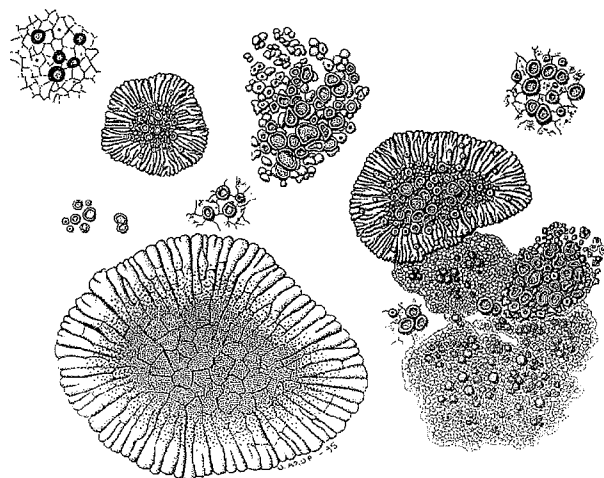


INTERNATIONAL LICHENOLOGICAL NEWSLETTER

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

INTERNATIONAL ASSOCIATION FOR LICHENOLOGY

The International Association for Lichenology (IAL) promotes the study and conservation of lichens. It organizes symposia, field trips, and distributes a biannual newsletter. There is a listserver that 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 or become members of IAL are requested to send their subscription (one payment of 40 USD for 2001-2004) to either Treasurers.

The **International Lichenological Newsletter** is the official publication of IAL. 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) **Reviews**: presentation of recent progress and other topics of interest in lichenology with optional discussion. 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 June 15 and November 15 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 4 Symposium (Barcelona, Spain, 2000) are listed below, and will serve until 2004.

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ASSOCIATION NEWS

IAL COUNCIL MEETING – Venezia, Italy, March 16-18, 2002

(CNR Institute of Marine Biology and Ca' d' Oro Museum)

IAL Council met in Venice during March 16-18. Those present were: P.L. Nimis (President), I. Brodo (Vice-President), L. Sancho (Secretary), F. Lutzoni (Treasurer), Ch. Scheidegger (Deputy Treasurer), M. Grube (Editor), T. Randlane (Organizer of IAL5), R. Honegger, and G. Kantvilas. A. Saag (Tartu) participated in the sessions devoted to the organization of IAL5. The meeting was financed by several individual institutions, and did not involve any IAL funds.

A) IAL 5

The 5th IAL Congress will take place at the University of Tartu (Estonia) between August, 16 and 21, 2004. The congress will include 6 non-parallel main sessions of half a day each, 6 poster sessions having the same titles as the main sessions, 2 shorter special sessions, and an exhibition on "Lichens and Education".

The (provisional) titles of the 6 main sessions are: 1) Biodiversity and Conservation (incl. floristics and geography), 2) Ecology (incl. vegetation science, population ecology, reproductive biology and mineral cycling), 3) Genes, Physiology and Structure (incl. ecophysiology, metabolism, molecular biology, functional biology, ontogeny), 4) Systematics and Evolution (incl. phylogenetics, taxonomy, population genetics), 5) Photobionts, and 6) Using Lichens (incl. biomonitoring, biodeterioration, ethno-lichenology, natural products, lichenometry, global change).

The two special sessions, in the form of round-tables with contributed short talks and ample opportunity for discussion - which together will share half a day - will be devoted to 1) In Search of Model Organisms, and 2) Phylogenetic Methods.

IAL Council will appoint a "Convener" for each session, who, together with two other colleagues (a "Chairperson" and a "Poster Session Organizer") selected by her/him, will be responsible for the organization of each session.

Scientific Committee - The Scientific Committee of IAL5 will be formed of the President of IAL, the Organizer of IAL5, and all Conveners, Chairpersons and Poster session Organizers with the following duties:

The Conveners (appointed by Council): a) to appoint a "Chairperson" and a "Poster Session Organizer"; b) to act as a link with Council, if needed.

The Chairperson (appointed by Conveners): to chair her/his respective sessions. They are expected to produce a golden thread through the oral contributions, leading from the past to future.

The Poster Session Organizers (appointed by Conveners): a) to select posters worthy of publication in the session volumes (see later), and b) to introduce the poster session.

Common duties of Convener, Chairperson, and Poster Session Organizers: a) to select 3-4 "invited" talks for their session (out of 10), b) to select other oral contributions from submitted abstracts and manuscripts, and c) to act as editors of a monographic issue of an International Journal (see later).

Council will provide general guidelines for speakers and authors of articles.

Posters – Posters will have a prominent position during IAL5. The poster session will be opened on the afternoon of the first day, just after the opening ceremonies. The 6 Conveners of the Poster sessions will have c. 20 minutes each to illustrate the input they received for the respective sessions, after which Poster Sessions will be officially open, and will stay open until the end of the Congress.

Publications – Council intends to avoid as much as possible delayed publication of bulky “Proceedings” volumes. Scientific proceedings arising from IAL5 should be published rapidly, and ideally in journals with a wide circulation. At least six international journals will be asked to host a volume for each session, edited by the respective organizers. More local journals could host volumes containing papers that are not easily accommodated in journals with a high impact factor. These papers, however, must also undergo a thorough reviewing process. English-speaking IAL members will be asked – via Lichens-I and IAL Newsletter – for assistance with English-editing.

Exhibition – There will be an exhibition on “Education and Lichens”, possibly one which could also be of interest to Tartu citizens. Ideally, this should involve National Societies (who should involve the respective school systems), museums, private companies, etc. At the very least the exhibition will resemble a poster session. If the response is positive, this could become an important international event (See also further below).

Excursions – Both pre- and post-Congress excursions will be organized in Estonia and neighboured countries.

Financial matters – The Congress fees should be as cheap as possible. The Organizer (Tiina Randlane) will provide the (next) Council and Auditor with an itemized budget, detailing how the money has been spent. Students and IAL members who cannot pay the entire fee will be eligible for a reduced subscription fee.

B) ACHARIUS MEDALS AND MASON HALE AWARDS

ACHARIUS MEDAL – The Council selected the person to be honoured with the next Acharius Medal at the IMA Congress in Oslo in August 2002.

MASON HALE AWARD – As two out of the three acceptable nominations were from Council members, it was decided to appoint a Mason Hale Award Committee, presided by M. Wedin, and including P. Crittenden and C. Culberson. The Committee was asked to make a decision before the end of June. The Mason Hale Award will also be delivered during the IMA Congress in Oslo.

A second Acharius Medal and Mason Hale Award will be delivered on the occasion of the next Symbiosis Congress in Halifax (summer 2003). A call for nominations will be made in the next issue of the Newsletter, and will be advertised via Lichens-I at the end of August, when the winners of the previous award and medal (Oslo) will be announced.

C) OTHER MATTERS RELEVANT TO IAL

Treasurer's report

A brief financial report follows on all IAL accounts as of March 29, 2002. Contrary to my previous report (ILN 33/2), Edit Farkas (previous Treasurer) and I decided to transfer the Hungarian account to the US account. The current balance in the IAL US account 1 (now at First Union Bank, North Carolina) is 4,902.93 USD. This small amount is due to a

transfer on April 23, 2001 of 13,000.00 USD from this account to a new IAL US account 2 (Money Market Fund, TIAA-CREF Mutual funds). This account has accumulated 339.91 USD in interest since this transfer. The total of these two IAL accounts is 18,242.84 USD. The current balance for the IAL Swiss account, under the responsibility of Christoph Scheidegger, is 1,066.83 USD. Therefore, the grand total (with interest earnings) of all IAL accounts is 19,309.67 USD. About 11 % (2,178.97 USD) of this amount comes from generous donations from IAL members. These donations constitute a substantial portion of the IAL budget. If you intended to contribute financially to IAL, you can still send your donation in US dollars as a cheque or money order to François Lutzoni at the address below. A letter acknowledging your contribution will be sent to you for tax purposes.

If you have not already paid your IAL membership dues for the 2001-2004 period, please do so as soon as possible. The IAL council has adopted a payment policy that consists of one payment of 40 USD for the 2001-2004 period. Payments need to be in USD, and cheques or money orders must be payable to the “International Association for Lichenology”. Please send your payment to the Treasurer, François Lutzoni, or the Assistant Treasurer, Christoph Scheidegger, at the following addresses:

François Lutzoni
Department of Biology
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USA 27708
E-mail: flutzoni@duke.edu

Christoph Scheidegger
Swiss Federal Institute for Forest,
Snow and Landscape Research
CH-8903 Birmensdorf
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E-mail: scheidegger@wsl.ch

A direct transfer of funds is also possible to the IAL Swiss account: Schweizerische Nationalbank Bern, BC 001158, Account nr: Z.G. K+R 1530-5-030, WSL 11490.334.001. If you do so, include the following note: 1158 - IAL members.

François Lutzoni, IAL Treasurer

Editor's report

Since IAL4, three issues of the IAL Newsletter have been published. The outline remained more or less the same as before, with only a slight change. Instead of forum discussions, a review section was introduced to focus on the presentation of recent progress in lichenology. The reviews were published via Lichens-I to promote an optional discussion. This was a considerable success, and in one case a contribution was later published in Nature (!). Together with the Treasurer, the Editor worked on a complete update of the addresses to which the Newsletter is sent. The mailing costs for the ILN were covered by IAL, whereas the printing was financed by the Institute of Botany in Graz. Due to general budget reductions at Austrian institutions, this can no longer be maintained. The Council wishes to acknowledge Helmut Mayrhofer, currently Head of this Institute, for his previous support.

