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Tropical Bryology in Peril: a Survey

by

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IAB Standing Committee on Tropical Bryology

The fast diminishing of rain forests in the humid tropics is a lamentable and irreversible trend in modern history. With their eventual destruction, numerous bryophyte species, many of which still are undescribed, will be lost forever. Thus, it is of critical importance to study the plants *in situ* now. Seen in this light, developing an active core of tropical bryologists is both necessary and important. But the last ten years have witnessed a decline of interest in the study of bryophytes among botanist residing in the tropics.

With tropical bryology seriously in peril, the standing Committee on Tropical Bryology of the International Association of Bryologists (IAB) conducted a survey in 1990 to determine the working conditions and research problems confronting bryologists residing or working in the tropics. The goal of the survey was to secure relevant data which would enable the IAB to formulate a definitive program to assist the development of tropical bryology and to help conserve the rich bryoflora in the tropics.

A four page multiple choice questionnaire was distributed together with the 1990 March issue of the *Bryological Times* to all members of IAB. To date, a total of 67 replies were received by the committee. This seemingly small return is rather significant though, considering the fact that there are only a handful of bryologists residing in the tropics or working on tropical bryology.

The geographical range of opinions in the survey was sufficiently wide in coverage and in scope to be meaningful. The countries represented in the survey and the number of respondents from each country are listed in Table 1. The twenty items asked in the questionnaire were formulated around five

areas, namely, the working conditions, problems hindering bryological work in the tropics, information on endangered species, localities of great bryological interest in the tropics, and required conditions for a transnational collaboration or joint research.

The information submitted by the respondents about the endangered species of bryophytes and localities of great bryological interest in the tropics have been turned over to the newly created standing committee of IAB on the Endangered Bryophytes and will not be reported on here.

Firstly, some background information about the respondents. Twenty seven respondents are from thirteen tropical and developing countries. Most of them are connected with teaching/educational institutions. The remaining forty are from fifteen developed countries in Europe, North America and Japan, and are mostly staff of research institutions. The great majority of non-tropical respondents have a Ph D or D Sc degree, whereas half of the respondents in tropical countries have only a B Sc or M Sc degree in Botany. More than 80% of the respondents have studied bryophytes for more than 5 years.

continued on p. 2

Friends of the Farlow Fellowship

The Friends support a fellowship for short-term study at the Farlow Herbarium, Harvard University for students enrolled in graduate degree programs in cryptogamic botany and related areas. Fellowships are designed completely to cover travel, living and research expenses for a few days or a few weeks at Harvard. Awards are made throughout the calendar year, so application may be made at any time, but at least three months before a desired visit. Application early in the year is encouraged. Students interested in a Friends of the Farlow Fellowship should submit a letter of application describing their proposed work at the Farlow and its relation to their current work and/or professional goals. An estimate of expenses and the duration and timing of a visit should be included. Transcripts and letters of reference are not required during initial application but may be requested at a later date.

Please submit applications to: Friends of the Farlow Fellowship, Farlow Reference Library & Herbarium, Harvard University, 20 Divinity Avenue, Cambridge, MA 02138, USA.

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The survey shows that bryologists in some developing countries outside of the tropics like China, India and Hungary, face problems in their research similar to those in the tropics. Often, the solutions to the problems suggested by them are rather comparable. In the following paragraphs, their responses are summarized together with those from bryologists living in the tropics.

When asked to rank the major problems confronting bryological research in their countries, these respondents, (27 in total) complained most about the lack of travel money to attend symposia or workshops abroad (see Table 2). This is followed by problems of having little or no access to good herbarium collections and type specimens for reference, and lack of good library facilities. Lack of governmental/institutional support in research funding and no contacts with outside colleagues are other serious complaints. However, for people working in China, India, and eastern European countries, like Hungary, high postal expenses and lack of contacts with outside professional world are two highly ranked problems.

