

# The BRYOLOGICAL TIMES

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## Endangered bryophytes and Conservation: a survey

by Tomas Hallingbäck, IAB Standing Committee for Endangered Bryophytes

Extinction is a natural process. Today, however, plant and animal species are disappearing world-wide at an accelerated pace. This includes bryophytes. The major cause of this is large-scale destruction of native habitats. The reasons for minimizing this process are many, not least that man has no right to exterminate any plant or animal; not even a tiny bryophyte species or variety!

As was concluded from the survey made by the IAB Tropical Bryology Standing Committee (Tan, Sastre-de Jesús & Pócs 1991) there are numerous bryophytes still undescribed and many of those could be lost forever through a continuation of deforestation and thoughtless exploitation of nature. During the last few years an increased interest in bryophyte conservation has been obvious among bryologists. This was clearly shown during the recent symposium in Uppsala (Sweden) focusing on Endangered Bryophytes - Causes and Conservation. The proceedings are now published as a special issue of the scientific journal *Biological Conservation* volume 59, Nos 2 & 3, 1992.

In order to collect as much relevant new information as possible about the state of knowledge in different regions, about threat status of bryophytes etc, the standing Committee for Endangered Bryophytes of the Inter-

national Association of Bryologists (IAB) conducted a questionnaire in 1991. The goal was to survey different aspects of bryophyte conservation including new literature, new research projects and different aspects of threats to bryophytes and bryophyte vegetation.

Our 12 question inquiry form was distributed together with the 1991 April issue of the *Bryological Times* to all members of IAB. More than 60 bryologists answered and thanks to the additional contributions from the survey made by the IAB Committee on Tropical Bryology 83 replies from 40 countries were received. Because some bryologists have answered for more than their own country the actual number of countries covered was 47. The geographical range of the respondents was with a few exceptions limited to Europe and North America. The countries represented in the survey and the number of respondents from each country are listed in Table 1.

We believe this response is rather good since bryophyte conservation has until recently not been recognized as a topic in its own right, or worthy of much effort.

Tomas Hallingbäck, Threatened Species Unit, SLU, Box 7072, S-75007 Uppsala, SWEDEN

### SINSKE HATTORI (1915-1992).

Dr. Sinske Hattori, Director of the Hattori Botanical Laboratory, died by bleeding of digestive organs at 9 AM on 12 May 1992, at the age of 76. His contributions to bryology were great and he will be missed throughout the botanical world. A memorial service, attended by many Japanese bryologists who were shocked by his unexpected death, was held at his home on May 14.

Dr. Sin Hattori was a great hepaticologist and a highly productive scientist. His list of publications includes over 380 titles. He was editing no. 72 of the *Journal of the Hattori Botanical Laboratory* until shortly before his death.

Most of the activities of the Hattori Botanical Laboratory will be continued. No. 72 of the *Journal* will be published by the end of August 1992. All communications for future volumes of the *Journal* should be addressed to: Dr. Masami Mizutani, Assistant Editor, Hattori Botanical Laboratory, 3888 Obi, Nichinan-shi, Miyazaki-ken, 889-25 Japan. [Z. Iwatsuki, Botanical Institute, Hiroshima University, Japan].

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## KNOWLEDGE ABOUT DECLINING BRYOPHYTES

**Question 1. Does a distinct decline of bryophytes occur in the region you know much about or in your country?**

Most countries in central and eastern Europe report a distinct decline in a number of species. China, India and the Philippines announce a decline in the bryophyte diversity. But from Australia, New Zealand and some countries in Latin America and Africa the answers indicated that insufficient knowledge prevent the question from being answered properly. As shown by the chart (fig. 1) the proportion of "Yes" answers is highest in Europe and Asia but lowest for Australasia where insufficient knowledge is the major problem!

**Question 1 b. If a decline, which species (or groups) and/or ecological groups have decreased?**

Only a few bryologists have specified systematic groups or species that have decreased. Hepatics as a group were often mentioned to be more sensitive than mosses and among families mentioned are Lejeuneaceae and several groups of thallose hepatics. Among mosses, families like Sphagnaceae, Cryphaeaceae, Hookeriaceae and Buxbaumiaceae were mentioned as having declined.

As shown by the chart in fig. 2 the bryophytes in woodlands and wetlands we considered to have decreased most markedly. As much as 33 % of all answers mention epiphytes as the most endangered ecological group in Europe. Other important groups are bryophytes in ombrotrophic bogs and in rich fens; this is especially true for North America and Europe. Some bryologists particularly mention epiphytic hepatics and two people point at calcareous grassland as well as oligotrophic heathland to be threatened in western Europe.

Fig. 1. Does a distinct decline occur in your region ?

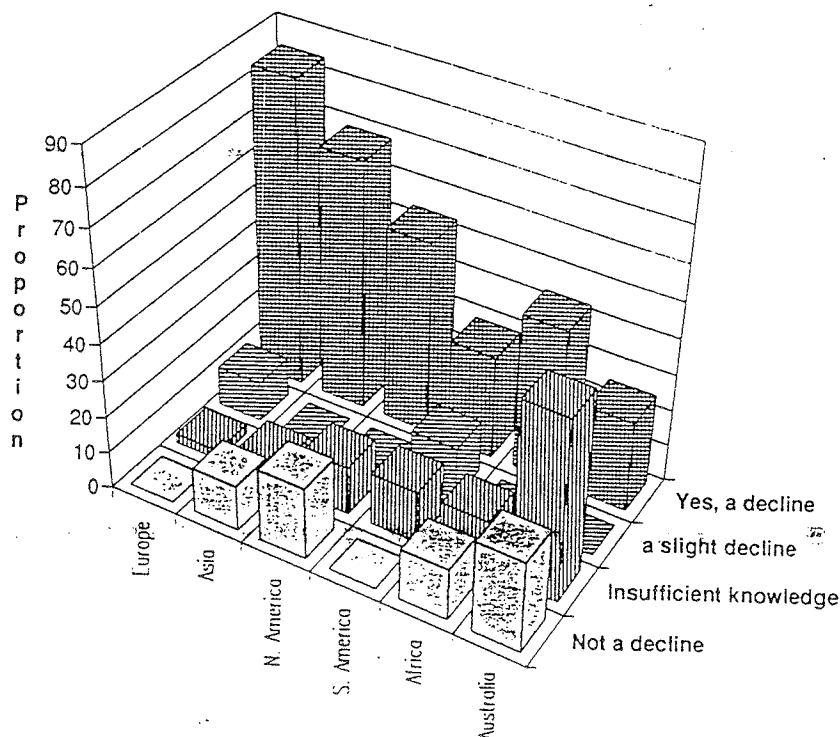
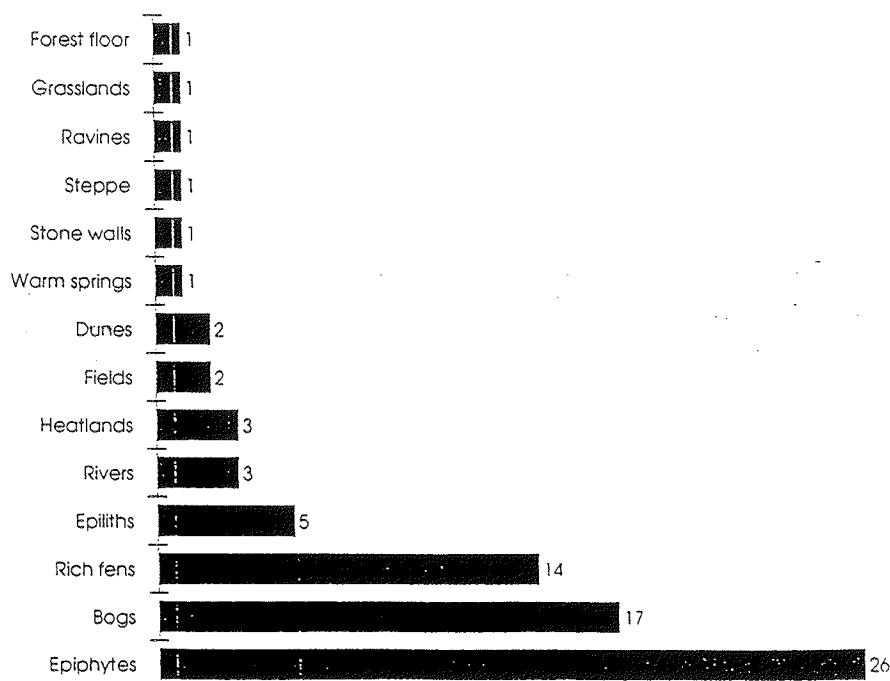


Fig. 2. Which habitat/ecological group has decreased most?



In Spain epiphytes are considered to be threatened only around cities and centres of industry. Much more threatened in the Iberian peninsula are probably the coastal sand dunes, salt water lagoons and gypsiferous areas on the coast. These habitats are indeed exploited by tourism and urbanization. In North-Western Spain the last few peat-bogs seem to be under a serious threat.