Martin Grube, IAL Editor

Report of the Coordinator of the Conservation Committee

This thematic group published the Proceedings of the International Conference on Lichen Conservation Biology, Licons, held in Birmensdorf, Switzerland, in September 1999. The volume comprises an introduction and 11 original papers devoted to different aspects of lichen conservation biology. "Towards Conservation of Lichens" contributes to technical and methodological aspects of the interpretation of the IUCN Red List criteria for cryptogams (Nick Hodgetts) and presents case studies of lichen Red Lists from Estonia (Tiina Randlane & Andres Saag), Valencia (Violeta Atienza & José G. Segarra) and Switzerland (Michael Dietrich et al.; Christoph Scheidegger et al.). Rebecca Yahr describes monitoring of the soil-growing lichen *Cladonia perforata* and focuses on post-fire recovery of this endangered species, while Pat Wolseley and Peter James provide examples of trends in growth and establishment of threatened *Lobaria* species from long-term monitoring squares in British woodlands. Trevor Goward and André Arsenault review cyanolichens on conifers and discuss the geographical distribution of this lichen guild sensitive to low levels of air pollution and acidification. Gintaras Kantvilas gives an overview of conservation strategies for Tasmanian lichens and describes a case study of the conservation measures taken in the rare *Xanthoparmelia willisii* (Gintaras Kantvilas & S. Jean Jarman). David Yetman gives an example of how people from youth organizations or young unemployed survey the globally threatened *Erioderma pedicellatum* in Newfoundland. The volume can be ordered at Paul Haupt Verlag, Bern (28 CHF) E-mail: verlag@haupt.ch. Web page: www.haupt.ch

Furthermore, C. Scheidegger joined an international workshop organized at Helsinki by the Finnish Ministry of the Environment on Red List assessment. Ch. Scheidegger will join the meeting of the executive committee of IUBS (end of May 2002).

Ch. Scheidegger, Coordinator of the IAL Conservation Committee

Establishment of a Global Biodiversity Committee

Council approved the establishment of a Committee on "Global Lichen Diversity" at the suggestion of the President. Membership will at first include T. Feuerer (Coordinator), S. Calvelo, B. Egan, T. Esslinger, D. Galloway, M. Grube, R. Lücking, P.L. Nimis, and G. Rambold. Participation in the Committee is open to all IAL members, who should contact the Coordinator. The Committee has as its main task forming links with similar initiatives worldwide (e.g. IUBS, IOPI, Planta 2000).

1st Announcement: Exhibition on "Lichens and Education"

Lichens are an ideal object for educational projects. They are one of the most interesting examples of symbiosis, they are used worldwide to estimate air quality, they are important in the deterioration of stone monuments, they have or had many interesting practical uses, some of which – e.g. dying or the production of perfumes – are related to their unique chemistry. Thousands of schools have been – and are – working on projects centered on lichens. In some countries these projects – esp. those on biomonitoring – were organized on a broad national scale. A simple search in the internet using two key words "Lichens school", "Lichens école", "Flechten Schule", "Licheni Scuola", "Lavar Skolan" etc., reveals the presence of hundreds of web-pages, many of which were constructed by school classes to illustrate the results of educational work centered on lichens. This widely dispersed material is often of a high quality, and is worthy of a coordinated effort for making it better known to the Educational Community worldwide. Likewise, several museums have already organized lichenological exhibitions of high educational value, to increase awareness of lichen symbioses by the public.

On the occasion of the 5th International Congress of Lichenology, which will be held in Tartu (Estonia) during August 2004, the International Association for Lichenology (IAL) will organize an exhibition on "Lichens and Education". The exhibition will be open to the citizenship of Tartu, but it will also include a large set of material for a much broader audience via Internet. On this occasion, the IAL will introduce and give the Sylvia Sharnoff Awards: for 1) the best Web page (incl. all schools below the university level), 2) The best project (incl. all schools below the university level), 3) the best drawings (restricted to individual students at the elementary school level). The attribution of the Prizes will be entrusted to an International Committee of three members, including a non-lichenological expert in educational sciences.

The exhibition will consist of three sections: A) Its nucleus, consisting of selected material coming from different exhibitions on lichens organized by national to local museums and other institutions, will introduce the visitors to the fascinating world of lichens. B) The "interactive" section will be devoted to Web pages constructed by schools of all levels, illustrating the results of educational projects centered on lichens. C) The third section – mainly dedicated to elementary schools – will be in the form of a poster exhibition, which will include drawings and short texts dealing with lichens.

Ideally, the organization of the exhibition will involve museums, private companies and individuals, but especially the National/Regional Lichen Societies, which are expected to involve the respective school systems. In its minimal form the exhibition will be something like an enlarged poster session, paralleled by the creation of a metadata Web page with links to Web pages created by schools. If the response will be broad, and if sufficient money will be raised from sponsors and participating institutions, the exhibition could become an important international event. An extended publication of the main results in a leading educational journal will be fostered by IAL.

This is a preliminary message – primarily addressed to all National/Regional Lichen Societies – which just intends to launch a call for interest. Those Societies which are interested to participate are asked to respond to a questionnaire before the end of August 2002. IAL suggests interested societies to launch an analogous call to the respective school systems, and possibly to establish two analogous National/Regional Prizes. The Societies, and all members of IAL, are warmly invited to contribute with links with potential sponsors, contacts with Museums, Ministries of Education and other institutions which could be willing to be involved, and with further ideas and suggestions.

Pier Luigi Nimis, IAL President

ACHARIUS MEDAL and MASON HALE AWARD ! Call for nominations !

IAL Council decided that an Acharius Medal and a Mason Hale Award will be awarded at the next Symbiosis Congress in Halifax in August 2003.

ACHARIUS MEDAL – The Acharius Medal recognizes the life-work of distinguished lichenologists. Nominations should be sent to the Secretary of IAL by e-mail (sancholg@eucmax.sim.ucm.es) before December 1, 2002. They must contain: a) name and address of the proponent, b) name and address of the nominee, and c) a brief illustration of the life-work of the nominee.

MASON HALE AWARD – The Mason Hale Award (500 USD) recognizes the excellence in research by young lichenologists for outstanding work resulting from doctoral dissertations or similar studies. Nominations of completed theses, finished after the last

General Meeting in Barcelona should be sent by mail to the Secretary of IAL (Leo G. Sancho, Dept.o de Biología Vegetal II, Facultad de Farmacia, Universidad Complutense, 28040 Madrid, Spain) before December 1, 2002. They must contain: a) name and address of the proponent, b) name and address of the nominee (which should be different from the proponent), c) a brief illustration of the research work of the nominee, including some notes on her/his curriculum, and d) a copy of her/his dissertation.

NEWS

Ticolichen on its way!

Robert Lücking, Adjunct Curator for Lichenized Fungi at the Field Museum in Chicago, recently received notice that the new project *Ticolichen*, a collaborative effort between the Field Museum, the National Institute of Biodiversity in Costa Rica (INBio), and the Botanical Museum in Berlin, will be funded by the National Science Foundation (NSF) for a period of three years (2002 to 2005). The primary goal of this project is to produce a printed lichen flora of Costa Rica by 2007.

Ticolichen is the first large-scale tropical lichen biodiversity inventory that combines well-developed local scientific infrastructure with international taxonomic expertise. It forms part of the Costa Rican sustainable development initiative, a collaborative effort to unravel Costa Rica's organismic diversity, supported by funds from the World Bank, the Norwegian Agency for International Development, and the Dutch Government. *Ticolichen* also complements the *Survey of Costa Rican macrofungi* and the *Survey of Costa Rican wood inhabiting pyrenomycetes* (supported by NSF grants to Greg Mueller, Sabine Huhndorf and Fernando Fernandez at the Field Museum), adding lichens as the third, important fungal component to the National Biodiversity Inventory.

The lichen inventory of Costa Rica is a collaborative project initiated by Robert Lücking, Loengrin Umaña (Curator of microfungi and lichens at INBio), and Harrie Sipman (Curator of lichens and scientific advisor for lichens of INBio's fungal taxonomic taskforce). *Ticolichen* comprises several field trips and workshops with the participation of local students, parataxonomists and professionals, and international specialists, as well as extensive taxonomic and ecological studies, including the compilation of databases and the installation of websites aiding in the identification of tropical lichens. Colleagues interested in collaboration or contributions to this project are welcome to contact Robert Lücking at rlucking@fieldmuseum.org. *Ticolichen* news and a regularly updated checklist of Costa Rican lichens are presently available at the following website:

www.fieldmuseum.org/research_collections/botany/botany_sites/ticolichen/checklist.html.

Robert Lücking, Chicago

A new society: The Japanese Society for Lichenology

It is our great pleasure to announce a new local lichenological society: The Japanese Society for Lichenology (JSL). Seventy-six people, including ten foreign lichenologists as

honorary members, were registered to JSL by the first meeting. In the opening ceremony and the first meeting of the JSL on February 17, 2002 at Kochi, we elected Isao Yoshimura as our President and determined the constitution and main activities of our society. The first issue of a new scientific biannual journal named *Lichenology* will be published in June 2002. It is devoted to all research fields of lichenology and the official languages are English and Japanese. The first annual meeting with scientific programs, including an international symposium entitled "Prospective of lichenology in 21st century" and oral presentations, will be held at Kobe on July 27–28, 2002. The first field excursion will be held at Mt. Nyugasa, Central Japan on September 7–8, 2002.

Japan already has one lichen association, the Lichenological Society of Japan (LSJ). However, during the annual meetings of 2000 and 2001, it became clear that the focus of the LSJ was mainly lichen taxonomy since its establishment in 1971. Detailed information is given in the recent issue of LSJ newsletter (*Lichen* vol. 12 No. 4, December 2001). The LSJ does not publish a research journal or holds scientific meetings. JSL was therefore established to cover all fields of lichenology, including taxonomy, morphology, physiology, ecology and chemistry. Foreign lichenologists are welcome to join JSL. If you are interested in more information, please contact the Secretary (yyamamoto@akita-pu.ac.jp).

