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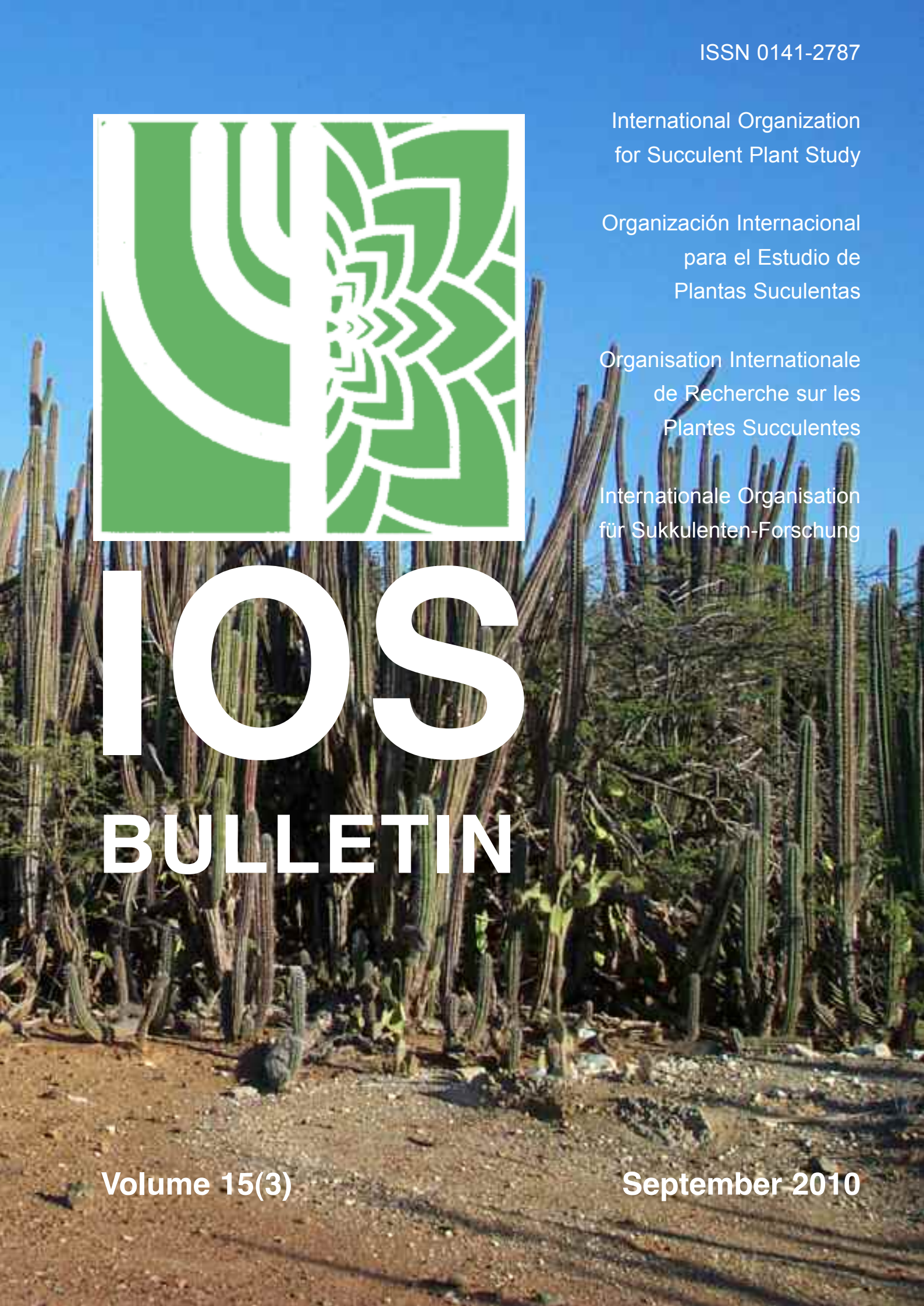
International Organization
for Succulent Plant Study

Organización Internacional
para el Estudio de
Plantas Suculentas

Organisation Internationale
de Recherche sur les
Plantes Succulentes

Internationale Organisation
für Sukkulenten-Forschung



IOS BULLETIN

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Contents

IOS Executive Board 2010–2012

Cover illustration

A dense stand of *Stenocereus griseus* in the northwestern part of Aruba, Netherlands Antilles, about 2 km from Palm Beach. *(photo: Jafet Nassar)*

This issue of IOS Bulletin compiled and edited by the Secretary

Message from the President

When re-elected as President in 2008, I had assumed that I would hand over to a successor in 2010. Late in 2009 the Vice-President announced that he wished to resign from the Board, and no other nomination appeared. Consequently I agreed to accept nomination for one more term, and my re-election was confirmed at the Congress in March. Some changes to the Executive Board have occurred, and I am happy to welcome Héctor Hernández, Rainer Mecklenburg and Sara Oldfield to their respective posts, as well as Ingrid Mecklenburg in the new position looking after our website. At the same time, I thank the outgoing officers for their contributions to the IOS.

A Congress in the Canary Islands, where there is a rich and interesting succulent flora, seemed like an attractive idea when the Board was thinking about the 2010 Congress. Unfortunately it was not to be. Those who know the islands well advised us that the best time to see the flora would be early in the year, in April. Whilst we were trying to decide on dates, we heard that there would be an AETFAT meeting in late April, and that would be held in Madagascar. Thus we had two problems — the clash of dates, and the fact that Madagascar would probably be more attractive for many of our members. Having been assured that the summer months would not be suitable for seeing the Canarian flora, we decided to hold our Congress in late March, even though that is not a convenient time for many. Then came another problem — only a little over 20 members had indicated an interest in attending, and this number was too low for us to seek special rates in hotels. Our botanic garden hosts there were also affected by severe budgetary problems as a result of the worldwide financial crisis. Ultimately we had to pull out, and find an alternative venue.

Whilst it was disappointing that circumstances prevented us from meeting in the Canary Islands, I understand that the late switch to Bonn was nevertheless successful. Unfortunately I was unable to be there, having been stricken with a medical problem a few days before the start of the Congress. A report prepared by Dr David Hunt will be found in this Bulletin. From this it will be seen that one aim of the IOS, to bring researchers together for exchange of ideas and discussion, was achieved once again.

The continuing participation of younger members, some students and some recent graduates, is heartening. It is well known that the hobby of growing succulent plants is attracting fewer young people today, but research interests are still alive. We hope that these younger members will maintain an interest in succulent plants, and thus contribute to continuing the aims of the IOS.

The Board has already started planning the next Congress, which will be held in Cuba in 2012. We hope that this unusual and relatively little-known location will attract a good number of members, and we shall also link up with enthusiasts from south and central America.

Our new website, designed, maintained and hosted by Rainer Mecklenburg and his wife Ingrid, is now up and running. We are grateful to Rainer and Ingrid for their work on this project. Improvement and expansion of the website will continue, and we welcome comments and suggestions from members.

Len Newton

31st IOS Congress, Bonn, Germany, 22-25 March 2010

Congress venue: The Nees Institute for Biodiversity of Plants, University of Bonn by courtesy of the Head of the Institute, Professor Dr Wilhelm Barthlott

As explained in the President's Message, it became necessary, at short notice, to find an alternative to the earlier planned venue for the Congress in the Canary Islands. IOS is extremely grateful to Professor Barthlott for allowing us to use the facilities of the Nees Institute for this meeting, as we did for the Inter-Congress in 2009, and for the assistance of members of his staff in making the necessary arrangements.

Programme

Tuesday 23 March

09:30–12:15 **Opening Session**

Welcome by Professor Barthlott
Announcements
General Meeting of Members (IOS Statutes Art. 16) (*see report p.*)

Presentations
Progress with Cactaceae biodiversity mapping
Prof. Dr Wilhelm Barthlott (DE)
The new IOS Website
Rainer & Ingrid Mecklenburg (DE)

12:30 **Lunch break**

14:00-17:30 **Session 2 Chair: Dr Nigel Taylor**

Alwin Berger - His Life and Work
Detlev Metzing (DE)
Sequencing data for the Hylocereeae (Cactaceae)
Reto Nyffeler (CH)
The SLCCS: Towards a consolidated network to promote the study and conservation of succulents in Latin America.
Jafet Nassar (VE)
From Chihuahua to the Great Basin Desert (slides)
Denis Diagre (BE)
Succulent Plants of the Canary Islands
Joël Lodé (ES)

19:00 **Dinner at 'Gasthaus Nolden'**

Wednesday 24 March

09:30 –13:00 **Session 3 Chair: The Secretary**

The ongoing need for education provision for whole-plant biology
Nigel Taylor (UK)
Genetic diversity in the Cactaceae: Emerging patterns
Dr Jafet Nassar (VE)

The genus *Matucana* (Cactaceae) in the Marañon valley
Graham Charles (UK)
Molecular phylogeny of *Gymnocalycium*
Massimo Meregalli (IT)
The Ritter Collections - New Life for Old Data
Urs Eggli (CH)

13:00 **Lunch break**

14:15-17:30 **Session 4 Chair: The Secretary**
Wild Species of Mexican Cactus Pear
Leia Scheinvar (MX)
Recent studies of nectaries in Aizoaceae
Ingeborg Niesler (DE)
Recent studies on *Hoya* (Apocynaceae)
Michele Rodda (IT)
***Sarcostemma* – an update**
Ulrich Meve (DE)
Succulent Plants of Socotra
Joël Lodé (ES)

Evening free

Thursday 25 March
09:30–12:00 **Final Session Chair: The Secretary**
Topics for further discussion:
IOS website
IOS Repertorium Plantarum Succulentarum *(see below p. 85)*
SLCCS-IOS collaboration
Future meetings