When asked what kind of research help is most needed, these respondents mention fellowships to conduct research in foreign institutions (preferably in the developed countries) as their number one need (Table 3). Access to a good library and joint research project with foreign colleagues are the other two solutions offered. Surprisingly, assistance in building a local reference herbarium ranked low among the many choices of solutions. Respondents who have not been trained in a developed country, whether tropical or non-tropical, strongly desire to receive a training in modern bryology in the developed country. *This is perhaps a worthwhile project for the IAB to consider; that is, to organize and conduct training workshops on various aspects of modern tropical bryology for participants from the tropics and developing countries.*

From the survey, it became clear

that one effective way to promote research in the tropics is to establish joint projects between colleagues from the developed and developing or tropical countries. Yet, ironically, the important collaborative conditions required by these two groups of participants are somewhat different. For tropical bryologists, the most sought-for condition is to study or to conduct research abroad. For collaborators from developed countries, the most sought-for reward is the opportunity to do field work in the tropics.

The survey further shows that in considering a joint project, many participants from non-tropical, developed countries expect their tropical counterparts to take charge of logistical duties such as securing plant collection permits, arranging for local transportation and reserving lodging places during field trip. In return, they promise accessibility to good library references through photocopies and/or service of identification of the specimens collected. Very few offer an opportunity for their tropical collaborator(s) to study abroad. However, some museum staff in Europe and North America did indicate the possibility of arranging for a short term study at their institutions. On the other hand, most tropical respondents do offer the above mentioned logistical services in exchange for travel money to go abroad, to do field works, or for equipment donation. Apparently, there is a gap in the required conditions for a collaborative project between the two sides. Fortunately, there are enough common interests to possibly initiate a collaborative effort. For example, joint publication is one benefit mentioned by both parties. Table 4 presents a summary of all relevant answers supplied by the 67 respondents on topics of research interests, geographical areas of research, and countries preferred for collaboration. Among the tropical bryologists, the most preferred country for a joint project is the United States. This is followed by Japan, Germany, Finland, England and the Netherlands in the order of popular

choices. *It would seem worthwhile for the IAB to undertake a listing of all the research grants, museum or university fellowship, travel money, training courses and study opportunities available in the developed countries and to circulate the information among members from developing countries, tropical and non-tropical who are in need of professional growth and advancement.* Dr. Inés Sastre-de Jesús of the Catholic University in Puerto Rico, USA, who is currently a member of the IAB Standing Committee on Tropical Bryology, has volunteered to take charge of this information drive. She would like to ask help from colleagues in the developed countries to send her the needed information.

For persons who seek assistance in naming bryophyte specimens, the survey found that most colleagues are willing to extend their hands of expertise when requested. The three common conditions demanded are: (1) no more than 10 to 20 specimens sent at one time, (2) no time pressure, and (3) the specimens be kept in the institution. However, some demand that a joint publication be made on the specimens identified, or at least a prior premission and/or an acknowledgement in publication be made for the use of determinations. Others prefer to be invited to participate in the local expedition in exchange for the service of specimen determination. A few request that return postage be paid for by the sender of the specimens. Interested parties may consult Table 4 for the names of people specializing in various groups of bryophytes around the world.

The survey also shows that one way of overcoming these difficulties and of promoting global interest in the study of tropical bryophytes is to initiate international collaboration through joint projects. As an international organization, the IAB can organize the needed information and formulate ways and means by which to assist and encourage compatible parties to form a joint research venture. Or, at the very

least, the IAB can continue to urge its members, especially those in developed countries, to help advance tropical bryology by sending reprints of their publications and duplicates of their determined specimens to institutions in the tropics even without the benefit of an exchange arrangement.

The success of international collaboration hinges on the communication and personality chemistry between two participants who often have different

cultural backgrounds and social values. It is important that both parties understand each other needs and interests. One misconception observed among workers from poor countries is that their colleagues from rich countries are automatically rich as individuals. The "rich" collaborator is then expected to provide all the research money needed, including food and travel expenses for the "poor" participants inside and outside the field and

host countries. Oddly, one survey respondent stated that for years he could not get a South American worker to be interested in a joint research proposal for funding from German institutions. Another one remarked wryly that the tropical bryologist can not understand why every body could go and collect in the European Alps without being asked first to apply for a permit and then be required to deposit a set of duplicates in the host country.