In Russia oligotrophic swamps and rich fens have been ploughed and turned into fields but also some epiphytes seem to have declined in woodlands. The threat to the forest bryophytes in Mexico seems to be very serious as well as in other tropical countries. In South America the flora of forests in general is declining, except for weedy species. Especially threatened are epiphytes and epiphyllous species of the rain forest.

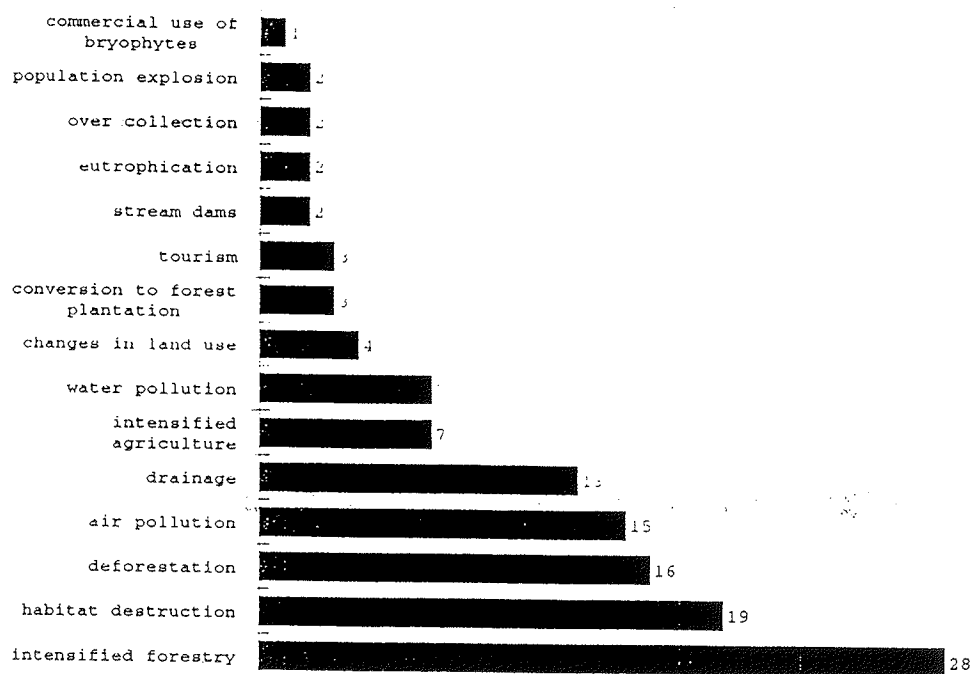
In Asia marchantioid hepatics of the Himalayan region are considered to be threatened. In the Philippines lowland rain forests are at the moment the most threatened habitats, lowland forest in Philippines now almost all gone, but in the future the montane forest flora will also probably become threatened.

In Australia the rain forest of the northern part is threatened. Elsewhere the bryophytes of the lowlands are endangered because sites are taken over for agriculture. In Africa epiphyllous bryophytes in mist-affected woodlands, especially hepatics, are threatened.

**Question 2. Do you know if anything is written (beside Red Data Lists) about changes in the bryophyte flora in the region you know best or in your country ?**

The knowledge in terms of literature about endangered bryophytes is apparently still very poor, but during the last few years several new papers have been published, not to forget the recent special issue of Biological Conservation

Fig. 3. Which are the main causes for the decline ?



volume 59 Nos 2 & 3. A bibliography on endangered bryophytes has been made and a copy can be ordered on request from me (also available as data file).

The state of knowledge in Europe and North America is comparatively good. In Africa, Asia, Australia and South America the state of knowledge is still very incomplete and many more baseline studies are needed.

**Question 3. Do you have any "Red Data List" for bryophytes in your country or in the region where you have studied bryophytes ?**

At present at least 10 countries in Europe have published a bryophyte red list (Finland, Sweden, Germany, The Netherlands, Belgium, Poland, Hungary, Austria, Switzerland and former Soviet Union) and at least five countries have

a list in manuscript. Outside Europe only two countries have published a national list of endangered bryophytes: Japan (Takaki & Ando 1975) and the Philippines (Tan, Fernando & Rojo 1986). Some countries have started preparation for a red list (e.g. Iberian peninsula and Norway). Beside national lists some federal countries e.g. the United States of America, Germany and former Soviet Union have made "state" or "Länder" Red lists.

**Question 4. Are any of your best bryophyte sites threatened in the region you know best or in your country ?**

There are more or less threatened rich bryophyte sites in nearly all responding countries, especially in Central and Western Europe, Iberian peninsula, European part of the former Soviet Union, but less so in North America. In Central and South America there are many localities under threat, especially rain forest sites. In India the slopes of the

Himalayas are very rich in bryophytes and the sites are very threatened by logging.

**Question 5. Do you need any help to investigate the sites and/or to suggest a conservation plan ?**

This question was interpreted in a variety of ways, some bryologists requiring financial assistance (!), and others suggesting that a letter of support from the international committee would be useful in bryophyte conservation. Others want help with developing methods for monitoring, assistance in constructing a local data base for endangered species, and help with greater recognition of the importance of bryophytes by federal agencies as well as help with inventories of bryologically undercollected areas. The IAB Standing Committee hopes to be able to fulfil at least some of these demands in the near future.

**Question 6. What is particularly important in an international context in your area ?**

The answers to the question on features of particular importance were very mixed. Endemic species and species with a restricted ecological amplitude were identified as being of particular importance. As one bryologist wrote: "In New Zealand many taxa are of great bryological interest and many are endemics, compared to e. g. Sri Lanka and East Africa which have few endemics; the sites rich in bryophytes are generally more at risk". Also montane forest in tropical areas and oceanic areas in Europe are of international interest as well as areas which are meeting points of several phytogeographic regions. Some questionnaire recipients did not fully understand the question. **Question 7. Is there any research on changes in the bryoflora caused by man at your institute ?**

Only a few projects, mainly in Europe,

have been carried out so far, such as several mapping and monitoring projects but also monographic studies of endangered species. Research on air pollution and bryophytes as well as the effects of disturbing wetlands are carried out in some countries. In the near future some new projects will start which focus on changes in the bryoflora. More information about current research projects could be received on request.

**Question 8. Which are in your opinion, the main causes for the decline of bryoflora in the area you have studied ?**

A variety of causes are mentioned and the most common threats are shown by the chart (fig. 3). The largest problem is "habitat destruction" reported from about 20% of the bryologists. The second most important cause seems to be "deforestation" which here includes intensified forestry practice (16%), followed by a third cause "Air pollution" (15%) and "drainage" (13%) which include utilization of wetlands. Answers like "habitat destruction", "man's impact", "human activities" etc are very imprecise and could include most threats like urbanization and industrial development, but also deforestation, drainage etc.

"Forestry" is a dominating cause in Asia, Latin America and Africa. Other threats are more obvious in Europe like "air pollution" and "fertilization". In North America (North of Mexico) "loss of habitat" seems to be one of the main cause. Astonishing to my mind is that the threat "tourism" was mentioned in three answers. Over-collecting was mentioned from three countries as a serious threat.

**MEASURES FOR PROTECTION OF BRYOPHYTES.**

**Question 9. Are bryophytes in general or any bryophyte species protected by law in your country ?**

Most countries have not protected bryophytes in general nor any species in particular. In those few countries where the bryophytes are formally protected, the responding bryologists do not seem to have faith in the observance of the laws. The genus *Sphagnum* is protected in several countries (most probably because of the economic value of peat).

**Question 10. Are bryophytes explicitly protected in nature reserves and/or national parks in your country ?**

In principle bryophytes are protected in all nature reserves in Japan, Russia, Armenia, Israel, The Netherlands, Great Britain and in some states of USA and Canada. They are protected in not all but some nature reserves in e. g. Sweden, Hungary, Germany, Argentina, China and Australia.

**Question 11. Is there any research carried out in connection with protective measures for bryophytes ?**

Worldwide very little research is carried out on bryophytes and protective measures for them. Research on protective measures is done in the following countries: The Netherlands, Great Britain, Sweden, Switzerland, Spain, United States (Oregon, New York state) and Australia. For more details, please send a request.

**Summing-up**

The result of the questionnaire clearly demonstrate that many bryophytes and bryophyte communities are perceived as threatened worldwide, and also that little is being done to conserve them. What, therefore, are the possible ways forward ?

The IAB Standing committee for Endangered Bryophytes is already working, in association with the IUCN,

towards a first Action Plan for bryophytes conservation, which the results of the questionnaire will be contribution to. The European Committee for the Conservation of Bryophytes has drawn up a draft Red List of bryophytes in Europe and is working towards a European Red Data Book and Site Register. These will all be useful documents to present to conservation organisations, governments and other bodies in order to promote bryophyte conservation.

