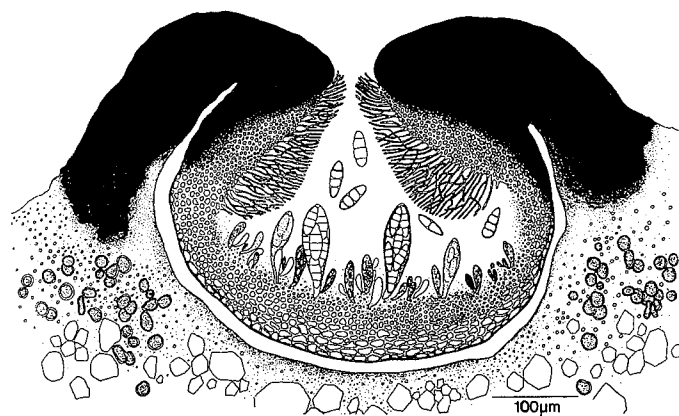


# INTERNATIONAL LICHENOLOGICAL NEWSLETTER

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The opinions expressed in the Newsletter are not necessarily those held by the International  
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## 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 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 or become members of IAL are requested to send their subscription (one payment of \$40 US 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) **Review**: presentation of recent progress in particular fields of 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 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 4 Symposium (Barcelona, Spain, 2000) are listed below, and will serve until 2004.

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## ASSOCIATION NEWS

In addition to the instructions you will find in the latest issue of the International Lichenological Newsletter (ILN 33/2: 49), to pay your IAL dues of 40 USD for the 2001-2004 period, it is now possible to make this payment by transferring funds directly from your bank account to the IAL account in Switzerland. Our Assistant Treasurer, Christoph Scheidegger, is responsible for this account. If you choose this mode of payment, you will need the following information:

## IAL-account

Bank : Schweizerische Nationalbank Bern BC 001158  
Account : Z.G. K+R 1530-5-030, WSL 11490.334.001  
Note: 1158.11 - IAL members

Your name **MUST** appear on the bank transfer or else it will be very difficult for Christoph to track down who has paid their IAL dues, and there is the possibility that we will never know that you did pay your dues. It is also important that the entire note - including "IAL members" is written on the transfer slip. IAL members who pay by bank transfer could also send a message to Christoph to double check that the transfer was done successfully.

Francois Lutzoni, Treasurer

## New Acharius medallists

**Teuvo 'Ted' Tapio Ahti** was born in 1934. His wide scientific activity is demonstrated by more than 250 publications, in many fields of botany and mycology and with a special focus on the Cladoniaceae. I would like to point out one of his works published this year, which is an impressive study about the family Cladoniaceae from the Neotropics, which includes 184 species. He has also published on non-lichenized fungi, mosses, as well as contributed articles in vegetation sciences. He has done extensive field work in Europe, Asia, Canada and South America.

Ted Ahti defended his doctoral thesis "Taxonomic studies on reindeer lichens (*Cladonia* subgenus *Cladina*)" in 1961, and was appointed curator of cryptogams at the Botanical Museum (H). He also worked there as deputy head curator of phanerogams between 1965-1968, and continued as head curator of the division of cryptogams by 1969. Ted became Professor of Cryptogamic Taxonomy at the University of Helsinki in 1979, and Research Professor of the Academy of Finland in 1991. Between 1975 and 1981 he was president and is currently Honorary President of the IAL.

An important point I would like to raise is that Teuvo Ahti shares his vast knowledge with a great humanity. All of us who had the fortune to meet him were impressed by his personality and charisma. He is always ready to help anyone and his advice has always been a great value for all of us. So, by this my sincere congratulations.

Ana Rosa Burgaz, Madrid

**Georges Clauzade** was born in 1914, in Marseille, France. He graduated in Natural Science in 1935 and became *Agrégé de Sciences Naturelles* in 1937, after which he began a teaching career in the State School (Lycée) of Apt. There he completed his training as a naturalist, acquiring an extensive knowledge of botany, zoology and geology. Through teaching, his exceptional education was passed on to students while he instructed them on the identification of plants, insects, galls, minerals, and rocks. However, Georges Clauzade realized that he was unable to name most of the lichen specimens collected by his students. Faced with a new challenge, he embarked on the personal quest for a better knowledge of lichens, a group of organisms very well represented in Provence, his native region.

It should be noted that in post-war France lichenology was not at its best; Bouly de Lesdain, des Abbayes, and Dughy were perhaps the only scientists working in this field in France at that time. After the fading of the golden age of Italian lichenology, the situation was very confused. Harmand's "Lichens de France" was the only comprehensive source of information. However, not only was this book difficult to obtain, it was also difficult to use for specimen identification. The information and the herbaria for the study of Mediterranean lichens were dispersed and difficult to access, and only Sbarbaro in Italy, Tavares in Portugal and Werner in Morocco focused on Mediterranean lichenology. In his search for more information, Georges Clauzade visited the *Musée des Sciences Naturelles de Paris*, where Valia Allorge introduced him to Bouly de Lesdain (1869-1965), who, by this time, was aged but still active, despite the fact that his entire herbarium and library had been burnt to the ground in the air raid over Dunkirk. Under Bouly's guidance, Georges Clauzade acquired a solid grounding in lichenology.

He then solved a number of taxonomic problems of Mediterranean lichens, mainly in Provence and in SE-France. Between 1948 and 1966, Georges Clauzade collaborated frequently with Y. Rondon, another lichenologist from Provence. Although he was somewhat cut off in Apt, and later in Cavaillon et Gordes, he exchanged material and reprints with leading lichenological centres all over the world. His collection of material on lichens was not limited to the Mediterranean region but covered also the Pyrenees, Mont Aigual, Cévennes and the French Alps.

In 1970, he updated Harmand's book by recent taxonomic changes together with his own experiences and published a new lichen flora of France: "Les Lichens" (Ozenda & Clauzade 1970), which marked the starting point of a new era in Mediterranean lichenology. It was later updated in the "Likenoj de Okcidenta Eŭropo" (Clauzade & Roux 1985). This book is still a key reference for determination of lichens and the reason why most Mediterranean lichenologists learned some Esperanto.

Around 1968, he began to train several Mediterranean lichenologists in the field and in the laboratory, e.g. Claude Roux, Juliette Asta, René Rieux and myself, and his 'grandsons' Bricaud, Ménard, Coeur, Abbassi-Maaf, Hladun, Gómez-Bolea, etc.

His herbarium, rich in Mediterranean material and incorporating the post-war herbarium of Bouly de Lesdain, is now located in Marseille (Herbarium MARSSI, Roux). Georges Clauzades published work includes 53 papers and four books, all of which are essential reading to understand the lichens of SW Europe.

His effort to improve the classification of Mediterranean lichen flora, his publications, his herbarium, his devotion to training lichenologists, and his spirit of collaboration qualify Georges Clauzade as an exceptional candidate for the Acharius Award.

## References

- Ozenda, P. & Clauzade, G. (1970) *Les Lichens. Etude biologique et flore illustrée*. 801pp. Paris: Masson & Cie.  
 Clauzade, G. & Roux, C. (1985) *Likenoj de okcidenta Eŭropo*, ilustrita determinlibro. *Bull. Soc. Bot. Centre-Ouest, n. sér., num. spéc. 7*: 1-893.

Xavier Llimona, Barcelona

**Nina Sergeevna Golubkova**, DSc, Professor, Honoured Scientist of Russian Federation, Vice-President of Russian Botanical Society, started her lichenological activity in 1955 taken on post-graduate at the Komarov Botanical Institute in Leningrad. At that time Prof. Vsevolod Savicz was the Head of the Department of Non-vascular Plants. He became her first teacher and the scientific supervisor of her PhD thesis "Lichens of Moscow Region". Having defended in 1962 Nina Golubkova continued to study lichens of the European part of Russia, resulting in her first monograph "Handbook of Lichens of European Russia" (Golubkova 1966).

By the beginning of the 1960s, while the huge material of Antarctic lichens gathered during the first Soviet Antarctic expeditions accumulated at the Komarov Botanical Institute, Prof. Savicz suggested that Nina Golubkova should investigate these. Nina Golubkova published eleven papers on lichens of this region. At the same time she studied lichens of another 'white spot' – cold high mountain deserts of the Pamir.

Important contributions to lichenology were her famous studies on the lichens of Mongolia. From 1970 to 1974, she traveled all around the Mongolian steppes, deserts and mountains collecting thousands of lichen specimens. The results of this work were published in the number of papers and two books (Golubkova 1981, 1983). In 1984 Nina Golubkova defended the DSc thesis "Genesis of Lichen Flora of Mongolia". A continuation of her taxonomic studies of arid lichens was the monograph on *Acarosporaceae* in the USSR (Golubkova 1988).

Furthermore, Nina Golubkova made an important contribution to the theory of lichenology. Evolving of the ideas of Alexander Elenkin about the nature of lichens symbiosis and evolution of lichen thallus structures she has elaborated a system of biomorphological forms of lichens.

Nina Golubkova always combines her scientific work with pedagogical activity. More than twenty Ph.D. theses were defended under her supervision. Now her disciples work all over the states of former Soviet Union. Presently Nina Golubkova is preparing a Chapter on *Bacidiaceae* for the next volume of the Handbook of Lichens of Russia. She is an Editor-in-Chief of this issue as well as the year-book "Novitates Systematicae Plantarum non Vascularium". Besides that, Nina Golubkova is a formal Head of the Laboratory of Lichenology and Bryology of the Komarov Botanical Institute and an informal leader of all Russian lichenologists.

## References

- Golubkova, N. (1966) *Handbook of Lichens of European Russia*. 256 pp. Moscow, Leningrad: Nauka. [In Russian].  
 Golubkova, N. (1981) *Outline of Lichen Flora of Mongolian People Republic*. 200 pp. Leningrad: Nauka. [In Russian].

Golubkova, N. (1983) Analysis of Lichen Flora of Mongolia. 248 pp. Leningrad: Nauka. [In Russian].

Golubkova, N. (1988) Lichen Family Acarosporaceae Zahlbr. in the USSR. 133 pp. Leningrad: Nauka. [In Russian].