Yoshikazu Yamamoto, Secretary of JSL

Fourth International Symbiosis Congress, Halifax, Nova Scotia, August 17-23, 2003

Preparations for this congress, organized by Douglas Zook (Boston) and David Richardson (Halifax) are progressing rapidly. The program covers symbioses in a broad sense and includes now 15 symposia. One of them is devoted to Lichens and the keynote speaker will be Mark Seaward (Bradford), while another symposium, on non-nitrogen nutrient movement, has Kristin Palmqvist, a lichen physiologist, as its keynote speaker. The lichen symposium is held in collaboration with the International Association of Lichenology, who will present an Acharius medal and a Mason Hale Award during the meeting.

Mid-congress field trips are planned to Thomas Radall Provincial Park and Abrahams Lake, both interesting sites for lichens as well as to the Joggins Fossil Cliffs. Visits to Peggy's Cove and Lunenburg (South Shore), the Bedford Institute of Oceanography in Dartmouth, and the National Research Council in Halifax are also being arranged. Papers and posters on symbioses can be submitted on-line at any time from February 15, 2002 through April 30, 2003. For more information visit the web site: <http://people.bu.edu/dzook/>.

Martin Grube, IAL Editor

Tropical lichen course in Utrecht, June 10-20, 2003

A course will be given on taxonomy and ecology of tropical lichens. The course is aiming at lichenologists with experience in temperate areas and at students from tropical countries with little or no experience with lichenology. It will be held at CBS, on the University Campus of Utrecht (The Netherlands). The principal teachers will be André Aptroot and Harrie Sipman (Berlin). Topics include introductions to the systematics of the main groups

and general topics (distribution patterns, guide to the literature, collecting and specimen handling, chemistry).

Each day will start with a lecture followed by practical work with microscopes on selected examples, using the Internet keys to genera of tropical lichens. Microscopes, material, disposables and literature will be provided, but participants are asked to bring specimens from their own research projects also, which can be identified during the course. Excursions are planned to lichen-rich habitats in the Netherlands.

The course fee is 750 EUR (375 EUR for students), to be paid in advance. With sufficient number of fully paying participants, some money will be put in a travel fund for students from tropical countries attending this course. Since CBS has only a few lodging rooms, convenient accommodation is also possible at a Youth Hostel (at 20 EUR/night) in Bunnik, not far from the Campus. To register send an e-mail to aproot@cbs.knaw.nl stating your interest in the course, your preferred lodging facility, and whether you are a student or not.

André Aptroot, Utrecht

Personalia

Ted Ahti (Helsinki) visited Washington (US) to study Cladoniaceae with **Paula DePriest** in April. He also visited the herbaria in Madison (WIS) and New York (NY). In June-July he will participate in the A. K. Cajander Expedition to the Lena River in Sakha Republic (Yakutia), working together with the local lichenologist **Lena N. Poryadina** and the reindeer range ecologist **Nikolay Karpov**.

André Aptroot (Utrecht) will host a British Council-sponsored workshop on lichens and global warming in Utrecht (the Netherlands) in July 2002. Participants from the UK (**Brian Coppins**, **Bryan Edwards** and **Mark Seaward**) will come as well as the Dutch colleagues (**Han van Dobben**, **Kok van Herk** and **Laurens Sparrius**) to analyse recent changes in the British and Dutch lichen floras.

Torbjørn Bjelland (Bergen) defended her thesis "Weathering in saxicolous lichen communities: a geobiological approach", supervised by **Tor Tønsberg**. **Rosmarie Honegger** and **Pier Luigi Nimis**, her opponents, also met **Per Magnus Jørgensen**, **Stefan Ekman**, **Christian Printzen**, **Louise Lindblom**, as well as **Ulli and Martin Grube**, who spent three months in Norway.

P.K. Divakar (Lucknow) defended his Ph.D. thesis entitled "Revisionary studies on the lichen genus *Parmelia* sensu lato in India", supervised by **Dr D.K. Upreti** at the Botany Department, University of Lucknow, India, on February 22, 2002. The review study is based on morphological, anatomical and chemical investigations of more than 5000 specimens preserved in different herbaria of India. He has enumerated 186 species distributed in 20 genera from India. A monograph on Indian Parmelioid taxa will be published in the form of a book in the near future. Currently he is working on Indian Cetrarioid lichens.

Mireia Giralt (Barcelona) has left the University of Barcelona and its lichenological team. She decided to accept a job at the faculty of Enology in Tarragona, Spain. It is to be

hoped that the new job leaves some time, in which case she will work on lichens as a hobby.

Dorothee Killmann and **Eberhard Fischer** (Koblenz) recently started a project on lichens in montane rainforests of Kenya. The project is part of BIOTA Africa and is funded by the German government. The study sites are Kakamega Forest and Mt. Kenya. One of the main aims is the comparison of different altitudinal zones and anthropogenic influence (primary forest vs. secondary forest). The first field campaign took place in October–November 2001 and will be continued in September 2002. During a visit to the Botanical Institute of Oslo first identifications were made. Additionally large collections of both macro- and microlichens have been made in Rwanda and Uganda during the last five years. Specialists who are willing to receive material for determination are invited to contact us. Email: killmann@uni-koblenz.de. Internet: www.biota-africa.org.

Angels Longán (Barcelona) successfully defended her Ph.D. dissertation on "Epiphytic lichens as indicators of the conservation status of Mediterranean forests. Methodological proposal for the *Quercus ilex* forests of Catalonia", supervised by **Antonio Gomez-Bolea** at the University of Barcelona, in March 2002. The study includes a catalogue of the 166 lichen taxa found on *Q. ilex*, with comments on their morphology, and especially ecology and distribution, as well as a catalogue of the stands.

H. Thorsten Lumbsch (Essen) has got a curator position at the Field Museum in Chicago. He will start his first job (!) in February 2003 after his current grant has finished. His students **Imke Schmitt** and **Nora Wirtz** will accompany him to Chicago. In January/February he joined a team of lichenologists headed by **Leo Sancho** (Madrid) to visit the Spanish research base on Livingston Island, Antarctica, after which he briefly visited **Christian Printzen** and **Stefan Ekman** in Bergen in April and **Mats Wedin** and his active group in Sweden for a week in May. In Umeå he also gave a course on lichen anatomy with focus on ascoma development.

New members

I. M. Antonova: Polar-Alpine Botanical Garden, Acad. Sci. USSR, 84230 Kirovsk-6, Murmansk reg., Russia

Seyhan Aydin: Fen-Edebiyat Fakültesi, Biyoloji Bölümü, Uludağ Üniversitesi, 16059 Görükle-Bursa, Turkey

Alexandra Bachran: Univ. Kaiserslautern, FB Biologie, Abt. Allg. Botanik, Postfach 3049, D-67653 Kaiserslautern, Germany

Paul Hoffmann: U. Stadtplatz 8a, A-6060 Hall in Tirol, Austria

Elizabeth Kantrud: 1524 York PL., Victoria, British Columbia, Canada, V8R 5X2

Michael Lakatos: Univ. Kaiserslautern, FB Biologie, Abt. Allg. Botanik Postfach 3049, D-67653 Kaiserslautern, Germany

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Obituary: Heinar Streimann, 1938-2001

Heinar Streimann was born on December 19, 1938 in Tartu, Estonia. His family emigrated to Victoria, Australia in the winter of 1950. After working for the Bureau of Meteorology,

he moved to Papua New Guinea in 1961, to take a job in the forestry industry. His particular job involved surveying, planning and building roads for the expanding industry. It was in Papua New Guinea that Heinar's love for botany came to the fore. He pursued his new interest with a passion and eventually began teaching botany at the Forestry College in Bulolo. In 1973 Heinar departed from Papua New Guinea to take up a position at the Australian National Botanic Gardens in Canberra where his employment continued (apart for a second stint at the PNG Forestry College in Bulolo in 1981-1983) until his retirement in April, 2000. It was here that Heinar really established himself as an expert bryologist and collector of mosses, lichens and liverworts. During this time Heinar was primarily responsible for building up the CANB cryptogamic herbarium (formerly CBG) to be the largest and best curated collection of cryptogams in the Southern Hemisphere. However, Heinar was never happier than when he was in the 'bush', going to new places in search of new or rare mosses, lichens or liverworts. Quiet and private by nature, Heinar was a very obliging and hospitable person, and an excellent host to our many visiting botanists from around the world. Heinar died on August 29, 2001.

Jack Elix, Canberra

New Literature

KRANNER, I., BECKETT, R.P. & VARMA, A.K. (eds) 2002. Protocols in lichenology. Culturing, biochemistry, ecophysiology and use in biomonitoring. Springer: Berlin, Heidelberg. 580 + XI pp. ISBN: 3-540-41139-9 (soft cover). price: 99.95 EUR.

This book presents an impressive array of protocols covering almost every method that has been applied to lichens, from macrophotography to SEM, herbarium management to culturing of the symbionts. The book is divided into 7 parts covering methods in "culture and cultivation", "ultrastructure", "physiology and ecophysiology", "lichen compounds", "nucleic acids", "bioindication and biomonitoring", and "biodiversity and information systems".

Each part contains a varying number of chapters written by specialists in their field and presenting a detailed description of one or a few methods and protocols (a full list of contents is available at: www.springer.de/books/toc/3540411399-c.pdf). Such protocols could of course also be copied from original publications, but the value of this compilation does not only lie in the concentrated form, in which these different methods are here compiled, but in the form of the presentation. After a brief introduction and an explanation of specific terms and abbreviations where appropriate, each protocol starts with a 'shopping list' of necessary equipment and materials, continues with a detailed step-by-step description of the procedures and ends with advice on troubleshooting, general comments and a list of suppliers.