#### Acknowledgements

I am grateful to Nick Hodgetts, secretary of the IAB standing Committee for Endangered Bryophytes, for valuable discussions and for several improvements in the English text.

#### References.

Takaki, N. & Ando, H. 1975. Rare Species and Their Conservation, Bryophyta. In Studies in conservation of natural terrestrial ecosystems in Japan. JIBP Synthesis Vol. 8. Tokyo.

Tan, B. C., Fernando, E. S. & Rojo, J. P. 1986. An Updated List of Endangered Philippine Plants. Yushania 3 (2): 1-5

Tan, B. C., Sastre-de Jesús, I. & Pócs, T. 1991. Tropical Bryology in Peril: a Survey. The Bryological Times 64: 1-6.

Table 1. The number of respondents from each country arranged in numerical sequence.

| No. | country     |
|-----|-------------|
| 11  | USA         |
| 8   | Germany     |
| 5   | Spain       |
| 4   | Netherlands |
| 4   | Russia      |
| 3   | Austria     |
| 3   | China       |

|   |                  |
|---|------------------|
| 2 | Argentina        |
| 2 | Australia        |
| 2 | India            |
| 2 | New Zealand      |
| 2 | Papua New Guinea |
| 2 | Philippines      |
| 2 | United Kingdom   |
| 1 | Armenia          |
| 1 | Belgium          |
| 1 | Bolivia          |
| 1 | Brazil           |
| 1 | Canada           |
| 1 | Colombia         |
| 1 | Cuba             |
| 1 | Czechoslovakia   |
| 1 | Fr. Guiana       |
| 1 | France           |
| 1 | Hungary          |
| 1 | Iceland          |
| 1 | Israel           |
| 1 | Japan            |
| 1 | Kenya            |
| 1 | Kerguelen Is.    |
| 1 | Luxembourg       |
| 1 | Malagasy         |
| 1 | Mexico           |
| 1 | Namibia          |
| 1 | Nigeria          |
| 1 | Panama           |
| 1 | Poland           |
| 1 | Portugal         |
| 1 | Puerto Rico      |
| 1 | Solomon Islands  |
| 1 | South Africa     |
| 1 | Sri Lanka        |
| 1 | Sweden           |
| 1 | Switzerland      |
| 1 | Tanzania         |
| 1 | Ukraine          |
| 1 | Vietnam          |

The "Mosses and Liverworts of Mt. Kinabalu" (see review on p.11) are not offered by booksellers outside Malaysia. Therefore a couple of copies have been bought in Malaysia and are made available at a price of US\$ 10 by J.-P. Frahm, Universität Duisburg, FB 6, Botanik, Postfach 101503, 4100 Duisburg, Germany.

#### Flora News

##### Towards a Liverwort and Sphagnum Flora of The Netherlands

by S. Rob Gradstein and Huub van Melick

The Dutch Bryological and Lichenological Society has initiated the preparation of a Hepatic and Sphagnum Flora of The Netherlands. The project is a sequel to the Moss Flora of The Netherlands (Touw & Rubers 1989), which treats the mosses of the country except *Sphagnum*. The main goal of the project is to prepare an up-to-date synthesis of the distribution and ecology of the liverwort and Sphagnum species in The Netherlands. The Flora will include distribution maps showing the distribution in the country of each species, keys, and brief descriptions of diagnostic characters, habitats, geographical range, etc. Illustrations will be provided for those taxa not illustrated in the Atlases of the Dutch bryophytes by Landwehr (1980, 1984).

The new Flora will be based on a complete revision of the holdings of the Dutch institutional and private herbaria. The revisionary work will be carried out by a team of Dutch bryologists, including:

ANDRÉ APTROOT - Lophoziaceae  
 MARIETTE APTROOT-TEEUWEN - illustrations  
 AD BOUMAN - Cephaloziaceae, Sphaerocarpos  
 GERARD DIRKSE - Sphagnum  
 HEINJO DURING - Fossombronia, Haplomitrium, Anthocerotae  
 ROB GRADSTEIN - Odontoschisma, taxonomic descriptions  
 HENK GREVEN - Calypogeia  
 HUUB VAN MELICK - Jungermanniaceae, Riccia, coordination ARNO VAN DER PLUUM - Metzgeria, Lejeuneaceae  
 WIM RUBERS - Marsupella, Plagiochila, various Marchantiales and Metzgeriales

HENK SIEBEL - Blepharostoma, Ptilidium, Trichocolea

KOOS VAN VLIET - Radula, Frullania

EDDIE WEEDA - reviewer for localities and habitats

BEN VAN ZANTEN - Lepidoziaceae

RUDI ZIELMAN - Scapaniaceae, Lophocoleaceae

The Hepatic project is coordinated by S.R. Gradstein, who is responsible for the preparation of the taxonomic descriptions and keys, and H.M. van Melick, who takes care of all organizational matters. Editing of the Hepatic Flora will also be undertaken by the coordinators. The *Sphagnum* Flora will be edited by G. DIRKSE.

It is hoped that the work will be finished in three years. The publication of the Flora will as usual be sponsored by the Dutch Natural History Society.

Address of Project Coordinator: Huub van Melick, Merellaan 13, 5552 BZ Valkenswaard, The Netherlands

### News from Herbaria

#### Paris (PC)

D. LAMY (Cryptogamic Herbarium, Museum of Natural History, Paris) informs us that the important herbarium of Montagne, a rich source of types of bryophytes and other cryptogams, is being reorganized. All original drawings (ca. 6000) have been taken from the specimens, with a reference number, and are now kept separately in non-acid paper. Furthermore, the label data are being computerized in a data base which allows for quick retrieval of original illustration, collector and region. The information also links up with Montagne's publications and with his unpublished manuscripts kept at PC, including a "Herbarium Register" (5 volumes, 1820-1860) in which he has entered all specimens and letters received.

Thus far, all bryophyte specimens (13000), all lichens and about half of the algae

have been included in the data base. Monsieur Lamy is now being preparing a documentation about Montagne's work on the cryptogams of South America.

IDA BRUGGEMAN (Zeist, The Netherlands) also reports about efforts undertaken to make the bryophyte collections of the Museum of Natural History, Paris more accessible. Traditionally, collections donated to the Paris herbarium have always been stored separately, with the taxa arranged according to the system accepted by the original owner. Of two families, Sphagnaceae and Fissidentaceae, the collections of many separate herbaria are being transferred to the "Herbier Général", e.g., of the hb. Thériot, Le Sourd, Ledien, Cardot, Lachmann, Bizot; the "herbier de France" and the "herbier Région parisienne". For historical reasons, an exception is made for the collections of the Montagne Herbarium. In the general herbarium the specimens are arranged geographically within the species (mostly per continent). Lists are being prepared of all species and Type collections kept in the general herbarium.

#### Eger (EGR)

The overseas Musci of the Eger College Herbarium (EGR), which were on permanent loan basis in Vacratot (VBI) since 1978, are transferred back to Eger and united with the Hepaticae, which were already transferred last year. GABRIELLA KIS will become the Curator of the Herbarium and of the Botanical Garden of Eger College. Her new address, effective 15 July 1992, is: Esterhazy Teachers College, Dept. of Botany, Eger, pf. 43, H-3301 Hungary.

### News from Societies

THE BRYOLOGICAL SOCIETY OF JAPAN has elected new officers for January 1992 - December 1993, at the general meeting in Okayama, 2-4 Aug. 1991:

President: Z. Iwatsuki (Hiroshima University)

Secretary: M. Higuchi (Hiroshima University)

Treasurer: T. Nagatsubo (Hiroshima University)

Auditor: H. Deguchi (Kochi University)

Editor: H. Kanda (Natl. Inst. Polar Research)

Associate Editors: T. Nakamura (Natural History Museum, Chiba) and N. Nishimura (Okayama University of Science).

THE SWISS BRYOLOGICAL AND LICHENOLOGICAL SOCIETY (Schweizerische Vereinigung für Bryologie und Lichenologie) has started a new periodical MEYLANIA. It is conceived as a newsletter giving information on our association's doings, reports on meetings and excursions, and research results of our members who are mainly non-professionals, amateurs interested in improving their taxonomic knowledge and in floristics. All members are invited to communicate their observations. The editors, Michael Dietrich for lichenology and Irene Bisang for bryology, will function as advisor to the authors but not as severe referees. The contributions may be written in the four Swiss national languages as well as in English.

