

INTERNATIONAL

LICHENOLOGICAL

NEWSLETTER Vol. 30, nr. 2, December 1997

Official publication of the
International Association for Lichenology

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ISSN: 0731 - 2830

The opinions expressed in the Newsletter are not necessarily those held by the International Association for Lichenology.

INTERNATIONAL ASSOCIATION OF LICHENOLOGY

The International Association of Lichenology (I.A.L.) promotes the study and conservation of lichens. It organizes symposia, field trips, and distributes a biannual newsletter. There is a listserver which enables on-line discussion of topics of interest. Webpages devoted to lichenology are also maintained by members of the Association. People wishing to renew their membership in or become members of I.A.L. are requested to send their subscription (\$20 for the biennium 1997-1998, \$40 through 2000) to the Treasurers.

The **International Lichenological Newsletter** is the official publication of I.A.L. It is issued twice a year (July and December) in English. The Newsletter is also available on the Internet. The Newsletter is divided into five main sections: 1) **Association news**: official information concerning the Association, such as minutes of Council meetings, proposals of constitutional changes, new members, changes of addresses, etc. 2) **News**: information about lichenologists, institutional projects, herbaria, requests of collaboration, announcements of meetings, book reviews etc. 3) **Reports**: reports of past activities, short lectures, obituaries, short historical novelties, etc. 4) **Forum**: discussion of controversial scientific matters. It includes proposals of new themes for discussion (max. 1.5 page), and reactions to former proposals (max. 1 page). When the material exceeds the available space, the Editor will prepare a summary, on prior agreement with the contributors. 5) **Lichenology on-line**: information on Web sites devoted to Lichens. Any information intended for publication should reach the Editor on or before 15 May and 15 October for inclusion in the July and December issues, respectively.

IAL affairs are directed by an Executive Council elected during the last General Meeting. Council members elected at the IAL 3 Symposium (Salzburg, Austria, 1996) are listed below, and will serve until 2000.

I.A.L. EXECUTIVE COUNCIL 1996-2000

President: Hans-Martin Jahns, ^{Heinrich-Heine-Universität} Botanical Institute, Universitätsstrasse 1, D - 40225 Düsseldorf, Germany. ^{Stroße}

Vice President: Dianne Fahselt, Dept. of Plant Sciences, University of Western Ontario, London, Ontario, N6A 5B7, Canada. ^{johns@mail.72.uni-duesseldorf.de}

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Treasurer: Edit Farkas, Institute of Ecology and Botany, Hungarian Academy of Sciences, H-2163 Vácrátót, Hungary.

Deputy treasurer: François Lutzoni, Dept. of Biology, Indiana University, Jordan Hall 142, Bloomington, Indiana, USA.

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ASSOCIATION NEWS

The President and the Secretary met in München, and discussed several matters concerning the IAL. Several proposed changes in the constitution of the IAL were discussed; these ideas have been submitted to the Constitution Committee elected at the Salzburg meeting. The Committee's proposals will be published in the next issue of the Newsletter. Technical difficulties related to the payment of membership fees must be resolved. It was recommended that the history of the IAL should be documented. An excellent framework was provided by Ingvar Kärnefelt at the Salzburg meeting. A meeting of the Executive Council was planned during the meeting of the German Mycological and Lichenological Society at Regensburg in October, but only the President, the Secretary and S. Ott as a member-at-large were present. It was decided that members-at-large will be encouraged to represent the IAL at local meetings in their countries. All members of the IAL are invited to send proposals for the Mason Hale Award and the Acharius Medal to the Secretary. Discussion about the activities of the IAL in connection with the International Mycological Congress in 2002 must start now! Suggestions about lichen symposia at the Congress should be sent to the Secretary. The next Council Meeting and that of the Constitution Committee will be held at the symposium in London 9-11 January, 1998. We hope that as many council members as possible will be able to attend.

M. Jahns, Düsseldorf and D. Triebel, München

Treasurer's Report

When I took over the office in September 1996, I received DEM 39 (European account) and US\$ 2990 (American account). In Salzburg 103 members paid during the IAL3, and a further 132 members subsequently. Unfortunately, more than half of the membership has not yet paid. A few members have complained about the high costs of membership and bank fees. Some have cancelled their membership. Many preferred to pay for the 4 year period because of lower bank costs (I also prefer this solution since it means less administration). Another good solution is sending a cheque, which lessens bank fees. Altogether, 8230\$ (incl. donations of 1062\$: 912\$ from Cambridge University Press and 150\$ from a few members), were deposited on the account of the Association in Hungary. Expected expenses for 1997 are ca. 1202\$ (including costs of IAL3, 1996 Awards, the Newsletter issues of October 1996, June 1997 and December 1997). After this, there will be 7028\$ left (plus the amount of the continuously arriving membership fees). Donations are, of course, welcome. For the members who have not paid yet, the final deadline before cancellation of membership is January 30, 1998. After that date the Newsletter will only be sent to paid subscribers.

The following accounts are available: 1) Edit Farkas, Institute of Ecology and Botany, Hungarian Academy of Sciences, H-2163 Vácrátót, Hungary - cheques should be made payable to: Hungarian Foreign Trade Bank, H-1051 Budapest, Szent István tér 11, Acc. no.: 501-00047-2100-4019 MTA "TUDOMANY", as remark please add "IAL membership fee 1997-98 (or 1997-2000)" - All fees should be paid in US dollars! You are kindly requested to add 5\$ for bank charges if you send a cheque, or in case of bank transfer the sender should pay all bank fees. 2) IAL dues can be also paid to: François Lutzoni, Deputy Treasurer, Center for Evolutionary and Environmental Biology, Dept. of Botany, The Field Museum of Natural History, Roosevelt Road at Lake Shore Drive, Chicago, IL 60605, USA.

E. Farkas, Budapest

New members

Explanation of the fields: name, institute, street, town, country, fax, e-mail, telephone.

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Telephone numbers in Graz - The number of the Institute is (+43) 316 380, followed by the extensions: Arup 5655, De Los Rios 5655, Grube 5655, Hafellner 5648, Komposch 8834, Mayrhofer 5654, Obermayer 5658, Pruegger and Moeslinger 5659, Suppan 8833, Trinkaus 5660, Wilfling 8832.

NEWS

Registration of Plant Names - Test and Trial Phase (1998-1999)

Subject to ratification by the XVI International Botanical Congress (St Louis, 1999) of a rule already included in the *International code of botanical nomenclature* (Art. 32.1-2 of the *Tokyo Code*), new names of plants and fungi will have to be registered in order to be validly published after the 1st of January 2000. To demonstrate feasibility of a registration system, the International Association for Plant Taxonomy (IAPT) undertakes a trial of registration, on a non-mandatory basis, for a two-years period starting 1 January 1998. The co-ordinating centre will be the Secretariat of IAPT, currently at the Botanic Garden and Botanical Museum Berlin-Dahlem, Germany. Co-ordination with present indexing centres for major groups of plants is being sought, in view of their possible active involvement at the implementation stage. The International Mycological Institute in Egham, U. K., has already accepted to act as associate registration centre for the

whole of fungi, including fossil fungi. The co-ordinating registration centre (IAPT Secretariat), and any associated centre operating under its auspices, will register and make available all names of new taxa, all new combinations or rank transfers that are brought to their attention in one of the following ways: by being published in an accredited journal or serial; by being submitted for registration (normally by the author or one of the authors), either directly or through a national registration office; or (for the non-mandatory trial phase only) as a result of scanning of other published information by the registration centres' own staff.

Registration by way of publication in accredited journals or serials - For a journal or serial to be accredited, its publishers must commit themselves, by a signed agreement with the IAPT, to point out any nomenclatural novelties in each individual issue of their journal or serial, either by including a separate index of novelties or in another suitable, previously agreed way; submit each individual issue, as soon as published and by the most rapid way, to a pre-defined registration office or centre. Accredited journals and serials will be entitled, and even encouraged, to mention that accreditation on their cover, title page or in their impressum. A permanently updated list of accredited journals and serials is being placed on the World Wide Web (<http://www.bgbm.fu-berlin.de/iapt/registration/journals.htm>). This list will be published annually in the journal *Taxon*.

Registration by way of submission to registration offices - Authors of botanical nomenclatural novelties that do not appear in an accredited journal or serial (but e.g. in a monograph, pamphlet, or non-accredited periodical publication) are strongly encouraged to submit their names for registration - and will be required to do so once registration becomes mandatory - in the following way: all names to be registered are to be listed on an appropriate registration form, using a separate form for each separate publication; the form (in triplicate) must be submitted together with two copies of the publication itself, either to a national registration office (see below) or, optionally, directly to the appropriate registration centre. Reprints of articles from books or non-accredited periodicals are acceptable, provided their source is stated accurately and in full; one dated copy of each form will be sent back to the submitting author in acknowledgement of effected registration. Registration forms can be obtained free of charge (a) by sending a request to any registration office or centre, by letter, fax or e-mail, or (b), preferably, by printing and copying the form as available on the World Wide Web (<http://www.bgbm.fu-berlin.de/iapt/registration/regform.htm>). Registration offices are presently being arranged for in as many different countries as possible. They will serve (a) as mailboxes and forwarding agencies for registration submissions and (b) as national repositories for printed matter in which new names published locally appear. A permanently updated address list of all functioning national registration offices is being placed on the World Wide Web (<http://www.bgbm.fu-berlin.de/iapt/registration/offices.htm>). This list will also be published annually in the journal *Taxon*.

Registration date - The date of registration, as here defined, will be the date of receipt of the registration submission at any national registration office or appropriate registration centre. For accredited journals or serials (and, for the duration of the trial phase, for publications scanned at the registration centres), it will be the date of receipt of the publication at the location of the registration centre (or national office, if so agreed). For the duration of the trial phase, i.e. as long as registration is non-mandatory, the date of a name will, just as before, be the date of effective publication of the printed matter in which it is validated, irrespective of the date of registration. Nevertheless, the registration date will be recorded, for the following reasons: to make clear that the name was published on or before that date, in cases when the date of effective publication is not specified in the printed matter; to assess the time difference between the (effective

or stated) date of the printed matter and that of registration, since it is envisaged that the date of registration be accepted as the date of names published on or after 1 January 2000.

It is therefore in the interest of every author to submit nomenclatural novelties for registration without any delay, and by the most rapid means available.

Access to registration data - Information on registered names will be made publicly available as soon as feasible, (a) by placing them on the WWW without delay in a searchable database (<http://www.bgbm.fu-berlin.de/iapt/registration/regdata.htm>), (b) by publishing non-cumulative lists biannually, and (c), hopefully, by issuing cumulative updates on a CD-ROM-type, fully searchable data medium at similar intervals.