Although a book can of course never replace practical experience, it appeared to me as if I just needed to order the necessary stuff and get started (given space and money, of course). As a person not familiar with many of the techniques described in the book, I was especially caught by the detailed comments. Perceivably, these advice reflect long standing practical experience. Some of the methods, that are described in great detail seem a bit anachronistic. For example, hardly anyone would use isoenzymes as molecular markers now that DNA-studies gained so wide acceptance. A single person can hardly evaluate all presented protocols but on the whole, I gather, it is difficult to find serious shortcomings in this book. Those I know better from my own work rarely contain minor flaws. For example, the reagents necessary for PCR-reactions vary in concentration, and

as dilution of stock solutions is more or less up to the researcher, molarities instead of volumes would have been necessary in the recipe. Decreasing polymerase concentration will not usually increase DNA yield. The detection of lichen substances by TLC and HPLC is basically the same for lichens and cultured mycobionts. In the article on mycobionts reference should have been made to the previous chapter instead of introducing another protocol. A rather high number of typos might annoy some readers. But these points do not lessen the general usefulness of the protocols and could easily be handled in a second edition. Lichenologists with no prior experience of "hi-tech" methods will certainly be encouraged to broaden their methodological spectrum. Regrettably (but as usual), the high price for the book will prevent its wide circulation. But ask your local library!

Christian Printzen, Bergen

Nash III, Th.H., Ryan, B.D., Gries, C. & Bungartz, F. (eds) 2002. Lichen Flora of the Greater Sonoran Desert Region Volume 1 (the pyrenolichens and most of the squamulose and macrolichens). Lichens Unlimited, Department of Plant Biology, Arizona State University, Tempe. 532 pp. ISBN 0-9716759-0-2 (hard cover). Price: 29.95 USD. Shipping costs: additional 3.50 USD for domestic shipping and handling within the United States, ca. 9 USD to Canada, 12 USD to Europe, and 13 USD to Asia.

The first volume of the long awaited Sonoran Desert Lichen Flora is out! This initial volume covers almost 600 species in over 140 genera, and includes most of the pyrenocarpous lichens, the Lichinales and most of the genera with species forming squamulose, foliose or fruticose thalli. The book is organized into smaller or larger chapters and – occupying the major part – sections devoted to generic treatments, each with its individual authors. Beside the editors a further 32 other lichenologists from all over the world contributed one or more of these sections.

Following an introduction to the circumscription of the study area, the region's climate, geology, geomorphology and vascular plant vegetation are covered, followed by an extensive and richly illustrated introduction to characters important in lichen identification is provided. These introductory chapters also include one on lichen photobionts which contains a key (pp. 44–47) adapted from several sources. This key is probably the best available so far and will also work in other holarctic regions of the world.

Keys to natural or practical groups and individual genera give the less experienced botanist a chance to determine particular lichens. Groups and genera to be treated in a second volume are indicated. The keys are followed by individual generic treatments (genus description, key to species within the genus and species descriptions), each arranged in alphabetical order, which constitute the major part of the volume (pp. 89–508). All species descriptions include information on nomenclature, morphology, anatomy, ecology, and distribution. Notes containing additional information e.g. on similar taxa, are frequent but not obligatory. Dot distribution maps within the study area are included for most of the species with a more restricted overall distribution pattern, as well as habit illustrations (many black and white photographs, several drawings) for many of the rarer species. Collection information is only given for newly described taxa. For other species collection data on specimens preserved in ASU herbarium can be looked up at ces.asu.edu/ASULichens/index.html or directly in the database at ces.asu.edu/collections/.

It is worth noting that the volume includes a number of descriptions to new taxa, e.g. the genus *Lobariella* and new species in the genera *Catapyrenium*, *Cladonia*, *Endocarpon*, *Hypogymnia*, *Hypotrachyna*, *Parmotrema*, *Placidium*, *Psora*, *Pyxine* and *Toninia*.

Tom Nash, as the initiator of this huge project and senior editor of the volume, is to be congratulated for this immense piece of work. It will be useful not only for determining lichens from the Sonoran Desert but far beyond in the south-western U.S.A. and Mexico, since; the pragmatic circumscription of the study area necessarily includes a rich set of mediterranean, subtropical and temperate taxa.

The flora is available from the senior editor contacted via tom.nash@asu.edu. A preview the flora is provided on the internet at ces.asu.edu/ASULichens/Sonoran/Flora.html

Josef Hafellner, Graz

Nimis, P.L., Scheidegger, C. & Wolseley, P. (eds) 2002. Monitoring with Lichens – Monitoring Lichens. NATO Science Series. Kluwer Academic Publishers, The Hague, The Netherlands. 408 pp. ISBN 1-4020-0429-X (hard cover). Price: 150.00 EUR / 138.00 USD / 95.00 GBP.

Lichenologists are sometimes asked about the use of lichens. The usual response is to point out the importance of lichens as indicators of air pollution or environmental change. This prominent topic in lichenological literature was the focus of a workshop in Orierton, UK, in August 2000, which resulted in the publication of the present book. It summarizes the results in three main sections: lichens as indicators of air pollution, monitoring lichen diversity, and methods for monitoring lichens. Diverse aspects of biomonitoring are covered in the first two sections, ranging from air pollution, climate change, oxidative stress, ecosystem function, red lists, etc. These largely review contributions were all authored by well-known specialists in the field. In the methods chapter, the quest for comparability of monitoring studies is especially apparent from the strict format of the individual contributions. This section is a valuable and comprehensive compilation of "recipes" and contains a variety of recording techniques for different purposes, as well as transplantation methods, chlorophyll measurements, and more. Some of these procedures may become widely accepted approaches. Considerable attention has also been paid to sampling schemes, standardization of data collection and quality control. Genetic diversity in populations is still treated marginally in lichen monitoring, this source of information will probably gain more attention in the future. Since the individual chapters are sometimes cross-referenced by their consecutive numbers, it would have been convenient to add these numbers to the chapter titles. As a whole, the book is a cornerstone publication of state-of-the-art methodology and will certainly become a standard reference which should be present in any lichenological library.

Martin Grube, IAL Editor

ØVSTEDAL, D.O. & LEWIS SMITH, R.I. 2001. Lichens of Antarctica and South Georgia. A guide to their Identification and Ecology (Studies in Polar Research). Cambridge University Press. 350 pp. ISBN 0-521-66241-9 (hard cover). Price: 70 GBP.

This is a long-awaited book, which will undoubtedly prove to be a landmark study of Antarctic lichens. No work covering the whole Antarctic area has been published since Dodge's Antarctic Lichen Flora (Dodge 1973), and the Flora by Redón (1985), limited in original information and to herbarium studies. Dodge's book, which includes more than 400 taxa, has been strongly criticized, and more than the half of the species actually are synonyms of species already described for the Northern Hemisphere (see Castello and Nimis 1995, 1997). While it was argued in recent years, that the Antarctic lichen flora would be relatively poor, Øvstedal and Lewis Smith include again more than 400 taxa (427 in total, 33.5% Antarctic endemic taxa, including 41 undetermined taxa).

An excellent bibliography includes the immense majority of papers published on Antarctic lichens, even those published in languages different from English and in magazines or proceedings with very limited distribution. This is complemented by extensive study of collections, both private and public, of Antarctic lichens preserved in many herbaria around the world. The book does not consist, however, solely of a systematic and ecological account of genera and species. The chapters on "Environmental Lichen Ecology" and "History of Lichenological Investigations" are interesting and useful accounts, although these do not include ecophysiological or microclimatic references. "Biogeography and Diversity" is an especially brilliant and original chapter. The tables provided in this chapter clearly summarise the current knowledge on lichen distribution in the different Antarctic regions. "Systematic Arrangement" is, probably intentionally, short and quite conservative. The authors focus on relatively simple keys to species, in many cases accompanied by drawings or good-quality black-and-white pictures. In contrast, the keys to genera could be misleading in some cases. It is also a pity that the quality of the colour pictures does not really account for the spectacular chromatic variety of many Antarctic lichens.

It is evident that numerous Antarctic zones still remain to be explored and that the accuracy of current knowledge across the different lichen genera is not homogeneous. Important genera as *Rhizocarpon*, *Lecanora* or many of the lecideoid lichens are pending further studies, but this book will encourage specialists around the world to pay attention to Antarctic lichens, which undoubtedly hold numerous surprises for future investigators.

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Leo Sancho, Madrid

REPORTS

Reports from local lichenological societies

The end of January found the **California Lichen Society** celebrating eight years of existence. Bad weather cancelled a foray planned for that day but a membership meeting and potluck supper provided an opportunity for the discussion of future plans. Much of this discussion centered around the purpose and methods of the Conservation Committee – now chaired by Eric Peterson – as lichen conservation has always been an important element in the planning of CALS programs.

Leading CALS in its endeavors for the next two years is Bill Hill, who was voted in as the new President, replacing Judy Robertson. Judy has done an outstanding job over the past four years, and CALS membership now approaches two hundred.

Over the past year CALS held workshops in both macro- and micro-lichens, and organized field trips to places as far south as the Santa Margarita Ecological Reserve in Southern California, and north to the Pigmy Forest in Mendocino County. This year's schedule will be just as varied and will include a return visit to Santa Cruz Island in the Channel Islands in August, led by Charis Bratt.