End of Congress

Congress Participants

Prof. Dr Wilhelm Barthlott (DE)
Sven Bernhard (DE)
Kirsten Burstedde (DE)
Graham Charles (UK)
Dr Urs Eggli (CH)
Dr Denis Diagre (BE)
Andrew Gdaniec (UK)
Dr David Hunt (UK)
Nadja Korotkova (DE)
Joël Lodé (ES)
Dr Martin Lowry (UK)
Rainer & Ingrid Mecklenburg (DE)
Dr Massimo Meregalli (IT)
Dr Detlev Metzing (DE)
Dr Ulrich Meve (DE)
Dr Jafet Nassar (VE)
Dr Philipp Neeff (DE) *(p.m. only)*
Dr Ingeborg Niesler (DE)
Dr Reto Nyffeler (CH) *(23 March only)*
Michele Rodda (IT)
Dr Léia Scheinvar (MX)
Dieder Supthut (CH)
Dr Nigel Taylor (UK)

Abstracts and Transcripts of Congress Presentations

Tuesday 23 March

Biodiversity and distribution of Cacti

Wilhelm Barthlott[1,2], *Kirsten Burstedde*[1], *Nadja Korotkova*[1], *Jens Mutke*[1]
[1]Nees Institute for Biodiversity of Plants, [2]Botanical Garden, University of Bonn, Germany
www.nees.uni-bonn.de

2010 – The International Year of Biodiversity
The United Nations have declared the year 2010 as the International Year of Biodiversity. This aims at enhancing public and scientific awareness of the importance of biodiversity and the putative impacts from its loss.

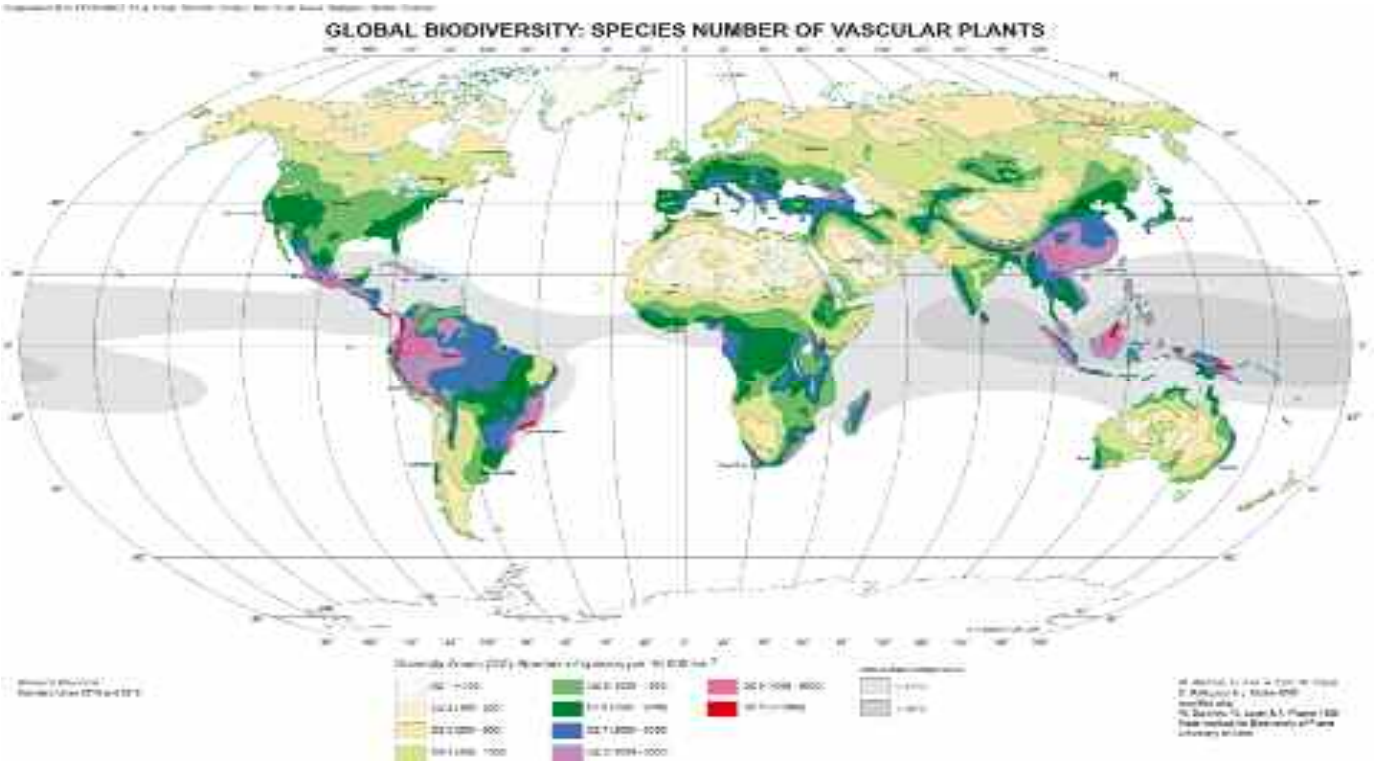
How many species are there?
The diversity of life on our planet is still not sufficiently studied. There are an estimated 10 or maybe even 20 million species on Earth but only 1.7 million have been formally described. Hence we have to assume that 90% of all life on Earth is unknown!

There are only a few groups of organisms that are well known to science. These are the large and conspicuous animals, including vertebrates and birds, and attractive smaller creatures such as butterflies. Approximately 80% of the higher plants have also been described. Of these, however, there are only about 300,000 species, which is a small number compared to those estimated for animals. Insects and their relatives may already make up 15 million species. But while animals represent 80% of the biodiversity, plants represent 80% of the biomass. Plants are therefore the most important structural components of terrestrial ecosystems and also play an important role as the primary producers. In view of the importance of plants in terrestrial ecosystems, a sound knowledge of the spatial patterns of plant diversity is fundamental basis for an understanding of the ecosystems but also for planning conservation activities. This applies especially to those plant groups that constitute important elements of their individual ecosystems.

The global spatial patterns of biodiversity
Fig. 1 shows a world map of patterns of plant diversity. Generating such a map was possible for vascular plants because they are so well known and there is a large amount of data for their distribution. A diversity map for animals would be only possible for few groups. However, we assume that the centres of plants diversity will overlap with the centres for animal diversity.

The diversity of vascular plants is very unevenly distributed across the planet. This is partly explained by the unequal distribution of environmental factors such as climate, geology, soil and water availability. The sum of all these factors is termed geodiversity (Barthlott et al. 1996, 2007). Global centres of vascular plant diversity coincide with highly geodiverse areas in the tropics and subtropics, where high tropical mountains exhibit the highest diversity.

There are more plant species native to the Andes than to the entire European continent. Thus, regions with high geodiversity and consequently a large number of different habitats are the basis for high biodiversity.



Mapping the diversity of cacti

First approaches to describe or map patterns of distribution of cacti were made by Karl Schumann (1899) and Curt Backeberg (1942). Backeberg was maybe the first cactologist to recognize the importance of biogeographic patterns within cacti. His contribution has hitherto remained the best hypothesis concerning the biogeography and evolutionary history of cacti and his *Kakteenlexikon* (Backeberg 1966) contained a series of generalized distribution maps for the numerous suprageneric groups he recognized or proposed.

Perhaps the first true biodiversity map for cacti (i.e. a map demonstrating the location of *centres* of diversity, rather than the ranges of individual taxa) was published by Barthlott (1983) showing the diversity patterns of the epiphytic Rhipsalideae. The work was continued in the 1990s by Barthlott and co-workers at the University of Bonn and a preliminary biodiversity map for cactus species and genera was published a few years ago (Mutke & Barthlott 2005). Subsequently new methods for generating diversity maps were developed and a new approach to cactus biodiversity mapping using GIS-based methods was started in 2008 at the Nees-Institute in Bonn.

A high-resolution GIS dataset and corresponding database consisting of >45,000 records with distribution data for cacti was compiled. The main data sources were literature such as floras, checklists, taxonomical works, monographs and lexica with distribution information or range maps. Electronically available herbarium records and field data were also used. From the database, range maps for all Cactaceae species recognized in the *New Cactus Lexicon* (Hunt 2006) ('NCL') were generated, as well as diversity maps for all genera, tribes, subfamilies and the complete family. The initial species maps were then further reviewed and revised by experts for the respective Cactaceae groups. Preparation of the maps and accompanying commentary as the major contribution to a third volume of NCL is now under way, and will be completed, it is hoped, in time for publication before the end of 2010.

Centres of cactus diversity

The main centres of cactus diversity are north-eastern Mexico, the eastern Andes of Bolivia and Argentina and south-eastern Brazil. However, the diversity patterns differ in terms of species diversity compared to generic diversity. The main centre of generic richness is also Mexico, but Bolivia/northern Argentina/Paraguay, south-eastern Brazil, the Caribbean region and Peru show high generic richness as well. The differences of species and generic diversity are most striking in the Opuntioideae. Their centres of species richness are is the arid south west of the USA, northern Mexico, and the Mexican altiplano. The centre of generic diversity is located in the dry forest zone of southern Bolivia and northern Argentina with about 12 genera occurring there. That centres of species-richness and genus-richness do not necessarily coincide, as observed in the Opuntioideae, is just an example of the insights that can be gained from diversity maps.