MEYLANIA, which will appear twice a year, started with number 1, 1 (28 pages on recycled paper) on Jan. 31, 1992. This issue includes, besides the annual programme (see the Diary of The Bryological Times), an account on the biology and present, heavily reduced distribution of the Lichen *Lobaria amplissima*; a note on the difference between *Pedinophyllum interruptum* and *Plagiochila asplenoides* s.l.; a short biography of Charles Meylan (1868-1941), teacher at Ste-Croix in the Jura Mts. and author of the Swiss Hepatic Flora, whose papers on cryptogams added much to the advancement of Swiss Cryptogamy in the first half of this century; a presentation of a private enterprise working with lichens for ecological expertise; and other

III Simposio Latino-americano de Briologia  
Mexico City, 13-18 July 1992

Programme

14 July

9.00 Opening

9.30 Mona Bourell, "Bryophyte flora of Chiapas, Mexico".

10.00 Peter Döbbeler, "Ascomycetes en hepáticas epífilas de Costa Rica."

10.30 Angel Zambrano & Irma Rosas, "Biomonitoreo de plomo en los bosques de oyamel de la Cuenca de México mediante *Leptodontium viticulosoides* (Musc.)".

11.30 Bruce Allan, "Neotropical floras: The Central American moss flora".

12.30 Angeles Cárdenas, "Situación de la enseñanza de la briología en México".

13.00 Clementina Equihua, "Sucesión de briofitas después de fuego en un matorral xerófilo de Florida".

15.00 Alan Whittemore, "The thallose liverworts of México".

15.30 Denise Pinheiro da Costa, "Ocorrença da família Peuroziaceae (Hepaticopsida) no Brasil".

16.00 Angel Durán, C. Cisneros, Antonio Vargas & V. Agustín, "Evaluación briológica de los efectos de la contaminación atmosférica en la ciudad de México".

16.30 Deisi Reyes M., "El estudio de la briología en Cuba".

15 July Fieldtrip

16 July

9:00 Denise Pinheiro da Costa & Raul Machado, "Detalhes da morfologia de *Metzgeria conjugata* Lindb. (Metzgeriaceae, Hepaticopsida)".

9:30 Clementina Equihua, "Investigación reciente sobre briofitas en el Amazonas".

10:00 Roberto Riverón, "Variaciones estacionales de microartrópodos en musgos altimontanos en México".

10:30 Claudio Delgadillo M., "El banco de datos de los musgos neotropicales".

11:30 Richard W. Spjut, "Systematic screening of bryophytes for antitumor agents".

12:30 Noris Salazar Allen, "Revisión de las especies de *Octoblepharum* del neotrópico".

13:00 Efraín J. Moreno, "Historia de la briología en Venezuela".

15:00 María Magdalena Schiavone, "Formas de vida y distribución de las Polytrichaceae fueguinas".

15:30 Efraín de Luna, "El uso de métodos morfométricos en sistemática filogenética".

16:00 Robert R. Ireland, "The moss genus *Isopterygium* (Hypnaceae) in Latin América".

16:30 Angel Motito M., María Helena Potroni H. & Deisi Reyes M., "Estado actual y perspectivas futuras del estudio de los musgos cubanos".

17:00 Visita al herbario briológico de la UNAM.

17 July

9:00 Bernardina Bello y Bello, "La colección briológica del Herbario Nacional, México".

9:30 Anita Hoffman & Roberto Riverón, "Biorelaciones entre los musgos y su acarofauna en México".

10:00 Celina M. Matteri, "Biodiversidad muscinal al sureste de la Cordillera Andino-Patagónica".

10:30 María T. Moyá Guzmán, "Fenología de *Marchantia chenopoda* L. en el bosque estatal de Maricao, Puerto Rico".

11:30 S. Rob Gradstein, "Conservación de la brioflora de las selvas neotropicales".

12:30 Ronald A. Pursell, "Progress report on the monograph of neotropical *Fissidens*".

13:00 María Isabel Morales-Zurcher, "La posición taxonómica de *Aphanolejeunea heterophylla* (Hepaticae)."

15:00 Efraín J. Moreno, "Estado actual del conocimiento taxonómico sobre briofitas en Venezuela".

15:30 Inés Sastre-de J., "Comunidades de briofitas en madera en descomposición en el bosque subtropical lluvioso de Puerto Rico".

16:00 Kesia Mustelier M. & Deisi Reyes M., "La familia Lejeuneaceae (Hepaticopsida) en Cuba".

16:30 Sesión de la Sociedad Latinoamericana de Briología.

18:00 Clausura.

18 July Fieldtrip

## Can one test competition in bryophytes

by Janice M. Glime and Yenhung Li

*Ecology Column.* Send contributions to the column editor Janice M. Glime, Dept. of Biological Sciences, Michigan Technological University, Houghton, Michigan 49931, U.S.A.

One of the most interesting challenges of science is to present one's arguments on a controversial topic in such a way as to influence others to one's way of thinking. This of course only remains rewarding if one is not disproved, and of course is more rewarding if we ourselves or others can support our arguments with good experimental data. Such a challenge is the concept of competition in mosses.

Some bryologists, such as Slack (1982), question whether mosses even have competitive exclusion. Others have tried to demonstrate it and failed (Watson 1980). I have recently found field evidence among geothermal species that indeed one bryophyte may reduce the abundance of another by replacing it in the middle of its niche range. But is that really why the species is absent mid range, while being abundant at both ends?

Vascular plant biologists challenge us to carry out the experimental transplants to demonstrate such interactions. But mosses usually fail abysmally at transplanting, leaving us with little recourse to defend or refute the notion that competition really exists.

One moss system that lends itself to easy transplantation is *Sphagnum*. Living without attachment to a substrate and being supported by its companion plants, *Sphagnum* does not suffer the risk of desiccation that threatens the life of soil species when their underlying substrate dries and shrinks away from its connections to the moss in its new location. In fact, *Sphagnum* can even gain water from its new companions when it is transplanted into the middle of a hummock of existing individuals.

Having solved one of the most difficult

of transplant problems, *Sphagnum* unfortunately confounds the issue by another need that is not at risk in its vascular counterparts. *Sphagnum* maintains its water by capillary movement among the individuals and prevents great evaporative loss in the same way. With its enlarged capitulum, its stems can be widely spaced, yet present to the atmosphere a nearly continuous blanket of plant material in the interconnected capitula. Such an arrangement presents a surface that affords minimal evaporation of water from every individual.

Now suppose that our transplant is a superior grower at the ambient temperature when compared to its new companions of an established species. It soon advances and extends above the blanket of heads, showing its superiority dramatically as it lords above them. As it continues to grow, it may rear its entire head above all its inferior companions.

But as water recedes, our lofty transplant now faces a loneliness that only a bevy of companions of its own species can cure. Its exposure to air movement and water loss can only be prevented if it is part of that bevy of heads that makes a blanket against the considerable water escape. It has no choice but to shut down metabolism, and thus growth, until its new companions once again join it by their own much slower growth (Clymo 1973).

Thus, the fast growing transplant is stopped in its quest of superiority by factors that can only be dealt with in the company of others, and it is most likely to maintain that company with other members of its own species. In the company of other species, it is at the mercy of wet weather to maintain its

hydration so that it may continue its quest.

Such a closely tuned co-existence makes it difficult to show competition to the point of competitive exclusion because it is only under some circumstances that a species may win, only to become the loser in the next regime of a different set of weather patterns. And so I submit that while *Sphagnum* may be able to compete in the short term, the demonstration of a long term winner is a much more difficult challenge to surmount. Rydin (1985) has been successful in demonstrating competition among four *Sphagnum* species by measuring rate at which one species replaced surface area occupied by another.

If we attempt to examine such a phenomenon in any cushion moss by the acceptable transplant method, we are faced with much the same problem of drought when one moss dares to exert its superiority by growing faster and taller. This leaves us examining the pleurocarpous mosses for a possible answer.

Now suppose we choose one of the geothermal bryophytes I suggested above. The warmth-loving *Hypnum plumaeforme* seems to supplant *Odontoschisma prostratum* mid range, where the latter all but disappears. *Hypnum* grows horizontally in a mat of nearly vertical branches where the moist steam of the vent favors its growth. *Odontoschisma prostratum* grows flat on the surface of the soil, making a nearly impenetrable cover over the surface. If we consider the growth of each, one can surely imagine that the three-dimensional *Hypnum plumaeforme* could easily extend over the surface of the flat-growing *Odontoschisma prostratum*, hardly missing its occasional

point of contact with the soil below. As it shades the *O. prostratum*, the latter succumbs to the superior light trapping ability of *H. plumaeforme*.

But the proof of this is more challenging. A transplant of *O. prostratum* into *Hypnum plumaeforme* would surely result in death of the former by sheer disruption of its delicate contact with the substrate, depriving it of its essential moisture regime from below. On the other hand, a transplant of *H. plumaeforme* might succeed from the transplant, since we have been successful in transplanting it in non-competitive situations, but if it indeed surpasses the *O. prostratum*, resulting in its death, can we demonstrate that such an event ever occurs in nature? Can natural transplantation of whole plants ever result to the extent that we see evidence of competition? Would they not instead be from small pieces that fail more often than not due to desiccation from being alone? Or should we be looking at fragments of leaves, invading slowly, but succeeding in establishment more readily? Can we follow such events in nature, monitoring them to the point of overtake, without interfering with the system by our monitoring methods? And if they do not establish in our experiment, does it mean that without our prodding and poking they would also fail?