L. Borgen, Oslo, W. Greuter, Berlin, D. L. Hawksworth, Egham, J. McNeill, Toronto, D. H. Nicolson, Washington (Officers of the IAPT)

Workshop: Progress in molecular studies of lichens. (11.-15. August 1998, Graz, Austria).

This is the announcement for the first workshop devoted to molecular systematics of lichens. After about one decade of molecular lichenology results and the future challenges will be discussed. Programme of the workshop: Talk sessions: 1. Molecular and morphological evolution, with contributions by U. Søchting, H. Döring & M. Wedin, L. Myllis, G. Rambold, A. Crespo. 2. Advances in lichen molecular systematics, with contributions by M. Wedin, S. Ekman, A. Thell, N. Ivanova, J. Miadlikowska, T. Friedl. 3. Molecular population studies, with contributions by O. Cubero & A. Crespo, M. Vinuesa, B. Gutmann, S. Zoller. 4. Sterile lichens and their phylogenetic positions, with contributions by N. Hoffmann, U. Arup, M. Grube. - Discussion forums: 1. Classification and phylogeny (moderated by O. Eriksson), 2. Introns and their significance for molecular systematics (moderated by P.T. DePriest), 3. Genes and their information content for phylogenetic studies (moderated by F. Lutzoni), 4. A comparison of phylogenetic methods (moderated by A. Gargas), 5. Integration of different data sets (moderated by A. Tehler). - Laboratory seminars: 1. Alignment techniques (by M. Grube), 2. DNA isolation techniques for lichens (by O. Cubero), 3. Microslide PCR and in situ hybridization (by H. Wolinski), 4. Automated sequencing (by I. Korschineck). - Organisation: M. Grube (Graz), M. Wedin (London), P. Blanz (Graz). Info: <http://bkfug.kfunigraz.ac.at/~grubem/msl-workshop.html>.

Lichens of North America

We happily report that The Canadian Museum of Nature has now signed a contract with Yale University Press for the production of "*Lichens of North America*". Ernie Brodo has been given permission by the Museum to resume work on the book (funding had been cut off in January 1996 and no work was permitted since 3 December 1996 pending the signing of the contract). The authors plan to submit the completed manuscript by October 1998. Yale estimates 18-24 months for production. Ernie, Sylvia and Steve thank all members of the lichenological community for their support during these difficult months.

I. (E.) Brodo, Ottawa, S. & S. Sharnoff, Berkeley

New Societies

North America, East: Eastern Lichen Network, Info via email: Glennmar@shu.edu (Dr. Marian Glenn). - The Eastern Lichen Network has about 25 members linked via email,

and posts announcements, keys and requests for information as submitted, with about 1 or 2 postings per month. The network was set up with the long range goal of preparing a lichen flora for Eastern North America.

Brazilian Lichen Society - A lichen society, called the Grupo Brasileiro de Lichenólogos (GBL), was established on 23 July 1996 at Nova Friburgo, Rio de Janeiro State, during the XLVII Congresso Nacional de Botânica. It is publishing a newsletter, *Boletim Informativo*. The President of the society is Marcelo Pinto Marcelli.

Journals

LICHENS is a new indexed international journal aiming at establishing closer scientific relationship among Universities, Botanical Gardens, private collections, as well as professionals and students. Three issues, constituting a volume, will be published per year. All articles will be electronically peer-reviewed. Once accepted, titles, summaries and bibliographies will be sent by electronic mail to an international title list prior to printing at the Web address: <http://www.ciens.ula.ve/~cires> (see there for further information). Areas of interest: all aspects related to lichen structure, anatomy, morphology, genetics, molecular biology, molecular systematics, natural history, chemistry, evolutionary biology, ecology, etc., reports from scientific events, book reviews. - Calendar: closing the volume: March 1st, July 1st, November 1st. Publication: April 30th, August 31st, December 31st. Subscription Price for Institutions: Printed Edition, U.S.\$ 600.

MYCOSISTEMA - The Chinese mycological journals - which contain many lichenological articles - *Acta Mycologica Sinica* and *Mycosystema* have been united so that in 1997 they together form a quarterly journal called *Mycosystema* but bearing the volume number 16. Orders: China International Book Trading Corporation, P.O. Box 399, Beijing, China.

DISCONTINUED JOURNALS - The periodical *Systema Ascomycetum*, which was started at Umeå, Sweden, in 1982 by O. E. Eriksson, and later edited by him and D. L. Hawksworth at the International Mycological Institute in England, shall be discontinued from the beginning of 1998. The periodical *Cryptogamic Botany*, which was published by the Gustav Fischer Verlag in five volumes in 1989-1995, was discontinued from the beginning of 1996.

Personalia

Ted Ahti (Helsinki) received an honorary plaque from the Grupo Latinoamericano de Lichenólogos at the GLAL-3 meeting at Campos do Jordao, Brazil, for his work on Latin American lichenology. From Brazil he went to Mexico to continue his work on Mexican Cladoniaceae in Guadalajara with Laura Guzman-Davalos and Isela Alvarez. He also visited the herbaria at Arizona State University, Tempe, AZ, and The New York Botanical Garden.

Ulf Arup (formerly Lund) has moved to Graz where he has a two-year post-doctoral position at the Dept. of Botany. He will work with M. Grube on a project called "Molecular phylogeny of *Lecanora* subgenus *Placidium*". One of the main questions of the project is: "What are the phylogenetic relationships of lobate to crustose species in the genus *Lecanora*?" Molecular, morphological, anatomical, and

chemical data will be used. The project will also try to find out how groups within the genus with certain character sets are related to each other, and to other genera outside *Lecanora* with similar character sets. The placing of the sterile species *L. demissa* will be dealt with using molecular data. Another objective is to study the congruence between SSU rDNA and LSU rDNA data. Freshly collected (up to 2-3 years old), material of *Lecanora* subgenus *Placodium* (except *L. muralis*) would be greatly appreciated. The material should be sent to: Institut für Botanik, Karl-Franzens-Universität Graz, Holteigasse 6, A-8010 Graz, Austria. Ulf Arup may also be reached by e-mail: ulf.arup@kfunigraz.ac.at.

Patrik Frödén (Lund), after completing his Master's thesis in December 1996 (*The taxonomy of Lecanora glabrata and L. allophana—two taxa in the L. subfusca group.*), began his PhD-studies in Lund in May 1997. Under the supervision of I. Kärnefelt, he is working on a taxonomic revision of *Teloschistes*. Material and information on the subject is much appreciated.

Linda Geisler (Corvallis, OR) is conducting lichen surveys in Denali National Park and the Seward Peninsula of Alaska and would be interested in corresponding with anyone who has collected there. Address: L. Geisler, U.S. Forest Service, Siuslaw National Forest, 4077 Research Way, P.O. Box 1148, Corvallis, OR 97339. Phone (541) 750-7058, fax (541) 750-7234, DG: L.Geisler:r06f12a, geislerl@proaxis.com.

Scott La Greca (Durham, NC), who has just received the PhD degree from Duke University as the last student of the Culbertsons, will be Visiting Assistant Professor of Biology at James Madison University, Harrisonburg VA 22807, USA. His dissertation "*Systematics and evolution of the lichen genus Ramalina, with an emphasis on the Ramalina americana complex*", was based primarily upon molecular analysis. At James Madison University he will teach introductory botany and a course of molecular biology.

Louise Lindblom (Lund) will defend her doctoral thesis "*The genus Xanthoria in North America*" (Journ. of the Hattori Bot. Lab. 83) on December 12, 1997, with U. Söchting as opponent.

Cristina Maguas (Lisbon) and **Fernando Valladares** (Madrid) intend to organize a workshop on functional thallus structure. Lichenologists are welcome to express their interest and to provide suggestions, opinions and ideas regarding the way of arranging the workshop, its possible location, and its scientific content. In addition, they plan to promote scientific discussion in the fields of ecology, physiology and functional thallus structure, by means of a "Discussion Group" on the Internet, following the example of the Forum-discussions in the Newsletter.

Tatiana Makryi (Novosibirsk) has organized a joint expedition between Russian biologists (L. Malyshev, Novosibirsk, V. Chepinoga, S. Kasantovskiy and V. Pleshanov, Irkutsk) and Italian botanists of the University of Trieste (P.L. Nimis, M. Tretiach) in the Lake Baikal Region (July 1997). Next winter she will spend a month in Italy, at the Department of Biology, University of Trieste, working on a checklist of lichens and lichenicolous fungi from the Baikal region.

Isabel Martinez (Madrid) successfully defended her doctoral thesis at the Universidad Complutense on 17 October, 1997. The thesis "*Taxonomy of the genus Peltigera Willd. (lichenized Ascomycetes) in the Iberian Peninsula and the study of its lichenicolous fungi*" was prepared under the supervision of A. R. Burgaz. The members of the panel were C. Vicente, A. Crespo, J. M. Egea, O. Vitikainen and N. Marcos. 24 taxa occur in the Iberian Peninsula (24 in Spain, 18 in Andorra and 13 in Portugal). New anatomical, morphological or chemical differences were found in *P. apthosa*, *P. didactyla* s.l., *P. hymenina*, *P. malacea* and *P. polydactylon*. 30 species

of lichenicolous fungi were found (21 Ascomycetes, 5 Coelomycetes, 4 Hyphomycetes), and 11 lichenized Ascomycetes.

Leopoldo Sancho (Madrid) finished his sabbatical year (April 1997-February 1998) in the Botanisches Institut der Universität Kiel (Germany) working with Prof. Kappen and Dr. Schroeter on an ecophysiological study of vagrant (*Aspicilia* subgen. *Sphaerothallia*) and bipolar (*Umbilicaria nylanderiana*, *Stereocaulon alpinum*) lichens, supported by the Spanish DGICYT, and by the EEC plan for the mobility of scientists. He was mostly involved in gas exchange and fluorescence experiments including: 1. photosynthetic performance of vagrant lichens, with or without movement of the thalli under controlled irradiance levels, temperature and hydration. 2. comparison of maximal assimilation capability and optimum of light and temperature between populations of *Umbilicaria nylanderiana* from the Antarctic and from Mediterranean mountains. 3. photosynthesis in relationship with temperature of *Stereocaulon alpinum* through a coastal-inland gradient in the maritime Antarctic. He would like to express his deep appreciation to Prof. Kappen and his team for the excellent arrangements, warm hospitality and kind help.