Outlook – Further insights into cactus ecology and evolution

The data used for the generation of the distribution and diversity maps are digitally available in a geographic information system. GIS-based methods will allow further analyses focussing on various aspects of cactus ecology and distribution. First, data from phylogenetic studies are already available for a number of Cactaceae tribes and genera, data from those studies can be linked with distribution patterns. This will allow us to infer likely ancestral areas of the groups and detecting possible links of distribution patterns with phylogenetic patterns. There is already evidence that such connections exist in Cactaceae, as it has been demonstrated in *Pereskia* (Edwards et al. 2005) that the two monophyletic groups indicated by phylogenetic studies coincide with two discrete distribution and diversity centres in the genus as a whole. The second aim of further research would be the correlation of distribution data and environmental parameters such as mean annual precipitation, mean annual temperature, seasonality, elevation and habitat heterogeneity. These data could be further linked to characters such as growth forms, pollination mechanisms or seed dispersal strategies. A first analysis of this kind is currently under way for the epiphytic cacti. Since these environmental factors certainly influence cactus distribution, it would be very interesting to study the degree to which environmental factors explain degrees of diversity.

Acknowledgements

We are grateful to the BIOMAPS working group of the Nees Institute to supporting this mapping project during the last years and to the people formerly and currently involved, especially A. Stein, L. Geffert and D. M. Rafiqpoor. We are grateful to P. Ibisch (Eberswalde, Germany) for his continuous contribution to the mapping project. We also thank D. Hunt, N. Taylor, G. Charles, P. Hoxey, M. Lowry (all UK) and R. Bauer (Offenburg, Germany) who reviewed the initial distribution maps and helped further improving them. Continuous financial support for the Cactaceae mapping project from the Akademie der Wissenschaften und der Literatur, Mainz, is gratefully acknowledged.

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The new IOS Website – communicating our mission

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At the 8th Inter-Congress in Bonn, May 2009, an overhaul of the existing IOS Website was discussed. In the past decade, the website had been updated and enlarged several times. During these years, the communication behaviour on the Internet and the expectations of visitors to a website have changed considerably. Based on an analysis of today's requirements, further readjustments did not seem appropriate and a complete redesign was decided.

For an organization, a website is a powerful tool of external and internal information, communication, and organization in support of its objectives. For the IOS mission *'to promote the study and conservation of succulent and allied plants and to encourage international collaboration amongst those interested in them'*, the website needs to make available relevant publications, promote collaboration between members, facilitate and support work of appropriate organizations and individuals, and support organizing 'Reserve Collections' of living plants, herbaria, and reference libraries as a resource for research and conservation.

These challenging goals require significant efforts of the members. Their identification with major goals, key values and a vision of some desired future state are promoters for success. In its 60-year history, IOS has produced results with which one can identify. Uniting botanists, students, curators, horticulturists and dedicated amateurs is a major goal that makes IOS special amongst hundreds of other groups studying amongst their own kind. This pooling of specialized and complementary skills has yielded synergetic results like the consensus classifications for Cactaceae and for Crassulaceae and lately the *New Cactus Lexicon*. Moreover, IOS leaves no doubt about its values: IOS became the first plant organization to publish a *Code of Conduct*, initiated the Conservation Action Plan that set standards in the IUCN's Species Survival Commission, compiled CITES checklists for Cactaceae, for *Aloe* and *Pachypodium*, and for succulent *Euphorbia*. The planned collaborative development of a network of 'Reserve Collections' carries the potential to complement the continuing success in research, systematics and taxonomy. Both the goal to collaborate and the values of conserving nature, forge the vision of the future state of "many experts collaborating to increase knowledge and contribute to conservation of biodiversity." The IOS Website must clearly communicate this mission to both, the public and the members.

As IOS is all about collaboration, the organization has to compete with other options for cooperation. Today, many researchers have developed flexible networks on the Web to suit this purpose, and the need as well as the disposition to enter into a formal commitment like a membership is generally declining in the global village. However, there is a big difference between a cross-linking in virtuality and relations in real groups. This difference needs to be recognized and also communicated. On the Web, collaboration with reduced personal contact and weak social bonds bears a high potential for misunderstanding and distrust. Cooperating largely in anonymity and with short-term horizons, promotes the natural behaviour of players to take more than to give, which fosters a non-cooperative attitude and in turn lowers the probability for future cooperation. This is an ambivalent ground for researchers who have to cope with the potentially conflicting issues of cooperation on one side and job-related competition on the other. Best results are still achieved in an atmosphere of trust, transparency and stable social relations. In fact, the group sharing interests and values and creating an atmosphere of respect and good will is the appropriate frame to cooperate and compete and achieve best results in a long-term perspective. Thus, IOS has not lost attraction. There are plenty of qualified people that would wish to co-operate if they knew about the possibility to begin with and could develop a clear idea of what to expect on an informative website. If their enthusiasm can be maintained, the IOS mission is not at stake.

Against this background, the IOS Website history and the members' expectations of an Internet presence were evaluated. From the very beginning, members argued for a functional interactive website with links to other relevant pages and presentations of IOS documents like statutes, by-laws, and the *Code of Conduct*. The website should be used as an educational and communications tool. On one hand there is the continued request for substantial information for members and on the other hand the repeated demand for enhanced internal communication. Over the years, internal communication needs seem to have outranked external information requirements. Since sufficient information and good communication are fundamental for achieving IOS goals, a member forum was incorporated in the website to provide an efficient communications platform and facilitate internal coordination and collaboration.

All collected information was brought in line with IOS declared goals and the intended means to achieve them, and from this perspective a website concept was derived. We followed the 'one content per page principle' to focus the attention on one larger subject each. Accompanying images are intended to indicate the variety of succulent plants and not to distract from the text. Photo galleries will be established later.

Special attention is drawn to the menu point 'International projects'. It is intended to facilitate cooperation by offering an overview of running and planned projects in the international community (IOS and others). We hope for the willingness of researchers to provide information about their activities and to support the idea of bringing proper partners together. On this page, the interested individual can identify suitable opportunities to coordinate or collaborate. It should also encourage the serious amateur to get into contact with the respective project manager.

Emphasis is also placed on describing the complexity of the steadily growing global networks of organisations fighting for species survival. We think it will be helpful and educative to offer navigation to succulent plant related issues in these networks. These pages are abstracts of some dozens of Web pages, for quick information in one place.

The IOS Website is still under construction and will probably remain so for some time. More pages and modules will be added as needed.

The new website has been checked with different analysis tools and was functioning properly with the browsers Firefox, Opera, and Safari. There might be problems, however, with browsers that do not follow the internationally accepted standards agreed upon in the World Wide Web Consortium (W3C).

Alwin Berger: gardener, botanist & succulent researcher. His life and scientific work from today's view

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The name Alwin Berger today is inseparable from the history of succulent plant science, although his botanical interests were not confined to succulent plants only. Stimulated by and in cooperation with the Berger family, who mounted an exhibition about Alwin Berger in 2009 in Möschlitz, I started to collect all available data and material about the botanical and scientific work and life of Alwin Berger.

Alwin Berger was born in 1871 in the small village Möschlitz (Thuringia, Germany). After school he became a gardener and worked in several nurseries and botanical gardens between 1887 and 1897. In 1897 he became curator of the Hanbury garden 'La Mortola' in Italy, where he also met and married his wife Elise Berger (who perished in the German concentration camp Theresienstadt in 1944). His son Fritz Berger (1905) and his daughter Iris Verna Berger (1906) were born at that time. During the time at La Mortola, Berger came into contact with cacti and succulents, and it was the famous gardener Karl Sprenger, who suggested he study succulent plants more in detail. Because of World War I the Bergers had to leave Italy in 1915. From 1915 to 1922 he was employed at the "Wilhelma" in Stuttgart, Germany. For a study of 'small fruits' (*Rubus*, *Ribes*, *Fragaria*, etc.) he moved to the United States From 1923 to 1926. After completion of this project he became 'Hofgartendirektor' at the Museum of Natural History in Stuttgart till his death in 1931 (caused by appendicitis).

Alwin Berger started his career as gardener and became an esteemed authority and botanist later. During his life he had correspondence and personal contacts as well as friendships with many gardeners, botanists and biologists, well known not only in the 'succulent scene', for instance Nicholas E. Brown, Kurt Dinter, Ernst Haeckel, Joseph N. Rose, Camillo Schneider, Frederic A.C. Weber, Richard Wettstein. For his studies of succulents he visited many botanical gardens, herbaria, succulent plant collections and nurseries, such as Kew Gardens and the collections of De Laet, Haage, Weingart, etc., but he never visited the main distribution areas of his favourite study objects.

More than 200 publications attest to his extensive work. Besides well known books as *Die Agaven* (1915), *Entwicklungslinien der Kakteen* (1926), *Kakteen* (1929), etc there are contributions for Engler's *Das Pflanzenreich* (Aloineae, 1908), Engler & Prantl's *Die natürlichen Pflanzenfamilien* (Crassulaceae, 1930), Bonstedt's *Pareys Blumengärtnerei*

(several succulent plant families) as well as about 200 papers in journals devoted to horticulture, botany or succulent plants. Most of these papers have been published in the journals *Monatsschrift für Kakteenkunde* and *Gartenwelt*. In addition to the eleven books under his own authorship, he published some more books for gardeners in the 1920s under the pseudonym A.B. Burgk.

Alwin Berger was in one of the first botanists who began to study seriously the phylogenetic relationships of cacti. Within a few years of the publication of the *Gesamtbeschreibung der Kakteen* by Karl Schumann he recognized that the few big genera still usual at that time do not reflect natural relationships very well. His ideas were worked out and broadened later by Britton & Rose in their monograph *The Cactaceae* (1919–1923). Hundreds of new names and combinations were published by Berger, mainly in succulent plant families, as well as in Asteraceae, Rosaceae, Grossulariaceae, etc.

To deepen our study and insights in life and work of Alwin Berger all material and data related to him and his botanical and horticultural activities is still being sought. Publications and exhibitions about him, his life and work, are in preparation. All additional items of information (as well as published or unpublished illustrations, writings, etc.) would be welcome to complement the Alwin Berger archive!

Acknowledgements
Thanks to Lutz Schmalfuss and Horst Luding from the Berger family for providing some private unpublished material as well as for inspiration and cooperation.