CALS' new mailing address is: The California Lichen Society, P.O. Box 472, Fairfax, CA 94930, U.S.A., or e-mail: aropoika@earthlink.net. The web site remains at: ucjeps.berkeley.edu/rlmoe/cals/html.

Janet Doell, Fairfax

The **Lichenological Society of Japan (LSJ)** was founded in 1971. The 30th annual meeting of LSJ was organized by Professor I. Yoshimura and held in Kochi on August 26, 2001. New members of LSJ Executive Council (2002–2003) were elected: M. Inoue (President), H. Kashiwadani, N. Hamada (Secretary), H. Miyawaki (Editor), T. Okamoto (Treasurer).

The following day, an enjoyable excursion was made to Mt. Kuishi (alt. 1176 m), which is covered by deciduous forest. *Dibaeis baeomyces* and *Pilophorus clavatus* were found on the trail, and *Mycoblastus japonicus* and *Phaeographis exaltata* were seen on the bark of beech-tree near the summit. All specimens collected during annual excursions are listed in the Newsletter of LSJ, namely **Raiken** (Japanese for lichen).

This summer the 31st annual meeting and excursion will be organized by Professor H. Kashiwadani and held at the outskirts of Mt. Fuji.

Nobuo Hamada, Osaka

15th Meeting of Australasian Lichenologists, Blue Mountains, April 20-21, 2002

The 15th Meeting of Australasian Lichenologists was held at the Blackheath Neighbourhood Centre in the Blue Mountains of New South Wales, Australia. As usual, the conference provided a great opportunity for all participants, ranging from experienced lichenologists to students interested in the lichens of the region, to catch up on each other's research, exchange ideas and initiate new collaborations. The meeting was opened by D. Eldridge. The first speaker was T. Entwistle, who presented us with the *status quo* of cryptogamic research in Australia in terms of who is actually employed in this field, in which institutions (universities, herbaria etc) and where "gaps" exist in knowledge and expertise. This was followed by S. Louwhoff's presentation on the genus *Hypotrachyna* and allied genera in Papua New Guinea. Sh. Ford, who recently completed her Ph.D. on lichens in cool temperate rainforests in Victoria, Australia, presented her results on the effect of rainforest stand age and size on lichen populations. W. Cuddy, presented his findings on soil crust lichens as bioindicators in the inland slopes of NSW and G. Kantvilas spoke about the Tasmanian Parmeliaceae Atlas, about to be published by Australian Biological Resources Study (ABRS - Environment Australia) and the Tasmanian Herbarium. S. Louwhoff also presented some research with William Purvis, on how London's lichen flora is changing as a result of changes in atmospheric pollution. P. McCarthy informed us about the *Flora of Australia* lichen publications.

The day after, a field trip lead to the Blue Mountains National Park, which covers approximately 202,000 ha of mostly uninhabited wilderness, and supports a number of different habitats, including magnificent sandstone canyons with wet forests down in the

valleys (where, incidentally, the Wollemi Pine – *Wollemia nobilis* – was discovered as recently as 1994), “hanging swamps”, heathland and dry sclerophyll forest on the higher slopes. The Blue Mountains take their name from the distinctive blue haze that surrounds the area, caused by the oil droplets released by *Eucalyptus* trees. Our first stop was the Grand Canyon, a beautiful wet valley, but unfortunately lichenologists often do not make it past the car park and this was no exception, with less than a handful actually making it into the valley. Luckily one can never lose the others as there is always the sound of happy chipping on the sandstone boulders and many excellent collections were made. Following lunch we visited a rainforest area as well as making a quick stop-off at a churchyard to look at the lichens on the gravestones. After that it was goodbye for another two years for most of us. We should mention that Alan Archer was sadly missed, but we were happy to learn that his health is improving. D. Eldridge and A. Archer were responsible for organising the venue, speakers, and fieldtrip and we are grateful to them for taking care of this. We also wish to thank the NSW National Parks and Wildlife Service for providing permission to make small, personal collections.

Simone Louwhoff, London

GLAL-5 in Olmué, Chile, November 19-23, 2001

The Fifth meeting of the Grupo Latino Americano de Lichenólogos (GLAL-5), took place at the Centro Turístico La Campana, in the charming village of Olmué in Chile's 5th Region, last November. It was wonderfully well organized by Wanda Quilhot of the Universidad de Valparaíso, with the sterling help of Cecilia Rubio and Fernanda Cavieres and their colleagues from the Universidad de Valparaíso.

Lichenologists from 14 countries (Argentina, Brazil, Canada, Chile, France, Finland, Germany, Mexico, New Zealand, Norway, Peru, Spain, Sweden and the United States) attended, and very quickly became a cohesive, friendly, responsive group, helped along by the warm, Chilean hospitality.

The Plenary Lectures included the following: History of lichenological exploration of the Southern Hemisphere, with special reference to Chile (D.J. Galloway); Perception of light quality and signal transduction in lichens (C. Vicente); Concerning “Pseudoroccellaceae” and parasymbionts of “Eurocellaceae” (G. Follmann); Lichen photobionts: sources of bioactive compounds (L. Xavier Filho); Photoprotector capacity of lichen compounds (E. Fernández, W. Quilhot, M.E. Hidalgo & C. Rubio); Bioinformatics and a Checklist of South American lichens (S. Calvelo & T. Feuerer). Beside these there were numerous oral contributions to symposia and contributed papers. A workshop held by G. Follmann introduced us to the family *Roccellaceae* (*Arthoniales*).

As respite from the lecture hall for a day midway through the Congress, the organizers planned a visit to Cerro La Campana for the adventurous. On a gloriously fine, early summer morning, a large contingent essayed the quite steep climb from the Parque Nacional La Campana Headquarters, up through fascinating vegetation to the little forest of *Nothofagus obliqua* var. *macrocarpa* (Roble de Santiago) that grows near the summit, with many reaching the bronze plaque set into a rock below the summit commemorating the ascent of the mountain by Charles Darwin in August 1834. Darwin's notes on the ascent recorded in his diary are equally valid today: “...the surfaces of many enormous fragments presented every degree of freshness, from what appeared quite fresh, to the state when lichens can adhere. I felt so forcibly that this was owing to the constant earthquakes that I was inclined to hurry from beneath every pile of the loose masses...” (Keynes 1988: 252–254). We saw many lichens, and had we had more time, I am sure we would have added considerably to the list compiled for the region by Redon & Walkowiak (1978).

In sum, this was a really good Congress, interesting, diverse, at times provocative, and always extremely friendly. The standard of papers presented was high, and showed, to this observer at least, that Latin American lichenology is alive and well and flourishing on several fronts. GLAL-6 will be held in Mexico and Maria de los Angeles Herrera Campos, very obligingly consented to be President and organizer of it.

Our warmest thanks must go to Cecilia and Fernanda for looking after us all so well and for making sure that everything ran like clockwork; and especially to Wanda and her team who made the Congress, and our stay in Chile, such a richly memorable one.

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David Galloway, New Zealand

4th Latin American Congress of Mycology, Xalapa (Mexico), May 13-17, 2002

The sessions of the 4th Latin American Congress of Mycology included a Lichen Symposium, organized by Susana Calvelo (Bariloche-Argentina), which covered various aspects of lichenology. Susana Calvelo provided an “Introduction to Lichenology in Latin-America”, which was followed by Orvo Vitikainen (Helsinki) on “William Nylander's contribution to the knowledge of Latin American lichens” and Maria de los Angeles Herrera-Campos (Mexico) on “The phytogeographic affinities of the Mexican species of *Usnea* Hill (1753)”. The symposium continued with the presentation of the results of collaborative research on the “Revision of the genus *Protosnea* Krog (lichenized Ascomycota): morphology, anatomy, chemo-taxonomy and a new species” by Susana Calvelo, Elfie Stocker-Wörgötter (Salzburg), Sandra Liberatore (Bariloche) and John Elix (Canberra), after which Elfie Stocker-Wörgötter spoke about her results on “Experimental biotechnology of lichen fungi: induction of polyketide pathways and formation of chemosyndromes in cultured mycobionts”. Last but not least Mark Seaward (Bradford) spoke on a subject of particular interest to Latin America in general, and Mexico in particular, namely “Biodeterioration of ancient monuments by lichens”. During the sessions on fungus diversity in Costa Rica, Robert Lücking talked about “Lichenized fungi biodiversity in Costa Rica: an eco-geographic extrapolation”, and two short presentations were provided by Arcelia Pliego on “Lichen floristic novelties for Mexico” and by Miriam Gómez Peralta on “Considerations about lichenology in Mexico”. The congress was an excellent opportunity for encouragement and valuable discussions between lichenologists interested in Latin America lichens, most of whom participated in a field trip to appreciate the magnificent archaeological monuments at El Tajín, where Mark Seaward could demonstrate some biodeterioration processes.

Elfie Stocker-Wörgötter, Salzburg, and Susana Calvelo, Bariloche

REVIEWS

Photobionts: diversity and selectivity in lichen symbioses

Andreas Beck, Bayreuth

Photobionts are the indispensable partners in lichen associations: usually hidden under a cortex of mycobiont plectenchyma, they are the solar power stations of lichens. As such they harvest light under an extreme range of ecological conditions, which might often be unsuitable for any of the symbiotic partners alone. Furthermore, the photobiont is required for the formation of the lichen thallus. The study of lichen photobionts is consequently generally a prerequisite to understand the biology of lichens, while correlating the mycobiont with the photobiont diversity is of interest in the evolution of either organismal group.