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

Country	Number of Respondents
United States	8
Netherlands	6
China & Taiwan	6
Japan	5
Mexico	4
India	4
England	3
Sweden	3
France	2
Germany	2
Canada	2
Brazil	2
Panama	2
Hungary	2
Colombia	2
Austria	1
Belgium	1
Finland	1
Switzerland	1
Denmark	1
Australia	1
New Zealand	1
Philippines	1
Solomon Island	1
Puerto Rico	1
Bolivia	1
South Africa	1
Nigeria	1
Namibia	1
Total	67

Table 2 - Twelve most stated problems confronting Tropical Bryology, based on 27 correspondents from tropical and other developing countries.

- (22) No travel money to attend symposia/workshops
- (20) No access to good library/journals reprint collections
- (19) No access to good herbarium collections/type specimens
- (13) No financial support from the government/university/museum
- (12) No contacts with colleagues working abroad
- (11) High postal expenses
- (10) Low salary as bryologist/botanist
- (10) No herbarium assistant/laboratory technician
- (9) No foreign currency to pay for the IAB membership fees and to subscribe to professional journals
- (8) Lack of herbarium or laboratory equipments
- (5) Lack of public appreciation/institutional encouragement
- (4) No access/outlet for publication

Table 3 - Research assistance most needed by bryologists from the tropics and other developing countries. Ranking as in Table 2.

- (18) Fellowship to conduct research in a foreign institution
- (16) Access to a good bryological library
- (15) Joint research project with foreign colleagues
- (15) Research grant to do field work
- (14) Herbarium and laboratory equipments
- (11) Building a working herbarium collection
- (10) Intensive training/workshop on tropical bryology

We should like to wish all readers of *The Bryological Times* a Happy New Year!

The editors

Table 4 - Directory of tropical bryologists (based on returned questionnaire).

<i>Name</i>	<i>Resident Country</i>	<i>Research Areas</i>	<i>Groups Specialized</i>	<i>Collaborating Countries Preferred</i>
Aguirre C., J.	Colombia	Colombia (Andes)	Jungermanniales	Netherlands, USA, Central America, Brazil
Arrocha, C.	Panama	Central America, Panama	mosses	tropical countries
Bishler, H.	France	worldwide	Marchantiales, except Riccia and Asterella	any
Bowers, F.	USA	Mexico, Central America	mosses	Cent. America, Trinidad
Bruggeman-Nannenga, M.A.	Netherlands	Africa and nearby islands	Fissidentaceae	
Buck, W.R.	USA	Latin America	pleurocarps	Latin America
Chauhan, E.	India	W. Himalayas	bryophytes	Germany
Churchill, S.P.	USA	northern Andes	mosses, Polytrichaceae, Hookeriaceae	Colombia, Ecuador
Delgadillo, C.	Mexico	worldwide	Crossidium, Aloinella, Aloina	USA
de Luna, E.	Mexico	worldwide	Hedwigiaceae, Rhacocarpus	USA, England, Japan
Duckett, J.G.	England		bryophytes	any
Duell, R.	Germany	Mexico	mosses	
Een, G.	Sweden		bryophytes	Macarenas
Fife, A.	New Zealand	Western Pacific, Australasia	Entosthodon, Funariaceae	tropical pacific
Florschütz-de Waard, J.	Netherlands	Guianas	mosses	
Frahm, J.-P.	Germany	worldwide	Campylopodioideae	Latin America
Geissler, P.E.	Switzerland	tropics	hepatics	Paraguay
Giancotti, C.	Brazil	Brazil	Lejeuneaceae	USA, Germany, France
Glenny, D.	Solomon Is.	Solomon Is.	bryophytes	New Zealand
Gradstein, S.R.	Netherlands	neotropics	hepatics	any
Hattori, S.	Japan	worldwide	Frullaniaceae	any
Hodgetts, N.	England	SE Asia	hepatics, Plagiochila, Bazzania, Lejeuneaceae	Papua New Guinea
Hyvönen, J.	Finland	worldwide	Polytrichaceae	Argentina, Chile
Ireland, R.	Canada	Latin America	Plagiotheciaceae, Isopterygium, Pseudotaxiphyllum, Herzogiella, Taxiphyllum, Isopterygiopsis	

Table 4 - Continued.