Harrie Sipman (Berlin) just finished a busy travelling season. He participated in a lichenological and bryological expedition to Guyana organized by P. DePriest (Washington), and including S. Stenroos (Helsinki). This time, Paruima Mission in the extreme west of the country was visited. After this, he spent three weeks with T. Ahti in Helsinki to prepare a treatment of Cladoniaceae for the Flora of the Guianas. A draft key will be available on the internet soon. Also, types of Graphidales in the Nylander and Vainio herbaria were examined, for a treatment of Papua-New Guinea representatives. In August/September he joined the bryologist R. Gradstein and held a course on identification of neotropical mosses and lichens at the Universidad Católica in Quito. For this purpose a key to neotropical lichen genera was prepared. Finally, he participated in the "Recollecting Vainio" and GLAL3 meetings in Brasil.

Soili Stenroos (Turku) was recently appointed as curator of the herbarium in Turku (TUR). Her job includes the curation of the Vainio lichen herbarium (TUR-V).

New Literature

D. PUNTILLO, 1996 - *I licheni di Calabria*. Monografie XXII, Museo Regionale di Scienze Naturali Torino ISSN 1121-7545, ISBN 88-86041-17-9, 229 pages, xlii coloured plates and 25 plates, hardbound. Available from: Museo Regionale di Scienze Naturali, Via Giolitti 36, 10123 Torino, Italy; fax (+39) 11 4323331. Price L 120,000 + postage. - A catalogue of 856 taxa of lichens and lichenicolous fungi is presented. For each taxon localities, reference specimens and literature references are given, together with a note on world distribution and habitat information for Calabria. The introduction treats geology, geography and climate of the area. At the end a survey is presented of phytogeographical elements, an alphabetical index to scientific names and synonyms, colour photographs for 335 taxa, and distribution maps for 100 taxa. This work transforms Calabria from a lichenological *terra* (almost) *incognita* instantaneously to one of the best-known areas in Europe and probably in the world. It is almost exclusively based on field work by the author, and contains 19 taxa new to Italy, 164 new to Calabria, and one new to science. The 335 colour photographs are of excellent quality, and will be of great help for those identifying Mediterranean lichens. This is the OPTIMA Commission for Lichens Publication nr. 3. In Italian.

H. Sipman, Berlin

G. SCOTT, T. ENTWISLE, T. MAY, & N. STEVENS, May 1997 - *A conservation overview of Australian non-marine lichens, bryophytes, algae and fungi*. Published by: Wildlife Australia Endangered Species Program. Cost: AU\$15 Available from: The Botanical Bookshop, PO Box 351, Jamison ACT 2614, Australia. Fax: 06 250-9549. - This is the first listing of endangered lichens in Australia. 2494 accepted names for lichens in Australia at time of printing. 2 species considered extinct 94 species endangered 94 species vulnerable 31 species potentially vulnerable Many of the species are members of the Parmeliaceae.

G. S. RINGIUS, April 1997 - *Evaluation of potential impacts of development on Erioderma pedicellatum in Eastern Newfoundland*. Available from: Canadian Forest Service Natural Resources Canada 580 Booth Street, 8th Floor Ottawa, Ontario - "Life cycle is intimately tied in with forest succession." "Thallus grows with phorophyte and reaches sexual maturity when the tree is 60-80 years old." Now there are "34 known sites." "Total number of known thallus is 677." "Main threats are forest harvesting and air pollution."

C.W. Smith, Honolulu

W. M. MALCOLM & D. J. GALLOWAY, 1997 - *New Zealand Lichens. Checklist, key and glossary*. The Museum of New Zealand Te Papa Tongarewa, Wellington. ISBN 0 909010 40 4. Price: US\$ 30.00 plus postage. Order by e-mail: annef@ikaroa.monz.govt.nz. - This splendid book is not only an updated edition of David Galloway's earlier New Zealand lichen checklist, it also contains revised keys to the New Zealand lichen genera (including some of non-lichenized calicialean fungi, and some other lichenicolous fungi), numerous modern references, and a very detailed glossary. I have not checked the key in detail, but my first impression is that it seems to be a solid piece of work. In addition, the book contains very valuable technical chapters on slide preparations, and chemical and microscopical techniques, which will be most helpful to beginners. One of the most interesting novelties is a description of a cheap, simple and very innovative 'ha'penny' pseudo-interference contrast optics technique, which has been used when taking many of the high-quality microphotographs presented in the book. It is extremely well illustrated by a multitude of Bill Malcolm's wonderful photographs, linedrawings and paintings. Malcolm and Galloway should be congratulated for their tremendous work, which will not only be a long lasting reference for every scientist working on Southern Hemisphere lichens, but it will also be a very valuable help for beginners and amateurs in Australasia and elsewhere. There are a few minor points of criticism; several of the superb illustrations have, for instance, been used several times (the same spores of *Pertusaria velata* have been used on at least four pages), and the identity of one or two of the illustrated lichens may perhaps be questioned (the *Bunodophoron* species depicted on page 164 and 165, for instance). The non-lichenized genus *Phaeocalicium* A. Schmidt (Mycocaliciaceae) is not included, despite that the other genera of this family are covered, which perhaps is not entirely logical. These comments, however, should not overshadow the grandeur of the volume, which is highly recommended!

M. Wedin, London

D. ELDRIDGE and M. TOZER, 1997 - *A Practical Guide to Soil Lichens and Bryophytes of Australia's Dry Country*. Available from: The Information Centre, Department of Land and Water Conservation, G.P.O. Box 39, Sydney, Australia, 2001. AU\$ 15.00 (add \$2.00 for P & H). - This interesting booklet examines the common species found across Australia and is illustrated with over 50 colour photographs. It

discusses: i) the roles of biological soil crusts in dry environments, ii) the major components of the crust, iii) how to recognise individual species and iv) the effects of land use on crusts and the composite organisms. Keys are included for the common mosses, lichens and liverworts, as well as a glossary and bibliography. The book is aimed at botanists, naturalists, land managers and anyone interested in non-vascular plants and arid environments.

M. A. FADEEVA, N. S. GOLUBKOVA, O. VITIKAINEN and T. AHTI, 1997. - *Predvaritel'nyy spisok lishaynikov Karelii i obitayushchikh na nikh gribov. (A preliminary list of lichens and lichenicolous fungi of Karelia)*. Karelskiy nauchnyi tsentr RAN, Petrozavodsk, 100 pp. ISBN 5-201-07975-X. - An annotated list of lichens and lichenicolous as well as some allied fungi of the Karelian Republic, Russia. The area includes the north shore of Lake Ladoga and the Paanajärvi National Park, which earlier belonged to Finland and were intensively studied by V. Räsänen and M. Laurila, for instance. The list is based on both Russian and Finnish sources and includes 1013 taxa. In Russian, with a short English summary.

E. FARKAS & T. PÓCS (eds.), 1997 - *Cryptogams in the Phyllosphere: Systematics, Distribution, Ecology and Use*. (Proc. of IAB & IAL Symposium on Follicolous Cryptogams, 29 August - 2 September 1995, Eger, Hungary), *Abstracta Botanica* 21(1):1-216. - The volume contains the obituary of P. W. Richards by D. Ratcliffe, a birthday tribute to R. Santesson by L. Tibell, and 21 bryological and lichenological papers by the participants to the symposium from 17 countries. A very interesting volume, full of valuable biological information.

The Editor

REPORTS

American Bryological and Lichenological Society Meeting, Montreal

The American Bryological and Lichenological Society meets each year, often as part of the larger American Institute of Biological Sciences conference. There are the standard sessions of "contributed papers", symposia, posters, and always a "foray" (collecting expedition) to some nearby region. The year 1997 was no exception. Although there was only a short (but interesting) session of contributed papers in lichenology (see below), there was a particularly good symposium devoted to lichens. The symposium, held in Montreal, Quebec, Canada, on August 4-7, 1997, was entitled, "*Bridging the gap between phylogeny and the classification of lichen-forming Ascomycetes*," and was organized by François Lutzoni, who recently took up a position at Chicago's Field Museum of Natural History. François invited speakers from Europe to participate in the North American meeting, giving the symposium a distinctly international feeling (unusual for an ABLS meeting). Authors from nine different countries were involved. The symposium was sponsored by ABLS and The Field Museum of Natural History. The focus of the symposium was clearly stated in the title. Many papers on the phylogeny of lichenized fungi have appeared in recent years, some devoted to analyses of morphological characters (and often secondary metabolic products), and others dealing only with the results of molecular studies. Here was a chance to bring these two bodies of data together, or at least to start people thinking about the incorporation of all data sets into comprehensive analyses. The very real problem of using phylogenetic trees (which are regarded by all to be simply testable hypotheses) to create acceptable

classification systems (often involving name changes, e.g., when the generic level is involved) is a thorny issue, and it was hoped that the participants and audience would contribute to its solution. Space does not permit me to summarize each paper (even if I were competent to do so), so I will simply list those who participated, mention one or two of the main points made by the speakers, and share the general mood of the gathering and the feelings they generated in me personally. François began the session with a short outline of the task and reason for the gathering. The symposium consisted of three parts. The first part addressed theoretical aspects intrinsic to establishing a phylogenetic classification. Participating in this first part were D. Hibbett (with M. Donoghue), who suggested that a "rankless classification system" rather than the traditional Linnaean hierarchical system is better suited to translating modern phylogenetic analysis into classification schemes, and he encouraged lichen taxonomists to explore that option. The ensuing discussion, however, seemed to indicate some serious misgivings with abandoning the hierarchical system. J. W. Taylor, who supported Hibbett's view, addressed the difficulties in classifying asexual species of fungi. Based on molecular work, he pointed out that truly clonal species are rare, which should facilitate the future integration of species classified within the artificial phylum Deuteromycota into the Ascomycota. P. L. Nimis made an earnest plea for more caution in the creation of new generic names based on phylogenetic analyses...and even more so, in the absence of phylogenetic analyses, and this also generated a lively discussion. The second part of the symposium provided examples of lichenological studies in which both morphological and molecular data were gathered, and where phylogenetic trees were used to establish new classifications. L. Tibell (with M. Vinuesa) summarized new classification decisions made necessary from the results of rDNA studies of the old "Caliciales". M. Grube (with M. Matzer) dealt with the reclassification of genera within the Arthoniales. G. Rambold (with Th. Friedl and A. Beck) emphasized that lichenologists have been remiss in ignoring the photobionts of lichens in constructing classifications because photobionts may well have evolved in parallel with lichen fungi and have much to tell us about phylogeny. The last third of the symposium was devoted to the higher classification of lichenized and non-lichenized ascomycetes and the origin of lichen-forming ascomycetes. P. DePriest (with S. Stenroos, N. Ivanova and A. Gargas), and A. Gargas in her own presentation, dealt with the origin of lichenization and phylogenetic relationships within the ascomycetes based on small subunit rDNA sequences. F. Lutzoni (with J. Crodian and V. Reeb) addressed the same issues but using both the small subunit nrDNA and a new data set consisting of nucleotide sequences from the large subunit nrDNA. François tested whether these two data sets could be combined and presented a phylogenetic analysis based on the combined data. O. Eriksson, in the final presentation, gave a general account of classification within the Ascomycetes as a whole, setting the lichenized orders into context. Discussions were mainly devoted to classification at the family level or above. In most cases, it was pointed out that the available data were incomplete (too few analyses were represented to provide reliable analyses of the phylogenetic relationships of the higher taxa). In addition, different phylogenetic trees have been generated from analyses of different molecules of the same sets of species, and from analyses of the same molecule using different sets of species. The repeatability of results has yet to be tested in most cases, and many of the phylogenetic "clades" are poorly supported by statistical analyses of alternative configurations using resampling methods such as bootstrap or jackknife. "Much work remains to be done with both genetic and morphometric data collection", was a recurring statement. Nevertheless, there was an exciting feeling of progress, with genetic data more often than not supporting hypotheses proposed based on morphological and chemical characters. The integration of morphological and genetic