Our understanding of lichen photobionts has increased significantly in the past years, much as a result of the pioneering work by Tschermak-Woess (see ILN 34/2). With respect to the most common photobiont, *Trebouxia*, the detailed morphological characterizations by Gärtner (1985) and Friedl (1989) served as a starting point for molecular studies. It is possible to determine the photobiont identity without culturing the algae since DNA sequence data can be obtained from whole lichen DNA extracts by using algal specific primers. Nevertheless, algal cultures still supply important and independent characters and should be prepared at least when genetically unique photobionts are found. The introduction of molecular data resulted in an increase of studies on lichen photobionts since the mid-1990s. While the 'Recent literature on lichens' database lists 66 entries between 1990 and 1995 using the search string "photobiont" this amount increases to 82 entries between 1996 and 2001. The many contributions at IAL4 in 2000 turned a new leaf in the study of photobionts, and it is likely that the number of photobiont studies will increase steadily.

Cyanobionts

Studies of cyanobionts have focussed on *Nostoc*-containing lichen species belonging to the genera *Nephroma*, *Peltigera* and *Pseudocyphellaria*. Based on studies of the trnL^{UAA} intron, the occurrence of only one *Nostoc* strain is reported within individual lichen thalli (including bipartite and tripartite morphotypes) or among cephalodia of a single thallus (Paulsrud & Lindblad 1998, Paulsrud et al. 1998, Summerfield et al. 2001). This finding is consistent with the assumption of a single event of cyanobiont acquisition during the formation of the thalli and cephalodia. However, at least in *Peltigera venosa* different cephalodia of one and the same thallus may contain different *Nostoc* strains (Paulsrud et al. 2000), suggesting that the formation of a cephalodium can also involve an independent cyanobiont acquisition from the environment. The species studied were shown to be highly selective in their photobiont choice, as the species identity of the lichen, rather than its geographical origin, determined the *Nostoc* strain present. There was little or no spatial variation in the cyanobacterial symbionts of specific lichen species. However additional data seems to be necessary as these findings partly contradict data reported by Miao et al. (1997) who found two

different *Nostoc* strains in *P. membranacea* as based on 16S rDNA studies. On the other hand further support for selectivity comes from additional observations in *P. aphthosa*. Paulsrud et al. (2001) removed all cephalodia from thalli of this lichen and inoculated these with known strains of cyanobacteria. Nevertheless, all newly formed cephalodia contained the same *Nostoc* strain as found in those which were removed, a clear indication that the inoculated strains were not incorporated into the cephalodia.

Phycobionts

Based on 18S nrDNA analyses, and in agreement with ultra-structural data, Friedl (1995) erected a new class of green algae, the Trebouxiophyceae, representing a similar concept as the 'Pleurostrophyceae' sensu Mattox and Stewart (being a later synonym of Chlorophyceae due to its type species, *Pleurastrum insigne*). This class contains many lichen phycobionts and other soil algae, such as *Coccomyxa*, *Dictyochloropsis* and *Stichococcus*, as well as members of the polyphyletic genus *Chlorella*. The genus *Trebouxia* was shown to be heterogenous and should be split in two parts: *T. magna* and related species (e.g. *T. erici*), which are more closely related to *Myrmecia biatorellae* versus the other members of the genus *Trebouxia* (Friedl 1995, Friedl & Rokitta 1997). This is also corroborated by morphological characters, and a close relationship of *T. magna* to *Myrmecia* has already been suggested by Friedl (1989). As a consequence, the *T. magna*-group is referred to as a separate genus, namely '*Asterochloris*' (Rambold et al. 1998).

Most recent phycobiont studies dealt with lichens containing *Trebouxia* as algal partner, which is therefore the best studied lichen phycobiont. In the most recent ITS nrDNA phylogenies, the genus *Trebouxia* sensu stricto comprises five major clades, which encompass a single or several morphospecies. Two of these clades are closely related, while the relationships of the remaining are still unresolved (Friedl et al. 2000, Helms et al. 2001). Thus, four main groups exist in *Trebouxia* sensu stricto. Between the members of the *T. magna* group investigated so far, considerably less variation in the ITS nrDNA sequences has been reported (Piercey-Normore & DePriest 2001). Based on sequence and RFLP data the authors concluded that *T. glomerata*, *T. pyriformis* and *T. irregularis* are probably conspecific, as earlier suggested by Friedl (1989). However, ITS sequence data alone are obviously not sufficient to resolve the relationships in the *T. magna*-group. The *Coccomyxa* photobiont from six species of the basidiolichen *Omphalina* also exhibits a low rate of genetic change (Zoller & Lutzoni 2001). Interestingly, the photobiont showed a significantly lower rate of change than the mycobiont, which was revealed to be partly due to an accelerated rate of change in the latter as compared to aposymbiotic sister species.

Species diversity

It is currently difficult to estimate how many species of photobionts exist, even in the best known genus *Trebouxia*. Their number depends on the species concept applied. Using a two gene approach and a phylogenetic species concept, Kroken and Taylor (2000) suggested that there may be many more species than previously thought. If these findings hold true, the real number of *Trebouxia* species will increase considerably and it is likely that these species cannot be distinguished by morphological observations alone – due to the limited number of characters in unicellular green algae. Nevertheless, there are also new taxa in *Trebouxia* which can be circumscribed using morphological characters, as exemplified by *Trebouxia jamesii* ssp. *angustilobata* (Beck 1999). This subspecies differs significantly in both morphology and ITS nrDNA sequence from other *Trebouxia* strains

and the species rank would be appropriate here (in prep.). It is not yet shown if other *Trebouxia* strains with distinct ITS sequences also differ in morphology.

Sexuality

The occurrence of sexuality in *Trebouxia* has long been a question of dispute (Ahmadjian 1993), and sexual stages have only been reported in a very few studies (Ahmadjian 1967, Gallé 1968). New arguments for sexuality were recently provided by Kroken and Taylor (2000), whose multilocus DNA sequence dataset suggest recombination within a species of *Trebouxia*.

Coevolution and selectivity

Studies on coevolution focused on foliose and fruticose lichen genera. As a general rule, the mycobionts are more selective than the photobionts and therefore no cospeciation (congruent phylogenies of the two bionts) could be detected so far. However, it still remains to be investigated, whether cospeciation occurred in strictly vegetatively reproducing lichens. The degree of selectivity varies depending on the taxa studied and the taxonomic level of comparison. Within the genus *Letharia*, Kroken and Taylor (2000) observed selectivity of some fungal species for an algal species and of the genus *Letharia* for an algal species complex (*T. jamesii* sensu lato). All *Cladonia* species investigated by Piercey-Normore and DePriest (2001) had '*Asterochloris*' as photobiont, *Trapeliopsis* and *Pertusaria* species were associated with *Chlorella ellipsoidea* and *Trebouxia* respectively (Schmitt & Lumbsch 2001) and all members of the Physciaceae were constantly associated with *Trebouxia* species (Helms et al. 2001, Dahlkild et al. 2001). Within the Physciaceae, selectivity is not that pronounced at the genus level. While species of *Anaptychia* and *Physcia* were always associated with photobionts belonging to the same *Trebouxia*-clade (Helms et al. 2001, Dahlkild et al. 2001), species from more than one clade might be selected as photobionts in *Buellia* or *Rinodina* (Helms et al. 2001). The species of *Chaenotheca* form symbioses with even four different photobiont genera (*Dictyochloropsis*, *Stichococcus*, *Trebouxia* and *Trentepohlia*), but within one species only one photobiont genus is found (Tibell 2001). All these results, obtained by molecular studies, are well in accordance with data based on morphological observations (as compiled by Ahmadjian 1993). Further morphological studies identified *Dictyochloropsis symbiontica* as photobiont in four species of *Sphaerophorus* (Ihda et al. 1997), *Trentepohlia lagenifera* in all nine specimens of *Pyrenula japonica* (Nakano & Ihda 1996), three species of *Trebouxia* as photobiont in 83 specimens of six species of *Anzia* (Ihda et al. 1993) and only members of the *T. magna* group have been found in ten Japanese species of *Cladonia* (Nakano & Iguchi 1994). In 22 species of lichens growing in the supralittoral zone of seashores Watanabe et al. (1997) identified 14 species of Chlorophyta. *Trebouxia* was reported to be the most common photobiont, but lichens with algae that frequently occur free-living had various species of photobionts.

Lichen algae are shared among certain members of a community, and this may well be the reason for the lack of co-speciation in lichens (Beck et al. 1998, 2002). However photobionts do not occur randomly in the lichen species. Studies in the *Physcietum adscendentis* revealed the same photobiont species for *Physcia* and *Phaeophyscia* on the one hand and *Xanthoria* and *Lecidella* on the other (Beck et al. 1998). In consequence, these species specifically select their photobiont. The same applies to lichenicolous lichens. In only two cases the photobionts of lichenicolous lichens have been investigated together with the photobionts of their 'host lichen' (Friedl 1987 in *Diploschistes muscorum* and Tschermak-Woess 1980 in *Chaenothecopsis consociata*). Both studies

indicate, that the photobiont of the mature lichenicolous lichen is different from the original photobiont of its 'host lichen'. Morphological and molecular observations confirmed that the photobiont of the lichenicolous lichen differs in several cases from that of the 'host lichen', but identical photobionts have also been found (Beck 2000). Obviously other factors might be even more important for lichenicolous taxa than the photobiont (e.g. improved humidity, nutrient supply).

In green algal lichens, homogeneous and heterogeneous photobiont populations have been observed within one and the same thallus. Again this seems to be dependent on the species investigated. Kroken & Taylor (2000) report homogenous photobiont populations in *Letharia* species, and so did Beck & Koop (2001) for *Tremolecia atrata* and *Pleurosticta acetabulum*. However, Friedl et al. (2000) found small genetic differences between algal clones isolated from *P. acetabulum* and Souza-Egipsy et al. (2000) report different photobiont species in a single thallus of *Squamaria lentigera*. The heterogeneous populations may reflect fusions of young thallus primordia containing different photobionts. This could explain growth variation among individual lobes of *Parmelia* species as observed by Armstrong and Smith (1992), highlighting the importance of photobiont analysis also in physiological studies of lichens.