Jisnadi, S.	Brazil	Brazil	Meteoriaceae	USA, Germany
Joshi, D.Y.	India	southern India	bryophytes	Japan, Australia
La Farge-England, C.	Canada	pantropical	Dicranoloma, Leucoloma, Holomitrium, Sclerodontium	Madagascar, East Africa
Lai, M.-J.	Taiwan	Asia	Palamocladium, Hypopterygiaceae	Finland
Lewis, M.	Bolivia	Andean countries in central America, Chile	mosses	USA, Germany, Netherlands, England
Lewinski, J.	Denmark	worldwide, Australasia, S. America	Orthotrichum, Zygodon	S. America
Liu, Z.-L.	China	eastern Asia	Radulaceae, Fabroniaceae	Japan, USA
Luo, J.-X.	China	Asia	Porellaceae, Meteoriaceae	Finland, USA, Japan, Canada
Mishler, B.	USA	Latin America	Tortula	Latin America
Nishimura, N.	Japan	tropics	Hypnaceae	tropical Asian countries
Ochi, H.	Japan	worldwide	Bryaceae	
Odu, E.A.	Nigeria	Nigeria	mosses	USA
Onraedt, M.	Belgium	Philippines, Madagascar, La Reunion	hepatics	Philippines, Madagascar, La Reunion
Orban, S.	Hungary	Africa, Madagascar, Macarones	Calymperes	USA, Belgium, Netherlands, India, Japan
Pant, G.	India	northwest Himalayas, India	Neckeraceae, Splachnobryaceae	USA
Pócs, T.	Hungary	African tropics, neotropics	bryophytes	
Pursell, R.	USA	neotropics	Fissidens, Erpodiaceae	
Redfearn, P.	USA	China	mosses	China
Russell, S.	Namibia	tropical and southern Africa	bryophytes	Great Britain
Salazar A., N.	Panama	worldwide, neotropics	Leucophanes, Octoblepharum	USA, Germany, Netherlands
Sastre D.J., I.	Puerto Rico	new world	Neckeraceae, Thamnobryaceae	USA
Saxena, D.K.	India	India	bryophytes	USA, Germany, Japan
Schriebl, A.	Austria	worldwide	Polytrichum	Australia, Oceania
Sollman, P.	Netherlands	worldwide	Pottiales	any
Streimann, H.	Australia	Pacific	pleurocarps	

Table 4 - Continued.

Tan, B.C.	Philippines, USA	tropical Asia, China	Sematophyllaceae, Hookeriaceae, Fissidentaceae	USA, Japan, Netherlands, China
Thiers, B.	USA	tropics	Lejeuneaceae	Latin America
Timme, S.	USA	Peru, Antilles, Central America	Lejeuneaceae	Peru
Tixier, P.	France	SE Asia, Oceania, African Is., French Guyane	Lejeuneaceae, mosses	
Touw, A.	Netherlands	tropical Asia, Australasia	Hypnodendraceae, Thuidiaceae, Neckeraceae, Pogonatum	countries in As 4
Towsend, C.	England	Indian subcontinent	mosses	
Uribe M., J.	Colombia	Colombia	thalloid hepatics	Mexico, Netherlands, USA
van Rooy, J.	South Africa	South Africa, Africa, Antarctic, Subantarctic	bryophytes	
van Zanten, B.O.	Netherlands	Philippines, worldwide	Racopilaceae, Trachypodiaceae, Dawsonia, Clastrobryum, Trismegistia, Ectropothecium p.p.	Philippines
Wang, Y.-F.	China	East Asia	Entodontaceae, Brachytheciaceae	USA, Japan, Finland
Yamada, K.	Japan	neotropics, Asia	Radulaceae	
Yamaguchi, T.	Japan	tropical Asia	Leucobryaceae	Indonesia, India, China
Zhu, R.-L.	China	China	bryophytes	USA, Japan, Finland, India