Yuri Kotlov, St. Petersburg

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### NEWS

#### The E. Frey lichen herbarium has moved to G!

The lichen collection of Eduard Frey (1888–1974) with more than 30.000 specimens is one of the most important lichen herbaria in Central Europe, especially for the study of the

lichen flora of the Alps. Originally, the herbarium was stored in the private house of the famous lichenologist in Münchenbuchsee close to Bern. After the death of E. Frey in 1974, the herbarium was bought by the University of Bern and became, between 1978 and 1995, the center of the Cryptogamic department where two generations of lichenologists have been trained. In September 2000, after the Cryptogamic department in Bern was closed, the herbarium Frey has been given to the Conservatoire et jardin botanique of the city of Geneva (G). This herbarium is thus now housed at G and will be little by little integrated into the general collection. In the future all loan requests should be addressed to the Conservatoire et jardin botanique of Geneva. The whole story can be read in a small paper published in Meylania 19.

Philippe Clerc, Keeper of the Mycology herbarium at G

#### The Lichen Collection at the Michigan State University Herbarium (MSC)

Michigan State University Herbarium (MSC) houses an extensive lichen collection of c. 110.000 accessioned specimens. The collections include over 15.000 specimens from the Caribbean islands, 12.000 from southern South America (e.g. Falkland Islands, Juan Fernandez Islands, Fuego-Patagonia, Isla de los Estados (Staten Island)), and c. 6.000 from Australasia (mainly from South Island, New Zealand and the New Zealand shelf islands) and Isles Kerguelen. There is also a large collection (c. 2.500) from the Canary Islands. Other important collections are from North America (c. 57.000), with around half of these originating from the Great Lakes Region, and an extensive collection from alpine regions of western North America.

This extensive collection was mostly assembled between 1950 and 1970 by Henry A. Imshaug and his graduate students (who included I. M. Brodo, R. C. Harris, K. Ohlsson, R. Taylor, and C. M. Wetmore), but has never been easily accessible to researchers. However, a recent U. S. National Science Foundation (NSF) award (No. DBI-9808735, Alan Prather, PI), has led to the re-activation of the collection, which is now fully accessible through visits and loans. Over the last three years many lichenologists have visited MSC, courtesy of the NSF award, to conduct specimen-based research (i. e. Jutta Buschbom, Irwin Brodo, Philippe Clerc, Tassilo Feuerer, Katherine Glew, Hannes Hertel, Frank Kauff, Jolanta Miadlikowska, Roar Poulsen, Ulrik Søchting, and Clifford Wetmore). The herbarium now has an active loans and exchange program for its lichen collection and has also recently hired a lichenologist, Alan Fryday, as a full-time Assistant Curator. We encourage loan requests from institutions where lichen taxonomic and floristic projects are ongoing.

The accessioned specimens are superbly curated – only 100% rag paper used, one specimen per herbarium sheet, pre-printed labels that for the Sub-Antarctic collections included a map indicating the collection location – and many thousands of sheets also contain thin-layer chromatography (tlc) data. The collection is now filed alphabetically by genus, within each genus by species, and then by geographic region (i.e. N. America, Michigan, Caribbean Islands, Central & South America, Australasia and Old World) in colour-coded folders.

When Henry Imshaug retired in 1990 there were still a large number of unaccessioned specimens requiring a considerable amount of re-organization. In the past ten years approximately 60.000 specimens have been sent out on exchange or as gifts, thousands of

unfiled and/or unaccessioned specimens have been organized and refiled and about 30,000 specimens accessioned into the herbarium. A further c. 30,000 collections (mostly from N. America, southern S. America, and Australasia) remain unaccessioned and are stored in cardboard boxes housed, temporarily, in a separate room. Members of the herbarium staff are working on accessioning these valuable specimens and distributing the duplicates to other herbaria. Visitors are welcome to study these unaccessioned collections.

See also: <http://www.bpp.msu.edu/herbarium/index.html>.

Alan M. Fryday and L. Alan Prather, East Lansing

### New Lichen Society in North America

Lichenologists in the Pacific Northwest of North America recently reorganized themselves into Northwest Lichenologists (NWL), subsuming the Northwest Lichen Guild. NWL is a nonprofit tax-exempt corporation. It has the following goals: facilitate communication, sponsor meetings, and conduct field trips for lichenologists interested in the Pacific Northwest. We include both amateurs and professionals. We promote and encourage professional training, growth, and renewal. We seek to maintain and promote high standards of performance in field lichenology, through a certification program in the Pacific Northwest. We define the Pacific Northwest as the region along the Pacific coast of North America from northern California to Alaska, inland through British Columbia and western Montana.

Our current officers and board members are Daphne Fisher Stone, President; John Davis, vice-president; Bruce McCune, secretary and treasurer; and board members Abbey Rosso, Andrea Ruchty, and Linda Geiser. Our postal address is 1840 NE Seavy Ave., Corvallis OR, 97330, USA. Our email address is [mccune@proaxis.com](mailto:mccune@proaxis.com). The new editors of our occasional newsletter are Katie Glew, Gayle McHenry, and Dana Ericson. Please send contributions to Katie at [kglew@ups.edu](mailto:kglew@ups.edu).

Our web-site [www.nwlichens.org](http://www.nwlichens.org) is an information resource. We sponsor a workshop and an annual general meeting every year. The annual meeting is in March, in conjunction with the Northwest Scientific Association. We also sponsor field training and certifications. Upcoming events are listed on the web-site.

Similar to the NW Lichen Guild, NWL is not a members organization – no dues, no members. The organizers wanted to avoid unnecessary bureaucracy. None of us wanted the hassle of collecting annual dues and keeping membership lists. Instead, we keep an email list of interested people. If you are not on the list, but want to be, please email your request to Sherry Pittam at [pittams@bcc.orst.edu](mailto:pittams@bcc.orst.edu).

To post items of regional interest to the email list, send the message to: [lichen\\_guild@scarab.cordley.orst.edu](mailto:lichen_guild@scarab.cordley.orst.edu). The message will be broadcast to everyone on the email list.

We encourage participation by anyone interested in the lichens of the Pacific Northwest of North America. You can participate in the following ways: come to the meetings; lead, host, or participate in training or workshops; become certified in macrolichens of the Pacific Northwest; keep your address up-to-date on the email list; volunteer as an organizer; and contribute to our electronic newsletter.

Bruce McCune, Corvallis

### "Here designated" is now mandatory in new typifications!

The authors and editors of taxonomic papers should pay attention to an addition made into the International Code of Botanical Nomenclature (2000: 7: Art. 7.11) concerning the indication of new typification: "...designation of a type is achieved only if...the type element is clearly indicated by direct citation including the term "type" or an equivalent, and, on or after 1 January 2001, if the typification statement includes the phrase "here designated" (hic designatus) or an equivalent".

Now every time you make (or think you may make) a new lectotypification, neotypification or epitypification, or just typification (in case of genera or other supraspecific ranks the words lectotypification etc. are not used), it is mandatory from 1 Jan 2001 to indicate "here designated" (or equivalent). Otherwise the typification is not valid. Actually every time when you cite "lectotype" etc. it is useful to cite the author, date and publication of typification. Note that unpublished typifications (often seen on herbarium labels) are always invalid. However, Art. 9.8 (with Ex. 3) is still retained in the Code. It reads that "the use of the term defined in the Code as denoting a type, in a sense other than that in which it is so defined, is treated as an error to be corrected". Ex. 3 gives an example where use of "holotype" is an error to be corrected to lectotype. In case of such correction of typification published after 1 Jan 2001 it is wise to cite "here designated" to be sure that the corrected typification is valid. Incorrect use of holotype is not uncommon in lichenology, since it can be very tricky to distinguish between holotype and lectotype in pre-1953 names if no specimens or herbaria were exactly cited. It is now advisable to designate a lectotype in every case when it is not absolutely clear that the type material consists of only a single type specimen (e.g., no duplicates exist in other herbaria - which is often impossible to know). Use of lectotype validates the typification even if it is later shown that holotype or neotype are more correct designations!

Teuvo Ahti, Helsinki

### Please apply the standardized citations of Acharius, Nylander and Vainio Herbaria!

In taxonomic studies it is customary to cite locations of specimens in various herbaria, especially in case of type material. It is generally accepted in botany and mycology (incl. lichenology) that the standardized abbreviations for each herbarium as listed by Holmgren et al. in the Index Herbariorum (Part I: The herbaria of the World. Ed. 8. 1990; new edition under preparation) are used. Many herbaria have recently been added to the directory (published in small articles in Taxon). - like RAMK in Bangkok. The basic and largely updated data of the Index Herbariorum are available in the website <http://www.nybg.org/bsci/ih/searchih.html>.

The purpose of this note is to point out that some herbaria have designated special acronyms for important collections which are kept separate from the main collections. Such herbarium symbols are often overlooked by authors and editors of lichenological (and bryological) papers. Almost all issues of The Lichenologist and The Bryologist, for instance, contain erroneous citations of the following herbaria, in particular:

H-ACH = Herb. Erik Acharius in Helsinki (H); not H-Ach, H-Ach., H-Hb. Ach., H-Acharius

H-NYL = Herb. William Nylander in Helsinki (H); not H-Nyl etc.

TUR-V = Herb. Edvard A. Vainio in Turku (TUR); not TUR, TUR-Vain etc.

However, the separate Acharius collections in London (BM) and Uppsala (UPS) have no published standard designations so that BM-Ach and UPS-Ach are then as correct as BM-ACH and UPS-ACH. In fact, it would be useful if many other herbaria had standardized citations for their separate collections. Why not designate them in the coming new edition of the Index Herbariorum?

Teuvo Ahti, Helsinki

### Aktuelle Lichenologische Mitteilungen (ALM)

This publication was resurrected a year ago, starting with a new series. Some of the old issues are still available, including honorary issues for Siegfried Huneck and Otto Lange, with bibliographic data. These can be ordered for the price of 1 Euro from the address below. The ALM-new series will be published at least until spring 2003 with 3-4 issues per year, and are emended by several aspects compared to the old series. E.g., excursion reports and collecting lists as valuable information for other lichenologists will be included. The journal is also available on the WWW under [www.alm-neu.de](http://www.alm-neu.de). Printed issues are available from: Redaktion der ALM, Botanisches Institut und Bot. Garten der Universität Essen, Universitätsstraße 5, D-45117 Essen, Germany

Benno Feige, Essen

**International Symbiosis Congress, August 18-25, 2003** in Halifax, Nova Scotia, Canada.

St. Mary's University will serve as the host institution under the leadership of the host site organizer, Professor David Richardson, and with ISS President Douglas Zook of Boston University as the co-organizer. Contact David Richardson for further information.