Slack (1982) lists other possibilities that make exhibition of competition difficult: habitats where bryophytes grow are often ephemeral and interaction cannot develop before the habitat itself is gone; competition might occur at an earlier protonemal stage, making the conspicuous adult populations already the result of competition.

In vascular plants we can demonstrate competition by planting seeds of varying numbers and percentages of two species in pots and measuring weight gain in each treatment. But where is the system in mosses that lends itself to such a simple treatment by spores or other propagules, that can be followed in a reasonable length of time, and that will not have the circumstances change

to favor the other before the subjects are large enough to stand up and be counted?

#### References

- CLYMO, R. S. 1973. The growth of *Sphagnum*: Some effects of environment. *Journal of Ecology* 61: 849-869.
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- SLACK, N. G. 1982. Bryophytes in relation to ecological niche theory. *Journal of the Hattori Botanical Laboratory* 52: 199-217.
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*cont. from p. 6*

short communications.

The next issue will include, besides original communications, reports on the mapping projects for bryophytes and for lichens, identifications keys for bryophyte genera of which there is no recent treatment for Central Europe, and a listing of research projects and institutions working in bryology and lichenology.

All paid-up members of SBLA receive MEYLANIA without any further costs. New members are welcome. Please write to Philippe Clerc (president) or Patricia Geissler (secretary) both at Conservatoire et Jardin Botaniques, Case postale 60, CH-1292 Chambesy/Geneve. [P. Geissler].

#### Requests

DAVID LONG, Royal Botanic Garden, Edinburgh, EH3 5LR Scotland, UK, is currently working towards a monograph of the genus *Asterella*. For the past two years work has concentrated on Asiatic species but he now wishes to begin loo-

king at African material. He wishes to see herbarium material of any collections from Asia or Africa, especially material with sporophytes. The revision will include accounts for the *Bryophyte Flora of China* and *Bryologia Africana*. Material from any other continent will also be welcome.

JILL L. BUBIER, Dept. of Geography, McGill University, 805 Sherbrooke St., Montreal, QC, Canada H3A 2K6, is looking for a copy of Robert Ireland's *Mosses of The Maritime Provinces*, which is out of print. Anyone who has a copy for sale please contact her.

#### Deaths

GENEVA R. SAYRE (1911-1992), authority on the history of bryology and first recipient of the IAB Hedwig medal at the World Conference of Bryology in Tokyo, 1983, died on 26 May 1992. Contributions in her memory may be made to the Geneva Sayre Fund, Harvard University, c/o D.H. Pfister, 20 Divinity Avenue, Cambridge, MA 02138, U.S.A.

SIEGHARD WINKLER (1935-1992).

Shortly before his 57th birthday Sieghard Winkler, a professor of Plant Ecology at the University of Ulm, Germany, died from heart failure during a sailing tour, which he had undertaken in preparation for a transatlantic crossing commemorating Columbus' discovery of the New World.

As a student of Zimmermann and Mägdefrau, he became interested in the ecology of cryptogams during a teaching assignment at the University of El Salvador in 1962. He collected intensively in this country and made a detailed study of the ecology and morphological adaptations of epiphyllous mosses and hepatics (Winkler 1964/65, 1967). He also recognized the importance of the rhizoid discs of the Lejeuneaceae, introducing an important new taxonomic character in

this difficult group (Winkler 1970). Very early he became aware of the deploring state of tropical bryophyte taxonomy and choose the stunning, highly specialized hepatic genus *Stephaniella*, which he had encountered in the high mountains of Colombia, for a monograph (Schmitt & Winkler 1968). During travels in Venezuela and Colombia (e.g., Winkler 1971, 1976a) he collected rich materials for an anatomical investigation of the conducting tissues of hepatics (Winkler 1969). He had also a good knowledge of Central European mosses and some regional developmental studies were carried out by him (Mägdefrau & Winkler 1966) or under his supervision (e.g., Fiala & Winkler 1969). His later studies were mostly on the ecology of cryptogams (Seidel & Winkler 1974; Kottke et al. 1976; Winkler 1976; 1977; Winkler & Zoller 1978; Hildebrand et al. 1978; Muhle et al. 1980; Haseloff & Winkler 1980; Sommer & Winkler 1982; Burkhardt et al. 1983; Hofmann & Winkler 1990). The private herbarium of Professor Sieghard Winkler will be transferred to the University of Ulm and loans should be possible by late 1993. [Hermann Muhle, Abt. Spezielle Botanik der Universität Ulm, Postfach 4060, D-7900 Ulm, Germany].

**Bryological Publications of Sieghard Winkler; compiled by Hermann Muhle.**

- Winkler, S. 1964/65: Beiträge zur Bryologie von El Salvador, C.A. I. Laubmoose.- Rev. Bryol. Lichénol. 33: 505-540.
- Mägdefrau, K. & Winkler, S. 1966: Zur Morphologie und Entwicklungsgeschichte von *Sphagnum monocladium* (v. Klinggr.) Warnst.- Zeitschr. f. Pflanzenphys. 54: 174-182.
- Winkler, S. 1967: Die epiphyllen Moose der Nebelwälder von El Salvador, C.A. - Rev. Bryol. Lichénol. 35: 303-369.
- Schmitt, Ursula & Winkler, S. 1968: Systematische Untersuchungen über die foliose Lebermossgattung *Stephaniella*. Oesterr. Bot. Zeitschr. 115: 120-135.
- Fiala, Ingrid & Winkler, S. 1969: Entwicklungsgeschichtliche Untersuchungen an *Sphagnum centrale* Jens.- Flora Abt. B 158: 390-401.
- Winkler, S. 1969: Anatomische Untersuchungen über die Leitstränge der Gametophyten bei den Lebermoosen.- Oesterr. Bot. Zeitschr. 117: 348-364.
- Winkler, S. 1969: Systematisch-anatomische Untersuchungen über die marsupialen Lebermoose der Sierra Nevada de Santa Marta in Kolumbien. - Mitt. Inst. Colombo-Aleman Invest. Cient. 3: 59-76.
- Winkler, S. 1970: Zur Anatomie der Rhizoidplatten neotropischer holostiper Lejeuneaceen. - Rev. Bryol. Lichénol. 37: 47-55.
- Winkler, S. 1971: Oekologische Beziehungen zwischen epiphyllen Moosen des Chocó (Colombia, S.A.). - Rev. Bryol. Lichénol. 37: 848-859.
- Seidel, D. & Winkler, S. 1974: Verlandungssukzessionen bei Kleinstökosystemen der Hülben (Ostalb, SW-Deutschland). Arch. Hydrobiol. 73: 84-107.
- Kottke, Ingrid, Krisch, T. & Winkler, S. 1976: Untersuchungen über den Einfluß von Pilzen auf die Konkurrenzfähigkeit von Moosen.- Beitr. Biol. Pfl. 51: 407-415.
- Winkler, S. 1976: Moose als Indikatoren bei SO<sub>2</sub>- und Bleibelastung.- Daten und Dokum. Umweltschutz 19: 44-55.
- Winkler, S. 1976a: Die Hepaticae der Sierra Nevada de Santa Marta (Columbia SA).- Rev. Bryol. Lichénol. 42: 789-827.
- Winkler, S. 1977: Flechten und Moose als Bioindikatoren, p. 155-176.- In Frey, W., Hurka, H., Oberwinkler, F.: Beiträge zur Biologie der niederen Pflanzen.
- Winkler, S. & Zoller, F. 1978: Beziehungen zwischen Waldalter und Wasserspeicherkapazität der Moosdecke.- Nova Hedwigia 29: 1043-1063.
- Hildebrand, R., Kottke, Ingrid & Winkler, S. 1978: Untersuchungen über den Einfluß von Pilzen auf die pH-Abhängigkeit von Laubmoosen.- Beitr. Biol. Pflanzen 54: 1-12.
- Muhle, H., Scherrer, M. & Winkler, S. 1980: Wassermoose in den Nebenflüssen der Donau um Ulm.- Mitteilungen des Vereins f. Naturwissenschaft und Mathematik Ulm 30: 115-129.
- Haseloff, H.-P. & Winkler, S. 1980: Influence of heavy metal ions on the gas exchange of mosses. - Cryptog., Bryol. Lichénol. 1 (1): 53-65.
- Sommer, C. & Winkler, S. 1982: Reaktionen in Gaswechsel von *Fontinalis antipyretica* HEDW. nach experimentellen Belastungen mit Schwermetallverbindungen.- Arch. Hydrobiol. 93 (4): 503-524.
- Burkhardt, Eva, Muhle, H. & Winkler, S. 1983: Zum Indikatorwert von submersen Wassermoosen in Iller und oberer Donau.- Verhandlungen der Gesellschaft für Ökologie (Mainz) 10: 441-449.
- Hofmann, A. & Winkler, S. 1990: Effects of Atrazine given in environmental concentrations on the submersed macrophytes of running waters. Arch. Hydrobiol. 118: 69-79.