Meetings

Nordic Bryological Society Annual Meeting and Excursion

The Annual Meeting and Excursion of the Nordic Bryological Society will be held in Kilpisjärvi, Finland, August 3-9, 1992. Kilpisjärvi is situated in the extreme NW-Finland, Lapponia Enontekiensis, very near the Swedish and Norwegian borders. The excursions will include places from the coast of the Arctic Ocean to (sub)continental areas and from sea-level to 1500 m, from palsa mires and birch forests to snowbeds and oroarctic streams. During the meeting there will be also short lecture and poster sessions and social events with, the organizers hope, a good bryo-atmosphere. Accommodation is in the Kilpisjärvi Biological Station. Preliminary registration and further information: Krister Karttunen, Department of Botany, University of Helsinki, Unioninkatu 44, SF-00170, Finland. FAX + 358 0 708 4830. Tel. + 358 0 708 4725/4724.

Personalía

TAMÁS PÓCS has regained his old position and has moved back to Eger, Hungary. His new address: Prof. T. Pócs, Dept. of Botany, Esterhazy Teachers' College, Eger, pf. 43, 3301 Hungary. Phone 36-3610466, Telex 63309 FOISK H, FAX 36-3610119.

The Hepaticae collections of the EGR herbarium, which were at Vácrátót (hb. VBI) together with the Musci on a long term loan basis, are now returned to Eger where they will be curated by T. Pócs. The Musci remain in Vácrátót, on a loan basis, where they are being curated by Gabriella Kis.

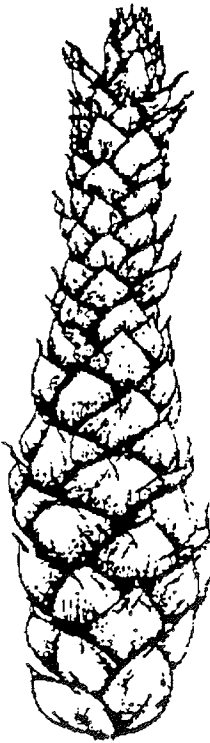
ZENNOSKE IWATSUKI announces that his institute has moved to a new site, about 40 km east of the present university campus. His new address: Botanical Institute, Faculty of Science, Hiroshima University, Higashi-hiroshima-shi, Hiroshima 724, Japan. Tel 824-227111, FAX 824-220709.

Systematics and Evolution of Mosses:
A Symposium* in Honor of
Dr. Lewis E. Anderson's 80th Birthday

June 5 - 7, 1992

Duke University

Durham, NC



All bryologists, students, colleagues, and friends of Dr. Anderson are invited to attend a meeting this June that will combine formal scientific talks, informal discussions, a field trip, and unforgettable social events.

The plan is for people to arrive on Friday, June 5. Friday afternoon there will be an open house in the Duke bryological laboratories and herbarium; in the evening there will be a reception. Saturday morning there will be a scientific session with invited talks by some of Dr. Anderson's associates on general topics of moss systematics and evolution. In the afternoon there will be time for contributed papers or posters and possibly some discussion groups. Saturday evening will feature a gala dinner, followed by a roast in honor of Dr. Anderson, featuring some of his closest (and most candid) colleagues. Sunday, there will be an all-day field trip to the coastal plain, returning to Durham in the evening, probably after dinner (so Monday morning would be the best time to depart, although we hope folks will attend even if they have to skip the fieldtrip). You are welcome to spend more time in Durham for research purposes.