The Editor

### Progress at the Natural History Museum, London

We now have a lichen curator, Simone Louwhoff, who obtained her PhD at Canberra on Parmeliaceae of the Pacific Islands with Jack Elix. It is good to have a lichenologist in this post, and *Bibliotheca Lichenologica* Band 78 is the latest in an already impressive list of her publications. Following a visit by Gintaras Kantvilas early in the year several hundred Tasmanian lichens have been incorporated into the collections. Peter James is working on British material to get it incorporated into the collections, and after running the *Opegrapha* workshop will be working on the Azorean material here together with Clifford Smith who is now based in the UK.

Dr Wanaruk Saipunkaew from Chiang Mai University Thailand is here until the end of October on a 6 month Royal Society fellowship to identify material collected during her thesis at Basel University (obtained in 2000). This includes c. 70 taxa of Parmeliaceae which she is working on at the moment together with Simone and myself. After this we hope to tackle some of the many Arthoniaceae and crustose Roccellaceae which appear to be tolerant of the polluted urban environment in Chiang Mai city. Anna Crewe is also

here working on her M.Sc thesis looking at speciation of *Peltigera* in the Azores combining traditional morphological and chemical characters with molecular, and Dr Chandrani Wijeyeratne will be here in August to continue work on lichens of Ritigala mountain, Sri Lanka. At the time of writing William Purvis is in Russia working with Irina Mikhailova. William and I are involved with producing the Lichen Monitoring volume following the meeting at Orierton in 2000, together with Pier Luigi Nimis, Christoph Scheidegger, Susan Will-Wolf, David Hill and many other contributors. The trial version of the Lichens on twigs key is available from me or Field Studies Council, together with a web version at [www.nhm.ac.uk/lichen/twig](http://www.nhm.ac.uk/lichen/twig) including a recording form to assess eutrophication and acidification of the environment. Please try it out if appropriate and send comments by Nov 1<sup>st</sup> when we will finalise both versions. I am still continuing with the tropical work in SE Asia but I have to say watch this space because it is slow work!

Pat Wolseley, London

### Deaths: Lars Fagerström (1914–2001), A Finnish lichenologist

The Finnish botanist, also a lichenologist, Dr. Lars Fjalar Fagerström died on 27 May 2001 at Hamina (Fredrikshamn) in Finland. He was born on 24 July 1914 at Porvoo (Borgå). Fagerström was a junior or associate curator of vascular plants at the Botanical Museum, University of Helsinki, for more than 30 years (to 1979). He mainly worked on floristics and taxonomy of higher plants but also collected thousands of lichen specimens and published over a dozen papers on them. He was helped by Veli Räsänen, who checked many of Fagerström's collections. The first set of Fagerström's specimens are located in H, Helsinki. Many specimens were distributed in exsiccata or were sent in exchange to other herbaria. He chiefly collected in Finland but also on the Karelian Isthmus (now belonging to Leningrad Region, Russia) and Sweden. As a Finnish soldier during the World War II he collected in Russian Karelia. He was a very industrious person and one of the most prolific collectors of plants and fungi of all times in Finland. Some of his lichenological papers (mostly written in Swedish, his mother tongue) are cited below; all of them were published in the *Memoranda Societatis pro Fauna et Flora Fennica*, a journal which he himself edited for many years.

Fagerström, L. (1939) *Cetraria nivalis* (L.) Ach. funnen i Terijoki. [*Cetraria nivalis* found at Terijoki]. *Memoranda SFFF* 15: 23–25.

Fagerström, L. (1945a) En förteckning över lavar, insamlade i Fjärrkarelen sensommaren 1942. [A list of lichens collected in Russian Karelia in late summer of 1942]. *Memoranda SFFF* 20: 142–145.

Fagerström, L. (1945b) Ett bidrag till kännedomen om lavfloran i Terijoki socken på Karelska näset. [A contribution to the lichen flora in Terijoki parish on Karelian Isthmus]. *Memoranda SFFF* 20: 155–170.

Fagerström, L. (1946) Några intressanta lavfynd. [Some interesting lichen records]. *Memoranda SFFF* 22: 52–65.

Fagerström, L. (1954) Lavar från norra Veckelaks (Vehkalahti) i Karelia australis. [Lichens from northern Vehkalahti in Karelia australis]. *Memoranda SFFF* 29: 45–50.

Teuvo Ahti, Helsinki

## Personalia

**Ted Ahti** (Helsinki) visited Xinjiang, China, in the autumn of 2000 to study *Cladonia* and other lichens. A field trip with Prof. **Abdulla Abbas** was made to Chinese Altay Mts. He also stopped over at Beijing to give lectures and meet Professors **Wei Jiang-Chun** and **Chen Jian-Bin** and their students. In 2001 he spent one month in Washington with **Paula DePriest** and also visited herbaria at St. Paul (MIN), Chicago (F), and Beltsville (BPI). In October to November 2001 he is planning a trip to Lucknow, India, and Bangkok, Thailand, to work on Himalayan and S.E. Asian Cladoniaceae.

In the working group of **Benno Feige** (University of Essen), **Kerstin Linke** is working on her thesis on comparative biology of lichenized cyanobacteria (Nostoc) in *Peltigera*, and **Randolph Kricke** investigates the recolonisation of the Ruhr area by epiphytic lichens. Both are about to complete their studies by the end of the year.

**Ester Gaya** (Ph.D. student with **Pere Navarro-Rosines**, Barcelona, Spain) and **Celia Möbius** (Ph.D. student with **Harrie Sipman**, Berlin, Germany) visited **François Lutzoni**'s lab at the Field Museum in Chicago for three months this past winter to learn molecular techniques and phylogenetic methods. Ester and Celia are conducting thorough systematic studies on *Caloplaca* and *Hypotrachyna*, respectively. They both had a productive stay in terms of sequences generated and analyses performed due to generous help of **Valérie Reeb**, **Stefan Zoller**, and **Jolanta Miadlikowska** (all members of François' Lab). This was a very enjoyable three months for everyone involved.

After defending his thesis in Uppsala, **Starri Heiðmarsson** moved back to Iceland and received a position at the Icelandic Institute of Natural History in Akureyri in northern Iceland. He enjoys collaboration with his first mentor in lichenology, **Hörður Kristinsson** and shall primarily be engaged in projects relating to the lichen flora of Iceland. He will furthermore curate the lichen-collections at AMNH. The lichen herbarium at AMNH contains more than 14000 computerized Icelandic specimens and we especially welcome loan requests from specialists in various groups of crustose lichens who would like to include Iceland in their monographic works.

Starri is interested in continuing his revisional work on *Dermatocarpon* and hopes to extend it beyond Northern Europe in the future. He welcomes collaboration with lichenologists who have collections of *Dermatocarpon* which have not been studied in detail.

**Olga Hilmo** (University of Trondheim) finished her Ph.D. on 'Lichen response to environmental changes in managed boreal forest systems'. She just started a new project with a main objective to study edge effects on lichens in spruce forests in relation to the size of the clearcuts. In this new project, as in her thesis, special attention is paid to the early stages in the life cycle of lichens.

**M.J. Lai** (Tunghai Univ, Taiwan) invited **André Aptroot**, **Harrie Sipman** and **Laurens Sparrius** for a 3-week collecting trip in Taiwan in October 2001.

**François Lutzoni** (The Field Museum, Chicago) will join the faculty of the Department of Biology at Duke University (Durham, North Carolina) on July 1, 2001. All members of his research group currently at the Field Museum, **Jolanta Miadlikowska** (Postdoctoral Research Associate; Peltigerineae systematics and photobiont-mycobiont coevolution), **Valérie Reeb** (Ph.D. student; Acarosporaceae systematics and Ascomycota phylogenetics) and **Stefan Zoller** (Postdoctoral Research Associate; population biology of lichens, molecular evolution and bioinformatics) will also transfer to Duke University. There they will join two new Ph.D. students, **Heath O'Brien** (evolution of lichen photobionts) and **Carla Rydholm** (evolution of lichen symbiosis) who initiated their Ph.D. studies at Duke last fall under François' long-distance supervision with the help of **Rytas Vilgalys**, **Chicita** and **Bill Culberson**, **Daniele Armaleo** and **Molly McMullen**. The recently (1996) created curatorial position for the lichen collection at The Field Museum will not be terminated with the departure of François. **Robert Lücking** (University of Bayreuth) will take over this position starting August 2001 for at least two years.

**Dag Olav Øvstedal**, Department of Botany, University of Bergen, recently published *Lichens of Antarctica and South Georgia* (Cambridge University Press) in cooperation with **Ron Lewis-Smith** of the British Antarctic Survey. Also in Bergen, Master's student **Fiona Mohr** concluded her thesis *Evolution and taxonomy of the marine Pyrenocollema* (lichenized Ascomycota) in North-Western Europe in May. Her supervisor, **Stefan Ekman**, is proud to say that she was awarded one of the best marks ever for a systematics thesis in Bergen. For the time being, she has returned home to Ireland, but hopes to continue to be part of the 'lichen family'. **Tor Tønsberg** recently returned home from two and a half months of field work along the North American west coast and in Arizona.

## New Literature

CALATAYUD, V. & M. J. SANZ, 2000. Guía de líquenes epífitos. En las parcelas del sistema Pan-Europeo para el seguimiento intensivo y continuo de los sistemas forestales (Red CE de nivel II) en España. Ministerio de Medio Ambiente. Parques Nacionales. 185 pp, 180 color and 29 black and white photographs, and line drawings. Hard cover, 25 x 17.5 cm, ISBN 84-8014-298-7. Price: 1.400 pesetas / 8.44 EUR (approximately 7.36 \$) +postage and packing. Available from Mundiprensa Publisher (pedidos@mundiprensa.es).

This photo guidebook has been produced in the framework of the activities of the UN/ECE International Cooperative Programme on Assessment and Monitoring of Air Pollution Effects on forests (ICP-Forest). The focus of this photo guide of lichens is primarily to help the environmental technicians to identify lichens in a net of field plots for intensive and continuous monitoring of Forest Ecosystems (Level II EC Net) in Spain.