data sets is beginning, but problems remain, especially in establishing the reliability of phylogenetic trees. Following the symposium, contributed papers on "The Biology of Lichens" were presented in a session chaired by S. Hammer by S. LaGreca, S. Selva, D. Fahselt and J. Lawrey. The papers covered a diversity of topics including classifying species of *Ramalina* with the help of DNA data, hints for finding Caliciales in the field, the effects of extreme pressure (as in the weight of glacial ice) on the presence of phenolics on medullary hyphae, and the pathogenicity of certain lichen parasites in different geographic areas due, perhaps, to the sequence of infection.

I. M. Brodo, Ottawa

1st Workshop on Verrucariales, Graz

During IAL III in Salzburg some people met, who were in different ways engaged in the studies of the Verrucariales, a group studied by only a few scientists scattered around the world. Stimulating discussions brought up the idea of organizing a Verrucariales-Workshop. Two students from Graz, A. Wilfling and N. Hoffmann accepted the task of hosting the workshop, but Ch. Keller and O. Breuss were also heavily involved in the organization. I must confess that, while discussing the idea of the workshop, I was rather sceptical that it would ever happen. I thought that it surely will come to nothing...everybody is too busy with different things. You can imagine my surprise and joy when at the beginning of February I received an e-mail from A. Wilfling concerning the workshop. When I arrived in Graz, on May 17th, the final programme contained nine contributions, one field trip, a discussion forum, and plenty of time for common practical work. I was astonished by the facilities available, and the large number of participants attending. What I supposed to be a little workshop turned out as a "mini" symposium with almost 30 participants from eleven countries. The programme included many interesting contributions: O. Breuss introduced his new generic concept dividing *Catapyrenium* s.l. into seven genera, both new and resurrected. A. Orange gave some demonstrations on the genus *Thelidium*. E. Stocker talked about culture and growth of some species of Verrucariales. C. Keller gave her view on some poorly known characters in the Verrucariaceae. The day ended with a forum discussing characters and their definition at species level because the lack of characters is a common problem for researchers working on Verrucariales. The second day began with an overview of the lichenicolous Verrucariales given by D. Triebel and M. Matzer. M. Grube gave some notes on the genus *Leucocarpia* and allies. The following demonstration showed that, when staining *Leucocarpia* with carbofluorwhite and then examining it with epifluorescence, a ring-structure in the ascus tip appears. During the workshop this ring-structure was also found in some other genera of the Verrucariales. The afternoon was spent in the field in the beautiful Alps and we ended the day by wineproofing Austrian wines. The following morning started with H. Harada introducing us to the maritime species of *Verrucaria* in Japan. Next S. Heidmarsson talked about *Dermatocarpon* in the Nordic countries. Finally L. Fröberg talked about ecological affinities in calcicolous Verrucariaceae in the Baltic island of Öland, Sweden. In the concluding meeting it was obvious that a 2nd workshop has to follow. Hopefully we will meet in Uppsala in a few years. When thinking back to the workshop there are many things that cross my mind. Of course the seminars were useful by introducing different views, different problems, and many possible solutions. But afterwards I feel that most useful were the informal discussions, the common practical work and the personal contacts. Finally I would like to thank the organizing committee for a really fantastic job in mixing everything together in a good way: seminars, practical work, field work and discussions with visits to nearby restaurants for lunch or dinner and informal discussions.

S. Heidmarsson, Reikjavik

The XII Symposium of Cryptogamic Botany, Valencia

Over 40 lichenologists, mainly from Spain but also from Portugal and Italy participated in the XII Symposium of Cryptogamic Botany held in Valencia, 17-20 September 1997. Papers on lichens were presented in two sections: Taxonomy-Biogeography-Ecophysiology and Bioindication. In the section conducted by A. Crespo, contributions related with the forthcoming Iberian Lichen Flora were presented. Some of them included new genetic data and lichen substances analysis. In the section conducted by L. Sancho, we appreciated very much the active participation and the very interesting papers presented by our Italian and Portuguese colleagues, sharing with them our own results in lichen biomonitoring and photosynthetic performance of lichens from different habitats. A workshop on "Structure of the lichen thallus" was organized and conducted by F. Valladares. Eight speakers (C. Ascaso, S. Fos, I. Martinez, L. Balaguer, J. M. Egea, A. Terron, A. Gomez-Bolea, and X. Llimona) presented examples of their recent research, opening topics and raising problems for the general discussion. This was a one-hour-long debate involving the whole audience, dealing with our current understanding of the variability of lichen morphology and anatomy, and pointing to areas for future research. A critical analysis of the techniques available versus those currently used by lichenologists was presented, emphasizing the strong influence of the equipment on the results. Topics focused on ecophysiology were: i) the influence of growth form, anatomy and ultrastructure on lichen water relations, ii) interactions with the substrate both in saxicolous and in epiphytic species, and iii) implications of the allometric relation surface area vs. dry weight for gas exchange of the thallus. Speakers with a more taxonomical approach presented examples of remarkable variability in thallus features of diagnostic value, such as colour, growth form (endo- vs. epilithic), presence of soralia, pruina or epinecral layers. For example, the separation of genera within Teloschistales according to growth form (i.e. crustose *Caloplaca*, foliose *Xanthoria*, fruticose *Teloschistes*) was questioned, due to the anatomy of intermediate taxa. Structural variability is an interesting challenge in ecology, but a complex problem in taxonomy. Besides, it was concluded that the promising information of molecular biology regarding phylogeny and taxonomy of lichens has to be used with care, because it seems unclear whether it reflects the evolution of certain molecules or the evolution of lichen taxa. The debate addressed briefly the controversial concept of species in lichens. Most participants agreed that the species concept must be a useful-practical one, and that the name of a lichen must be a tool for biologists for referring to a recognizable organism. Despite the many theoretical objections, the morphological recognition of a species is crucial for both field ecologists and laboratory biologists, and it is the only feasible way to tackle many issues concerning lichen biodiversity. Finally, two more suggestions were discussed: a) the need for unifying definitions, terms and units in lichen biology, since many features such as those referring to water relations are expressed in different ways using different units by different authors, which makes comparisons and general reviews an almost impossible task; b) the need for improving our understanding of the variability of lichen structure by comparing not only different thalli but also different populations, and by looking not only at individuals of average size (and age) but also at those encompassing the natural range of sizes (and ages) of a given population, since size allometrically affects many structural features. As usual, during the Symposium the meeting of the Sociedad Española de Liqueología (SEL) was held, chaired by the President, X. Llimona. The assembly decided to provide some student grants for the next SEL excursion, which will be held in Sanabria (Northwestern Spain) in September 1998.

led by Dr. López de Silanes and Dr. Terrón. On Friday, D. Hawksworth delivered an excellent lecture about "Questions of individuality in lichen thalli", and P. L. Nimis moderated the following discussion in such a way that this could have been by itself an endless enthusiastic meeting if we did not have to hand over the floor to the general assembly. Lichenologists also had the opportunity to follow highly interesting lectures on other cryptogams. Especially fascinating was the inaugural lecture presented by L. Margulis about "Photosynthetic life. Symbiogenesis and the origins of the algae". None of us will ever forget the exciting video about sex with or without reproduction in protocists, with accompaniment of suitable music and surrounded by a really "hot" atmosphere. Eva Barreno, president of the Symposium, is to be thanked for the splendid arrangements, including an excursion, two concerts and a Hollywood-like reception at the Botanic Garden. The organizers of the next meeting in Madrid (September 1999) will have to work hard to maintain the level reached in Valencia. We promise we are going to try it!

F. Valladares and L. Sancho, Madrid

Herbert Schindler 90!

Participants of the IAL field meeting "Recollecting Vainio" will have encountered in the secondary bushes around the famous Carassa monastery the conspicuous, large, orbicular patches of a lobulate *Parmelinopsis* species. Celio Ribeiro, one of the organizers and expert of Parmeliaceae, informed me that this was *Parmelinopsis schindleri*. Its name is a testimony of the activity of a remarkable lichenologist, Dr. Herbert Schindler from Karlsruhe in Germany, who celebrated his 90th birthday this spring. His interest in lichens was raised in his young years, but in those days opportunities for a career in lichenology were limited. Consequently, Herbert started a productive professional career in pharmacy. Lichens remained his hobby, and especially after his retirement he visited many places all over the world to explore their lichen floras. The efforts to make his collections available to specialists resulted a.o. in the description of *Parmelinopsis schindleri*. More details about his life, a photograph and his list of lichenological publications can be found in an article by B. Feige in *Aktuelle Lichenologische Mitteilungen* 14: 1-4. Congratulations!

H. Sipman, Berlin

FORUM

Topic 1: MOLECULAR SYSTEMATICS OF LICHENS

Introduction: Molecular systematics in lichenology - quo vadis ?