Another interesting aspect of molecular studies in lichen photobionts is their contribution to the understanding of group I-intron evolution. Results by Bhattacharya et al. (1996) and Friedl et al. (2000) suggest that these introns were present in the common ancestor of the Chlorophyta and were in general either stably inherited or lost. But within the genus *Trebouxia* several lateral transfers of this intron have occurred as suggested by incongruence between intron and nrDNA phylogenies. Therefore *Trebouxia*-species represent an excellent model for the study of intron evolution and lateral transfer.

Future perspective

Undoubtedly, more work on the identity of lichen photobionts is necessary to assess their geographic and ecological ranges in more detail, as well as their use as indicators of phylogenetic relationships of lichens (Rambold et al. 1998). Honegger (2001) estimates that the photobiont has been determined to the species level in less than 2% of the lichens known. Moreover, most photobiont records available to date are from lichens in temperate regions in the northern hemisphere, while only very limited data is available for tropical lichens (e.g. Stocker-Wörgötter 1998) or lichens from the colder parts of the southern hemisphere (Aoki et al. 1998, Romeike et al. 2000). It will be an important task of upcoming studies to identify which factors are influencing the photobiont choice of a given mycobiont taxon. To allow a better overview and improve access to the existing photobiont records, it will be necessary to set up a database for the storage of mycobiont - photobiont connection data which should be linked to the LIAS database to combine traits of the mycobiont with its photobiont selection.

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A note on the distribution of lichenologists

Martin Grube, Graz

A study on the distribution of lichenologists can only be started after it is clear what a lichenologist is? If lichenologist could be any mycologist, studying the association with algae, this might be a too simple answer, as many lichenologists do not stem from a purely mycological background. Furthermore, lichens, as in the past, continue to be studied separately from the fungi in so-called “lichenological centers”. However, lichens display many unique features, in for example the thallus morphology and physiology, which are not comparable in other fungal groups. Only after the integrative efforts, starting with Nannfeldt and Santesson (antedated only by ideas of Vainio), lichens entered more and more into the mycological arena. While it was more common in the past to see lichenological articles in bryological journals (a tradition still maintained in *The Bryologist* for example), an increasing number of lichen articles is now published in originally mycological journals – beside the contributions in molecular periodicals. In recent mycological congresses, lichenological investigations are often presented under diverse symposia, which are not focusing on lichens. Is this the lichenologists diaspora into other scientific fields? Certainly not. Lichenologists still feel part of a large scientific family, glued together by the interest in the lichen symbiosis.

Spatial distribution of lichenologists

Though lichenological research centers exist - as will be shown below - lichenological research of today is more decentralized as in the past. We find lichenologists scattered at different places and in different countries. The nomadism of contemporary scientists adds to this, and while some lichenologists are lucky in getting a stable job and may be affiliated to an institution for their lifetime, others are ephemeral in the field or move rapidly to wherever their research is funded. While many lichenologists move in their own country to continue lichenological activities, particularly in the USA, there are some noteworthy international movements. Several younger colleagues moved from European

countries to the USA (in particular the Field Museum, Chicago), to the UK (Natural History Museum, London) or within Europe to Norway (Botanisk Institutt, Bergen).

To find out more about where lichenologists are distributed, we may follow several paths. First, there is an address list provided by Cliff Smith (Honolulu) on the web, which currently includes c. 750 people. I will focus here on a closer circle of lichenologists, as represented by members of IAL, and will base the following enumerations on the address list which I received from the IAL Treasurer. The IAL membership list is continuously updated; currently it includes 472 members, 9 of these are not persons, but institutions. The 463 lichenologists of IAL are very unevenly distributed over the countries of the planet, as is shown in Table 1. Most lichenologists are from the European community, but the country with the highest absolute number of IAL members is the USA. When these absolute figures are divided by the number of the total population of each country, we get some surprising results. Iceland, Estonia and Norway are the countries with most IAL members per total population (but this may rapidly change if a small country gets a new member of IAL).

The gender question will be treated in a forthcoming contribution, hence only a few counts are mentioned here. Among the countries with more than two IAL members, Argentina, Slovakia, and Brazil have the highest female proportion, with more than 70% women. Several countries have a balanced figure, whereas some have a significantly low percentage of female IAL members: Germany (32%), Norway (32%), The Netherlands (29%), Czech Republic (25%), Austria (23%), Sweden (17%), and Italy (17%).

Table 1: The numbers of IAL members per country.

USA	87	Brazil	7	Venezuela	3	Latvia	1
Germany	57	Estonia	7	Belgium	2	Lithuania	1
Spain	32	India	7	Greece	2	Mongolia	1
Sweden	24	The Netherlands	7	Iceland	2	Pakistan	1
UK	24	Australia	6	Israel	2	Philippines	1
Russia	23	Finland	6	Mexico	2	Portugal	1
Japan	20	Italy	6	Ukraine	2	Slovenia	1
Norway	19	New Zealand	6	Azerbaijan	1	South Africa	1
Canada	16	Argentina	4	Bulgaria	1	South Korea	1
Austria	13	Czech Republic	4	Chile	1	Tajikistan	1
Switzerland	10	Slovakia	4	Ethiopia	1	Taiwan	1
France	10	Denmark	3	Luxemburg	1	Tanzania	1
Turkey	8	Croatia	3	Georgia	1	Thailand	1
Poland	9	Hungary	3	Ireland	1	Uruguay	1
China	8	Romania	3	Korea PR	1	Yugoslavia	1

“Centers”

If we have a look at the aggregation of IAL members in cities, we may consider lichenological centers. Twenty four cities have more than 3 IAL members and Table 2 gives their absolute numbers. However, the term “center” must not be oversimplified, because it may only be applied when the persons in these cities are active as lichenologists. Moreover institutions with important collections but fewer lichenologists can also be regarded as “central” to lichenology.

Table 2: Cities with more than 3 IAL members.

Barcelona	7	Durham	9	Kiel	4	Madrid	12	Tartu	4
Bayreuth	4	Essen	4	Köln	5	Moskwa	4	Tempe	4
Beijing	4	Graz	5	London	6	Oslo	4	Umeå	6
Bergen	8	Helsinki	4	Lund	4	Paris	4	Uppsala	5
Corvallis	5	Kaiserslautern	5	Madison	4	St. Petersburg	8	Zürich	4

Activity in terms of publications

One way to assess not only the number of lichenologists but also their scientific activity is to evaluate the number of lichenological publications. This is possible by querying the Recent Literature on Lichens Database (RLL) maintained by Einar Timdal in Oslo. This fairly complete compilation is continuously updated and emended backwards in history. At present, 23011 records are included in RLL. The following analysis is restricted to the period 1996-2001. During these 6 years, a total of 4664 publications was included in the lichenological literature. Table 1 shows the contribution of IAL members to these publications. The figures must not be confounded by publications per country, which would not consider co-authorships. In fact, lichenologists represent a strongly networking community and more commonly than in the past, papers are co-authored by several authors, often from different countries and different research areas. Between 1996 and 2001, German authors contributed to 596 publications, followed by the U.S.A. (475 publications), U.K. (281), Sweden (225), Spain (215), and Austria (199). A better estimation of individual activity of IAL members could be by listing countries according to the number of publications per number of IAL members in a country. The leading three countries in this respect would be Australia (192 publications / 6 members), The Netherlands (160 / 7) and Luxembourg (20 / 1).

Of the 4664 publications in 1996-2001, 1486 match the substring "lichen" anywhere in the title, keyword, or abstract fields. Despite this is not the main purpose of this note, I wondered whether research interests in lichenology are apparent from enumerations of keywords used in these publications. The most frequently used keywords were as follows: "air pollution" (in 298 publications), "lichenicolous" (154), "Spain" (149), "Russia" (120), "Italy" (119), "book review" (119), "Australia" (119), "bioindication" (114), "conservation" (113), "water relations" (109). This result needs careful interpretation. It is somehow surprising to see "lichenicolous" at second position. However, there are not many related terms in this case, whereas work related to air pollution could use a number of similar terms, e.g. bioindication, air quality, etc. If the names of the countries are used to query the RLL database, the results show that these are mostly floristic and taxonomic contributions. These are not necessarily all published by authors from these countries, but suggest that there is a particular interest in their local lichen flora.

Local Societies

More lichenologists than IAL members are members of local lichenological societies. Beside the coverage of more than one country (e.g. by BLAM or NLF), lichenologists may be members of more than one local society, and some local societies are shared both by lichenologists and bryologists (e.g. BLAM and ABLs). This makes it difficult to assess the total number of lichenologists – with a much higher rate of amateurs – by summarizing local memberships. Nonetheless, a look to the number of persons in some local lichenological societies indicate how many more lichenologists there are; for example,

while only 6 persons from Italy are members of IAL, the rapidly grown Società Lichenologica Italiana has 326 members, of which only c. 30 are not Italians.

Table 3. Local societies and their numbers of members.