The first two chapters of the book deal with the use of the guide, methodological aspects and basic information on lichens. Two further chapters (3 and 4) are devoted to lichens and air pollution. Chapter 4 especially is dedicated to the above mentioned Level II CE Net. Since 1987, periodical observations of tree health are carried out by environmental technicians using easily quantifiable parameters. Results from 53 plots in the study are partly reported in tables in the annex of the book. The main body of the book is chapters 5, 6 and 7. Chapter 5 contains a key to all lichen genera treated, mainly



epiphytic macrolichens. Chapter 6 includes diagnostic keys for each genus with color photographs (108 in total) with diagnostic details of each species. In chapter 7, brief descriptions of the species are presented, which also include distributional (in Spain and abroad), chemical, ecological and air pollution sensitivity information for the 108 species considered. A glossary of terms, a taxonomic index and a map with the situation of the 53 plots of the Level II EC Net are provided at the end of the book.

Although written primarily for beginners, this guide will also be valuable for professional lichenologists involved in air pollution monitoring and also especially for University teachers to introduce students to lichens. This book is written in Spanish, is easy to understand and contains a lot of attractive color photos. Spanish students are lucky this time, at least! However I believe that the guide will also attract the attention of lichenologists everywhere. Thanks to support by the Spanish Ministerio de Medioambiente the high quality of printing comes with a low-price.

Violeta Atienza, Valencia

HAFELLNER, J. & TÜRK, R. 2001. *Die lichenisierten Pilze Österreichs – eine Checkliste der bisher nachgewiesenen Arten mit Verbreitungsangaben*. Stapfia, vol. 76, 167 pp. - Available from: OÖ. Landesmuseums, Biologiezentrum, Johann-Wilhelm-Klein Straße 73, 4040 Linz, Austria (bio-linz@landesmuseum-linz.ac.at) Price: 40.7 Euro.

Perhaps because of Global Change, the deluge of checklists is not over. The present one deals with a tiny spot on the map called Austria (0.056% of the Earth), which is here claimed to host 2.237 lichenized taxa, plus 60 fungi that lichenologists wrongly imagined enjoying the company of a photobiont. Lichenicolous fungi are not admitted. If we generously guess that - as far as we know - the Earth hosts c. 22.000 lichens, Austria has more than 10% of its lichen budget. In other words, the species/area ratio of Austria is almost 200 times higher than that of the Earth as a whole. How can we explain this 'Austrian Anomaly'? There could be three reasons: a) the surface area of Austria does not correspond with her dramatic ecological diversity; b) Lichens have broad distributional ranges, Austria shares several species in common with e.g. Canada, the species/area ratio has another meaning for lichens than for animals or plants; c) the authors adopt a rather narrow species concept and accept several poorly known taxa which are likely to be synonymized with other species in the future (which is OK in the first checklist ever published for a country). The main reason for the 'Austrian Anomaly' is however the simple fact that Austria is one of the lichenologically best-known areas in the World. Just two names: Ferdinand Arnold and Josef Poelt...and the students of Poelt, and the innumerable guests of Poelt who not only visited the herbarium of Graz, but also made at least a short excursion on the hill near his house (sometimes describing a new species from a stump or from the cement wall of his garage). History makes indeed of Austria a very special dot in our lichenological map, a model from which we can learn a lot.

This checklist does not include literature citations, which would have transformed it into something else. It gives however information on regional distribution in 9 administrative units and 7 altitudinal belts, on the main substrata, and on the main synonyms. Notes are used with (almost too much) parsimony. Several times a species is given a name which differs from current trends because of interesting taxonomical concepts of the authors. A few words there would have been useful, but perhaps a checklist is not the right place to do this. In any case, there is a very interesting nomenclatural-taxonomical appendix

containing the validation of some older invalid combinations, some new combinations, five new species names, and especially the description of seven new genera (*Aspilidea*, *Bryodina*, *Calvitimela*, *Myxobilimbia*, *Protomicarea*, *Pycnora*, and *Timdalia*). This is not the place to discuss this, but I must say that most of these proposals helped me to resolve open problems in my Italian checklist. Printing errors are a mortal sin in a checklist, especially if they concern names. I have checked the present one name by name (three days of work...), and I have found a few printing error, e.g. in a note to *Lepraria*, or in the combination of *Bryodina selenospora* ! In my opinion, this is one of the most important checklists which appeared in the last decade: It will be an indispensable and useful tool for lichenologists far beyond the borders of Austria.

Pier Luigi Nimis, Trieste

HUNECK, S., 2001. *New Results on the Chemistry of Lichen Substances*. Progress in the Chemistry of Organic Natural Products vol. 81. Springer, Wien New York ISBN 3-211-83518-0, Price: 258 SFr.

This book is the 81<sup>st</sup> volume in the extensive series of Progress in the Chemistry of Organic Natural Products founded by L. Zechmeister. Since the last major review by Elix in 1984 in vol. 45 of the same prestigious series, important progress has been realized in the field of lichen chemistry. This book will be particularly welcomed and highly appreciated by the analytical and organic synthetic natural products chemists and by biologists that need to know the state of the art of lichen chemistry at the start of the 21<sup>st</sup> century. The author is the world-leading specialist in the field. Reading the 10 chapters one realises immediately, the wide-ranging and deep knowledge and experience of a man that has dedicated all of his life to lichen chemistry.

The first 20 pages summarize progress in analytical methodologies for isolation and structure elucidation with a reminder of the general methods for derivatisation and regeneration of lichen substances. This chapter provides a multitude of useful, accurate and practical information which will be of great help not only to beginners but also to experts in lichen chemistry. Chapter four is the biggest and the most extensive one (200 pages) and includes structural elucidation and synthesis of lichen substances, covering especially the new depsides and depsidones. This is reported in detail with all the formulae and reaction schemes, but also with some known compounds and revised structures. This chapter is well written, nicely presented and accurate and will be of great value to all chemists working on aromatic lichen metabolites and indeed for those working on general, fully substituted aromatic compounds. The last five chapters describe progress in a relatively new domain, i.e. the culture and chemistry of lichen symbionts and cell culture of lichens. Biosynthesis, chemotaxonomy, biological activities, the harmful effects and the commercial use of lichen substances and lichens are also described. No aspect is forgotten and all the chapters are useful and provide comprehensive review.

The only small criticism concerns the use of different drawing methods and fonts for chemical formulae (more than 1.500!), but this, in no ways detracts from the high scientific quality of the book.

Raffaele Tabacchi, Neuchâtel



SCHOLZ, P. 2000. *Katalog der Flechten und flechtenbewohnenden Pilze Deutschlands*. – Schriftenreihe für Vegetationskunde 31. Bundesamt für Naturschutz. Bonn – Bad Godesberg. 298 pp. ISBN 3-7843-3501-2. Soft cover. Price: 29.80 DM. Available from the BfN-Schriftenvertrieb im Landwirtschaftsverlag 48084 Münster (Germany), tel +49 2501 801 300, fax +49 201 801 351; or via Internet: [www.lv-h.de/bfn](http://www.lv-h.de/bfn).

Germany is, not only for historical reasons, one of the lichenologically best known countries in the world. The high number of active lichenologists helped to increase the number of lichens from that country. The updated catalogue contains 2399 accepted taxa (2325 species; 219 of these are lichenicolous fungi). 125 species are new (62 lichenicolous fungi) since the last checklist by Wirth (1994, Stuttgarter Beitr. Naturkd. S. A (Biol.) 517: 1-163). The enumeration of the diversity in each province suggests that all parts of Germany are well investigated. While the Brandenburg-Berlin area includes 517 lichens, the species number is highest in Bayern with 1626 species.

The format is similar to Santesson's checklist of Lichens from Norway and Sweden (Santesson 1993; reviewed in ILN 27/1), including useful cross references of synonyms to accepted names. All changes are shown in a separate chapter. A complete list of literature references is included at the end of the catalogue.

A narrow concept of genera was here applied, including the segregates of *Catapyrenium*, *Cetraria*, *Parmelia* etc., while *Cladonia* and *Buellia* are treated in the broad sense (including reindeer lichens, and not separating *Diplotomma*). Species are often accepted in a wider sense, e.g. not accepting chemically characterized species in *Cladonia*. Mistakes are hardly found (e.g., *Thelidium montanum*, as a synonym, points to *Paraphysothela montana*, which itself is not accepted), and the compilation is done with high accuracy. Furthermore, the updated catalogue of lichens in Germany is available at a remarkably low price, which certainly contributes to its wide distribution.

The Editor

#### A new journal: *Mycological Progress*, the international journal of fungal sciences

The first issue of the new international journal of fungal sciences will be published in February 2002. *Mycological Progress* generally accepts contributions to systematics, taxonomy, mycodiversity, evolution, ecology, symbiosis (lichens, mycorrhizae, animals), pathology (pathogens of plants, animals, humans), cell biology, function, physiology, biotechnology and applied mycology. All currently applied methods are accepted: e. g. morphology, anatomy, ultrastructure (TEM, SEM), genetics, molecular biology. Review articles are also welcome, and contributions on novel methods and trends in mycology are always appreciated. Instructions to Authors are published in the home page of *Mycological Progress*: <http://www.botanik.biologie.uni-muenchen.de/botsyst/mycpro.html>

The Editor

## REPORTS

### Informal meeting on a future European Lichen Database project

Participants: P.L. Nimis, G. Rambold, E. Timdal, M. Grube, S. Martellos  
Department of Botany, Trieste, 19. Feb. 2001

The participants discussed how the different databases which exist in lichenology can be joined. Pier Luigi Nimis stressed the role that IAL could play in such joint efforts. IAL should not finance initiatives, but could effectively assist by its potential representation in international associations, e.g. CODATA or IUBS. It was also discussed how a common data model for herbaria can be developed prior to the joining of small databases. Many problems of joining databases are due to nomenclatural incompatibilities. A thesaurus of names is available from the Italian database, where the implementation of a potential taxon concept is anticipated. This thesaurus is open for everybody and should be enlarged by other sources. The exchange and combination of descriptive data sets for dynamic and interactive keys is a particular challenge. Gerhard Rambold plans to use a low number of mandatory characters in the descriptive data sets of LIAS, however the total number of character reference list will exceed 1.000. The participants suggested Tassilo Feuerer and Einar Timdal as representatives of IAL in IOPI. Pier Luigi Nimis proposed that IAL should create a committee to handle IOPI-related matters and to nominate future representatives in IOPI. The advisory board will be contacted for further proposals on that committee. Another project that will be initialized quickly is an emendation of RLL backwards in time, which has been accomplished meanwhile by inclusion of Matticks index.

