centre at Swakopmund, but still at the same postal address. He enjoys reading the Journal very much. I am doing most of the business on visits to Swakopmund, so must apologise for the renewal a bit late.
Yours sincerely,
Dr IS Watt
Estcourt

*Dr IS Watt is referring to his father, Dr JS Watt who is the author of **Medicinal and Poisonous plant of Southern and Eastern Africa**, by Watt and Breyer-Brankdwijk.*

Thank you to our many retired members who still take such a keen interest in the society. Our

retired members are also the only group whose membership fees are totally paid up.

Can somebody please help?

Dmitry Chernyshov is a dedicated young PhD student at the Department of Cell Biology, Institute of Botany in Kiev, Ukraine. He is anxious to make contact with botanists in the West. He sent an abstract of a proposed talk to the organisers of the SAAB 2000 conference, but it is clear that it will be almost impossible to obtain funding to visit South Africa.

The title and abstract of his contribution are given below. If there is any South African botanist who is interested in making contact with Dmitry, he can be contacted at:

Dmitry Chernyshov, PhD student
Department of Cell Biology
Institute of Botany
2, Tereschenkovskaya St
Kiev 252004
Ukraine
Fax (=38) 044 212 3236
e-mail: dmitry_chernyshov@yahoo.com

Prof. RB Kemp of the University of Wales has met Dmitry and will give information about him if contacted. He can be reached at his e-mail address: rbk@aber.ac.uk

Strange intranuclear and cytoplasmic inclusions in epidermal and parenchyma cells of *Caragana arborescens* Lam.

Chernyshov, D. & Kordyum, E.

Siberian pea (*Caragana arborescens* Lam.) is studied specifically because in spring it shows the presence of unique spherical inclusions that appear naturally in the nuclei and cytoplasm of

epidermal and parenchyma cells of growing leaf petioles and pedicels. Light microscope and transmission electron microscope studies as well as a virological investigation were carried out to determine the composition and possible nature of the structures.

Immediately after bud unfurls the first inclusion of 1 micron in diameter appears attached to the nucleolus. A day later a second inclusion of the same size appears in the cytoplasm. Initially this inclusion adjoins to the external nuclear membrane. The further day, a homogenous zone of lower electron density without the restrictive membrane surrounds the inclusion that increases in diameter up to 12 microns. Some days later, orderly arranged fibrils begin to develop in the center of the cytoplasmic body and continue to grow in the homogenous zone, so the process of polymerization starts. By the end of flowering, both inclusions begin to disappear. Only the numerous accumulations of the regularly arranged fibrils are spread through the cytoplasm, but they also disappear soon.

The cytochemical tests carried out indicate the possible presence of RNA and proteins and the absence of DNA in the inclusions. It is also shown that these structures do not have a virus nature, they are inherent to normal and healthy plants. It is supposed that these inclusions play some role during flowering of Siberian pea.

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Membership list

In 1992 a booklet with the address details of SAAB members were published. There has been numerous requests to have this done again. Due to the high cost of printing, and the fact that address lists outdate so soon, the council decided to make the SAAB membership list electronically available to all SAAB members. In order to receive this, please contact Marianna Smith and it will be send to you via e-mail.

for saab@mweb.co.za



Council members for 2000

Nominations for SAAB council members closed on September 30, 1999. If more candidates than vacant positions is received, members will have to vote to elect council members. This topic will be addressed in the next issue of *Forum*.

According to a change in the constitution, which was proposed on the last Annual General Meeting of SAAB, in Umtata in January this year, the National Botanical Institute will automatically have one person on the council of SAAB.

Thank you very much for the candidates willing to serve on SAAB council, as well as members nominating them.

Plant Biology for the New Millennium

Potchefstroom gives us a taste of what's in the pipeline

The 26th Annual Conference of the South African Association of Botanists will take place on the campus of the Potchefstroom University for Christian Higher Education from 11-14 January 2000.

Late registration is still available!!

<http://www.puk.ac.za/botany/saab.htm>

Tel: (018) 229 2501

A number of prominent overseas scientists are expected to participate in plenary sessions and workshops. To wet your appetites we have included information on some of them:

Prof. Robert Birch is Associate Professor at the Plant Molecular Improvement Facility in the Department of Botany at the University of Queensland. His research team works in the science of plant molecular biology, and its practical applications through plant biotechnology. He will deliver a plenary talk on "*Transgene expression and silencing in sugarcane: Implications for plant molecular improvement*".

Prof. Chris Bornman is well known in South Africa and completed his BSc and MSc degrees in agriculture at the University of Stellenbosch. He was Adjunct Professor in the Department of Plant Physiology at Lund University until his retirement. For six years he was Editor-in-Chief of the journal, *Physiologia Plantarum*. This makes him an excellent choice to conduct a workshop on "**Writing scientific papers**". If there is enough interest, this workshop will be repeated during the conference to enable all young plant biologists, as well as the more experienced scientists, to attend.