The introduction of molecular methods in lichenology was accompanied by hopes that sequence data would be the answer to problems of traditional lichen classification. After nearly a decade there is a wide range of such molecular approaches. An on-going debate is focused on the origins of lichenization within the Eumycota. Is this derived from a single gain of lichen-habit, which was lost numerous times in more advanced groups of fungi, or from multiple lichenisations ? Results from different working groups are contradictory, which suggests that more data are required. Nucleic acid sequence data are also used in studies at lower taxonomic levels. Current discussions on generic concepts will be stimulated by molecular data, and this also applies to "species pairs" and the relationships of taxa with uncertain systematic position. The advent of PCR

facilitated molecular work with lichens, and sequencing will become a standard technique in lichenology in the near future as 'wet' laboratory techniques are now fairly optimized for work with lichens. DNA-isolation is possible from a very little amount of material and the availability of non-algal primers allows amplification of fungal target DNA. It is not a problem to work with herbarium specimens of certain groups. However, species exist where sequence data are obtained only with difficulty, and prior to DNA-isolation, careful examination of the samples is essential to avoid undesired amplification of contaminating fungal material. The first gene studied with a broader range of lichenized fungi was the nSSU rDNA, which codes for the smaller nuclear subunit ribosomal RNA, an indispensable part of the protein synthesis apparatus. SSU rDNA has been studied extensively by molecular biologists who have accumulated a huge amount of information about the function of this molecule. Particularly in lichen mycobionts, numerous insertions (many of them are group I introns) have been found, and knowledge is growing about the position and nature of the insertions which are excluded from phylogenetic analyses of the data. Ribosomal RNA is a structural molecule with a complex pattern of secondary and tertiary intramolecular interactions, including helical regions and pseudoknots. The constraints on a particular higher order structure may result in frequent complementary changes of paired nucleotides. Although such characters are not independent, informative characters for phylogenetic analyses are found by comparing an alignment of one-dimensional sequence data. SSU and LSU rDNA are mainly used to study relationships at higher taxonomic levels as these genes are quite conserved in general and only contain short regions of high sequence variability. Within the ribosomal gene cluster there are also sequence regions with a low degree of conservation. The ITS (Internal Transcribed Spacer) regions between SSU and LSU rDNA are a good example. In mycology, the ITS genes have been used in studies at low taxonomic level, for example investigations of species relationships. However, they may also be of interest at higher taxonomic levels. For higher plants it has been shown that the ITS2 region can be used to resolve the relationships of angiosperms (Hershkovitz & Zimmer, *NAR* 24, 1996). Sufficient sampling of taxa is necessary in such approaches and even then, alignments of such highly variable sequences may be problematic. A future alternative to ribosomal genes will be protein genes. Since these follow a 3-bases reading frame, less ambiguity in the alignments is expected even if distantly related taxa are compared. There is no consensus about the most appropriate method for sequence data analysis. Phylogenetic analysis is usually carried out using parsimony. However, Gargas (*Am. J. Bot.* 84, Suppl., 1997) showed that maximum likelihood was a more robust analysis than parsimony and slightly different topologies result from analyses of the same data set with either parsimony or maximum likelihood. Maximum likelihood is a computer-intensive technique and handling larger amounts of data will be problematic without use of high-performance hardware. A different approach to classification by using signature sequences within the rDNA data was proposed by Eriksson (*Can. J. Bot.* 73, Suppl. 1, 1995) to circumscribe larger taxonomic units. Signature sequences are short pieces of sequence characteristic of a taxonomic group. This approach is probably the most traditional in molecular systematics, because it principally adds molecular traits to traditional classification without phylogenetic analysis. Most molecular investigations are carried out with single genes of the rDNA cluster, therefore phylogenetic trees only represent the phylogeny of genes. This is done by assuming a constant mutation rate in the genes and interpreting sequence variation as a kind of chronicle of evolution. Today, the only way to discuss both the validity of these assumptions and the results of molecular studies is to compare them with traditional concepts. It is frequently observed in phylogenetic studies of rDNA that certain taxa do not have a stable or well supported position in a tree. This is often due to a

comparatively high sequence divergence in those taxa and may indicate insufficient sampling of taxa or molecular characters. Two strategies may help in this situation: gathering more taxa and more sequence information per taxon. More sequence information will include combined analyses of sequence data from more than one gene. Lutzoni et al. (*Am. J. Bot.* 84, 1997) showed under what conditions different molecular data sets may be used in combined analyses. Issues of taxon sampling have been clearly pointed out by DePriest et al. (*Am. J. Bot.* 84, 1997), who suggest that a group in an analysis should be represented by at least 4 taxa. Phylogenetic trees are strongly dependent on the set of taxa which is included in an analysis - both as ingroup or outgroup assemblage. Also important in the interpretation are the gaps between the clades, i.e. the taxa which have been excluded for certain reasons but which may have considerable influence on the tree topology. Furthermore, one may question whether sampling of taxa should be more detailed in presumably older groups with longer evolutionary history. Finally, if we feel certain of a phylogenetic hypothesis, how can this be transformed into a classification? It has been suggested that classification systems without ranks can be applied in fungal systematics. My feeling is that this will cause practical problems, at least with the current state of knowledge. Given the fact that innumerable Ascomycetes are still to be described or revised in very traditional but urgently needed monographs, it is premature to adopt a rank-free classification. Despite these considerations, the next years will probably be the most interesting for molecular lichenology as the field emerges from infancy and we learn from our experiences. Real progress will be achieved by the symbiosis of traditional and molecular approaches.

Martin Grube, Graz

Lichenology will be improved by molecular systematics!

Change is difficult, but none the less beneficial. As the twentieth century ends, there is a sense that lichenology as a field hesitates to move forward. It is all too easy to erect barriers and blockades to progress, perhaps an uneasy consequence of our collective obsessions. We agonize over field-specific issues such as the recognition of chemotypes as species, and the segregation of genera until they contain 20 or fewer species. Should we recognize species pairs? Can ascus tips provide the key to familial classification? Hypotheses have been advanced, data have been gathered, but definitive conclusions remain elusive. Instead of focusing on recognizing species, genera and families, we ask again and again what arbitrary rules allow us to find them? Have we forgotten that lichen species OUTNUMBER sexual species of Ascomycetes? Concerning fungal classification, lichenologists can seize the upper hand. Will they? Many of the character systems developed for lichen-forming fungi have no equivalents in other fungal groups, making lichenology a quaint and eccentric relative to 'normal' mycology - an amusing uncle no one takes seriously. This eccentricity, though not without its charms, constrains lichenology as the poor relation of mycology, and even most of the traditional botanical disciplines, in funding and staffing but especially in status and standing. With molecular tools lichenology has the potential not just to catch up, but to be at the forefront of research among these and other disciplines. It is time to cast off the 'poverty-mentality' of our past - DNA is a great equalizer of large and small organisms, of the culturable and the obligately symbiotic. This new era may be said to have begun five years ago at the IAL2 in Lund, when a half-day symposium marked the beginnings of the molecular subdiscipline in lichenology. Today, molecular research is no longer a privilege but is an expectation for young scientists, even in lichenology. Talks on molecular results could go on for days (or at least seemingly so to those who are a bit wearied by the specialized terminology). With refined molecular tools lichens have proven their broad potential to

answer questions central to the whole of biology. Lichenology has already made a direct attack on fundamental questions, not least those with evolutionary and phylogenetic components. With this lichenology has led the systematics community in modernity and sophistication. Now is the time to state clearly: what important results are gained through molecular lichenology? How has lichenology realized the promise of molecular techniques? It is time to stop calibrating molecular techniques against traditional classification and systematics and use our results to present new and exciting hypotheses. Or will we show ourselves as a rebellious new generation using current fungal classifications as our strawmen and traditional taxonomists as our whipping boys? Molecular systematics research done by lichenologists, and including lichen species, has already shown that the lichen habit evolved multiple times and in diverse groups of true fungi. Phylogenies based on molecular data, including lichen-forming species of fungi, have resolved relationships of the Ascomycetes, and shown that the old classes Discomycetes, Plectomycetes and Pyrenomycetes are not monophyletic, and should be abandoned. Furthermore, molecular data have clearly demonstrated that lichen species are highly variable. Some may find these results trivial (see Jørgensen, *Intern. Lichenol. Newsl.* 28, 1995), yet they have stimulated interest among mycologists, botanists, and biologists in general. Results based on molecular data have gained attention for lichens and lichenology in the international science world and the popular media. One arresting new observation, in the discovery of which we were privileged to take part, is that lichens (at least those in the order Lecanorales) have a remarkable incidence of group I introns in their ribosomal genes. This finding has aroused interest from evolutionary biologists, medical researchers and even those in theoretical biochemistry. What do these group I introns mean, and how can lichenologists run ahead with this new research area? Our advances in lichen-based research have not gone unnoticed by the people with the authority to enable further lichenological research through awarding jobs and funding. Most importantly these new techniques have allowed us to showcase lichenology and lichen-forming fungi as lucrative research areas. Perhaps a decade ago a professor in mycology would have been reluctant to take on a student interested in lichen research. Today mainstream "mycologists" actively encourage projects on lichens. There is a particular satisfaction to being at the frontier of a field - teetering near the edge. Although as a reasonable biologist, one will have moments of doubt. All leaders are vulnerable to attack. Do molecular advances have to be paid for with competition and conflict? We are sadly afraid so. Lichenology is a very small pie in the overall scheme of things, and lichenologists presume that there is not enough fame and fortune to go around. Instead of fighting over who gets the bigger piece of the pie, it would be more profitable to seize a bigger pie, so to speak, by expanding lichenology and lichenological topics. Unfortunately it is easier and more scientifically defensible to deconstruct vigorously competing hypotheses than to welcome serendipity and truly novel discoveries. There is admittedly some conflict among current phylogenetic results, and questions remain unanswered. Which results most closely approximate reality? In this we know that only hindsight will provide us with clear vision, and before we know what is 'true' we are obliged to forge ahead. Among other phylogenetic results there is common agreement, and this should be emphasized for the short-term. We agree that Ascomycetes are a monophyletic group, we agree that the Pezizales are basal among the filamentous Ascomycetes (excluding the enigmatic genus *Neolecta*). For that which remains in question, seemingly wasteful gathering of the same sequences and repetition of the same analyses for independent confirmation is a necessity of scientific progress. Only through such painful and uncertain exercises can we ever hope to reach true consensus. Molecular lichenologists are now poised to publish their results as DNA sequences and phylogenetic trees even if these hypotheses are preliminary. Proposed

classification schemes will serve as strawmen for the next generation of research. These molecular classifications should be rigorously tested against new molecular data and phylogenetic analyses and, what is most important, against anatomical or morphological character systems. At the IAL3 in 1996, our research group first presented a molecular phylogeny based on small subunit ribosomal DNA (SSU rDNA) for the suborders of Lecanorales in poster form. In two manuscripts, one currently submitted and one in preparation, we will propose that the Lecanorales includes the suborders Agyriineae, Cladoniineae, Lecanorineae, Peltigerineae, Teloschistineae, and the family Sphaerophoraceae, but excludes the suborders Umbilicariaceae, Pertusariaceae, possibly Acarosporineae, and the asexual taxa *Siphula* and *Thamnolia*. Will this phylogeny be wrong? Absolutely! Will the ribosomal DNA, and any other gene we could use, have its own evolutionary noise? Certainly! But these phylogenies will serve well as a strawman to stimulate future work, just as the multiple origins of the lichen habit already have! It seems that as a field the molecular phylogenetics of lichen-forming fungi has entered its difficult teen years. Gone are the blushful days of naïveté; we know that molecular data will not solve all problems instantly. A few tearful tantrums are to be expected during the maturation of molecular lichenology. Molecular systematics appears deceptively simple, but data analysis and interpretation remain fraught with complications. Data accumulate faster than they can be processed, and some may have to be reserved to await new methodological and technological tools. We are in the enumeration phase. As with any innovation in systematics, cytology, chemotaxonomy or phytogeography, an initial phase of promise in these subdisciplines was necessarily followed by an era of data cataloging and management before true progress could be registered - much as Chacita Culberson's "Chemical and Botanical Guide to Lichen Products" (University of North Carolina Press, Chapel Hill, 1969) was critical in developing lichen chemotaxonomy. Each sequence submission to repositories such as Genbank and each published phylogenetic hypothesis adds to our comprehensive reference library. In truth, lichenology and lichenologists cannot turn back from the molecular revolution - that would signal oblivion for our field. We are obligated as scientists to move forward with alacrity and vision tempered with a realization of our limitations. This, in combination with a sense of wonder, a feeling for our organisms, and a healthy dose of humor will stand us in good stead to meet the challenges of the future.