Sequencing data for the Hylocereeae (Cactaceae)

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A short report was given concerning a molecular study of tribe Hyocereeae commenced by the author but now discontinued. Data from the study have been communicated to the Director of the Botanic Garden and Museum, Berlin, where it is hoped the study will be continued.

Sociedad Latinoamericana y del Caribe de Cactáceas y otras Suculentas (SLCCS): Towards a consolidated network to promote the study and conservation of succulents in Latin America

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The SLCCS is celebrating this year its 20th anniversary. Even though it is already recognized in Latin America as a leading organization bringing together people interested in the conservation and study of succulent species, it is necessary to increase our efforts to spread awareness of the goals, activities and reach of the society, especially outside the Americas, where there are many consolidated organizations that share similar goals with the SLCCS and a genuine interest in succulent plants.

The SLCCS was founded in 1990 in Havana, Cuba, during the 5th Latin American Botany Congress. The founders of the society were Helia Bravo-Hollis (Mexico), Honorary President; Jorge E. Gutierrez Amaro (Cuba), President; Léia Scheinvar (Mexico), Vice-president; Alicia Rodríguez Fuentes (Cuba), 1st Secretary; Baltazar Trujillo (Venezuela), 2nd Secretary (Venezuela); Maricela Ponce (Venezuela), Treasurer; and Charles Glass (US), Honorary Member. Originally, 18 Latin American countries had regional representatives to publicize the existence of the organization.

The statutes of the SLCCS were created and approved in July 1992 during the 5th National Congress and 3rd International Congress on the uses of Nopal. They can be modified during General Assembly meetings, in the presence of members of the Board of Directors and Regional Representatives. Five central objectives were proposed for the organization: (1) to support and stimulate studies on cacti and other succulent plants in Latin America; (2) to contribute to the unification of taxonomic criteria in the Cactaceae; (3) to encourage conservation initiatives in succulent plants; (4) to organize scientific events of broad interest to the large community of people interested in succulent species in Latin America; and (5) to facilitate collaboration and joint studies among scientists and students in the region.

The SLCCS is composed of researchers, students, plant collectors, plant growers and public in general. The current Board of Directors (elective period 2006–2010) includes the following members: Jafet M. Nassar (President), Léia Scheinvar (Honorary President), Roberto Kiesling and Salvador Arias (Vice-Presidents), and Adriana Sofía Albesiano (Secretary and Treasurer). Following a tradition since the beginnings of the Society, we will elect a new Board of Directors during the coming 10th Latin American Botanical Congress this year, in La Serena, Chile. Besides the five members of the Board, we have 13 Regional Representatives for the Society in the Americas: Argentina, Bolivia, Brazil, Colombia, Costa Rica, Cuba, Chile, Ecuador, Mexico, Paraguay, Peru, Puerto Rico and Venezuela. We have between 40 and 50 active members, and our electronic bulletin reaches more than 500 people directly and over 1000 indirectly.

We conduct three very important activities that keep our organization alive: student training, publication of an electronic bulletin, and the design and maintenance of a web page. They allow us to have a real impact on the people and assist the development of the Society. Regarding student training, whenever members of our organization have the opportunity to participate in a scientific congress in the area of botany, we offer a pre-congress course (theory and practice) of two days to people attending the event. To date, these courses have always been dedicated to the taxonomy, systematics and ecology of cacti. At the end of the activity, we give students a certificate of attendance and encourage the most outstanding participants to engage in research projects with succulent species. Overall, we have offered more than 20 courses until now.

The electronic bulletin began in September 2004. It is our link with people all over the world, but especially with Latin American colleagues and students interested in succulent plants. Since the first number, it has been published every four months with the help of the Editorial Committee composed by regional representatives of the Society. Anybody producing information on succulent plants in Latin America can contribute articles to the Bulletin. All the manuscripts are submitted to the Editorial Committee and classified as articles of general interest or scientific articles.

More than 500 people in Latin America receive the bulletin periodically. They help re-transmit this publication to more readers all over the world. Up to now we have produced 15 issues, some with more than 30 pages of varied information. The bulletin starts with an editorial article, followed by a section dedicated to initiatives for the study, conservation and cultivation of succulent plants. The next section is dedicated to description of ongoing research projects in Latin America. Many of these studies are part of undergraduate and graduate theses. Thanks to the Bulletin, many people around the world are aware that those studies are being conducted. After this section, we include divulgation and scientific articles on a wide variety of topics. In the case of scientific papers, we send them to referees to decide the quality of their content. In addition to this, we include a series of sections of general interest: informative tips, special announcements, review of recent publications and a list of recent published papers. The last page of the bulletin is dedicated to provide basic information on endangered species and to list the names and addresses of all regional representatives. Overall, we have produced 15 editorial articles, 13 contents on initiatives, six general comments, 39 projects, 34 articles for the general public, 21 scientific articles, six special announcements, 11 book reviews, 127 informative tips and we have listed 390 published references. Everybody interested in receiving our bulletin can send a message to *jafet.nassar@gmail.com* and ask to be included in the list of subscribers.

In May 2008, we launched the official web page of the SLCCS. The electronic address is *http://www.ibiologia.unam.mx/slccs/www/index.htm*. The page is updated every four months and it has free access. The first service provided is a list of updated events related to succulent plants, including congresses, courses and announcements, among others. The page also contains all the issues of the *Bulletin of the SLCCS*. There is also a virtual library, where the visitor can see and download articles in PDF format and pictures of succulent plants donated by the public. Our latest idea is to include in the page a "Post a Sign" section, where people can announce their requests for papers, assistants, research material, collaborators, equipment, seeds, books, etc. The more people use the page, the more updated and useful it will become.

We have received the support of the international community of researchers and general public, which encourages us to continue offering all these activities. But we have needs that, once satisfied, would allow us to offer a better service to our members and readers. For instance, we need more referees to evaluate the quality of the manuscripts submitted for publication. We also need to receive a greater and steadier volume of contributions to the bulletin. This will allow us to programme in advance the structure and content of future issues. And of course, we would like to reach more people and stimulate them to contribute with publishable information in the bulletin. In the case of short-courses, we would like to expand the content of the programme and include more instructors. The production of a didactic manual to distribute among the students would facilitate the instruction of the courses.

These are just some of the avenues for development of the SLCCS in the coming years, but there are other possible ways to grow and make greater impact; especially by establishing collaboration agreements with other organizations with similar goals. To make contact with them and discuss strategies to achieve common goals is a challenge our society has to face in the coming years.

The afternoon session on 23 March concluded with slide-lectures by Denis Diagre (National Botanic Garden of Belgium, Meise): 'From Chihuahua to the Great Basin Desert (Utah)', demonstrating the beauty of the desert cactus flora seen on his journey; and Joel Lodé (Spain): 'Succulent Plants of the Canary Islands' covering many of the 120 mostly endemic species native to the archipelago. Transcripts of their talks are available on request from the IOS Secretary.

Wednesday 24 March

The ongoing need for education provision for whole-plant biology

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This talk will not focus on succulent plants, but is intended to flag up the urgent need to restore or maintain teaching at all educational levels for whole plant biology. It was previously presented at the UK's Association for Science Educators (ASE) annual conference (January 2010) and is therefore focused on the situation in the UK, but its relevance for many other countries is hopefully obvious.

Plants and fungi are the largely unseen heroes of our planet's ecosystems and much of nature nowadays is alien to us, because we live in cities and our foraging is in the supermarket, its neatly packaged goods all far removed from the soil. Yet plants have never been more vital for our continued existence. Most people will recognize that we all depend on them for food, whether directly or as fodder for the animals we eat, but in many societies around the world they are also the source of medicines, shelter, fuel and in every way deeply woven into human culture. Less well understood by the majority is that whilst green plants may be rooted in the soil and derive water and minerals from it, they absorb and are primarily built from atmospheric carbon – thus healthy vegetation has a mitigating effect on climate change. Sadly, however, its destruction, which goes on ignored in places far away from our city homes, is placing more carbon into the atmosphere than all the world's fossil-fuelled transport systems.

Our great botanical institutes, museums and universities know most of what is already recorded about the diversity and importance of plants in the world, but there is still much more to discover and time is running out. It may come as a surprise that our catalogue of the world's flora is still so incomplete, even if the molecular revolution of the last two decades has provided a more robust framework for its classification. But with the environmental crisis now upon us, the knowledge that can enable the monitoring and advice for the conservation of remaining vegetation is vested in ever fewer individuals. Whole plant science and especially the vitally important means of classifying and ordering living things has all but disappeared from higher education providers – the university that educated me as well as a recent director of Kew Gardens no longer offers a degree in either botany or horticulture! Where are our future plant conservationists going to come from?

At Kew "Breathing Planet" is a programme aligning knowledge of plant diversity around the world with the means to conserve what remains and restore areas capable of recovery. We mount expeditions in partnership with our many overseas stakeholders to collect, identify and carefully document the plants that represent huge and complex ecosystems. We use satellite

technology and geographical information systems to pinpoint biodiversity hotspots and to draw the attention of those we hope can take action, be they politicians, government departments and NGOs. This requires people with good botanical and horticultural knowledge or at least the enthusiasm and interest to obtain it. Those with the training to acquire, assemble, analyse and interpret complex sets of data are also in demand. Likewise, the ability to interpret this work and convey its importance to the public, engendering their support, is also a skill that the botanic garden looks for.