Raleigh-Durham International Airport (RDU) is an American Airlines hub, so there should be no trouble finding convenient, relatively inexpensive flights (especially staying over Saturday night and booking ahead). Given the varied tastes (and pocketbooks) of different people, it would be best if everyone made their own lodging arrangements; several hotels are close to campus, with a considerable gradient in cost. Our favorite local travel agent is McDonald Travel: (919) 286-7456 or (800) 334-8352. We will attempt to house visiting graduate students in homes. A modest registration fee will be set later, as will the price of a banquet ticket.

☞ All interested parties should contact Brent Mishler at (919) 684-3715; Dept. of Botany, Duke University, Durham, NC 27706, as soon as possible. We need to know how many will attend, and who would like to present a contributed paper or poster.

*sym•po•sium *n*, *pl* sym•po•sia [L, fr. Gk *symposion* to drink together, fr. *syn* - + *pinein* to drink]
1 a : a drinking party esp. following a banquet b : a social gathering at which there is a free interchange of ideas
2 a : a meeting at which several speakers deliver short addresses on a topic or on related topics b : a collection of opinions on a subject c: discussion (Websters New Collegiate Dictionary)

Culture Collection of Mosses and Ferns

by

J. Lukavský, V. Cepák, M. Kaspárková and M. Keil

The history of the Culture Collection of mosses and ferns at Trebon is tightly coupled with the collection of Autotrophic Organisms established at Prague by V. Uhlir in 1913. The original aim of the collection was to maintain only algal strains. In the twenties, G. Lorbeer (professor at Charles' University, Prague) added a number of liverwort strains and before World War II the collection was extended with a great number of moss isolates provided by Mrs. and Mr. Keil. A list of the moss strains was published by S. Prát (1948). At that time the collection comprised, besides algae and cyanobacteria, 62 strains of liverworts and 54 strains of ferns. Gradually the collection has been enlarged with other strains mainly thanks to Mr. Keil, and at present it contains 62 strains of liverworts, 93 strains of mosses and 12 strains of ferns. The collection is now housed at Trebon and it is registered with the "World Federation of Collections" under the acronym CCALA.

Further information concerning the history of the collection and the list of cyanobacterial and algal strains can be found in a recent paper (Lukavský *et al.* 1991). All strains are available on request. For detailed information and price-list, Fax 42/333/2391.

Isolation of strains

Isolation of pure cultures of mosses is a simple procedure. In principle three approaches are used:

1. Seeding of spores

Intact capsule is sterilized by washing in 3% of H₂O₂ for 3 hours. The sterile capsule is then opened and spores are seeded on the agar plate. This procedure is not convenient for liverworts because their capsules are very fragile and it is difficult to obtain them intact. In some frondose liverworts such as *Riccia*, moreover, the capsules are

hidden in the thallus and are difficult to isolate and open.

2. Fragmentation of thallus

Part of the moss plant is placed on an agar plate or on a sand layer. The moss starts to grow towards the light source within a few days. The newly growing part is cut off aseptically and transferred on a fresh, sterile growth substrate.

3. Treatment with fungicides.

Using fungicides gives contradictory results. We tested e.g. Topsin-M 70 WP (Nippon Soda Co., Ltd, Japan) in the concentration range recommended by producer, but pure culture was obtained only in rare cases.

Keeping the strains

Mosses are maintained by using the following nutrient solutions, solidified with 2% of agar:

Liverworts & Ferns		Mosses
NH ₄ NO ₃	0.12 g	0.20 g
KH ₂ PO ₄	0.70 g	0.10 g
MgSO ₄	0.12 g	0.10 g
CaCl ₂	0.02 g	0.10 g
FeCl ₃	0.03 g	0.005 g
agar-agar	10 g	10 g
H ₂ O dist.	1000 ml	1000 ml

The cultures are transferred to a fresh agar plate within some half year period. We use Erlenmeyer flasks (250 ml) with a wide mouth. The newly transferred culture is placed in an air-conditioned cultivation room to about 15 °C in order to prolong the period between transfers. From the beginning on it is grown under light conditions of about 1.5 W.m⁻² (cca. 330 lx) provided by fluorescent tubes "white". Necessary infrared radiation is provided with ca. 10% of light from incandescent bulbs. After a few weeks of growth, the light

intensity is reduced to about 1 W.m⁻² (ca. 220 lx). Light is controlled to 12h/12h light/dark, to save on cooling system and expenses.