Address: Abt. Spezielle Botanik der Universität Ulm, Postfach 4066, Ulm, Germany

## New Publications

Sent items for this column to the editor,  
S. Rob Gradstein.

**Bryophyte Systematics. Advances in Bryology Vol. 4** (edited by N.G. Miller), 264 p., ISBN 3-443-52002-2. Published for the International Association of Bryologists by Borntraeger Verlagbuchhandlung, Johannesstrasse 3A, 7000 Stuttgart. Price about DM 220,-/US \$ 126.

This new volume of the *Advances* contains eight review articles dealing with various aspects of bryophyte systematics. I find the articles by Stoneburner et al. on the application of enzyme electrophoresis, McQueen's review of the relevance of culture experiments, and Mishler & De Luna's exposé on phylogenetic analysis and the use of ontogenetic data, the most valuable chapters of this book. Together with Whittemore's paper on Marchantialean chemotaxonomy they discuss important innovative approaches in the field and make very good reading. Very well written is also Buck's essay on the classification of the pleurocarps.

Somewhat less satisfactory is the review on genecology and evolution of bryophytes by Shaw. I find this chapter too long and complicatedly written and believe it should have been edited more rigorously. Unfortunately, the paper also provides a distorted interpretation of van Zanten's pioneering and original approach to phytogeography.

The book also contains contributions on computer applications in bryology (Magill) and evolutionary links between algae and bryophytes (Graham et al.), and ends with some summarizing thoughts by Crum on the present state of bryophyte (only moss!) taxonomy. As a whole I find this volume of the *Advances* less good than previous ones. The book has a strong bias on moss taxonomy and is very poor in hepatic data. The book is also surprisingly poor in information on

the more classical type of systematic and monographic work, which is unfortunate since the bulk of current research would probably qualify as such (may be another title should have been chosen for the book!). Finally, one notices that all of the authors are from the US (except one of the contributors to the first chapter), a situation which does not seem very appropriate for a publication sponsored by the IAB. Hopefully, next volumes of the *Advances* will be more international in this respect [S.R.G].

**Frahm, J.-P., W. Frey, H. Kürschner and M. Menzel 1990. Mosses and Liverworts of Mt. Kinabalu, 91 p., 79 figs. including numerous color photographs. Sabah Parks Publication No. 12. Published by Sabah Parks Trustees, P.O.Box 10626, 88806 Kota Kinabalu, Saba, Malaysia. Price M\$ 12.**

Mount Kinabalu (4100 m) on North Borneo is one of the highest mountains of tropical Asia and is known for its rich bryophyte flora. The authors of this field guide have studied the bryophytes of the mountain in detail in the framework of the German BRYOTROP project (see Nova Hedwigia 1991). The booklet provides brief accounts on the different types of rain forest and the bryophytes inhabiting them, and discusses the ecology and geography of the species and their adaptations to the rain forest habitat in some detail. A checklist of the mosses and liverworts of Mt. Kinabalu and a brief bibliography are also provided.

The most striking feature of the booklet are the wonderful illustrations, including numerous strikingly beautiful color photographs of rain forest bryophytes taken by the first author. These are the kinds of publications that are needed for the public, to call their attention to the "hidden" beauty of the rain forest bryophytes! Also, any bryologist interested in tropical bryophytes would probably like to possess a copy of this attractive booklet [S.R.G.].

**Perold, S.M. 1990. A taxonomic revision of the Ricciaceae Reinchenb. (Marchantiales: Hepaticae) in Southern Africa. PhD Dissertation, Dept. of Botany, University of Pretoria, Private Bag X101, Pretoria, South Africa, 228 p.**

Due to its relatively arid climate, southern Africa has a very rich *Riccia* flora. In her admirable monograph, the author recognizes 51 species, 17 more than were listed in the last bryophyte checklist of southern Africa (Magill & Schelpe (1979). Nearly three quarters of the species seem to be endemic to southern Africa. There appear to be two centres of diversity: one in the western Cape, an area with winter rain, and one in the Orange Free State (summer rain). All species are described, mapped and illustrated in detail, and numerous SEM photographs of spores are provided. A brief, speculative discussion on the phylogeny of the family is also included. In all, this seems to be a very valuable contribution to our knowledge of Ricciaceae systematics and the author, as well as her associate Prof. Volk, are to be congratulated with this work. Publication in the series "Bryophyta in the FSA Cryptogam Series" is foreseen [S.R.G.].

**R. Düll 1991. Die Moose Tirols, unter besonderer Berücksichtigung des Pitztals/Oetztaler Alpen. Band 1: 1-224. Band 2: 225-441. Published by IDH Verlag, Funkenstrasse 13, D-5358 Bad Münstereifel, Germany. Price DM 95,- excluding postage.**

Since the beginning of this century when Dalla Torre & von Sarnthein published their "Flora of Tirol", no comprehensive overview has been prepared of the bryophyte flora of Tirol. The present work, in 2 volumes, provides an up-to-date, annotated catalogue of the bryophyte species recorded from the region. In all 214 hepatics and 655 mosses are known; a further 75 species have been recorded from Südtirol (Italy). For each species data on relevant synonymy, literature, specimens, distribution in Tirol

and phytogeography are given. Special attention is given to the species of the Piztal area, an area where the author has spent many summers bryologizing. A history of the bryogeographical exploration of Tirol and selected distribution maps are also provided. *Pohlia tundrae* is reported as new to Europe.

This new catalogue of Tirolean bryophytes is an important contribution to Austrian bryology and should be an indispensable reference for those interested in the rich bryophyte flora of Tirol [S.R.G.].

**Lee F. Klinger 1990. Bryophytes and Forest Decline. Memoirs of the Torrey Botanical Club 24 (1): 50 p. Published for the Torrey Botanical Club by the New York Botanical Garden, Bronx, N.Y. 10458., U.S.A. Price US \$ 14,- excluding postage.**

This work examines the various hypotheses that have been put forward to explain the phenomenon of forest decline in both polluted and unpolluted regions of the world. Based on ecological observations in natural forests of southern Alaska and northern New York, the author concludes that natural die-back of the forest may be caused by *Sphagnum*. Owing to their capacity to acidify the soil water, the ground-dwelling *Sphagnum* species are considered to kill the fine tree roots. This, in turn, is believed by the author to be a main reason for tree mortality and forest decline in the area [S.R.G.].

**C. Cortini Pedrotti, R. Schumacker, M. Aleffi & E. Ferrarini. Elenco critico delle briofite delle Alpi Apuane (Toscana, Italia). Bull. Soc. Roy. Sci. Liège 60 (4-5): 149-361.**

This is the first critical catalogue of the bryophytes of the Apuan Alps, Toscana (Italy). Based on extensive fieldwork in the area as well as revision of some 4000 herbarium specimens, the authors were

able to recognize 300 species in the area. An appreciable number of species are new records, including *Diplophyllum obtusatum* which is new to Europe.

The Apuan Alps, which reach up to almost 2000 m and receive over 3000 mm of rain, have a phytogeographically interesting flora which includes a considerable number of oceanic-macaronesian, subalpine and mediterranean species. The authors discuss the origin of the flora in the light of recent paleoclimatical and paleo-ecological data and argue that the oceanic-macaronesian species could not survive Pleistocenic glaciation in the Apuan Alps or neighbouring areas. They therefore reach the important conclusion that the present occurrence of these species in the region dates back to recent, postglacial immigration [S.R.G.].

**A. R. Perry 1992. Mosses and Liverworts of Woodland, a guide to some of the commonest species. British Plant Life, nr. 1. Published by the National Museum of Wales, Cathays Park, Cardiff, CF1 3NP, U.K. - ISBN 0 7200 0362 8. Price 2.95 pounds sterling excluding postage; with postage: 3.45 pounds UK orders, 3.75 European Community orders, 3.95 non EC orders.**

This is a charming introductory guide to 29 common species of mosses and liverworts occurring in British woodlands. Each species is illustrated by a black-and-white photograph and a short description. A map showing the distribution of the species in Britain, a few line drawings and a brief introduction on recognition and life history of bryophytes are also provided. One's appetite is wetted by the excellent, close-up color-photographs of 10 further species. Popular nature guides like this one on bryophytes are certainly highly in demand these days and are a valuable means to stimulate public awareness and interest. The price of this booklet is a bargain [S.R.G.].

### New Exsiccata

**BRYOPHYTA NEOTROPICA EXSICCATA** Fasc. 6, Nrs. 250-300 (1992), edited by S. Rob Gradstein (Herbarium, University of Utrecht). The series contains miscellaneous common and rare neotropical species of mosses and liverworts and is available on an exchange basis to herbaria specializing in tropical bryology. The 50 sets are being sent to those who received Fasc. 5 (1990) and sent contributions to the series or tropical specimens in exchange. Contributions for the next fascicles - from all regions of tropical America, in sufficient quantity to make 50 duplicates - are appreciated and may be sent to the editor.