As a child my acquisition of plant knowledge was almost assumed, because the learning environment was conducive. There was the family garden plot given by parents for young Nigel to grow his vegetables and eventually a greenhouse for the cactus collection. At primary school, classrooms had nature tables and the teachers could be expected to recognize much of what the kids brought in of biological interest from the local park or as encountered *en route* to school. How many teachers today can identify more than 10 species of the British or European flora? Three species is a challenge for many! Plants must not be seen any longer as merely the sepia background to our daily environment. Their diversity and the health of their habitats around the world are steadily eroding and will continue to do so if we do not bring the importance of plants in our lives higher up educational agendas. Kew has been proactive about getting plants included in UK high school science curricula, but it will require greater focus on the part of teachers at all levels to ensure that the fruits of interest and knowledge are realised.

Genetic diversity in the Cactaceae

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From arid zones to dry forests, available evidence indicates that anthropogenic activities are causing major negative impacts on dry ecosystems around the world. Land conversion and desertification are causing considerable degradation of soils, reduction of population size of many xerophilous plants and population fragmentation. In many cases, these effects are accompanied with loss of genetic diversity and an increase in the risk of extinction of species at a local and regional level. Management and conservation programs aimed to recover threatened plant species under this scenario should include information on the levels of genetic diversity present in the remnant populations.

In general, plants from arid lands have been the subject of relatively few genetic diversity surveys. This is so despite the fact that many woody species associated with xeric lands can be considered key elements that sustain life in these environments. Estimates of genetic diversity obtained until present in this ecosystem type correspond to approximately 118 species, belonging to 13 families. Fabaceae, Cactaceae and Colchicaceae are the dominant groups, representing 81% of all species. For cacti, we have estimates of genetic diversity for 31 species. This number of taxa is considerably low for a family with more than 1800 species recognized; however, an analysis of the available estimates on genetic variability on this group can give us some preliminary trends for the family.

All species included in our review were analyzed using allozymes as genetic marker. Allozymes remain as the main genetic markers used to examine genetic diversity in cacti, and it is still frequently used in surveys of genetic diversity in plants in general. Parameters of genetic diversity reviewed included percentage of polymorphic loci (*P*), number of alleles per locus (*A*), number of alleles per polymorphic locus (*AP*), effective number of alleles per locus (A_e), and Nei´s genetic diversity (equivalent to expected heterozygosity in the case of diploid taxa). Genetic structure parameters reviewed included the inbreeding coefficient (F_{IS}) and several genetic differentiation coefficients ($F_{ST,}$ $G_{ST,}$ and θ).

Species reviewed included one leaf-bearing cactus (*Pereskia guamacho*), two segmented cacti (*Opuntia basilaris* and *O. caracassana*), six globose cacti (*Melocactus curvispinus*, *M. glaucescens*, *M. paucispinus*, *M. ernestii*, *M. ×albicephalus* and *M. concinnus*), 22 columnar cacti (*Carnegiea gigantea*, *Cereus repandus, Escontria chiotilla*, *Facheiroa squamosa*, *Pachycereus gatesii*, *P. pringlei*, *P. schottii*, *Pilosocereus aureispinus*, *P. lanuginosus*, *P. machrisii*, *P. tillianus*, *P. vilaboensis*, *Polaskia chende*, *P. chichipe*, *Praecereus euchlorus*, *Stenocereus eruca*, *S. griseus*, *S. gummosus*, *S. pruinosus*, *S. stellatus*, *S. thurberi* and *Weberbauerocereus weberbaueri*). In our review, four species are autotetraploid: *Pachycereus pringlei*, *Pilosocereus lanuginosus*, *P. tillianus* and *Weberbauerocereus weberbaueri.*

Cacti have on average equal or more genetic diversity than other families studied in xeric environments with the exception of the legumes, which seem to be in first place. The average *H* of allozymic variation for cacti was 0,256, a pretty high value compared with plants in general (*H*= 0,15) and woody (*H*= 0,17) species in particular. This result suggests that cacti in general have pretty high levels of genetic diversity among flowering plants. The species with the highest heterozygosity were the treelike cactus and columnar cacti (*H*= 0,129-0,443). Most of these species are predominantly xenogamous.

Regarding population genetic structure, cacti on average have a moderate level of population differentiation (F_{ST}= 0,142), this meaning that gene flow is not negligible among populations and in many species it is enough to counteract population genetic isolation. Compared to plants in general, cacti exchange much more genetic material among populations than many species. But compared with woody plants, cacti possess more genetic structure, a pattern in concordance with George L. Stebbin's and Daniel Axelrod's ideas of rapid speciation in arid landscapes. The lowest estimates of genetic structure were associated with columnar cacti (F_{ST}= 0,127; min= 0,028-max= 0,484). This result suggests that substantial historical gene flow has occurred among their populations. The melocacti as a group presented higher levels of population structure (F_{ST}= 0,190), probably due to limited gene flow among their populations. In relation with the inbreeding coefficient, the highest deficit of heterozygote individuals was associated with the melocacti, a group in which all species have mixed-mating.

We recognize that there is still a very limited number of cacti studied to detect patterns. Besides this, available data are not equally balanced between the different growth forms, mating systems and geographic origin of the taxa. Therefore, we are missing important aspects of the ecology and evolutionary history of cacti that need to be considered to construct a more representative database.

Despite these limitations, we can observe the following emerging trends:

1. As a group, the Cactaceae present high genetic diversity at both species and population levels. This family possesses more genetic diversity than other groups of higher vascular plants investigated.
2. They have population genetic structure above the average value reported for woody species.
3. Large cacti, including both leafy and columnar cacti, are the species with the highest levels of genetic variation in the family. This must be in part correlated with the predominance of xenogamy and limited clonality in this growth forms.
4. Mixed-mating increases the level of inbreeding in cacti.

We need to increase the number of species studied to continue walking the route towards defining the patterns of genetic diversity and structure in the Cactaceae. For this, we need to balance the number of species representative of the different categories of the relevant factors that we think have influence on the population genetics of cacti: more globose and opuntioid cacti, inclusion of epiphytic cacti, more mixed mating, autogamous and clonal species, and species with restricted geographic distribution.

Matucanas from the Marañon

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The Marañon river valley has the highest concentration of taxa belonging to the cactus genus *Matucana*, some 15 in total. In Peru, the river runs from south to north and, over the region of *Matucana* distribution, drops from over 3000 m to about 500 m. The various taxa occur either at or near river level, or high on the mountains above. Some taxa are widespread whilst others are localized, occasionally with a specific habitat preference. Our knowledge of the distributions is limited by the nature of the terrain, which is frequently very steep mountainsides making exploration away from the roads very difficult. It is clear that the type localities of the various names are near to the crossing points of the river. In recent years, new crossings have been constructed to give access to the eastern side of the river whilst others have been improved. One new crossing, the road from Sihuas to Huacrachuco, now provides good access the River Rupac, a tributary of the Marañon flowing from the west. A new taxon of *Matucana* discovered in this river valley will be described in Quepo (2010). Like all the matucanas from this region, this new plant has good potential for cultivation even though, like others from lower altitudes, it is cold sensitive and requires a minimum of 10˚C.

Molecular phylogeny versus morphology in the infrageneric classification of *Gymnocalycium* (Cactaceae)

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Phylogeny of the South American genus *Gymnocalycium*, based on DNA sequences from

cpDNA, was compared with the traditional infrageneric classification, based on seed shape. The molecular data were obtained from three non-coding chloroplast regions; Bayesian inference trees and maximum parsimony trees were constructed. The genus includes three major, well-supported clades. One of these contains the species typical of the Chaco ecosystem, mainly distributed in southern Bolivia and Paraguay, with one species widespread in Argentina; it corresponds to the morphologically defined subgenera *Muscosemineum* and *Pirisemineum*. Another well-supported clade encompasses a large part of the species currently belonging to the subgenus *Microsemineum*. The third clade includes the remaining species; within this clade, the subgenus *Trichomosemineum* represents a monophyletic group, thus appearing phylogenetically related to the subgenera *Gymnocalycium* and *Macrosemineum*. This last taxon is probably paraphyletic.

The Ritter Collections: New Life for Old Data

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Friedrich Ritter (1898–1989) was an extraordinary German traveller, geologist, adventurer, amateur botanist, and cactus collector. He is best known for the cactus seeds he collected and that were sold by his sister Hildegard Winter, and for his 4-volume work *Kakteen in Südamerika*, which summarizes the results of his many years of travel (1952–1971). Ritter's personal herbarium was deposited in the Museo de Historia Natural in Santiago de Chile in 1972. The material – mostly mere plant fragments associated with small scraps of paper with short locality data – remained in its original state (enveloped in newspapers, packed in boxes) until the early 1990s, when the Swiss National Science Foundation financed a project to compile a complete inventory. This was done together with Beat Leuenberger, and was published in 1996.

About 10 years later, the feasibility of geocoding Ritter's locality data was studied. In a trial, 901 collections from Chile were associated with latitude/longitude data with the help of ESRI ArcGIS software. Geocoded locality data can be used in a multitude of ways to visualize taxon distribution, and some examples will be demonstrated with taxa of the Chilean genus *Eulychnia*.

Recently, David Hunt was able to acquire an extensive set of Friedrich Ritter's slides. With the help of a numerical list of photographs present in the archives of the Sukkulenten-Sammlung Zürich, it is now possible to put dates and, in many cases, locality data to Ritter's published and unpublished slides. Using FR 479a (*Eulychnia saint-pieana*) as example, the intricacies of synchronizing the known herbarium collections and their localities with the data associated with individual slides will be explained. All available evidence corroborates earlier caveats concerning the problems of multiple localities associated with a single collection number. This is especially troublesome in connection with material cultivated under FR numbers, because no definite locality can be ascertained in most cases.