The Editor

### Second Russian Lichenological Field Meeting (Volgograd and Astrakhan regions, SE European Russia, May 2<sup>nd</sup> – 9<sup>th</sup>, 2001)

The tradition of Russian Lichenological Field Meetings started in the year 2000, with a meeting in the Kola peninsula. In 2001 lichenologists gathered in the Volgograd and Astrakhan regions in early May. The purpose was to attract attention of the national lichenological community to the lichens of steppe and semi-desert zones of Eurasia. The meeting was organised by the St. Petersburg Naturalists Society, and by the Komarov Botanical Institute and University of St. Petersburg. The University of Volgograd acted as a host for the event, which was held under the auspices of the International Association for Lichenology. The endorsement by IAL helped to rise the overall significance of the meeting, and attracted attention from Russian funding agencies.

A total of 34 participants from all parts of Russia, as well as from Ukraine and Belorussia, took part in the excursions and in a mini-symposium entitled "Lichens of arid zones". Due to the limited facilities, organisers had to restrict the number of participants, so that – unfortunately – not all those who had expressed their interest were able to come.

Following the plan of the first field meeting, the second one also included field excursions, a mini-symposium, short lectures and workshops. Excursions were planned in such a way as to visit several lichen-rich sites. The region is lichenologically interesting, since in this area the flora from Asian steppes meets elements of the Ukrainian and Black Sea arid regions. The first trip was to Mamajev Kurgan, a Second World War memorial in

the city centre. Here, together with an historical excursion, we studied the urban lichen flora of a typical southern city of Russia. The second excursion brought us to the western bank of the Don river with *Artemisia* steppes, limestone cliffs and chalk fields. *Cetraria steppae*, *Cladonia foliacea*, *Diploschistes* sp., *Neofuscelia loxodes*, several *Xanthoparmelia* species were dominant. On the way back a stop was made in "bairak" forests, which are rich in epiphytic lichens (mostly *Physciaceae* and *Parmeliaceae*). This forest type is natural in relatively humid erosion profiles along river valleys. Further steppes (with *Artemisia* and *Stipa*) were visited during the third excursion to the western bank of the Volga river, that crosses the region about 100 km east from Don. The last two-day long trip brought us to Bogdo-Baskunchak, a nature reserve in the Astrakhan region on the border with Kazakhstan. The reserve is unique by its over 100 m high hill, raised by the pressure of the neighbouring salt-water lake, which hosts stony substrates otherwise extremely rare in the area.

During the evening lectures, Grigory Insarov (Moscow) spoke about lichens and global climate change, and Natalia Ivanova (Moscow) presented her views on molecular techniques in taxonomy. Workshops on *Physciaceae* (Gennady Urbanavichus, Apatity), *Ramalina* (Olga Katenina, St. Petersburg), *Cladonia* (Dmitry Himmelbrant, St. Petersburg), and cyanolichens (Tatiana Makry, Novosibirsk) were considered to be an extremely useful part for the field meetings. In the course of the mini-symposium, all participants presented the results of their studies in the form of posters. Abstracts of lectures and poster presentations, as well as brief descriptions of field trips, are published and will be shortly displayed at the Russian Lichenological Resources web-site (<http://nature.vspu.ru/lichens/indexe.html>), maintained by Vitaly Kulakov (Volgograd).

On behalf of the Organising Committee I'd like to express our gratitude to the Russian Federal Programme "Integration" and to the St. Petersburg Naturalists Society for providing financial support. A warm thanks also to all lichenologists who attended the meeting. We all are thankful to IAL for considering the event to be of importance for the Association, and we are looking forward to welcome colleagues at the Third Russian Lichenological Field Meeting, planned to be held in the Ural mountains in August 2002. For further information please contact Alexei Zavarzin ([Zavarzin@yahoo.com](mailto:Zavarzin@yahoo.com))

Alexei Zavarzin, St. Petersburg, Russia.

## REVIEW

### How DNA data challenge lichen systematics today

M. Grube & M. Wedin

The introduction of new techniques to systematic lichenology has repeatedly resulted in drastic re-interpretations of the natural relationships of lichens. This was true when the microscope was introduced in the beginning of the 19<sup>th</sup> century, and again when chemical variation in lichens was explored by thin-layer chromatography in the mid-20<sup>th</sup> century. The last technological 'revolution' in lichenology, DNA-sequencing, started only a decade

ago. However, the impact of the latter is different from previous renewals in lichen systematics, because phylogenetic analysis was finally accepted as theoretical framework of evolutionary and systematic studies. Three and a half years have passed since molecular systematics in lichenology was discussed on lichens-I and published in ILN 30/2. Since then, molecular techniques have increasingly been used in systematic papers. The results do, in many cases, confirm long-held views, but sometimes, exciting and surprising discoveries are revealed.

A lichen group that experienced a complete re-interpretation after molecular work is – or better 'was' – the order Caliciales. Caliciales was previously regarded as a well-circumscribed natural (i.e. monophyletic) group of lichens, characterised by evanescent asci and the formation of a mazaedium. Caliciales include the well-known pin-lichens, some of which are important bioindicators of old-growth forests. Already long before molecular techniques were feasible, Tibell (1984) demonstrated that the order was highly heterogeneous. In a series of papers by Wedin and co-workers, this was subsequently supported and analysed in a phylogenetic framework. While the lichenicolous and saprophytic Mycocaliciaceae is now regarded as a separate order Mycocaliciales (Tibell & Wedin 2000), the predominantly lichenised Caliciaceae belong to the Lecanorales, and form a monophyletic group with Physciaceae (Wedin et al. 2000a). Sphaerophoraceae, formerly included in Caliciales, represent a distinct clade in Lecanorales, which also includes non-mazaediate genera (Wedin & Döring 1999, Wedin et al. 2000b). It is now apparent that the evanescent ascus is a special morphological development in several lineages of ascomycetes, and not a trait characterising a single monophyletic group. Ascus characters in the Lecanorales may be more variable within monophyletic groups than previously thought (Wedin et al. 2000b), which is also seen in other lecanoralean groups as the Lecanoraceae and Bacidiaceae (Ekman & Wedin 2000). The classification of lichen mycobionts on the basis of ascus characters has also proved to be problematic at the rank of orders. Platt & Spatafora (2000) showed that neither Baeomycetaceae nor Lecanodermaceae are related to Leotiales as previous classification suggested, and they claim that both families represent independent lichenisation events. In their study, *Baeomyces* formed a sister group to Pertusariales. The latter was also included by Lumbsch et al. (2001), who found that *Pertusaria*, *Diploschistes* and members of the resurrected order Agryales form a sister group to members of Umbilicariaceae. The bootstrap support for this was not impressive though, and more studies are needed to resolve these relationships. Less surprising perhaps is that Graphidales is closely related to the Ostropales, as indicated by the position of *Diploschistes* and *Graphis* with other ascomycetes (Winka et al. 1998).

The inapplicability of some traditionally used phenotypic characters for the circumscription of taxa is recognised in several lichen groups and at different hierarchical levels. One of the previously well-accepted characters to circumscribe genera was the growth form of the thallus. Studies in the Lecanoraceae, Teloschistaceae and Physciaceae showed that monophyletic groups include species with different types of growth forms (Arup & Grube 1998, 1999, 2000; Grube & Arup 2001). An analogous situation is found in the Arthoniales by Myllys et al. (1998). Their data indicate that the fruticose growth form found in the family Roccellaceae evolved independently several times.

Molecular data confirm that some phenotypic characters were overemphasised in earlier classifications, and that their independent evolution is the common case. On the other hand, at the basal level of species, new evidence arises which suggest that

morphologically defined species may be composed of several distinct phylogenetic lineages ('cryptic species'). A multi-gene study indicated that this is the case in *Letharia*, which was previously interpreted as a pair of an asexual, clonal species and a sexual progenitor species. Work by Kroken & Taylor (2001) now suggests that *Letharia* comprises at least six phylogenetic species, which are also morphologically characterised. In other cases, well-known morphologically defined species may prove to be better treated as one variable taxon, as in the 'species pair' *Physcia aipolia/caesia* (Myllys et al. 2001).

All this growing evidence confronts lichen systematists with new challenges. The morphological adaptations evolved in lichens in a more complex manner than previously thought, and the hidden genetic diversity within currently accepted species might drastically increase the known figure of species diversity. In both cases, prevailing questions will be how to treat the various molecular results in taxonomic terms, and when to formalise the results in nomenclature. These questions are especially interesting with regard to nomenclatural stability of the binomial, i.e. at the genus and species level.

The situation with genera was discussed thoroughly by Nimis (1998), who suggested guidelines to be considered when new genera are introduced. However, no general measure can be suggested for the genus rank. With DNA data, it would be clearly unacceptable to consider, for example, a certain number of nucleotide differences in a comparison of homologous genes as a basis. Phylogenetic hypotheses are generally accepted to investigate relationships between genera. Yet, it is not clear, at what level a genus rank is appropriate, and such uncertainty could be neglected in a phylogenetic classification without ranks. A rank-free classification, however, creates other problems and controversies, and a stable classification using the traditional and universally accepted code of botanical nomenclature is still preferred. One of the challenging situations derives from the conflict between phenotypic circumscription of genera and phylogenetic results. This situation arises, for example, when smaller foliose groups evolved within large crustose genera (e.g., *Lecanora*, *Rinodina*, and *Caloplaca*). This could indicate that we may have used inappropriate phenotypic characters for classification in the past, and that these characters need to be re-evaluated in many instances. A phylogenetic revision within the genus *Peltigera* was provided by Miadlikovska & Lutzoni (2000), which combines the phylogenetic re-investigation of phenotypic characters with DNA sequence data.