Local Society	Total number of members (female proportion, where available)	Number of foreign members
AAL (New Zealand, Australia)	86 (26%)	34
ABLS (USA)	361 (?)	224
BLAM (Austria, Germany, Switzerland)	363 (22%)	80
BLS (Great Britain)	577 (?)	299
Bryolich (Switzerland)	235 (29%)	114
Czech Bot. Soc., Bryol. Lich. Sect.	73 (53%)	10 (from Slovakia)
Californian Lichen Society (USA)	191 (43%)	8
Dutch Bryol. Lichenol. Soc. (The Netherlands)	316 (20%)	35
Eastern Lichen Network (USA)	62 (35%)	13 (11 of these from Canada)
GLAL (Latin American countries)	40 (70%)	0
JSL (Japan)	84 (30%)	10 (all honorary members)
LSJ (Japan)	154 (17%)	9
NLF (Scandinavian countries)	181 (35%)	69
Northwest Lichenologists (USA)	100 (c.50%)	5
Polish Bot. Soc. – Lich. Sect. (Poland)	50 (60%)	3
SEL (Spain)	51 (51%)	0
SLF (Sweden)	107 (17%)	1
SLI (Italy)	326 (?)	30
TLT (Turkey)	33 (42%)	1

This note can only give an impression of the world-wide distribution of IAL members. The higher number of lichenologists in local societies promotes our science from a broad basis and it is one of the primary goals of IAL to further strengthen this, e.g. by efficient information exchange among the societies and people.

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A History of Lichenology: why we need a new one

David J. Galloway, New Zealand

It is a common and well-founded belief amongst taxonomists of any group, that it is fundamentally necessary for a real comprehension of one's own particular Science, to assemble as deep an understanding of the Science's history and development as possible, given the practical and information constraints of the era and place in which one works.

When historical matters form as important a framework as they directly do for the practising taxonomist of whatever discipline, this belief hardly requires support or explanation.

Twenty one years ago I was invited to participate in a meeting in London on the subject "History in the service of systematics" convened by the Society for the Bibliography of Natural History [now the Society for the History of Natural History], and as my contribution to that meeting I gave a preliminary discussion of the long and fascinating correspondence between Erik Acharius and Olof Swartz, that documents the evolution of their ideas on the abandoning of the old collective genus *Lichen*, in favour of a new system and concept of genera in Lichenology. At the same meeting the late Joe Ewan, doyen of the North American Historical Botany, commented "...History is insurance: against wrong association, wrong inference, and ultimately the wrong decision..." (Ewan 1981).

As a landmark starting point for a History we have Krempelhuber's classic work on the history and literature of lichenology from the earliest times up to 1870 (Krempelhuber 1867-1872). Although it is a marvellous compendium of information, it is of course 130 years out of date and worse, now extremely difficult to obtain. Besides, Krempelhuber restricted himself to the published record then available to him, and made no efforts to dig any further below the surface in terms of the great wealth of unpublished material present in archives, libraries and herbaria. Annie Lorraine Smith's introductory chapter on the history of lichenology is also an excellent brief survey (Smith 1921: 1-19) but is only the briefest of introductions, and of course is over 80 years old. The whole field of 20th century lichenology still awaits an historical record.

Lichenologists in the latter part of the 20th century have been much more successful in terms of documenting the beginnings of lichenology. Today we have available to us, almost as never before, the tools necessary for reviving, researching and recording the past history (including the very recent past) of our subject. For instance, our knowledge of the Linnaean period is now much greater thanks to the painstaking work of Per Magnus Jørgensen, and his colleagues (Jørgensen et al 1994, Jørgensen 1999), and the history of European lichenology from the time of Acharius onwards is now much better known than it was formerly (see for example Galloway 1981, Hale 1984, Hawksworth & Seaward 1977, Nimis 1993, Arvidsson 1999), as sources of correspondence, and early herbaria are re-discovered, curated, assessed and analyzed. Yet a great deal more of filling in the gaps of exploration, curation, communication and publication remains to be done. Should it be done? Is it worth it? I most certainly think that it is.

To be in touch with our past, with our history, is a fundamental mark of the vitality of our subject at every level, with advances in any area being necessarily dependent on and building upon, what has gone before. The past informs both the present and the future and we neglect our history at our peril. Over the years at various times and in different places, I have discussed an update of *Krempelhuber* with Per Magnus Jørgensen, Lars Arvidsson, Roland Moberg and Ingvar Kärnefelt, lichenologists who are both interested in and knowledgeable about the history of lichenology. We have all been enthusiastic about the possibility of such an undertaking, but have tended to put off any definite sort of decision on it until "later on", in the face of more immediate and pressing problems. In so many ways I feel that the time is ripe NOW to capitalize on a wide interest in the history of lichenology, and to formalize this interest in a grand cooperative project, viz. a modern History of Lichenology spanning the 350 years from the publication of Linnaeus's *Species Plantarum* (Linnaeus 1753) up to the end of the 20th century. We now have active lichenologists working on all continents, and our knowledge of the history of regional

lichenology is now greater than it has ever been previously. Unless we do something positive about harnessing this knowledge, then it will so easily be lost and the opportunity for "completeness" will not easily come again.

For example, in the last 10 years we have lost several major lichenologists (e.g. Mason Hale, Gunnar Degelius, Ove Almborn, Elisabeth Tschermak-Woess, Josef Poelt) who we never interviewed by tape recorder, or solicited from them a detailed personal history of their lichenological careers and the circumstance and people that shaped them. These are lost opportunities that subsequently, may be both difficult and time-consuming to recreate.

Nor, I suspect, do we take much cognizance of our own personal lichenological histories. Alex George a few years ago, highlighted the importance of keeping records that will be useful to future historians and asked the pertinent question "...what are we doing for those who come after us?". He listed the sorts of records that we should be keeping, so that future historians may have an easier task than us, as being the following: correspondence; journals and diaries; manuscripts; records of telephone calls; e-mail; Visitor books; field books; personal publications (George 1990). These personal records are often neglected or destroyed, and a potential historical resource is lost.

The above then, are random thoughts on why I think we need a good modern History of Lichenology. I would suggest that this proposed new History of Lichenology should be a cooperative venture of the IAL, We have on-line databases of herbaria resources, of lichen checklists, of journals and newsletters. Why not a History?

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LICHENOLOGY-ON-LINE

The Australian lichen checklist has been updated for 2001 with many new national, state and territory records and nomenclatural changes. It can be viewed at www.anbg.gov.au/abrs/lichenlist/introduction.html. The list now contains 3075 accepted names, a net increase of 198 taxa since the end of 2000.

Pat McCarthy, Canberra

As a result of a project on the lichen flora of Slovenia lead by Helmut Mayrhofer, an on-line database for lichens in Slovenia (SLIC) is available at dbiodbs.univ.trieste.it/web/slo/sl_home. The database, compiled by J. Pruegger and U. Suppan, includes more than 15000 records of lichens from Slovenia. Via the web, detailed information is available about localities (including a thesaurus of historic names). The locality data can be retrieved as full text or as Gauss-Krueger coordinates, which are available for a large number of recent collections. The database also includes a compilation of relevant lichenological literature for Slovenia.

News from the 'Recent Literature on Lichens' (RLL) database (www.nhm.uio.no/botanisk/bot-mus/lav/): The updated data set of Mattick's Literature Index now includes 9477 records, and the RLL database reaches back to 1536. A new server at www.nhm.uio.no improves the performance of the system.

Martin Grube, IAL Editor

As from end of August 2002 a new feature will be added to ITALIC, the information system on Italian lichens. This is an interactive page for facilitating the identification of lichens. The user has first to select the phytoclimatic portion of Italy where the lichen has been collected, and the type of substratum. After this, a second page appears, containing a series of selected morphological and chemical characters. The user has to specify a series of characters which fit the lichen under investigation, receiving in return a list of species which share a given combination of characters. When the list is shorter than 9 species, the user can ask for a dichotomic key, complete with automatically generated descriptions. An iconographical archive containing more than 2500 digital photos of ca. 1650 species is also available to facilitate the identification. For the moment, the database is limited to all (ca. 450 species) terricolous lichens of Italy. ITALIC can be found at: dbiodbs.univ.trieste.it/

P.L. Nimis & S. Martellos, Trieste

Downloadable at eee.uci.edu/~papyri/bibliography is practically every significant historic text published in Latin since the 14th century. This includes, for example, those of Linnaeus (e.g., Species Plantarum), HBK (e.g., Nova Genera & Species Plantarum), De Candolle (e.g., the entire Prodrromus), Martius (e.g., the entire Flora Brasiliensis), and such pre-Linnaean name sources as Tournefort's "Institutiones rei herbariae".

Mats Wedin, Umea

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: 0.25 USD per number (3 per volume); vol. 2-8: 0.50 USD per number (2 per volume); vol. 9-13: 1.00 USD per number (2 per volume); vol. 14-17: 1.50 USD per number (2 per volume). Back issues from vol. 20-29 are available for 1.00 USD 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 for vols. 1-29 to be sent to H. Sipman, Bot. Garten & Bot. Museum, Königin-Luise-Strasse 6-8, D-14191 Berlin, Germany, fax: (+49) 30-84172949, e-mail: hsipman@zedat.fu-berlin.de. For later issues contact the Editor.

Lichens-L is the official mailing list of IAL. You can subscribe by sending an e-mail to listproc@hawaii.edu with the message "SUBSCRIBE LICHENS-L YourFirstName YourLastName".

The cover-page illustration

The cover was reproduced from Ulf Arup's thesis with his kind permission. The illustrations shows several maritime *Caloplaca* species. The large thallus to the lower left shows *Caloplaca verruculifera*. The small ascomata to the left above *C. verruculifera* are from *C. inconspicua*. Right of these is a small fragment of *C. luteominia* and the larger, lobate, and apotheciate thallus of *C. brattiae*. Underneath, and at the lower right are thalli of *C. rosei*, which partly border the right margin of *C. marina*. The uppermost row shows, from the left to the right, the areolate thallus of *C. litoricola*, a small lobate thallus of *C. brattiae*, the loose thallus of *C. bolacina* and to the very upper right, a thallus of *C. luteominia*.

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