Recent developments in the study of *Hoya* (Apocynaceae-Asclepiadioideae)

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Hoya R.Br. species are mainly found in South East Asia, and present biodiversity centres in the Malesian region, particularly in the Philippines, New Guinea, the western Pacific Islands and southern Asia including the Indian subcontinent. They are generally climbing epiphytes with opposed rather thick and fleshy leaves and milky sap in all parts. They tend to inhabit primary rather than forests while secondary forests. The genus is badly in need of taxonomic revision. Today, it comprises 200–300 species and there are over 500 names listed in the International Plant Names Index, although it is uncertain how many of these names can be correctly applied. A network of international collaborations has been recently set up to try to address the problems related to *Hoya* systematics, taxonomy and nomenclature. In addition a five years project aimed at studying *Hoya* from Papua New Guinea in the field has just started. Papua New Guinea *Hoya* diversity, despite being very little studied, is reportedly very high (about 70 species described so far, the majority endemic)., therefore in the course of the present project new species are likely to be identified. Recent studies aimed at clarifying name-application, species-delimitation and describing novel species are hereby presented.

Wild species of Mexican cactus pear

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This research aims to contribute to knowledge of the biodiversity of the wild cactus pear (genera *Opuntia* and *Nopalea*). The methodology consists in three parts: I. Office work, II. Field work and III. Cultivation *ex situ*.

I. Office work. It was done in eleven parts: 1. Bibliographic revision, herbarium revision and status of conservation. The main literature revised was: D. Griffiths; Britton & Rose, Bravo; Benson; Weniger; Parfitt and Pinkava; Paredes et al.; Gonzalez, Riojas and Arreola; Anderson; Pinkava; Guzmán, Arias and Dávila; Parfitt and Gibson and Hunt. It is interesting to mention that for Sinaloa and Sonora the last taxonomic study of cactus pear was made in 1929 by Jesus González Ortega. We reviewed 42 Mexican herbaria, the IUCN International Norm (only two species), CITES, the Mexican Norm: NOM-059-ECOL-2001(2002) (only three species), the Norm of Protected Natural Mexican Areas and the Map of Priority Terrestrial Regions to observe which species inhabit these areas. 2. Identification of the species; 3. Georeferencing of the collected or observed plants in the field and herbarium sheets which lack such data; 4. Herborization of the plants collected in the field, elaborating 4 sheets from two cladodes to deposit them in MEXU, CHAPA, ARIZ and MO; 5. Capture of the information in our Data Base: "Wild Species of Mexican Cactus Pear" that has 21 fields and know we have 5667 records from plants collected in the field, revision of 42 Mexican herbaria and types from 3 international collections: US, NY and MO that are on the Internet. 6. Maps of geographical

distribution of each species, with ArcView 3.1 (ESRI 1999) and an overlay of Protected Natural Areas from CONAMP (2007) to evaluate the vegetation type where they live, which species are relatively protected in this protected areas and which species live near these protected areas (Lambert projection). We elaborated also potential models of distribution of the species (Garp and Maxent). We related 62 endemic species of *Opuntia* and 9 microendemic. In *Nopalea* we know 11 species, 6 endemic and 1 cultivated and we consider that Mexico is the centre of origin and centre of diversification of this genus. 7. With the scanning electron microscope we took photos of different structures (areoles, spines, glochids, pollen grains, epidermis and seed); 8. We made detailed descriptions of all the species (taxonomic cards) including distribution maps and bromatology [utilization for food]; 9. We revised the types of each species and designated some neotypes; 10. Bromatological studies of cladodes and fruits were done in our University; 11. We elaborated a diagram of a Web page to be implemented by UNIBIO; 12. Comparative studies of our taxonomic criteria were compared with the criteria of Bravo (1978), Guzmán, Arias & Davila (2003) and Parfitt & Gibson (2003).

II. Field work. Many excursions where made by the team collaborating in this project (our academic technician, two graduate students and 12 undergraduate students of Biology writing theses or working as a group) to study in the field and to collect plants in the states of: BC, BC Sur, Chih., Son., Sinaloa, Nay., Col., Jal., NL, Tamps, Zac., SLP, Mich, Gto, Qro, Hgo, E. Méx, Tlax., Pue, Oax, Ver, Tab, Camp, Yuc, Q. Roo and Chis. In the field we took data of ecological, and morphological characteristics that can only be observed in the field, and took digital photos at 300 dpi. We collected the same species from different populations to evaluate the variation of characters. Some plants from the same population were observed and described but not collected. From each plant we collected 4 cladodes, 2 to elaborate 4 herbarium sheets to be sent to: MEXU, CHAPA, ARIZ and MO; one was cultivated *ex situ* in our Botanical Garden and one sent to make bromatology studies.

III. *Ex situ* cultivation of the cactus pear. In theBotanical Garden of the Biological Institute of UNAM we cultivated one cladode of each collected plant, organized in 8 rows arranged according to the source state. This collection has more than 60% of all known wild species and in a Meeting of the "Mexican National Association of Botanical Gardens" it was named: "National Collection of Cactus Pear". Mexico shares species of cactus pear with other countries. Of the *Opuntia* species: 17 are common to the south of USA; 4 to Central America; 2 to South America; 2 to the Caribbean Islands and 1 to Canada. Of the *Nopalea* species 2 are common to Central America.

Some conclusions:

1. We consider that among cultivated cactus pear and wild ones there is no difference. For instance, we thought that *Opuntia undulata* Griffiths was a domesticated species but we found this species in the wild in three different states (Tamps., Col. and Nay.) in the "Bosque Tropical Caducifolio".
2. We consider that the cactus pear are poorly represented in most of the Mexican herbaria and it is necessary to improve field work.
3. In this year that is the Year of Biodiversity, we consider that our study is a contribution to the knowledge of Mexican Plant Biodiversity in Semi-arid Regions.
4. We acknowledge our student M. en C. Ernestina Preciado, who lives in Los Mochis, Sinaloa, and has collected the cactus pear in all Municipios of Sinaloa and Sonora, and especially our University, CONABIO and SAGARPA-SINAREFI-SNICS for their support for this project.

News on nectaries in Aizoaceae

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Nectary types in Aizoaceae. Three of the 4 subfamilies possess plain nectaries: in basal position in Sesuvioideae in a perigynous flower; in apical position in Aizooideae, also in a perigynous flower; in apical position but in an epigynous flower in the genus *Tetragonia* and in basal position as 'coilomorphic' nectaries in Mesembryanthemoideae. The fourth subfamily, the Ruschioideae, differ from those 3 subfamilies in developing bulging nectaries, either as holonectaries (a complete nectary-ring between the androeceum and the gynoeceum) or as meronectaries (no closed ring, but the single nectaries arranged on a ring).

Nectary types in the tribe Ruschieae. As a rule, both, mero- and holonectaries appear as smooth or crested glands, varying in shape to some extent. In the case of meronectaries, the number of glands is often the same as the number of carpels, an exception occurs, e.g, in the genus *Malephora*: 10 carpels are combined with only 5 meronectaries in one sample.

Size of the nectary slits. The average size of the guard cells forming the 'slit' is about 20 µm, (the same size has been found in some Cactaceae samples); the smallest slits have been found in *Brianhuntleya* (8 µm) and the biggest have been recorded in a sample from *Conophytum bilobum* (26 µm).

Position and distribution of nectary slits. The bulging nectaries, forming a kind of "koppie" (hillock) in longitudinal section, possess an inner surface and an outer surface, connected by a central ridge. In most cases, 1–3 rows of nectary-guard-cells are located on the outer surface, but a distribution of the guard cells all over the gland is realized as well in both, mero- and holonectaries. A very special case has been observed in *Cheiridopsis purpurea*: the pairs of guard cells forming the slit are not separated by subsidiary cells or normal epidermal cells, as is the case in the homologous stomata in the leaf epidermis but are placed immediately next to each other lacking subsidiary cells – their ontogeny is still a secret.

Special features Most glands in Ruschieae are dark green, caused by numerous chloroplasts in the cells. It remains an open question, however, how the variation of the green in the glands to pale colours or yellow to brownish-reddish colours can be explained. In *Dracophilus dealbatus*, red granules of different sizes have been found, obviously responsible for the dark reddish colour of the gland. Normally a genus shows either holo- or meronectaries. In *Delosperma* and *Drosanthemum*, however, examples have been found that differ from this rule, raising the question of delimitation of these two genera.

Outlook. Three fields are to be explored further: 1. Investigate as many genera as possible to accomplish a complete overview over the subfamily; 2. Study the ontogeny of the guard cells in the nectary region; 3. Analyse flower morphology in relation to pollination.

Reference

HARTMANN, H.E.K. & NIESLER, I.M. (2009). On the evolution of nectaries in Aizoaceae. Bradleya 27: 69–120.

***"Sarcostemma"* – an update**

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An overview on the current taxonomic status of the stem-succulent group of plants known as *Sarcostemma* is given. This Old World taxon, well-known to horticulturists because of being so hardy in cultivation but reluctant in flowering, has been found to belong within the stem-succulent part of *Cynanchum* phylogenetically. This originally Madagascan subgroup of *Cynanchum*, which already includes the genera *Folotsia*, *Karimbolea* and *Platykeleba*, would be paraphyletic unless *Sarcostemma* is also included. *Sarcostemma* is considered to be a fairly young group that underwent rapid expansion outside Madagascar between Cap Verde Islands and New Caledonia. More species and subspecies have been described in recent years, either under *Sarcostemma* or *Cynanchum*.

The afternoon session on 24 March concluded with an audio-visual presentation by Joel Lodé (Spain) principally devoted to the 'Succulent Plants of Socotra' but also featuring his bicycle, on which he made a round-the-world journey some years ago!