### New Addresses

GERHARD KRISTENSSON, Dekanvägen 87, 24010 Dalby, Sweden.

JETTE LEWINKY, Kuopio Museum of Natural History, Myhkyrinkatu 22, SF-90100 Kuopio, Finland (effective 1 July 1992).

MATTHEW NASH, Dept. of Botany, University of Alberta, Edmonton, Alberta T6G 2E9, Canada

K.J. STRANK, Hubertusstr. 8, 5112 Baesweiler 3, Germany

K. TERAOKA, 4-116-2 Umemoridai, Nissincho, Aichi Pref., 470-07 Japan.

### News and Notes

The Editor would welcome contributions to this column.

DALE VITT, University of Alberta, has been appointed Director of the University of Alberta Devonian Botanic Garden effective June 1, 1992. He remains Cura-

tor of the University of Alberta Cryptogamic Herbarium. The address of the IAB Secretariat remains the same as in the past.

The Devonian Botanic Garden is located just outside of Edmonton on about 190 acres of land and contains a recently developed Japanese Garden as well as research facilities for visiting scientists and well-developed public displays and landscaped gardens.

JAN-PETER FRAHM, University of Duisburg and S.R. ROB GRADSTEIN, University of Utrecht, will travel to Colombia during July-August 1992. Together with JAIME AGUIRRE C., Director of the Instituto de Ciencias Naturales, Bogotá they will study the bryophyte flora of everwet tropical rain forests in the Chocó Department, along the Pacific coast of Colombia. This area with exceedingly high rain fall (ca. 12000 mm/y) has a very rich endemic vascular flora but almost nothing is known about the bryophytes. By collecting along altitudinal gradients, inland as well as along the coast, they hope to get some insight in the bryogeographic diversity of the region. The fieldwork is supported by the National Geographic Society.

S. ROB GRADSTEIN, University of Utrecht, has completed his monograph of Lejeuneaceae subfamily Ptychanthoideae of the New World and has submitted his manuscript, totalling about 650 p., for publication in FLORA NEOTROPICA. The treatment includes a.o. a new classification of the family based on a cladistic analysis of genera. He is now continuing work on the conservation of tropical rain forest species, expanding on his chapter in the book *Bryophytes and Lichens in a changing environment* (Bates & Farmer, eds., Clarendon Press, 1992), and is preparing a Red List for presentation at the Symposium on neotropical bryology in Mexico in July 1992.

A problem related to conservation of rain forest bryophytes is the question as

to how vulnerable bryophyte species are to rain forest destruction. For that purpose he will engage in a pilot study on the bryological composition of primary and secondary rain forests in the Lacadon Biosphere Reserve, Chiapas, Mexico, together with CLEMENTINA EQUIHUA from the National University of Mexico. He will visit the area together with his wife and Ms Equihua in early July, preceding the Symposium in Mexico City.

TÁMAS PÓCS, Esterhazy Teacher's College, Eger, together with other biologists, led a field course for Budapest University students in Biology to Kenya, mainly on Mt. Elgon, between 6 January and 4 February 1992. Field work was arranged in collaboration with Nairobi University. Two bryologists from the Botany Dept. of Nairobi University, Dr. Min S. Chua and Mrs. Elisabeth M. Kungu, accompanied them and participated in the field work.

The botanical activities concentrated on the east slope of Mt. Elgon and in the caldera, at 3200-4000 m alt. About 650 bryophyte and 150 lichen collections were made. Full sets will be deposited in Hungarian and Kenyan institutions. The collections include many new species records for Mt. Elgon.

Detailed studies were made of epiphytic communities on giant groundsels (*Seneccio barbatipes*) and giant heather (*Erica arborea*) and of saxicolous communities in subalpine streambeds. Epiphytic biomass and rainfall interception were studied in mossy cloud forest dominated by *Rapanea*, *Hagenia* and *Prunus africana* and microclimate studies were carried out in three communities of the Ericaceous belt. The results will appear in a series of papers, to be published in Hungary. [Contribution to News and Notes and Tropical Bryology column].

#### SOFTWARE LIBRARY

The IAB software library contains at present 440 disks. Some of the earlier

numbers have been replaced by new versions:

#37 Labels3 latest version from 1991.

#62-63 Delta version 2.0, now compressed on one HD disk.

#112 DMAP Now with postscript output of maps, a text editor and a program for digitizing maps using a graphics tablet.

#236 Herbar 2.2 Enhanced version for the record keeping of the collections of the BRYOTROP expedition. Stores collection data, prints reports and labels.

#259 4Print Now version 4.0 with enhanced facilities. Supports now also foreign characters.

Since the last list of amendments published in the Bryological Times, 110 disks have been added. A high number of disks consists of programs for MS-Windows 3.0. A separate list of Windows-programs has been circulated by BRYONET. A list of new entries will be published on one of the next issues. A complete catalogue is available at any time on disk by sending a blank unformatted 5,25" disk.

The bibliography "Recent literature on hepatics viz. mosses" (nos. 325-328 in the software library) in dBase format for the use with the dBase program "Info" has been enlarged. Additionally, the following numbers are available:

#329 Recent literature on hepatics 110, 114, 120

#330 Recent literature on hepatics 116, 118

#423 Recent literature on hepatics 117, 119, 125

This bibliography will be updated soon and will contain all references provided in the series of literature on hepatics viz. mosses in the "Bryologist" from 1985 onwards. All data also can be downloaded from the IBIS (International Bryological Information System) at the university of Duisburg (for details see Bryol. Times 64:11, 1991). To save space, the data are not in dBase format but as ASCII file with the fields delimited with \$.

# Bryophyte collecting in the course of phyto-ecological research in the Bale Mountains, S Ethiopia

by Georg and Sabine Miehe

*Tropical Bryology Column.* Send contributions to the column editor, T. Pócs, Esterhazy Teachers College, Dept. of Botany, Eger, Hungary.

Between December 19, 1989 and March 7, 1990, phyto-ecological fieldwork was carried out in the Bale Mountains National Park, S Ethiopia (location: see Fig.). This National Park includes a c. 10 x 20 km wide high plateau above 4000 m with 2 peaks exceeding 4300 m. The Bale massif belongs to the southernmost parts of the Ethiopian Highlands, being separated from the nearest Central-East African mountains by at least 700 km of lowland and colline areas.

The expedition concentrated on the ericaceous and afroalpine belt in those parts of the Bale Mountains National Park, which have so far remained underexplored both floristically and ecologically. The main purpose of this study was to make a detailed phytosociological description of natural or little disturbed plant communities between the uppermost forest (3200-3500 m) and the summits of the Bale Mountains around 4300 m. The project was financed by the "Schimper-Stiftung" (Hohenheim) and the "Foundation for Forest Conservation in Africa" (Hamburg).

The vegetation cover was studied by application of the phytosociological method according to BRAUN-BLANQUET on irregularly distributed non-permanent sample plots. Voucher specimens were collected of all plant taxa of which identification needed verification. Most of these specimens were handed over to the National Herbarium, Addis Ababa, for determination and incorporation into the collection.

Microclimate features were documented and recorded with mechanically

London and Scandinavia. In the study of the cryptogamic collection, the following specialists are involved:

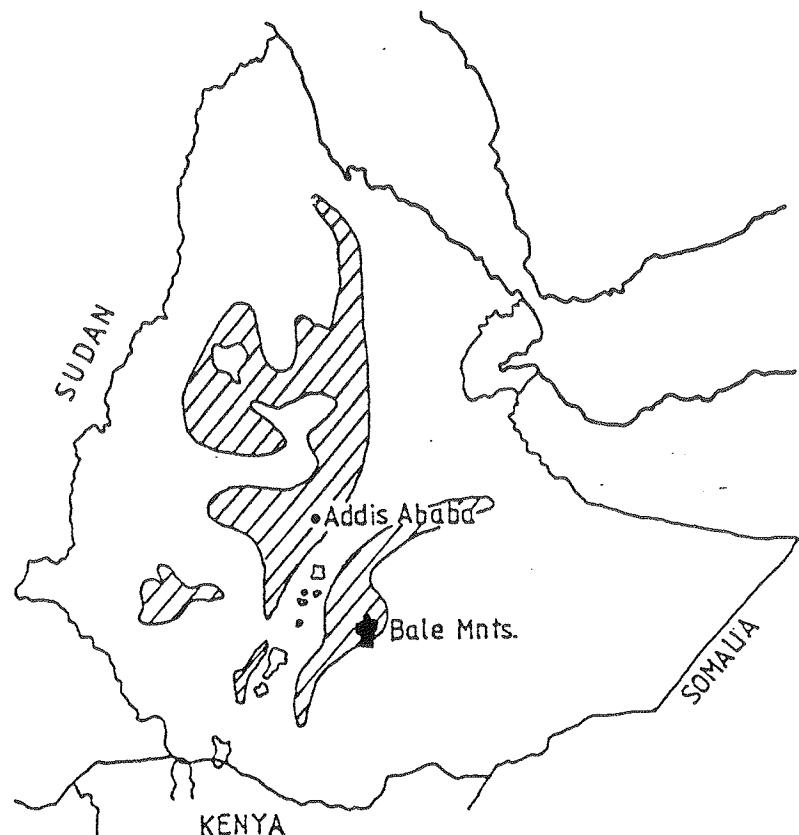
Lichens: T. Ahti, O. Breuß, H. Krog, J. Poelt

Hepaticae: E.W. Jones, T. Pócs

Musci: J.-P. Frahm, D. Horton, A. Koponen, T. Koponen, R. Ochýra, P. Sollman.