He has been actively involved in organising and teaching advanced level biotechnology

courses for African participants, first in Kenya and Nigeria, and since 1994 several times in South Africa. His plenary talk on the "Challenges facing the plant biologist in South Africa at the start of the millennium" will be from a position of experience and full knowledge of the situation in South Africa and the rest of Africa.

Another well-known Biologist, **Prof. Yitzchak Gutterman**, Professor of Botany at the Jacob Blaustein Institute for Desert Research, Ben-Gurion , University of the Negev will also attend the conference. The Unit studies several aspects of the ecophysiology and ecology of native Negev Plants. At SAAB 2000 he will deliver a plenary talk on "*Desert environment and annual plant survival strategies of seed dispersal, germination and seedling drought tolerance*".

A plenary paper entitled "*The oxidative pentose phosphate pathway: a neglected aspect of carbohydrate metabolism*" will be delivered by **Prof. Nicholas Kruger**, a lecturer in Plant Sciences in the Department of Plant Sciences, University of Oxford.

Dr. Ladislav Mucina serves as Vice-president of the International Association for Vegetation Sciences and Editor of the *Journal of Vegetation Science* and *Applied Vegetation Science*. He received his education in Slovakia. He served as visiting fellow and professor at several universities. At present he is Visiting Professor at the University of Stellenbosch in association with the National Botanical Institute, Kirstenbosch. His research activities concentrate on problems of vegetation surveys. He has co-founded and chaired the European Vegetation Survey and co-founded the National Vegetation DataBase in South Africa. Currently he is involved in the VegMap team coordinated by the NBI. During SAAB 2000 he will deliver a plenary paper entitled "*Descriptive Vegetation Science on Crossroads: Old Camels or Honourable Occupation*".

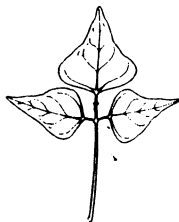
On the plant physiology front we invited **Prof. Reto Strasser**, full professor in Plant Physiology and Bioenergetics, Director of the Experimental Station of Botany, and also Director of the Laboratory of General Microbiology at the University of Geneva to kick off the new millennium. The general axis of his research is the description of plants' vitality in terms of activity and adaptability with the focus on stress and stress adaptation.

He has visited South Africa on several occasions and will conduct a workshop on "Fluorescence as a tool in plant stress physiology". This workshop focuses on the in vivo screening of higher plants for vitality, stress and adaptation, based on the fast fluorescence rise OJIP. His plenary paper is titled "Collective Intelligence as a Challenge to Approach Interdisciplinary Topics in Plant Biology".

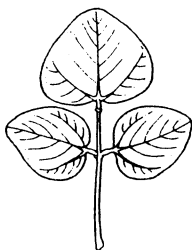


Visiting from Austria is **Prof. Tod Stuessy**, Ordentliche Professor, and Chairman of the Department of Higher Plant Systematics and Evolution, and Associate Director of the botanical garden, University of Vienna. He has conducted extensive fieldwork in the Americas. During SAAB 2000 he will conduct a workshop on "*Plant Biogeography, with emphasis on Island Archipelagos*". This workshop will include a brief overview of the discipline, with emphasis on modern methods of quantitative analysis. Attention will be given to island biogeography. The title of his proposed plenary paper is "*Barnadesioideae and Early Origin of Compositae*".

“*Vegetation Ecology for the New Millennium*” is the topic that will be addressed by **Prof. Eddy van der Maarel**, Emeritus Professor of the Department of Plant Ecology at the University of Uppsala. He has about 300 scientific publications to his credit, and has served on the editorial boards of several *Vegetation Science* journals.



Dr Thorsten Wiegand currently holds a permanent position in the UFZ Centre for Environmental Research Leipzig-Halle, Department of Ecological Modelling in Leipzig, Germany. He is the Leader of the OESA sub-department “Models for sustainable ecosystem management” at the UFZ. His major research interests include the development of simulation models to, for example, assess the risk of extinction of endangered species, or to analyse land use strategies.



Presently Dr Wiegand has official scientific collaborations with scientists all over the world, including Prof. Sue Milton, Dr Richard Dean and Dr K. Kellner in South Africa. He will deliver a plenary paper entitled “*The use of models in the long-term ecological research of semi-arid areas*”. He will also present a workshop on “*The use of models in long-term ecological research*”.

After the conference

A one-day excursion to the central part of the Vredefort Dome is offered on Saturday 15 January 2000

Contact person: Dr Sarel Cilliers
e-mail: plbssc@puknet.puk.ac.za

Geologists still hotly debate the origin of the world-renowned Vredefort Dome, situated near Potchefstroom and Parys. The generally accepted theory is that it originated 2000 million years ago when a meteorite struck the earth. It is acknowledged as the oldest, largest and best-exposed meteorite impact site on earth and is currently proposed as a World Heritage site. The area is also a registered conservancy. The impact of the meteorite created a mountainous landscape of unsurpassed natural beauty with a variety of unique microhabitats.