Congress participants outside the Nees Institute, Bonn, 24 March 2010 (*back row, left to right*): Dieder Supthut, Martin Lowry, Massimo Meregalli, Graham Charles, Ingeborg Niesler, Nigel Taylor, Ulrich Meve, Léia Scheinvar, Detlev Metzing, Rainer Mecklenburg, Jafet Nassar, Urs Eggli; (*front row*): David Hunt, Nadja Korotkova, Joel Lodé, Michele Rodda, Denis Diagre, Kirsten Burstedde, Andrew Gdaniec, Sven Bernhard. (*photo: Ingrid Mecklenburg*)

Congress Reports

IOS Executive Board Meeting
The customary pre-Congress Meeting of the IOS Executive Board was scheduled for Monday 22 March 16:00 at the Congress venue. The Secretary and interim Assistant Secretary duly attended and proceeded with an informal discussion of arrangements for the Congress and other business. However, in the unavoidable absence of the President (who had been taken ill during his journey from Nairobi) and the interim Treasurer, and that of the retiring Vice-President, the meeting remained inquorate (the statutory quorum for a Board Meeting being three persons). As it is also a requirement of IOS Statutes Art.10 that the Board 'shall meet in person at least once per year', the meeting will be re-convened later this year *(see page 86)*.

General Meeting of Members, 23 March 2010
On this occasion the statutory members' business meeting was held at the commencement of the Congress. *Present*: The Vice-President (Chair), the Secretary and the interim Assistant Secretary, and 18 other members.

1**.** *Apologies* for absence were received from Ralf Bauer, Heidi Hartmann, Héctor Hernandez, Susan Carter Holmes, Paul Hoxey, Beat Leuenberger, Sara Oldfield, Jean-Marie Solichon and Thomas Bolliger. Cards to convey good wishes to Len Newton and to Beat and Silvia Leuenberger were circulated for signature by those present.

2. *Obituary*. The death of Eduard Fuhrmann in 2008 was reported in IOS Newletter 3/2009: 2. A distinguished former member of IOS, Dr Reid Moran, died in January 2010 at the age of 93.

3. *Secretary's Report* This was printed in full in the Congress Programme and read by the Secretary. It is reproduced below on pp. 81-82.

4. *Financial Report for 2009 (see pp. 83–84).* Under the Board's interim arrangements, following the resignation of the former Treasurer, this had been prepared by the Secretary, in consultation with the Treasurer Elect, Also printed in the programme, together with a summary of the accounts, and presented by the Secretary. Graham Charles was elected to audit the accounts, and the new Board was requested to consider whether a single account, into which all members could pay their subscriptions via 'PayPal' or other means would be preferable to the present arrangements via regional accounts in different currencies.

5. *Interim Assistant Secretary's Report.* This concerned the development of our new website *(see pp. 65-67)* and generated extensive discussion.

6. *Repertorium Plantarum Succulentarum.* A note by the Secretary accompanying the mailing of RPS 59 to IOS members in November 2009 requested members' views on whether this publication should be available electronically. The 15 responses received were printed in full in the Congress programme. In summary, 4 respondents said they would prefer an electronic version, 4 would prefer the printed version and 7 would like both.

Dr Eggli, as leader of the team that compiles RPS and manager of the ZSS database from which it is derived, outlined current plans and future possibilities for on-line availability of the data. Discussion continued at the final session.

7. *Revision of Statutes and Byelaws.* Proposals by the Board to amend the Statutes and Byelaws, announced in IOS Bull. 15(2): 53–54 (2009) were approved unopposed.

8. *Executive Board 2010–2012.* The following nominees were elected unopposed:
President: Professor Len Newton (Kenya)
Vice-President: Dr Héctor Hernández (Mexico)
Secretary: Dr David Hunt (England)
Assistant Secretary: Rainer Mecklenburg (Germany)
Treasurer: Sara Oldfield (England)

9. *Subscription for 2011–2012.* This was fixed at the basic rate of Euros 30 or the equivalent. A supplement would probably need to be charged for printed copies of IOS publications.

10. *Future Meetings.* Preliminary enquiries were under way with a view to holding the 32nd IOS Congress at the National Botanic Garden in Havana, Cuba in 2012. There was general support for this choice of venue. Suggestions were invited for a venue for the 9th IOS Inter-Congress in 2011. The possibility of returning once again to Bonn, in view of its easy accessibility and other advantages, was favoured by several participants.

11. *Cactus d'Or 2010.* The Board's nominee for this award. sponsored by the Mairie de Monaco, is Myron Kimnach, who will be invited by the Mairie to recieve the award in Monaco in June 2011.

Secretary's Report

1. ***Inter-Congress 2009***. As this report is supposed to cover the whole period since the 30th IOS Congress at Natal, Brazil, I must initially cover ground that will be familiar to many of you who attended the Inter-Congress meeting at this Institute in May last year, the main event in the inter-congress period. I did not calculate the average age of the participants, but (apart from certain elderly members of the Executive Board), it brought together a relatively youthful group of researchers and enthusiasts, eager to share their knowledge and to collaborate, which seemed to me to a very positive sign that the aims that motivated the founders of IOS sixty years ago are still very much alive and well. [IOS will actually celebrate its 60th bjrthday at the end of September this year, an excuse for a party, perhaps?!].

2. ***Change of Congress Venue.*** Today we were supposed to be meeting in the Canary Islands, but the nearest we have got is the picture on the front of the recent issue of the IOS Bulletin. Very briefly, I suppose, we can blame the bankers, or at least the financial crisis. Hardly enough IOS members, it seems, could afford to go at their own expense, and even fewer could get institutional support. Also, severe budgetary cuts forced on the Island Council meant that the Botanic Garden could offer none of the hospitality the Director, David Bramwell, had originally offered, and by the end of January no definite arrangements had been made. Hence our decision to meet nearer home instead, and to hope for a visit to the Canaries in more prosperous times. At least there are several more of us here today than there would have been at Tafira Alta.

3. ***IOS Membership.*** If arrangements for the Congress did not exactly go to plan, there have been several very positive developments for IOS since the previous Congress in August 2008 and the Inter-Congress here last year. We have several more new members (10 since the Inter-

Congress), and the arrangements for receiving subscriptions via the various regional accounts are working well.

4. ***Website and BGCI partnership.*** We have also been very fortunate to be able to persuade Rainer and Ingrid Mecklenburg to devote their very considerable skills and experience to the construction and management of a new IOS website, and to establish a partnership with Botanic Gardens Conservational International in pursuit of our common objective of promoting ex situ conservation. As the icing on that particular cake, BGCI has agreed to undertake the management on the IOS reserve funds, with their Secretary General, our member Sara Oldfield, accepting nomination as IOS Treasurer for the next biennium.

5. ***Collaboration with SLCCS***. The very welcome presence of Dr Jafet Nassar in our midst today, whom a few of you met at the previous Congress, the joint IOS/SLCCS meeting in Brazil in August 2008, is evidence of the desire of both IOS SLCCS for closer cooperation and collaboration between European and Latin American students of cacti and other succulents. Dr Nassar, from Venezuela, is the President and driving force behind not only the very flourishing SLCCS, founded in 1990 and its excellent Bulletin, but 'Ecology Briefs' the Bulletin of the Centro Internacional de Ecología Tropical (CIET), Caracas.

It is also a pleasure to welcome Dra Léia Scheinvar, the Honorary President of SLCCS, with whom I made some field trips in Mexico nearly forty years ago, including one to look at some opuntias. Studying that genus is not everyone's choice, so it's to her credit that she has stuck to them, so to speak, ever since.

6. ***Collaborative projects.*** At last year's Inter-Congress, agreement in principle was reached with Dr Christiane Ritz (University of Giessen) to commence a collaborative study on the molecular systematics and phylogeny of the Andean Opuntioideae, supported by documented material and funding provided by IOS members in the UK. Unfortunately Dr Ritz cannot be with us today, but good progress made and it is hoped to publish initial results within the year.

After the Inter-Congress, an agreement was reached for IOS members with specialist field-knowledge of the Cactaceae to collaborate with the BIOMAPS project team here at the Nees-Institut in producing distribution and diversity maps of the Cactaceae. Three joint working meetings have since been held here in Bonn and in the UK and more will follow. It is hoped to publish the maps later this year as the principal contribution to a first supplementary volume of the New Cactus Lexicon. The travel and accommodation expenses of the UK members involved are being supported via a grant to IOS from the Mainz Academy of Sciences and Literature 'Biodiversity in Change Program'.

Work has also been proceeding on the new phase of the Ritter project, originally initiated under IOS auspices in 1990, and resulting in the monumental catalogue of Friedrich Ritter's South American Cactaceae collections, compiled by Urs Eggli and Beat Leuenberger and published in January 1996. A partial set of Ritter's Kodachromes, including about a 1000 of those published in black and white in his book Kakteen in Südamerika, was found some years ago in the library of the late Mrs Else Gödde. The slides have now been catalogued by me and scanned by our member Paul Hoxey for potential publication in colour, and Urs Eggli is collaborating with us in the dating of the pictures, and where possible, deriving additional data relevant to the typification of names proposed by Ritter. Beat Leuenberger has also given

permission for his biographical notes on Ritter to be reprinted in the proposed publication.

Finally, the compilation of a new edition of CITES Cactaceae Checklist (which is copyrighted to IOS), has been put on hold, at the request of CITES, until it is needed for the next Conference of the Parties.

David Hunt
IOS Secretary

IOS Financial Report 2009

1. ***New arrangements for IOS reserve funds.*** Following the resignation of Dr Bolliger last autumn (see IOS Bull. 15(2): 35. 2009), the IOS Board asked our former Treasurer Mr Dieder Supthut to assume responsibility for IOS reserve funds in our accounts at Credit Suisse, Zürich, and to effect the new arrangements for their investment and management announced and explained on page 52 of the 2009 Bulletin.