At the species level, we may now face a similar situation where genetically circumscribed species are not supported by phenotypic characters. Either more phylogenetic species can be hidden in what has been accepted as a morphologically circumscribed species (phenospecies), or one phylogenetic species is variable with regard to reproduction mechanisms, secondary chemistry, etc. When phylogenetic data show the independence of several lineages in a phenospecies, the species rank would be appropriate. But in many cases where cryptic species are delimited, formalised species names will be pointless - how will future workers identify nomenclatural types, particularly old material for lectotypification, if the taxa to be named are not possible to distinguish without DNA sequencing? Only informal solutions will work unless further phenotypic characters are recognised or the epitype concept is applied (Grube & Kroken 2000).

Future studies at higher taxonomic levels will include several loci beside the nuclear ribosomal DNA, and many studies can also be expected to explore recently developed phylogenetic procedures. An example of this is the recent study based on a Bayesian statistical procedure (Lutzoni et al. 2001) which elegantly suggests that the loss of lichenisation plays a greater role than earlier thought in the evolution of ascomycetes.

Data from protein-coding genes will test current phylogenetic hypotheses based on the nuclear ribosomal DNA, while they will provide more accurate data about the species diversity and population structure within species. Such extended data sets can be used to further investigate historic aspects such as reinvasion of lichens after glaciation periods, or a broad range of ecological questions, including the evolution and co-evolution of lichenicolous fungi.

A clear concept of taxonomic treatment of the results in all these approaches is still missing. Since taxonomy shall carry biological information, this is nevertheless an important question, and in need of further discussion. Until major groups of lichens will be thoroughly investigated, we may have to accept paraphyletic groups as an intermediate, temporary solution.

### Additions and comments

Adding to the review of the impact of DNA data on lichen systematics, Stenroos & DePriest's (1998) parsimony analysis of SSU rDNA was the first to discuss the monophyly and the latest infraordinal classification of Lecanorales by including a broader selection of taxa of that order, particularly cladoniiform lichens. Their results were in agreement with other and following studies, e.g. that Cladoniineae were not supported as a monophyletic group (see also Wedin et al. 1998) and that Baeomycetaceae, Icmadophilaceae and Siphulaceae were excluded from both the Lecanorales and Leotiales. In all hitherto published analyses of SSU rDNA, however, the bootstrap support for basal lineages in Lecanorales is relatively low. Investigations at that level could eventually be facilitated by switching to or including other gene loci.

Martin Grube, Graz

If it is likely that the current reorientation of lichen fungi into vastly diverse phyletic lines on the basis of new techniques is valid, then I think a new classification based on phylogeny will result in our losing all support by ecologists, general taxonomists, and 'practical' botanists. I had always hoped that molecular studies would reinforce traditional ones, but evidently that is not the case. I wonder if it will be necessary for professionals to admit that non-specialists will have to be allowed a more simplistic taxonomy more closely bound to traditional work so that their interests will be well served. I think we need lay, amateur, and non-professional support for what we are doing, or we will price ourselves out of the marketplace.

Bill Weber, Boulder

The imminent publication of *Lichens of North America* will affect this. This book will be a first for our country, and will be used by professionals and lay people for the next 25 years, maybe 50 at least. It will put lichens on the map for North America. Whatever phylogenies are used in it, they will become standard for the amateurs for a long time to come.

Jim Bennett, Madison

There MUST be a way to incorporate the truth into a taxonomy useful to the practical plantsman...

Darrell Wright, Arcata

As a lichen ecologist, I am interested in the outcome of the molecular studies, to shed more light on what lichen morphological characteristics are more closely linked to molecular characteristics, and therefore more likely to be linked to phylogenetic history.

I am even more interested to have studies showing when morphological and molecular characteristics are divergent, because that points to morphological characteristics which are environmentally plastic (or elastic) and thus have the potential to carry much ecological information. Improvement in understanding which of the morphological characters give the best environmental signals for ecosystem monitoring (and for which groups of lichens) will make such monitoring much more effective. I have been especially interested in studies which suggest that reproductive mode may in itself be an environmental signal of lichen response in some groups of lichens, but not in other groups. Once the taxonomic dust has settled, or perhaps concurrent with taxonomic work, ecological studies are needed to make clear just what environmental response is being shown with variation in plastic morphological characters.

I therefore suspect some of the taxonomic nightmares may turn into a lichen ecologist's dream!

Susan Will-Wolf, Madison

I'm a lichen ecologist and, frankly, I'm not too worried. My biggest concern is over how to deal with cryptic species. As long as the minor morphological differences between the new *Letharia* species are reasonably consistent (Kroken & Taylor 2001), then we can deal with them. Otherwise we can analyze the data with the various species lumped into '*Letharia vulpina* group'. And if there are no morphological differences, I would just automatically switch to using species 'groups'. The biggest problem I see with the use of species groups is in trying to assess rarity for conservation purposes. If you need to sequence in order to identify, then you will have to do a lot of sequencing to find out which of the cryptic species might actually be rare.

Another concern at the species level is species pairs (see Myllys et al. 2001). Those that turn out to actually be different species should be easy to deal with. Those that do not will be more problematic. Since in many cases, the different halves of the pair have different distributions, and sometimes different ecologies, we could probably deal with them at a sub-specific level... perhaps forms. We already are starting to deal with this issue to some extent with the cyanolichens which vary greatly in morphology due to the particular combination of algae/cyanobacteria that they host. Again the problem will be greatest with conservation. It is difficult enough to get a government to provide legal protection for a cute and fuzzy animal, much less a lichen. But in some cases they do provide protection to plants below the species level and are extending similar protections to some lichens. But getting protection for the rare fertile form of species X will be much more difficult than if you could refer to it as a distinct species.

On the other end of the scale, have we ever put much faith in taxonomic groupings for lichens? How many identification manuals start by keying lichens out to family like most vascular plant manuals do? There are some that start with orders, but the vast majority go nearly straight to genera. Changing around orders and families will make almost no

difference to people trying to identify lichens. I suppose that our tendency to identify lichens to genus first may indicate that genera will remain relatively stable (at least not much less stable than they always have been). My own favorite group, the "Caliciales" has been totally exploded. Some are in a new order (Mycocaliciales) while others may turn out to be just a part of the Physciaceae (*Calicium*), and some are still floating around the ascomycota searching for a place to root. But as an ecologist, I am at least as concerned with functional groups (e.g. nitrogen-fixing lichens) as with taxonomic groups, and the Calicioids still form a good functional group based on habitat and spore dispersal. So I say to the molecular folk, "make like Ginsu chefs with lots of nice sharp knives... as long as you make clean cuts and reassemble the pieces in palatable ways."

Eric Peterson, Carson City

I am not a lichenologist but I have participated in enough arguments like this in the green plants at various levels to want to jump in to the fray. I don't think you should go for a radical reclassification until the phylogenies settle down and are well-supported by a number of unlinked markers combined with cladistically-analyzed morphological data. However, once there are solid phylogenetic results, then we owe it to our users to change the classification to make it natural. True utility of a classification comes when related organisms are grouped together. Conservation biologists, ecologists, agronomists, public health workers, pharmaceutical seekers, etc. etc. need to know that the classifications we are giving them are not artificial assemblages.

This has already been a major bone of contention with angiosperms, of course. Bruce Baldwin and I have separate articles in *Madroño* back in 1995 in the Jepson Symposium issue (Baldwin 1995, Mishler 1995), and also in the last number of *Madroño* for this year (Baldwin 2001, Mishler 2001), that address these practical concerns where we've been facing them already with respect to the California flora.

People do complain when classifications change, but if we can give good reasons for the changes, people will adjust and realize that we have improved their ability to do their work or follow their hobbies. After all, systematists are scientists who have to be allowed to present their latest findings, which are clearly important to the world at large. It's just a matter of educating our users a bit.

Brent Mishler, Berkeley

At this point I entered the discussion with a 'tale' ("Once upon a time..." etc.). That tale will be published elsewhere, and thus it cannot be reproduced here (its original version can be however retrieved from the archives of lichen-l). The main points it raised were: 1) Names must remain reasonably stable, 2) The importance of their stability is proportional to that attributed to the things they designate, 3) Biodiversity, and especially species' names are indeed becoming important, 3) Our binomial system of nomenclature looks odd in this context: Species names do change according to phylogenetical hypotheses involving the generic rank, 4) Molecular phylogeny is rendering this a serious problem outside the circle of Taxonomists. The tale - while not touching the problem of species' delimitation - made a plea for 'species' having a unique designator (e.g. a number, a combination of numbers of letters, a bar-code, or whatever). Binomials could then take an intermediate position between more or less vernacular names and the unique designators. Social security numbers work well for people (who have a 'name' and often a 'vernacular' nickname), why should they not work as well for organisms? There is an alternative

solution: To let things run as they do. The problem will be solved when every single species will belong to a monospecific genus.

Pier Luigi Nimis, Trieste

There was talk a few years ago before the St. Louis Botanical Congress of trying to freeze the vascular plant names. Or at least a good percentage of them, not all. I don't think anything came of the plan – does anyone know? I remember this came about because the Name Users (thank you Pier Luigi) were getting fed up with the name changes that wouldn't stop, and they made some noises about it. I guess they lost. I think something like this could be done for the good field species of lichens so that ecologists and other Name Users could get their work done. I have this problem too. I have already started calling some lichens 'groups' like Eric Peterson said because I can't figure all the new names out. It's only going to get worse with more splitting.

Jim Bennett, Madison

This German saying "Namen sind bloß Schall und Rauch" literally means that names are just sound and smoke. The saying applies to the common experience that a name alone does not mean anything. The sound of the name *Letharia* does not mean much to anybody who is not a lichenologist.

Why then are we so upset about names? If Pierre Luigi Nimis would suddenly be called R2D2 he might still appreciate that reference to a small, clever robot in Star Wars. However, I am sure he wouldn't very much like to be ridiculed and I am also convinced that he feels that his personal identity is somewhat attached to his name. Names become important to us if they mean anything. A taxonomist who has spent almost his entire life devoted to the 'science of names', will almost certainly be offended when suddenly a young and eager student comes along and proposes to abolish his entire system of names for a much more 'scientific' numbering system. How long did it take us to learn all these names, to spell them right, to attach them to mental image of certain lichen. All this effort for naught? I think that in this battle of names we carefully have to distinguish several important arguments:

*Names (or numbers for that matter) have to change.* Taxonomic stability is an illusion. Organisms evolve. They change. No strict code will ever accommodate for this change. No numbering system either. Our perception of organisms also changes. With new scientific techniques we are able to discover differences and characters which were not available previously. Chemotaxonomy made life more difficult. The genus *Xanthoparmelia* in North America is a good example. Molecular taxonomy will also contribute to this process. However, the suggestion to freeze names for the sake of the working people is provoked by name changes which evidently only happen for taxonomists own sake. Let those scientists in their ivory tower fight a battle of taxonomy. We 'ordinary working people' just stick to our list of frozen names - much easier... Taxonomy would be dead if it failed to translate itself into a meaningful system of nomenclature.