The Vredefort Astrobleme is situated in a transitional area between the *Cymbopogon-Themeda* Veld and the Bankenveld and a number of plant communities, unique for this part of the North West and Free State Provinces occur, especially in the numerous ravines.

The high biodiversity is not restricted to the flora. More butterfly species are found here than in the entire United Kingdom. The Vredefort Dome, especially areas around the Vaal River, is also regarded as one of the 121 most important Bird Areas (IBA) in South Africa.

The area also hosts several tourist attractions such as hiking, canoeing, whitewater rafting, abailing, game viewing and visiting sites of archaeological and historical importance.

For further particulars regarding the conference, contact us at:

e-mail: saab20@puknet.puk.ac.za

Tel. 018 299 2501

Fax: 018 299 2503

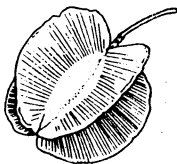
Additional student prizes to be awarded at SAAB 2000

Professor Hannes van Staden, Head of Botany, University of Natal, Pietermaritzburg made a generous donation available for the next three years in lieu of additional prizes at the annual SAAB conference.

The money will be divided over the next three years and two prizes each will be awarded to the best oral papers delivered by a M.Sc and a Ph.D student. These prizes do not replace the best paper delivered by a young scientist. In most cases the above mentioned prize was won by post-doctoral students and was disheartening for post-graduate students.

The prizes will be known as the Hannes van Staden prizes and will be awarded at the annual dinner.

SAAB wishes to thank Professor van Staden for this kind gesture. The students of our organisation are the leaders of tomorrow and we need to have them actively involved. We are awaiting other donations to keep this up after three years.



Exciting Developments Around New Crops!

Food production and food security are vital issues in Africa today. It is therefore necessary that agriculture constantly strive to improve nutrition by diversifying crop production and better exploitation of under-utilised plants.

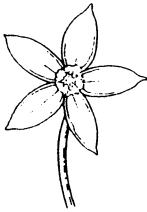
Despite the fact that many people in southern Africa are addressing these issues, and further afield, there is a total lack of communication and co-ordination between concerned parties. It was with this as background that proff. Schalk Louw and Wijnand Swart from the UOFS and dr. Sonja Venter and ms. Erika van den Heever from the South African Agricultural Research Council's Vegetable and Ornamental Plants Institute established the Southern African New Crop Research Association (SANCRA) on 14 January 1998.

Essentially, SANCRA is intended to serve as a communication platform for people in southern Africa involved with research and development of new or alternative crops. The following four crop commodity groups have been identified, viz.: (i) Food and Beverage crops, (ii) Medicinal crops, (iii) Industrial crops, and (iv) Forage, Fodder and Energy crops and are each represented by a specialist on the SANCRA Executive Committee.

The Inaugural mini-symposium of SANCRA, which was held in Pretoria during September 1998, was a resounding success. During the proceedings 56 paper and poster presentations were delivered and three workshops were held. The proceedings of the Inaugural mini-symposium as well as SANCRA's newsletters can be viewed on the SANCRA web-site: <http://www.uovs.ac.za/lib/agric/sancra.htm>

The 2nd SANCRA Congress will be held in Bloemfontein from 18-20 January 2000. The congress will be held jointly with the South African Weed Science Society and the South African Crop Production Society. If you are interested in attending the congress, or in becoming a member of SANCRA, please contact:

Prof. Wijnand Swart (SANCRA President)
Dept Plant Pathology
University of the Orange Free State
P O Box 339
Bloemfontein,
9300
Tel. +27-(0) 51-4012383
Cell 0829562227
e-mail- wjs@landbou.uovs.ac.za



FROM the WEB:

Society for Molecular Biology and Evolution

The society for Molecular Biology and Evolution is an international society that exists to provide facilities for association and communication among molecular evolutionists, and has as one of its primary goals increasing communication between the fields of evolution and molecular biology. In order to accomplish those goals the Society publishes the journal *Molecular Biology and Evolution* (MBE), and it sponsors an annual meeting.

The SMBE 2000 Meeting will be held at Yale University, New Haven, CT, USA, June 17-20, 2000. Suggestions for Symposia topics are welcome.

Include possible organizer and speakers.

Send to Jeff Powell by email:

jeffrey.powell@yale.edu

Tree of life

The University of Arizona coordinate and edit a multi-authored Internet project containing information about phylogeny and biodiversity.

The Tree of Life is a project containing information about the diversity of organisms on Earth, their history, and characteristics.

The information is linked together in the form of the evolutionary tree that connects all organisms to each other.

To look at pages in the tree, you might wish to begin at the root, or you may wish to search for a particular organism, or you may wish to go to some popular groups or browse some sample pages, or you might wish to examine some recently added pages.

You might also wish to look at the introduction to the project.

The prototype Tree of Life project first went online 16 November 1994.

The project was first formally announced on 5 January 1996.

If you have any inquiries about the project, please e-mail us at

tree@ag.arizona.edu or
treegrow@ag.arizona.edu