Under these arrangements, the Credit Suisse funds were duly transferred last December to a clearly identified tax-exempt client account held by Botanic Gardens Conservation International at HSBC in London. The amount transferred totalled CHF 76988.40, equivalent (after deduction of transfer fees of GBP 16.00) to the sum of GBP 45190.06.
When interest rates return to normal, it is the intention that the HSBC account should be managed to achieve a good return on the money deposited. Donations and surplus funds from the regional current accounts will be transferred to it and research grants etc approved by the IOS Board will be paid from it. As already mentioned, our member Sara Oldfield, who is Secretary General of BGCI, has kindly accepted nomination as Treasurer for the next biennium, and has signed off on this report, which I am reading in her absence. So far as management of the HSBC savings account is concerned, she is being assisted by her Finance Director, Bruce Jamieson, in consultation with the IOS Executive Board.

2. ***Regional accounts***. Besides the HSBC account, IOS now has four regional accounts, operated primarily to receive members' subscriptions in their local currency, and to make payments in that currency when required. Summary statements for each of the four accounts are provided on a separate sheet. It should be noted that the balances in these accounts at the end of 2008 were converted by the then Treasurer to Swiss Francs (CHF) at the exchange rates then prevailing and included in the overall total of CHF 85237 reported by him to the Executive Board when it met on 8 May 2009 (IOS Bull 15(2): 35. 2009). The gross total assets of IOS as of 31 December 2009 stood at nearly GBP 55819.00, equivalent to Euros 62271.00 Euros (as of 5 March 2010). These figures do however include the current balance of a subvention to IOS from the Mainz Academy of Sciences to cover the expenses of the members collaborating with the Nees-Institute's Cactaceae Biomapping Project, of which the remainder will be disbursed during this year.

3. ***Financial Position of IOS***. This has remained very stable over the past several years. Since 2006, however, the running costs of the organization have diminished thanks to the availability of electronic means of communication and savings achieved by printing and mailing the IOS Bulletin, enabling us to make membership more attractive to researchers and students simply by reducing subscription rates. With the assets it has, and provided it remains free of liabilities, the organization might therefore be expected to be more pro-active in conceiving, coordinating and funding (and if necessary fund-raising for) projects that would help achieve its statutory objectives.

4. ***Running Costs and Budget 2010-2011***. Since 2006, IOS has been endeavouring to cut its running costs, in order to reduce the annual subscription, as the subscription was seen as an impediment to attracting members, especially in the countries in Africa and Latin America with the richest succulent floras.

The first step was taken at the 29th Congress, by reducing the size of the Executive Board to five members and thereby cutting by almost two-thirds the amount payable in travel allowances to Board members attending its statutory annual meetings. For the record, the amount currently payable per member is now GBP 125 or Euros 135, unless a member's attendance involves inter-continental travel, in which case it is GBP 310 or Euros 340. Over our now two-year budgetary period, this still means a budget of GBP 2000 or Euros 2200, equivalent to a 2-year subscription of £20 for each of our 100+ paying members.

Now that the Bulletin is distributed electronically, except for a few copies printed off digitally, and the hard-copy version of the Rep. Pl. Succ. pays for itself via subscription payments from the German, Austrian and Swiss cactus societies, the Executive Board is once again the Organization's most expensive indulgence!

Our residual running expenses (actually just the out-of-pocket expenses of the Secretary and other officers, for stationery, postage, bank charges etc, probably do not now amount to more than about £500 pounds per annum, so for 2010-11 we need to budget say £1000 or Euros 1100. With the Board's existing travel allowances, this brings the Organization's likely expenditure for the period to say £3000 or Euros 3300.

To top this up, a fee charged to members attending Congresses and Inter-Congresses might be needed and we could perhaps lean a little harder on retired members, some 30 of whom are excused payment but are probably in a better position to pay than most of those still in work, for occasional donations.

Members, including institutional and library members, wishing to receive the Bulletin and occasional Newsletters etc as hard copy, should also be prepared to help cover the additional cost.

When we come to the point in the Agenda where we fix the subscription for 2011–12, it would certainly be helpful to propose making membership free to all members and would-be members in Africa and Latin America from next year. For members in Europe and the USA, a further reduction from its present level should also be considered.

Sara Oldfield (Treasurer)
David Hunt (Secretary)

Back issues of the IOS Bulletin and Repertorium

Printed copies of recent issues of *IOS Bulletin* (vols. 14 and 15) and the present issue are available from the Secretary (address on page 58), who also has a list of back numbers of *Repertorium Plantarum Succulentarum* still in print. Postage and a small payment for the publications will be requested. Please enquire for details.

Obituaries

Dr Reid Venable Moran (30 June 1916–21 January 2010)
Reid Moran, who has died aged 93, was well-known to many of our older members, though (having joined in 1956) he ceased to be a member of IOS after retiring from his post as Curator of Botany at the San Diego Natural History Museum in 1982, a post he had held since 1957. His love of plants, especially the Crassulaceae and the flora of Baja California, subjects in which he gained a legendary reputation, began very early – as may be guessed from the fact that he had a new species named after him when he was only 16 (*Dudleya moranii* Johansen, Cact. Succ. J. (US) 4(3): 244–245. 1932). A few years later, while he was studying at Stanford University, the same journal (l.c. 8: 125–126. 1937) published a letter from him, addressed to Eric Walther, tactfully exploding the latter's ideas on the phylogeny of *Echeveria* and the Crassulaceae as a whole. We are promised (by Myron Kimnach) a more detailed account of his career and many publications in Haseltonia vol. 16.

Dr Beat Ernst Leuenberger (27 Aug 1946–20 May 2010)
It is with great regret that we record the untimely death of Beat Leuenberger after a year-long battle with cancer. Beat was Swiss by birth and studied in his home town of Burgdorf, then as an exchange student in New Mexico, before higher education in the universities of Bern and subsequently Heidelberg, where he made pioneer SEM-studies of cactus seeds and pollen, the latter for his doctoral dissertation under the direction of Werner Rauh.

His thesis showed him to be the most meticulous of researchers, and his thoroughness and attention to detail is apparent in all his numerous contributions to the taxonomy and nomenclature of cacti, notably in his exemplary monographs of *Pereskia* an *Maihuenia*. A full list of his publications is available on the website of the Botanical Garden and Museum, Berlin-Dahlem, where he was employed as a Curator in the herbarium section from 1976–78 and Senior Curator and Head of the Department responsible for the glasshouse collections of tropical and subtropical plants until this year. His death is a great loss to the institute and to cactology.

Beat Leuenberger (with *Pereskia sacharosa*) south of Grl. Guemes, 750 m, Salta, Argentina, 11 April 1986, on a field-trip during the IOS Congress. *(photo: DH)*

As a member of IOS Beat served for several years as Assistant Secretary and Coordinator of the Cactaceae Section, where his fluency in several languages was a great asset as well as his knowledge, and his invariable friendliness, gentility and good humour, as well as sound judgment and modesty, endeared him to everyone. He was married to Silvia Arroyo, a specialist on Amaryllidaceae from Argentina, having met her at Kew some thirty years ago, and they jointly published several papers on that family, besides making frequent field-trips together. To Silvia and both their families we extend our heartfelt sympathy.

D.H.

Secretary's Notes

Future meetings: Preliminary announcements

IOS 9th Inter-Congress, Jardin Exotique, Monaco, 2011
With the kind agreement of the Director of the Jardin Exotique, our member Dr Jean-Marie Solichon, and the Mairie de Monaco, arrangements are in hand to hold this event in association with the annual 'Expo' meeting of AJEM (*Amis du Jardin Exotique de Monaco*). At the time of writing, the date is not yet fixed, but is likely to be the second weekend of April.

IOS 32nd Congress, Jardín Botánico Nacional, Havana, Cuba 2012
Agreement has been reached to hold this Congress in June or July 2012, probably in conjunction with the Sociedad Latino-Americana y del Caribe de Cactáceas y Suculentas (SLCCS). The local organizer is Luis Roberto González Torres, and further details will be circulated when available.

Subscriptions for 2011-2012

The IOS subscription for this two-year term is due on 1 January 2011. The basic amount for members with internet access is Euros 30.- or the equivalent in other currencies. If you need or wish to receive printed copies of the IOS Bulletin for 2011 and 2012, please add the equivalent of Euros 20 to cover printing and mailing costs.

Prompt payment of subscriptions is requested, so that no reminder is necessary, and may be made any time beforehand – please don't wait till after 1 January! And when paying by bank transfer, please remember to give your name and address for identification!

Payment in Euros via Dr Ralf Bauer
Please send your payment (**30 Euros**) to Dr Bauer's IOS account as follows:
For bank transfers within Germany: Volksbank Offenburg 66490000 Konto Nr.: 9043020
For transfers from elsewhere in the Euro zone, the international codes are:
BIC: GENODE61OG1 IBAN: DE20 6649 0000 0009 0430 20

Payment in US dollars ($40) via Dr E.R. Dorsch (e-mail: cubuff8@aol.com)
Please make checks payable to: **'Ernst R. Dorsch'** (***NOT*** to IOS) and mail to him at:
13011 So. Jennywood, Cypress, TX 77429-2273, USA
NB: Checks must be drawn on a clearing bank in the USA

Payment in British Pounds (£25 GBP) via Dr D.R. Hunt
Please make cheques payable to: Dr D.R. Hunt (IOS account) and send to him at:
The Manse, Chapel Lane, Milborne Port, Sherborne, DT9 5DL, UK
NB: Cheques or money orders must be drawn on a London clearing bank

Payment in Swiss Francs (40 CHF) to the IOS PostCheck account, Zürich
Payment may now be made to the following account only:
IOS PostCheck account no.: PC 80-8960-7 (IOS, 8002 Zürich)

Payment (any currency) via PayPal or with Credit Card via PayPal
If you wish to pay electronically by this method, please e-mail the Secretary (*dh@davidhunt.demon.co.uk*) for information on the amount to be paid, which will include a supplement to cover PayPal's commission and negotiation charges.

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