Paula DePriest, Washington, and Andrea Gargas, Copenhagen

Reactions

Both contributions were very stimulating and instructive, even for a layman in this field as I am. I did not, however, like very much the spirit of the introduction to De Priest's contribution: is it really necessary for "molecular" people to show the world that their data are THE data, and that everything else is conservative, outdated and not worthy of serious consideration by "progressive" scientists? We have heard this so many times in the past, whenever a new technique has appeared on the market! In Biology the study of relationships is essential, and taxonomy, in particular, has always been and always will be the converging point for data coming from widely different disciplines. Some of the "field-specific" issues mentioned by De Priest are, on the contrary, fundamental questions for Biology as a whole. The sentence "...instead of focusing on recognizing species, genera and families, we ask again and again what arbitrary rules allow us to find them" is something I cannot understand: how can we "find" taxa if we do not agree on their operational definitions? Molecular data are certainly important for solving biological problems, but the idea that they should be granted a kind of special status is, in my opinion, far from being a "progressive" one. On the contrary, it is a narrow-sighted

attitude which in Biology has already produced true disasters by bringing fundamental disciplines to the verge of extinction in some countries. Maybe this attitude reflects the pathologically harsh concurrence for funding which characterizes the American system: *mors tua, vita mea*. I do not think that this kind of Social Darwinism is healthy for a sound development of such a complex discipline like Biology. We should work together, trying to understand each others' problems, and to relate each others' results: finding a relationship between molecular data and other data coming from classical ecology, morphology, physiology is the best possible investment we can imagine for our results: in this way our data gain an enormous "added value". To do this, we will always need ecologists, morphologists, physiologists etc. Life is much more complex than the structure of nucleic acids!

Louis Le Bois, Venice

All characters which are of interest for taxonomists, from morphology to ecophysiology, ultimately derive from the structure of nucleic acids. Contrary to Le Bois, I can well conceive a taxonomic system based exclusively on molecular data. When will this happen? This is another story...

Pier Luigi Nimis, Trieste

There are about 13500 species of lichens described using morphology according to the "Dictionary of Fungi", and they serve as the ultimate basis for any molecular approach. The turnover of names suggests that there is still a lot of traditional work needed to improve molecular work. A funding policy which gives a lower priority to non-molecular lichen systematics is highly questionable. It might end up in molecular phylogenies of the genus *Lichen*! Most molecular studies are presented at congresses as being in preparation or in press. During the last 3 years everybody realized that hypotheses from different working groups who are studying the origins of lichenization are highly divergent. If sequence data are THE data, what is the reason for this incongruity? On what results can we rely? Shall we not trust anything at all or will we have to accept "multiple origins of taxonomies" as suggested by US Science? It might be interesting to merge the data sets of all the competing phylogenies. In molecular systematics all hypotheses are developed using a DNA-sequence alignment of a selected set of species (selected by what criteria?). Based on this alignment, phylogenetic trees are produced by applying a defined model of evolution. If we agree on the reproducibility of an alignment, will we still get highly divergent hypotheses, even when the sets of sequenced organisms overlap? Do we have to ask whether the evolutionary model is sufficiently well adapted for analyses of ribosomal genes? How to test this? If questionable results are produced, it will also be important to review the material used for sequencing. Storage of used material in herbaria, and an indication from where mycelium has been taken from the specimen must ensure this. Many lichenicolous fungi in certain lichen groups may lead to odd sequences. Indeed, "progressive" scientists may improve "traditional" knowledge of lichenicolous fungi by molecular approaches to the host lichens.

Martin Grube, Graz

First of all, I thank all contributors for this timely debate. I feel quite optimistic about the future of molecular biology in connection with lichen biology and phylogeny. This is not just a technique to confirm phylogenetic trees based on morphological or other kinds of characters. It is a novel approach which, surely, has to incorporate other information but will, in the long run, provide an unifying view of previous understanding. Two

subjects, at least, deserve being emphasized: lichen individuals and lichen populations. The study of lichen individuals is a complex subject that will certainly benefit from an understanding of the molecular biology of the single thallus. Furthermore, the molecular study of lichen populations is not an easy subject, and a trial and error approach will be mandatory to find reliable markers of populations. In my view, there are excellent prospects of incorporating the methods of molecular biology into the current effort of using lichens as bioindicators of atmospheric pollution, particularly in the study of the re-colonisation taking place in some parts of Europe following the improvement of air quality. Some exciting problems, such as the relationship between genotype and ecophysiological characteristics of populations, or that between biogeographic and genetic variability, can greatly benefit from the incorporation of molecular data. The most important contemporary paradigm cannot be but utterly rewarding for the development of our peculiar kind of mycology.

Ana Crespo, Madrid

The PCR or ADN-ADN hybridization techniques result in genetic distance. Are such data useful for reconstructing phylogenies?

Hector Aguilar, Merida, Venezuela

Like many cladists, I would respond that DNA-DNA hybridization, isozyme, RAPD, and other such data are often inappropriate for phylogenetic reconstruction because all of these are, basically, measurements of molecular similarity. Inferring a cladogram from such data is akin to inferring a cladogram from spore size. Systematists interested in the natural relationships of organisms must look for homology, not similarity, and must interpret such homologies parsimoniously. Is genetic distance data, then, obsolete? No. In my opinion, genetic distance remains an important part of modern systematics because it can be used for initial circumscription of species. Species circumscription, the purview of so-called "alpha" taxonomists and monographers, is an important precursor to phylogenetic analysis. Some workers (Davis & Nixon *Syst. Biol.* 41, 1992) view it as an essential first step, arguing that species must be defined before analysis because taxa below the species rank cannot be used as OTUs (operational taxonomic units). While a few studies (Davis & Manos *Syst. Bot.* 16, 1991; Freudenstein & Doyle *Syst. Bot.* 19, 1994) have applied molecular data in defining species boundaries, most do not. This is because most molecular systematists are not alpha-taxonomists. The applicability of molecular methods to species circumscription is promising, however, especially given the low cost of many of these methods compared to direct DNA sequencing, a technique which should be reserved for phylogenetic analysis itself. Some might argue, justly so, that basing OTU/species circumscriptions solely on molecular similarities could be seriously misleading. For example, using rDNA restriction sites to define OTUs within groups of closely related lichens could yield non-monophyletic groups because of possible Group I intron deletion. In all cases, I would strongly advocate using all available data - morphological, chemical, and molecular - when defining species for use in a phylogenetic analysis. It is best to include all available data to delimit our OTUs, and trust that non-monophyly of these OTUs will ultimately be revealed in future phylogenetic analyses of their relationships. Finally: how much genetic distance is required to warrant species status? At the recent (1997) ABLS meeting, one speaker suggested using a pre-determined distance for delimiting lichen genera. Other attendees spoke out against this, and I agree with them: I believe that ranking criteria must be different in every group of lichens, because genera (and species) are most certainly different in every group of lichens. Within any particular group (e.g., the Ramalinaceae, which I have worked with on the molecular level), however, I believe it is possible to

define a minimum genetic distance between recognized species given adequate sampling. For example: a lichenologist may be interested in determining whether two lichen photomorphs (two lichens which are morphologically indistinguishable yet possess different algae) are "good" species. A genetic distance analysis, including multiple samples from within both photomorphs as well as other, related, morphologically distinct taxa, is performed. Suppose the average distance between the photomorphs equalled (or exceeded) the minimum distance measured between two morphologically distinct species in the sample. Wouldn't these numbers, then, be useful as a ranking criterion within this group? Again, inclusion of characters from other data sets (in this case, photobiont type) in ranking these taxa would be preferable to using genetic distance alone. These characters, like the genetic distance measurements, will of course depend on the particular lichens being studied. As with most biological phenomena, speciation must always be considered on a case-by-case basis. Whether or not species circumscription or relationships (or both) are part of your molecular study, within-species variation in lichens should be addressed in some fashion. Many methods which have fallen into disfavor as tools for reconstructing phylogenies - e.g., restriction site and RAPD data - are still useful in assessing this variation because most are quicker and less costly than direct DNA sequencing. Alpha-taxonomists and/or workers without automatic DNA sequencing equipment still have much to contribute to lichen molecular systematics.

Scott LaGreca, Harrisonburg, Virginia

Topic 2: CITATION OF SPECIMENS AND OF WEB PAGES

There is a major problem that has been developing in monographic studies. The editors of journals will not let us cite many specimens seen. To me, the list of cited specimens is over half of the value of a monograph! I can look at the cited specimens and check the herbarium for duplicates, so I know what the monographer means. Now, I can put data bases or list of all specimens seen on the Web, but how does anyone ever cite a Web page? Is it a valid citation? If I look at someone's Web page and see that they have recorded these X species from X park, can I cite the page or do I just have to ignore that valuable information? The citations can be made available on the Web but why do it if none can use it and cite it? Any suggestions?

Cliff Wetmore, St. Paul

While I sympathise with the sentiments, I can also see the problems faced by the journal editors. I have seen many humungous lists of specimens cited. I wonder how much attention is paid by how many to these long lists anyway. If one can isolate a state or particular region in order to check what/where a species is found, or dupe in the herbarium to check as a voucher, I can see that there is some merit in the list of species. I suspect, however, that most people refer to a key to taxa and descriptions and illustrations of the taxon, rather than the specimen list - unless it happens to constitute a new record or new report in the case of rare taxa. From the journal editor's point of view, space is money. Also, with the costs of publication, a really long or useful monograph published in, e.g. *Bibliotheca Lichenologica* tends to become rather expensive for the individual or the Institution library. As a matter of interest, for the Flora of Australia, we can cite a maximum of 7 or 8 specimens for any widespread taxon and only 2-3 for one of restricted distribution. This paltry sample is supplemented by dot maps which are even less useful, in my opinion, because the size of the dots on the printed map equates to close on 100km! 2 dots covers nearly the length of Tasmania, 4 the whole Island.