*The Linnean System.* The Linnean System has long been just that: a working taxonomy. Outside the nomenclatural world every biologist was able to use the binominal names and we all understood each other. For the purpose of an ecologist it is not necessary to know to which family *Letharia* belongs or to which other lichen it is related. If he is interested in the lethal effects of that lichen on some other organisms in his ecosystem he can

nevertheless consult another scientist who might have just been analyzing the lethal compound of *Letharia*. Communication - this is what nomenclature is about. No chemistry professor would be in favor to abolish the Periodic Table with names like lead or cobalt just because a numbering system might be more straight forward. So should we abolish a system which has been able to be an efficient means of communication for centuries?

*Phylogenetics - or the 'scientific' argument...* Nomenclature should reflect the 'true' relationship of organisms. Taxonomy is not just naming organisms for their own sake, but a science in its own respect! It can only be referred to as a science if the naming of organisms has a scientific meaning. The scientific meaning of biological nomenclature is evolution. Thus biological nomenclature is supposed to be different from the periodic table. The periodic table is an artificial system of naming chemicals. Biological nomenclature is supposed to be a natural system of classification. The Linnean System is not a natural system – as a consequence we must get rid of it... But what do we take instead? Phylogenetics! Here we have a working system how to establish trees which reflect natural, evolutionary relationships and with the help of molecular sciences we have the ultimate tool to resolve which one of the millions of trees is truly the 'natural' one! Does anyone really believe that? Ok, ok – the goal is to get there and we haven't resolved the final tree. Every honest advocate of cladistics will not fail to mention that phylogenetic trees are scientific hypotheses. It is a far too common misunderstanding that science refers to truth. On the contrary every hypothesis and even theory is valid only as long as not falsified. Thus it is more than likely that we will never find the one 'true and natural' tree of life. Our understanding of life evolves just as we invent new methods. The Linnean System has proven to be surprisingly flexible. Everyone in favor of abolishing it should maybe consider this. What if we realize in a few years that many of our glorious phylogenetic trees just collapse because of new scientific evidence? For a numeric system that would not be much of a problem. We'll just change the numbers. Maybe we will eventually have to change them once a year, once a month, once a week or even daily. Why shouldn't we adopt the nomenclatural numbering to the speed of deciphering the genetic code?

*The Evil Hierarchy.* For the benefit of everybody let's keep some Linneaus. Just let's get rid of all the meaningless hierarchy. A clever guy already pointed out that to the everyday lichenologist levels like families don't mean much anyway. No key uses them, apparently they are entirely artificial anyway – so just let's get rid of them. Same for the stupid binominal. Let's just take the epithet. The genus is meaningless anyway. Oh – just give it a number. Hold on, for the people who don't like numbers we'll keep the name and for the number fetishists let's get some numbers. Everyone is happy!

But why do we do taxonomy? We are orderly people. The digital age, however, doesn't need this order. Initially, computers were black boxes only to be used by computer wizards. Today, however, every kid can use a computer. Why? Because of the interface. We do not need to feed the computer with 1 and 0. Windows or Macintosh make it easy for us to arrange all our files in folders even though the original data are just Ones and Zeros.

I personally believe that even in the future we will need an 'interface' for taxonomy. The hierarchical system may not reflect the 'natural' one, but is there any system which ever truly will? The hierarchical system has the benefit that it is a moderately easy interface for the taxonomy behind it. The phylogenetic hypotheses may be more easy to translate into common sense if we can attach names to the branches of the trees. Even

though hierarchies like order, family or genus are far from natural categories they can still be meaningful. Every grassland ecologist knows what grasses are. Sedges look similar but it can easily be explained they are nevertheless different. Lichens with black fruiting bodies don't look like lichens with orange fruiting bodies but they all belong to XYZ because their spores all look the same. ...e.g. in Teloschistaceae.

Frank Bungartz, Tempe

I agree with many of the considerations by Frank Bungartz. Here I would just like to object to a small point, where he says: "If Pierre Luigi Nimis would suddenly be called R2D2 ...". Now, on my identity card there is my social security number (NMSPLGP09...and whatever, I always forget it...) plus my 'Name' (Pier Luigi Nimis), while my parents call me "Pil" (vernacular name). I do not see anything wrong with this system, and I have no problems in being named "NMSPLGP09etc." in all official transactions with my government. If this works for people, why should it not work for organisms?

These things, of course, are not easy to do, but it is good that people start considering them. The proposal for conserving names, which was killed at St. Louis, was, in my opinion, a good one. I wonder however how many of those which voted against it had considered the problem in its whole complexity.

Pier Luigi Nimis, Trieste

If I may interject once more my thoughts on freezing, dropping, or whatever the current binomial system and using a numbering system as the 'true scientific method' for cataloging species:

(1) It would essentially turn the binomials into yet more common names, which will eventually have all the problems we currently attribute to common names.

(2) What are the advantages? We may not change the number of particular, clearly defined species as we transfer them from an incorrect lineage to a hypothetically correct lineage (~genus transfer). But what about splitting and lumping? We would still have all the same problems there and maybe even more since there will be no natural meaning to the numbers...

"What happened to species X496B79ER6S16 ? It got lumped?! What did it get lumped into? Into species B7616W37RR7!" or "There are new numbers in the branches I study... 68T4HI31S313, 4S33Y94S7TEM, RE68A181LLY, and 66ST891IN3KS! Where did they come from? Ok, 68T4HI31S313 was split from T816H371AT, 4S33Y94S7TEM was split from N3ONS4EN71SE, and RE68A181LLY and 66ST891IN3KS were split from 99B9A8DL01Y3. So which morphologies of these taxa are retained under the original number and which match the new numbers?" Have we really solved anything? Did the reading get any easier? I can understand a need for universal index numbers for the sake of database compatibility. But computers have no problem referencing that index number to the current binomial it represents. If we must convert to numbers because it is closer to what the computers actually use, then I also suggest we trade our keyboards and monitors in for the old rows of switches and lights. (in which case we would get to the really computer friendly species names of 1001001110100110, 0110101001101001, etc.)

(3) Taking things to a different extreme, there is a natural numbering system encoded in each organism that identifies them clear down to the individual. It is a base-4 system called DNA. Yes it is impractical to sequence entirely each organism just to identify it.

But consider how long the Linnean system has lasted (which is a good reason to keep it in itself). Will we be able to guess the best numbering system to use just as our biotechnologies are just getting started? Will it still be in use 200 years from now, or will people searching the literature need to look for a set of Binomials, plus several sets of numbering systems?

Wow, I never thought I'd sound so resistant to change... but I don't mind the changes of moving taxa around within the Linnean system.

Eric Peterson, Carson City

All we are talking about is not only a lichenological problem: although things like 'fishes' and 'reptiles' survive in everyday language, they are not the units phylogenetically oriented taxonomists (the Real Taxonomists) can deal with, although they might(?) be useful for Name Users etc. How incomplete our current knowledge of the phylogeny of lichens may ever be, for me personally (an many others) everything outside a strictly phylogenetically oriented taxonomy is unacceptable.

Although binomial names change because they carry phylogenetic information, they are incredibly helpful to keep an overview. If I remember correctly, one reason for including and using the genus in species names by Linnaeus was that the identification of a genus is often pretty straightforward (Ok, lichens may be more difficult because these evil organisms sometimes effectively hide important diagnostic characters). And every beginner in botany can quickly recognize *Quercus*, *Acer*, *Rosa*, but telling *Quercus petraea* from *Q. rubra* is a different story. That is, with some knowledge of lichens (or plants, or...) the name of the species gives us an idea of what the organism is alike. If someone says *Gyalecta*, I have a picture in mind. For a new species of *Gyalecta*, I only have to learn the new features, because I already know the general characteristics of *Gyalecta*. For some genera all that works better than for others, and maybe for *Teloschistes* etc. its more difficult than for *Usnea*. The genus in a species name divides a huge amount of names into - more or less - handy partitions. Genus-species names are also mnemonics.

And we should keep in mind that our phylogenies, although they might never be finished, or complete, become more and more stable. And therefore, as time goes by, names should become more and more stable. We are not guessing the underlying phylogeny, we are - slowly, slowly - inching towards reality. New techniques like sequencing invoke lots of changes in a rather short time, but we'll know that molecular phylogeny didn't really mix up the ascomycete phylogeny from the bottom. A few things were more surprising than others, but many of the changes were already been discussed, but often considered as being unlikely. The binomial system in a phylogenetic context is a compromise: a compromise between the complex phylogeny standing behind every organism, and the necessity of stable names when working with and talking about the units that evolution deals with: species. I like this compromise. It gives us a little bit of information about where to place an organism in the big tree of life, but it is also short enough to remain usable and unique. Names change, but I think we can deal with that. We are lichenologists.

Frank Kauff, Kaiserslautern

One minor remark to the name users including me: continuous learning, for example combinations of Latin genus names and epitheta, may actively prevent us from dementia



when we all get old and sick. And I am sure that learning Latin names is by far easier and much less boring than memorizing rows of numbers.

Current impact of molecular phylogenies on classification: Our gene trees may look excitingly new, but they do not necessarily contain what we are looking at: evolutionary history or phylogeny. Therefore, calm down real taxonomists (again including me)! If the new tree or its translation into a new classificatory scheme is better than the old one (i.e. less contradictory, more parsimonious, fewer excuses of character conflicts via ad hoc hypotheses of parallelism, higher resolved...) it should eventually be accepted (by taxonomists as well as by name users, individuals which are at least in part identical). If not, it is for the bin. Finally, if we are to lump or split genera because of striking evidence from whatever source of data, reconsider what Pier Luigi wrote about it back in 1998... in my opinion still good reading.