The results of the bryological studies will be published in collaboration with the specialists in the series "East African bryophytes" (Acta Bot. Hung.). A phyto-ecological monograph of the ericaceous vegetation is being prepared for the "Foundation for Forest Conservation in Africa" (Traute Warnke Verlag Hamburg; to be published in 1993).

Address: Geographisches Institut der Universität Göttingen, Goldschmidtstr. 5, D-3400 Göttingen, Germany.



## IAB Publications 1979-1992

by Dale H. Vitt

The following list presents recent publications that have been supported by the International Association of Bryologists. In order to receive any of these, please send your orders directly to the publisher as indicated.

To receive our specially negotiated prices from Borntraeger Verlagsbuchhandlung, Stuttgart, please send your order directly to the publisher indicating that you are a paid-up member of the Association. Borntraeger accepts credit card purchases and cheques in U.S. dollars as well as German Marks. In order to order by credit card, include the card name (Visa, master card, American Express), Card Number and your signature allowing the publisher to access your card account.

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| IAB           | REG.   | AUTHOR                   | TITLE                         | DATE OF PUBL. | AVAIL.       |
|---------------|--------|--------------------------|-------------------------------|---------------|--------------|
| PRICE         |        |                          |                               |               |              |
| (US \$)(US\$) |        |                          |                               |               |              |
|               |        | W.Schultze-Motel, Ed.    | Advances in Bryology, Vol. 1  | 1981          | Out of Print |
| 37.80         | 50.40  | W.Schultze-Motel, Ed.    | Advances in Bryology, Vol. 2  | 1984          | yes*         |
| 56.70         | 75.60  | N.G.Miller, Ed.          | Advances in Bryology; Vol. 3, | 1988          | yes*         |
| 75.60         | 100.80 | N.G.Miller, Ed.          | Advances in Bryology, Vol. 4  | 1991          | yes*         |
|               |        | N.G.Miller, Ed.          | Advances in Bryology, Vol. 5  | (1993)        |              |
| 56.70         | 75.60  | S.W.Greene               | Conspectus of Bryological     |               |              |
|               |        |                          | Taxonomic Literature, Part1   | 1988          | yes*         |
| 56.70         | 75.60  | S.W.Greene               | Conspectus of Bryological     |               |              |
|               |        |                          | Taxonomic Literature, Part2   | 1989          | yes*         |
|               |        | D.H.Vitt, S.R.Gradstein, |                               |               |              |
|               |        | Z. Iwatsuki              | Compendium of Bryology        | 1985          | Out of Print |
| 30            | much   | T.Pócs, Z. Tuba,         | Proceedings of the IAB        |               |              |
|               | more   | J. Podani                | conference in Bryoecology;    | 1985          | yes**        |
|               |        | J. Glime, Ed.            | Methods in Bryology,          |               |              |
|               |        |                          | Proceedings Methods Workshop  | 1988          | yes***       |
| 12            | 12     | R.E.Magill, Ed.          | Glossarium Polyglottum        |               |              |
|               |        |                          | Bryologiae.                   | 1990          | yes****      |
| 2             | 2      | J.J.Engel                | Index Hepaticarum             |               |              |
|               |        |                          | Supplementum: 1974-75         | 1978          | yes*****     |
| 2             | 2      | J.J.Engel                | Index Hepaticarum             |               |              |
|               |        |                          | Supplementum: 1976-77         | 1981          | yes*****     |
| 2             | 2      | M.R.Crosby               | Index Muscorum                |               |              |
|               |        |                          | Supplementum: 1974-75         | 1979          | yes*****     |
| 2             | 2      | M.R.Crosby,              | Index Muscorum                |               |              |
|               |        | C.R.Bauer                | Supplementum: 1976-77         | 1979          | yes*****     |
| 2             | 2      | M.R.Crosby,              | Index Muscorum                |               |              |
|               |        | C.R.Bauer                | Supplementum: 1978-79         | 1981          | yes*****     |
| 2             | 2      | M.R.Crosby,              | Index Muscorum                |               |              |
|               |        | C.R.Bauer                | Supplementum: 1980-81         | 1983          | yes*****     |
| 2             | 2      | C.R. Bauer,              | Index Muscorum                |               |              |
|               |        | M.R.Crosby               | Supplementum: 1982-83         | 1986          | yes*****     |

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## Colophon

*The Bryological Times*, founded in 1980 by Stanley Wilson Greene (1928-1989), is the newsletter of the *International Association of Bryologists*. It is published in Edmonton (Canada) and distributed from Albany (USA), Canberra (Australia), Edmonton (Canada), Eger (Hungary), Geneva (Switzerland), Hiroshima (Japan), Moscow (Russia), Praha (Czechoslovakia), St. Louis (USA) and Umea (Sweden).

**Important change from nr. 65 onwards:** all items for publication in *The Bryological Times* are to be sent to the General Editor, S. Rob Gradstein, Institute of Systematic Botany, Heidelberglaan 2, 3584 CS Utrecht, The Netherlands, FAX (31) 30-518061, except for those for the regular columns, which may go direct to the column editors.

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Vacancy

## Assistant Editor

P.W.A. Greene, Bilthoven

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## Correspondents

R.D. Seppelt (Australasia); B.C. Tan (East Asia).

For details regarding membership of the *International Association of Bryologists* (currently US \$ 10,- per year) write to the Honorary Secretary, Dale H. Vitt, Department of Botany, University of Alberta, Edmonton, Alberta, Canada T6G 2E9. All correspondence concerning mailing to Mrs. Sandi Vitt at the same address.

**Production: J.-P. Frahm, Duisburg**

## Diary

Send contributions to D.H. Vitt,

University of Alberta, Department of Botany, Edmonton, Alberta, Canada T6G 2E9

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**August 3-9.** Nordic Bryological Society Annual Meeting and excursion in Kilpisjärvi, NW Finland. Registration: Krister Karttunen, Dept. of Botany, University of Helsinki, FAX 358 0 7084830; Tel. 358 0 7084725.

**August 9-13.** ABLIS, Honolulu, Hawaii. Annual meeting in conjunction with American Institute of Biological Science annual meetings. Inquiries: Vernon Ahmadjian, Clark University, Dept. of Biology, Worcester, MA 01610, USA.

**September 17-21** (*not* Sept. 9-13!!). Schweizerische Vereinigung für Bryologie und Lichenologie, in conjunction with the BLAM. Field meeting and paper reading session in the Wassen, Gotthard Massif, Central Swiss Alps. Inquiries: E. Urmi, Institut für Systematische Botanik, Zollikerstrasse 107, CH-8008 Zürich, Switzerland.

**September 26-27.** BBS Annual General Meeting and Symposium, East Sussex. Inquiries: David Streeter, Sussex House, Falmer, Brighton, Sussex BN1 9RH, UK.

**October 31 - November 1.** BBS Bryophyte Workshop, Polytechnic of East London, on the Taxonomy of *Fissidens*. Inquiries: K.J. Adams, 63 Wroths Path, Baldwins Hill, Loghton, Essex IG10 1SM, UK.

**November 26 - December 1.** 8th John Child Fieldtrip, Mt. Ruapehu, New Zealand. Inquiries: Barbara Pilly, c/o Botany Department, National museum, Box 467, Wellington, New Zealand.

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**August 28 - September 3.** XV International Botanical Congress, including Symposia on Bryophyte Classification and Bryophyte Chemistry and the IAB general meeting. Tokyo, Japan. Inquiries: Zennoske Iwatsuki, Hiroshima University, Botanical Institute, Higashi-hiroshima-shi, Hiroshima, 724 Japan, FAX (824) 240709.

## From the Editors

In the past three years the production of *The Bryological Times* has been in the able hands of Guido van Reenen. Thanks to his computer skills, our newsletter has been transformed into an efficiently produced desk-top publication and has acquired the professional appearance characteristic of recent issues. Unfortunately, Guido van Reenen will not be able to continue this job and has resigned from his position as managing editor. On behalf of all members of the IAB we would like to express our gratitude for his excellent work on the newsletter.

All mail to the *Bryological Times* should from now on be sent to the general editor, S. Rob Gradstein, Institute of Systematic Botany, Heidelberglaan 2, 3584 CS Utrecht, The Netherlands.