Perhaps dot maps - at a scale where the dots mean something - and an abbreviated list of representative specimens rather than an all encompassing list, may be the way to go.

Rod Seppelt, Kingston, Tasmania

The problem of how to store specimen citations outside journals and that of conserving different versions of server-based data (for further details see Grube & Nimis *Taxon* 46, 3, 1997) can be solved by the same procedure. CD-ROMs and outprints could be deposited in a few selected libraries under defined conditions. At least one library should take part in North America, Europe and Japan. Only the librarian and not the public should have access to the CD-ROMs whereas the outprints can be filed in open access shelves. In case of controversies the CD-ROMs could be sent personally by the librarian to a committee. In this way the rights of the authors could be protected. The Herbarium Hamburgense could offer this service, as there is a room for precious books, accessible only by the librarian and large enough to store any amount of CD-ROMS. Copies of specimen citation outprints could be sent to interested scientists, at least if the number is limited.

Tassilo Feuerer, Hamburg

Topic 3: *PLACYNTHIELLA* OR *SACCOMORPHA*? THIS IS THE PROBLEM...

What is the right name for "*Lecidea uliginosa* group" - *Placynthiella* Elenkin, *Placynthiella* Gyelnik or *Saccomorpha* Elenkin?

Ave Suija, Tartu

The *Saccomorpha-Placynthiella* story is perhaps worthy of a brief discussion among us. Nimis & Poelt (1987, Lichens from Sardinia: 218-219) translated the original "description" of *Placynthiella* from Russian (Elenkin 1909). Most of the text is a description of sand dunes. Some "*black crusts*" are mentioned, attributed to "*Placynthiella arenicola* Elenkin *nov.sp. et nov. gen.*", with a note saying that this lichen will be treated in a forthcoming article. A few years later, Elenkin (1912) formally described this lichen under the name "*Saccomorpha*", with a very detailed description, and adding that it was already "*mentioned*" by him under the name *Placynthiella* in his earlier paper - thus showing that he did not consider *Placynthiella* as a validly described taxon. According to Nimis & Poelt (1987) *Placynthiella* is a *nomen nudum*. Presently, we have the unfortunate situation where north European authors still use *Placynthiella*, while south European authors use *Saccomorpha*. In one way or another we should agree on a name, whatever that will be. The use of *Placynthiella* implies the recognition of the sentence "*black crusts*" as a valid description; I am not an expert nomenclaturist, and it could be that this is OK (here advice is needed by the few colleagues who are real experts in nomenclatural codicils). However, my very personal feeling, based on common sense, is that if the "description" of 1909 is a valid one - and this against the real intention of the author - then I am the Emperor Josef II of Austria!

Pier Luigi Nimis, Trieste

We agree with Nimis & Poelt (1987) that *Saccomorpha* Elenkin is the correct genus name, given that the earlier name *Placynthiella* Elenkin was a *nomen nudum* (inadequate description). Coppins, James & Hawksworth (1987) considered *Placynthiella* Gyelnik a synonym of *Placynthiella* Elenkin. Unfortunately they are incorrect in accepting *Placynthiella* Elenkin (1909) as validly published, and the name *Saccomorpha* (1912) takes priority. The only remaining question is the identity of

Elenkin's type species *S. arenicola* - Hafellner (1984) considered *S. arenicola* a synonym of *S. uliginosa* (Schr.) Hafellner, but more recent examination of the type by Coppins, James & Hawksworth equates *P. arenicola* Elenkin with *P. hyporrhoda* (Th. Fr.) Coppins & P. James. - *Saccomorpha* Elenkin, Ber. Biol. Süßwasserstat. Kaiserl. Naturf. Ges. St.-Petersburg 3: 194, 1912 (Reprint at US!). Syn. *Placynthiella* Elenkin, Bull. du Jardin Imper. Bot. St.-Petersburg 9 (1): 18, 21. 1909, nom. nud., *Placynthiella* Gyelnik, Annls. Hist.-nat. Mus. Natn. Hung. 32: 187. 1939. Type species, *S. arenicola* Elenkin. [= *S. hyporrhoda* (Th. Fr.) Clauz. et Roux, fide Coppins, James & Hawksworth (1987)].

Paula DePriest and H. Robinson, Washington, DC

So the thorny business of *Placynthiella* vs. *Saccomorpha* raises its head again! A bit of history on the subject: I looked into this problem some ten years ago or so. I too was doubtful about whether or not Elenkin's 1909 *Placynthiella* was sufficiently described. In his 1909 paper he clearly states "*nov. sp. et nov. gen.*" Unless I have missed something in the Russian text, there is nothing to indicate that he did not accept the name of the new genus and species in the 'original place of publication'. Therefore the name is OK as far as Art. 34.1(a) is concerned - the fact that Elenkin later (1912) changed his mind has no bearing on the nomenclatural validity of the name, no matter what excuses he may have made. The next question is to whether or not *P. arenicola* was provided with a description. It must be remembered that there are many accepted plant and fungal names that originally had only very meagre descriptions or diagnoses, sometimes in a prosaic form. In the mid-1980s I sought advice on this from some eminent colleagues (e.g. T. Ahti, P. M. Jørgensen and R. Santesson). They all agreed that although the 'description' provided was meagre, it was sufficient to validate the name. My Russian is not very good, but Elenkin did say things like "*forming black patches on sand*" and "*becoming cone-like*". Hence I adopted *Placynthiella* Elenkin as the name for the '*Lecidea*' *uliginosa* group.

Brian Coppins, Edinburgh

A really nice problem for lawyers - so I tried to adopt a lawyer's mentality (but just for one hour) to see if we can get out of the dilemma. Art. 34.1 states that "*A name is not validly published: (a) when it is not accepted by the author in the original publication, (b) when it is merely proposed in anticipation of the future acceptance of the group concerned, or of a particular circumscription, position or rank of the group (so-called provisional name)...(c) where it is merely cited as a synonym*", etc. (older versions of the Code had a different formulation of Art. 34c: "*when it is mentioned incidentally*"). Is this our case? After the "description" (see later) Elenkin (1909) adds: "*detailed biological and morphological observations on Placynthiella arenicola will be presented in a special forthcoming paper*" (which is that of 1912 where this lichen is described as *Saccomorpha*). Does this mean that he: (a) "*merely proposes the name in anticipation of the future acceptance of the group concerned etc.*", or that, (b) the name is mentioned "*incidentally*"? (a) must be excluded, as he clearly accepts *Placynthiella* as a genus by stating "*nov. sp. et nov. gen.*", (b) the definition of "*incidental mention*" was given in Art. 34.3 (older versions of the Code): it meant that the "*author does not intend to introduce the new name or combination*", which is not our case, because the new name is there, and is even used twice in the text. Conclusion: the genus *Placynthiella* Elenkin is formally valid, provided that it was accompanied by a description (Art. 41.3 and 42.1). Is there a "description" in Elenkin 1909? There are only three "descriptive" sentences there: 1) "*it forms black patches on sand*", 2) "*These patches...become conical or hemispherical*", 3) "*The algae belong to the Stigonema-type*". Elenkin would have never considered this as a decent diagnosis, and he himself states that this would have

followed shortly, as indeed it did a few years later. There would be good arguments for a lawyer denying the validity of the "description" of 1909. However, a good point against them would be, as Brian says, that many other currently accepted taxa were described on the basis of even poorer descriptions: I consulted several old papers, and I realized that such cases are not so rare. Thus, if we do not accept *Placynthiella* Elenkin (1909) we would be forced to change several other names for the same reason. My conclusion is that, although this is a typical case of "*lex, dura lex*", disregarding the true intentions of the author, it is better to close our nostrils and to consider the "description" of Elenkin 1909 as a valid one. After this juristical tour de force, which spared you several other interesting codicils, and which demonstrates that I would have never been a good lawyer, I myself admit that we should accept *Placynthiella* Elenkin (1909) as a validly described genus. A small consolation: would you ever name a newborn daughter "*Saccomorpha*" ? *Placynthiella*, on the contrary, sounds much nicer...

Josef II of Austria (formerly P.L. Nimis)

One-word descriptions are common in some travel accounts, for instance, and the pragmatic decision that all such descriptions must be accepted has been made among nomenclaturists only because otherwise no limit can be drawn between valid and invalid publication. I re-examined the description of *Placynthiella* (knowing Russian) and again came to the conclusion that it must be accepted. The word "black" alone is sufficient for validating the description (even if the lichen would be white!!), which, of course, sounds ridiculous.

Teuvo Ahti, Helsinki

LICHENOLOGY-ON-LINE

New Websites

The Newsletter on-line - Starting with 1997, the old issue of the Newsletter is available on-line in two versions (frames and text only) at the following addresses: EUROPE: <http://www.sbg.ac.at/pfl/ial/Newsletter/home.htm> (text), and: <http://www.sbg.ac.at/pfl/ial/Newsletter/frames/home.htm> (frames). USA: <http://www.botany.hawaii.edu/cpsu/Newsletter/home.htm> (text), and: <http://www.botany.hawaii.edu/cpsu/Newsletter/frames/home.htm> (frames).

US Forest Service - A website regarding the use of lichens as air quality indicators in Oregon and Washington. Includes a literature review, species lists for national forests in the PNW, monitoring methods used by the Service, sensitivity info. <http://www.fs.fed.us/r6/aql/lichen>

Società Lichenologica Italiana - The new website of the S.L.I. provides information on the Society and on social events in 1998, a complete list of Italian lichenological literature in the last decade, and an index to the current and past numbers of the *Notiziario*. It also announces a prize, sponsored by the Society, for a thesis of lichenological content. Currently the page is in Italian only, but an English version will be available soon. Web site: <http://www.lrcser.it/~sli>

British Lichen Society - The page has been updated on 30 September 1997. It now includes, in addition to the Society's prospectus and an application form, the Society's rules, general information, names and addresses of officers and chairpersons of committees, a listing of taxonomic referees and how to contact them, details of meetings and publications as well as an evaluation version of the new U.K.