Matthias Schultz, Kaiserslautern

I would like to thank all contributors to this exciting and open-ended discussion. One interesting approach to the problems that were detected here is demonstrated by the NCBI taxonomy server (<http://www.ncbi.nlm.nih.gov/Taxonomy/>). Taxonomic identity codes (TaxID's) are given to each taxon in the database to have a unique designation along with a scientific or vernacular name. So far, past changes of the concepts are not linked, as in synonymy lists. However, a LinkOut option to external sites is established to retrieve further taxonomic resources.

The Editor

## References

- Arup, U. & Grube, M. (1998) Molecular systematics of *Lecanora* subgenus *Placodium*. *Lichenologist* 30: 415-425.
- Arup, U. & Grube, M. (1999) Where does *Lecanora demissa* (Ascomycota, Lecanorales) belong? *Lichenologist* 31: 419-430.
- Arup, U. & Grube, M. (2000) *Rhizoplaca* is a heterogeneous assemblage within *Lecanora* (Ascomycota, Lecanorales). *Can. J. Bot.* 78: 318-327.
- Baldwin, B.G. (1995) A future prospect for California botany: integrating biosystematics and phylogenetics. *Madroño* 42: 154-167.
- Baldwin, B.G. (2001) Roles for modern plant systematics in discovery and conservation of fine-scale biodiversity. *Madroño* 47 (4): in press.
- Ekman, S. & Wedin, M. (2000) The phylogeny of the families Lecanoraceae and Bacidiaceae (lichenized Ascomycota) inferred from nuclear SSU rDNA sequences. *Plant Biology* 2: 350-360.
- Grube, M. & Arup, U. (2001) Molecular and morphological evolution in the Physciaceae. *Lichenologist* 33: 63-72.
- Grube, M. & Kroken, S. (2000) Molecular approaches and the concept of species and species complexes in lichenized fungi. *Mycol. Res.* 104: 1284-1294.
- Kroken, S. & Taylor, J. (2001) A gene genealogical approach to recognize phylogenetic species boundaries in the lichenized fungus *Letharia*. *Mycologia* 93: 38-53.

- Lumbsch, H.T., Schmitt, I., Döring, H. & Wedin, M. (2001) Molecular systematics supports the recognition of an additional order of Ascomycota: the Agyriales. *Mycol. Res.* 105: 16-23.
- Lutzoni, F., Pagel, M. & Reeb, V. (2001) Major fungal lineages are derived from lichen symbiotic ancestors. *Nature* 411: 937-940.
- Miadlikowska, J. & Lutzoni, F. (2000) Phylogenetic revision of the genus *Peltigera* (lichen-forming Ascomycota) based on morphological, chemical, and large subunit nuclear ribosomal DNA data. *Int. J. Plant Sci.* 161: 925-958.
- Mishler, B.D. (1995) Plant systematics and conservation: science and society. *Madroño* 42: 103-113.
- Mishler, B.D. (2001) The need for integrated studies of the California flora. *Madroño* 47 (4): in press.
- Myllys, L., Källersjö, M. & Tehler, A. (1998) A comparison of SSU rDNA data and morphological data in Arthoniales (Eurascomycetes) phylogeny. *Bryologist* 101: 70-85.
- Myllys, L., Lohtander, K. & Tehler, A. (2001)  $\beta$ -tubulin, ITS and group I intron sequences challenge the species pair concept in *Physcia aipolia* and *P. caesia*. *Mycologia* 93: 335-343.
- Nimis, P.L. (1998) A critical appraisal of modern generic concepts in lichenology. *Lichenologist* 30: 427-438.
- Platt, J.L. & Spatafora, J.W. (2000) Evolutionary relationships of nonsexual lichenized fungi: molecular phylogenetic hypotheses for the genera *Siphula* and *Thamnia* from SSU and LSU rDNA. *Mycologia* 92: 475-487.
- Stenroos, S. & DePriest, P. T. (1998) SSU phylogeny of the cladoniiform lichens. *Am. J. Bot.* 85: 1548-1559.
- Tibell, L. (1984) A reappraisal of the taxonomy of Caliciales. *Beih. Nova Hedwigia* 79: 597-713.
- Tibell, L. & Wedin, M. (2000) Mycocaliciales - a new order for non-lichenized calicioid fungi. *Mycologia* 92: 577-581.
- Wedin, M. & Döring, H. (1999) The phylogenetic relationship between the Sphaerophoraceae, *Neophyllis* and *Austropeltum* (lichenized Ascomycota). *Mycol. Res.* 103: 1131-1137.
- Wedin, M., Döring, H., Nordin, A. & Tibell, L. (2000a) SSU rDNA phylogeny shows the lichen families Caliciaceae and Physciaceae (Lecanorales, Ascomycotina) to form a monophyletic group. *Can. J. Bot.* 78: 246-254.
- Wedin, M., Döring, H. & Ekman, S. (2000b) Molecular phylogeny of the lichen families Cladoniaceae, Sphaerophoraceae, and Stereocaulaceae (Lecanorales, Ascomycotina). *Lichenologist* 32: 171-187.
- Wedin, M., Tehler, A. & Gargas, A. (1998) Phylogenetic relationships of Sphaerophoraceae (Ascomycetes) inferred from SSU rDNA sequences. *Pl. Syst. Evol.* 209: 75-83.
- Winka, K., Ahlberg, C. & Eriksson, O.E. (1998) Are there lichenized Ostropales. *Lichenologist* 30: 455-462.



## LICHENOLOGY-ON-LINE

### On-line checklists

Checklists form an important tool for those engaged in nature protection as they provide a basis for the establishment of red lists. The Checklists of lichens project commenced in 1998 with the aim of producing online checklists of the major geographic units of the world.

Clickable maps under the URL <http://www.checklists.de> or [http://www.biologie.uni-hamburg.de/ialb/herbar/world\\_l2.htm](http://www.biologie.uni-hamburg.de/ialb/herbar/world_l2.htm) now supply links to checklists of 110 countries produced by different authors. As from July 2001, data for nearly 80 percent of 193 countries will be stored in a database on the basis of information derived from literature. Absolutely nothing is known of the lichen flora of 15 countries.

It is planned to produce report files from the database for every country giving taxon names and synonyms, literature, collectors and herbaria where material is deposited.

As standardization reduces errors, some proposals have been made by the author regarding layout in future contributions (<http://www.biologie.uni-hamburg.de/ialb/herbar/standard.htm>). The guidelines of Brummit & Powell 1990, Lawrence et al. 1968 and Bridson & Smith 1991 have been adopted. To supply equable information on different parts of the world it will be necessary to deal not only with the 193 countries but also with smaller administrative units of the larger countries. For this purpose geographical units defined by Hollis & Brummitt (1992) are used. Whenever possible, local specialists have been asked to contribute lists of their countries. It is one of the central aims of this international project to encourage contributors to this common effort.

A checklist of African lichens will soon be established in cooperation with Luciana Zedda (Bayreuth) and Bernhard Marbach (München) to provide, for instance, an important background information for the participants of the German BMBF project BIOTA in which eight lichenologists participate in joint ecological projects in West-, East- and South Africa. It is also planned to present a checklist of Latin American lichens at the GLAL 5 meeting in Valparaiso in November 2001.

Until recently individual checklists have been provided as plain text files. In close collaboration with Gerhard Rambold (Bayreuth), these checklists have been transformed and incorporated into a LIAS database module. Thus, it will soon be possible to link the geographical data with structural data, based on a global checklist of lichens.

Tassilo Feuerer, Hamburg

### References

- Bridson, G.D.R. & Smith, E.R. (1991) *Botanico - Periodicum - Huntianum/Supplementum*. Hunt Inst. Bot. Documentation, Pittsburgh.  
 Brummit, R.K. & Powell, C.E. (1990) *Authors of plant names*. Royal Bot. Garden, Kew, 732 p.  
 Lawrence, G.H.M., Buchheim, A.F.G., Daniels, G.S. & Dolezal, H. (1968) *Botanico - Periodicum - Huntianum*. Hunt, Pittsburgh.

Hollis, S. & Brummit, R.K. (1992) World geographic scheme for recording plant distributions. Plant taxonomic database standards No. 2, International Working Group on Taxonomic Databases for Plant Sciences (TDWG). Pittsburgh.

### News from ITALIC

Starting from July, 1, 2001, ITALIC can automatically produce identification keys, complete with colour images, distributional maps, descriptions and ecological notes. The keys are generated, starting from a new database of morpho-anatomical and chemical data, by an original software developed by S. Martellos at the University of Trieste. Users will be able to order keys 'a la carte'. They can specify any combination of morpho-anatomical, distributional and ecological data (incl. ecological indicator values) to define a set of species (e.g. foliose sorediate lichens) which are likely to occur in a 'virtual habitat' (e.g. isolated trees in an orchard near Trieste). The key will contain only the selected species present in that virtual habitat. At the moment the archive includes all epiphytic lichens of Italy (excluding *Usnea*) for a total of 732 species.

The procedure for allowing users to directly ask for a key via Internet is still under development. The main problems to be solved are those of Copyright. To give an idea of the kind of product which can be obtained from ITALIC, we have placed an example, a small key of the foliose lichens which are likely to occur on isolated trees in an orchard near Trieste. Further keys will be available in the next future. The procedures and the database are under continuous updating and improvement. We would be grateful for critical notes on these prototypes. ITALIC can be found at: <http://dbiodbs.univ.trieste.it/>

Pier Luigi Nimis and Stefano Martellos, Trieste

### New web sites

The Dutch Bryological and Lichenological Society (BLWG) has a new website, [www.blwg.nl](http://www.blwg.nl), including a searchable index of the journal *Buxbaumia*. A website devoted to the lichens of Colorado is available at: <http://www.webspinners.com/lichens/>. The journal "Allgemeine Lichenologische Mitteilungen" is available at <http://www.alm-neu.de/start.htm>, and the lichen herbarium of University Essen is found at <http://www.uni-essen.de/botanik/herbobot.htm>.

The Editor

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### The cover-page illustration

*Thelidium papulare* (Fr.) Arnold: Cross section of a perithecium. The species prefers calciferous rocks with vertical or inclined surface at moist situations. It is well recognized by the characteristically shaped involucrellum and the ascospore septation. Illustration: Alois Wilfling, Graz (1997, ined.).

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