Parmelia Ach. CD-ROM which has already been well received. This CD-ROM includes; a) access through current names or synonyms, each with B.L.S. identification numbers, b) 117 high quality colour photographs in a readily accessible and inexpensive form, c) up to 4 photographs of every species highlighting the distinctive features, d) descriptions of each photograph, e) results of Pd, K, KC and C chemical spot tests and UV response, f) table of major chemical constituents indicated by TLC, g) cross-references to similar species, h) a table of habitats showing likelihood of occurrence on different substrates, i) descriptions of each of the revised genera, k) an improved key based on the Flora key, l) an extensive glossary of lichen terms, m) the original distribution maps and text of the Atlas, n) over 4,000 links to provide easy navigation through the document. The CD includes three fairly large images which may take a while to download after clicking on the 'thumbnails'. The cost is modest, £8.00 (including postage and packing) for a single user. Full details are available on the site: <http://www.argonet.co.uk/users/jmgray>

Index Herbariorum - Updated information for U.S. herbaria listed in Index Herbariorum and its supplements (published in *Taxon*) is now available for searching by institution, city, state, acronym, staff member, correspondent, and research speciality at The New York Botanical Garden. Telephone and fax numbers, e-mail and URL addresses are included. Please send corrections and updates to pholmgren@nybg.org and/or nholmgren@nybg.org. Updates will appear about every two months. Updated information for Canadian and Mexican herbaria should be available at this Web site within the coming six months. Other geographical areas will follow as time permits. <http://www.nybg.org/bsci/ih/ih.html>

The Herbarium Hamburgense offers lists of its collectors and collections, including a list of lichens preserved in HBG, on the internet. The list contains 38,300 specimens of 3719 species which belong to 314 genera of lichens. Type-specimens are indicated. Some 15,000 further specimens, belonging to smaller, older collections and the newer herbaria of T. Feuerer, C. Marth, A. Niebel-Lohmann and others, are not yet incorporated. The lichens of the Herbarium Hamburgense are mainly drawn from the collections of C.F.E. Erichsen, T. Feuerer, O. Jaap, P. Junge, C. Kausch and C.T. Timm. Central Europe and South America are well represented. The oldest lichen collection found up so far dates from 1818. <http://www.uni-hamburg.de/ialb/herbar/listen.htm>

Acharius Collections at the Swedish Museum of Natural History described by Erik Acharius are to be found on <http://linnaeus.nrm.se/botany/kbol/ach/acharius.html.en> together with scanned images of over 60 of Acharius' specimens and labels. Registration numbers can be used to search for more information about the specimens in the lichen type database on <http://www.nrm.se/kbol/samllavtyp.html.en> and the web site is: <http://linnaeus.nrm.se/botany/kbol/ach/welcome.html.en>

Cliff Wetmore's home page - Cliff has created his new web page. It has a few links but he is also adding *Caloplaca* keys and data. There is also a section on graduate work there and the schedae for his recently issued Lich. Exs. Min. Later he will be adding a lichen picture and more *Caloplaca* data. Check it out and pass the word. Cliff would be happy to hear comments. Web site: <http://www.tc.umn.edu/~wetmore>

Lias Project

An online key of the 'Genera of Lichenized and Lichenicolous Ascomycetes' by G. Rambold & D. Triebel is now being offered at: <http://www.botanik.biologie.uni-muenchen.de/botsamml/lias/liasonline.html>. It works as an MS Access(tm) database

installed on a Windows NT(tm) database server. Data are accessible to the public via a database application 'DeltaAccess' and the two different web interfaces DAP ('DeltaAccess Perl') and DAWI ('DeltaAccess Web Interface'). Both interfaces are still beta versions and under development. Only categorical characters from a total of 93 characters and nearly 600 character states are used for the determination of 795 genera. Query options by additional categorical and numerical characters will be implemented to the web interfaces. In forthcoming versions, text information (literature references, etc.) and full description output will also be available, together with pure determination data. Log files of the web server indicate that several hundred downloads of LIAS key modules at: <http://www.botanik.biologie.uni-muenchen.de/botsamml/lias/modules.html> occurred during the last two years; however, user feedback to help in the improvement of these keys was almost zero. Resonance to improve the generic key data was also rather poor and less than 50% of the genera have been checked by specialists so far. For this reason, generic data still suffer from various shortcomings, e.g. by incompleteness of data due to reading errors and overlooked literature or by unsettled generic concepts. Thanks are due to A. Findling (Leibniz Rechenzentrum, München) for building up DAWI and for the installation of both interfaces on the LIAS web site, to G. Hagedorn (Biol. Bundesanstalt, Berlin), the author of DeltaAccess, for various help, and to the revisers of data sets listed at: <http://www.botanik.biologie.uni-muenchen.de/botsamml/lias/genrev.html>.

G. Rambold, München

Back issues of ILN

The following back issues of ILN are still available: 9(1), 9(2), 10(1), 10(2), 11(1), 11(2), 12(1), 12(2), 13(1), 13(2), 14(1), 14(2), 15(1), 15(2), 16(1), 16(2), 17(1), 20(1) and further issues. Photocopies are available of: vol. 1(1), 1(2+supp.), 1(3), 2(1), 3(2), 6(2), 7(1-2), 8(1-2). Two indexes are also available: Index to vol. 1-8, Index to vol. 9-13. - According to a resolution of the IAL Executive Council, published in ILN 16(1), April 1983, the following charges will be levied for back issues of ILN: Vol. 1: US\$ 0.25 per number (3 per volume); vol. 2-8: US\$ 0.50 per number (2 per volume); vol. 9-13: US\$ 1.00 per number (2 per volume); vol. 14-17: US\$ 1.50 per number (2 per volume). Back issues from vol. 20 onward are available for US\$ 1.00 per number (3 per volume). The Indexes are free. New members will receive free only copies of the numbers constituting the volume issued for the calendar year in which they join IAL. Orders to be sent to H. Sipman, Bot. Garten & Bot. Museum, Königin-Luise-Strasse 6-8, D-14191 Berlin, Germany, fax: (+49) 30-83006186, e-mail: hsipman@fub46.zedat.fu-berlin.de.

The front-page illustration.

Tornabenia africana A. Massal., unedited drawing by Abramo Massalongo (kindly provided by G. Lazzarin, Museo Civico di Storia Naturale, Verona).

LIST OF SOCIETIES

- Australasia:** Society of Australasian Lichenologists (SAL). Info: Dr. J. A. Elix, Dept. of Chemistry, The Australian National University, GPO Box 4, Canberra ACT 2601, Australia.
- Brazil:** Grupo Brasileiro de Liqueñólogos (GBL). Info: Dr. Marcelo P. Marcelli, Instituto de Botanica, Seção de Micologia e Liqueñologia, Caixa Postal 4005, São Paulo/SP 01061-970, Brazil.
- Central Europe:** Bryologisch-Lichenologische Arbeitsgemeinschaft für Mitteleuropa (BLAM). Info: Dr. Volker John, Pfälzmuseum für Naturkunde, Hermann-Schäfer-Strasse 17, D-67098 Bad Dürkheim, Germany.
- Czech & Slovak Republics:** Bryological and Lichenological Section of the Czech Botanical Society. Info: Dr. J. Liska, Institute of Botany, Academy of Sciences of the Czech Republic, CS-252 43 Pruhonice, Czech Republic.
- Finland:** Lichen Section, Societas Mycologica Fennica. Info: Dr. Teuvo Ahti, Department of Botany, P.O. Box 47, FIN-00014 University of Helsinki, Finland.
- France:** Association Française de Lichénologie (AFL). Info: Dr. Jean-Claude Boissière, Laboratoire de Biologie Végétale, Route de la Tour Denecourt, F-77300 Fontainebleau, France.
- Great Britain:** British Lichen Society (BLS). Info: Secretary, Dr. O.W. Purvis, Botany Department, The Natural History Museum, Cromwell Road, London SW7 5BD, UK.
- Italy:** Società Lichenologica Italiana (SLI). Info: Secretary, Prof. Giovanni Caniglia, Dipartimento di Biologia, Via Trieste 75, I-35123 Padova, Italia.
- Japan:** Lichenological Society of Japan (LSJ). Info: Dr. H. Harada, Natural History Museum and Institute, Chiba (CBM), Aobacho 955-2, Chuo-ku, Chiba 260, Japan.
- Latin America:** Grupo Latinoamericano de Liqueñólogos (GLAL). Info: Eugenia Cristina Goncalves Pereira, Caixa Postal 4792, Recife/PE 50630-970, Brazil. E-mail: ecpereira@npd.ufpe.br.
- The Netherlands:** Bryologische en Lichenologische Werkgroep der KNNV (BLW). Info: Leo Spier, Kon. Arthurpad 8, NL-3813 HD Amersfoort, The Netherlands.
- Nordic Countries:** Nordisk Lichenologisk Forening (NLF). Info: Ulrik Søchting, Botanical Institute, Dept. of Mycology and Phycology, ö. Farimagsgade 2 D, DK-1353 København K, Denmark.
- North America:** American Bryological and Lichenological Society (ABLS). Info: Dr. Robert S. Egan, Biology Department, University of Nebraska, Omaha, NE 68182-0072, USA.
- North America, East:** Eastern Lichen Network, Info via email: glennmar@shu.edu (Dr. Marian Glenn).
- North America, Northwest:** Northwest Lichen Guild. Info: Dr. Bruce McCune, Dept. of Botany & Plant Pathology, Oregon State University, Cordley Hall 2082, Corvallis, OR 97331-2902, USA.
- Poland:** Lichenological Section of the Polish Botanical Society (Polskie Towarzystwo Botaniczne). Secretary: Dr. W. Faltynowicz, Dept. of Plant Ecology, University of Gdansk, ul. Czołgistow 46, 81-378 Gdynia, Poland.
- Slovakia:** Lichenological Working-Group of the Slovak Botanical Society. Info: Dr. Eva Lisicka, Slovak National Museum, Vajanskeho nabr. 2, 814 36 Bratislava, Slovakia.
- Spain:** Sociedad Española de Liqueñologia (SEL). Info: A. Gomez-Bolea, Dept. de Biologia Vegetal (Botánica), Fac. Biologia, Univ. de Barcelona, Avda. Diagonal 645, E-08071 Barcelona, Spain.

- Sweden:** Svensk Lichenologisk Förening (SLF). Info: Dr. G. Thor, Dept. of Ecology and Environmental Research, Swedish University of Agricultural Sciences, P.O. Box 7072, S-750 07 Uppsala, Sweden.
- Switzerland:** Schweizerische Vereinigung für Bryologie und Lichenologie (SVBL). Info: Ph. Clerc, Conservatoire et Jardin botaniques, Case postale 60, CH-1292 Chambesey/GE, Switzerland.
- USA, California:** California Lichen Society. Info: Janet Doell, 1200 Brickyard Way, #302, Pt. Richmond, CA 94801, USA.