List of strains

Hepaticae

Anthoceros sp., *Asterella blumeana*, *A. stahliae*, *Athalamia hyalina*, *Blasia pusilla*, *Bucegia romanica*, *B. sp.*, *Calypogeia suecica*, *Cephalozia ambigua*, *C. catenulata*, *Conocephalum conicum*, *C. supradecompositum*, *Corsinia coriandriana*, *Dumortiera nepalensis*, *Exormotheca pustulosa*, *Fossombronia angulosa*, *F. pusilla*, *F. wondraczeki*, *Jamesoniella autumnalis*, *Jungermannia gracillima*, *J. sp.*, *Lophocolea bidentata*, *Lunularia cruciata*, *Marchantia alpestris*, *M. polymorpha*, *M. aquatica*, *Metzgeria conjugata*, *Oxymitra paleacea*, *Pellia endiviaefolia*, *Peltolipsis quadrata*, *Phaeoceros* sp., *Plagiochasma elongatum*, *Plagiochilla porelloides*, *Preissia quadrata*, *Reboulia hemisphaerica*, *Riccardia incurvata*, *R. latifrons*, *R. pinguis*, *R. sp.*, *Riccia bifurca*, *R. ciliifera*, *R. glauca*, *R. michelii*, *R. rhenana*, *R. sp.*, *Ricciocarpus natans*, *Sauteria alpina*, *Scapania* sp., *Trichocolea tomentosa*.

Musci

Amblystegium juratzkanum, *A. serpens*, *Barbula gigantea*, *Brachythecium populeum*, *B. velutinum*, *Bryoxiphium norvegicum*, *Bryum affine*, *B. caespitium*, *Buxbaumia aphylla*, *Calliergon cuspidatum*, *C. giganteum*, *C. stramineum*, *Chiloscyphus pallescens*, *Climacium dendroides*, *Conostomum boreale*, *Coscinodon cribrosus*, *Cratoneuron commutatum*, *Ctenidium molluscum*, *Cynodontium polycarpum*, *Desmatodon latifolius*, *Dichodontium pellucidum*, *Dicranella heteromalla*, *Dicranodontium denudatum*, *Dicranum scoparium*, *D. spurium*, *D. undulatum*, *Dissodon froelichianus*, *D. splachnoides*, *Distichium capillaceum*, *Drepanocladus aduncus*, *D. fluitans*,

Entosthodon hungaricus, *Eurhynchium rusciforme*, *E. striatum*, *Fissidens cristatus*, *Funaria hygrometrica*, *Grimmia torquata*, *Hygrohypnum smithii*, *Leptobryum pyriforme*, *Leucobryum glaucum*, *Mnium affine*, *Mnium undulatum*, *Moerckia hibernica*, *Orthotrichum diaphanum*, *Phascum acaulon*, *Philonotis seriata*, *Physcomitrium pyriforme*, *Plagiothecium denticulatum*, *P. undulatum*, *Pleurozium alternifolium*, *Pohlia commutata*, *Polytrichum alpinum*, *P. commune*, *P. formosum*, *P. gracile*, *P. juniperinum*, *P. norvegicum*, *P. ohioense*, *Polytrichum* sp., *P. strictum*, *Pottia heimii*, *P. intermedia*, *P. truncata*, *Pseudoscleropodium purum*, *Pterygandrum filiforme*, *Ptilium crista-castrensis*, *Ptilaisia polyantha*, *Rhodobryum roseum*, *Rhynchostegium murale*, *Rhytidadelphus loreus*, *R. triquetrus*, *Sphagnum amblyphyllum*, *S. cuspidatum*, *S. fimbriatum*, *S. molluscum*, *S. palustre*, *Splachnum ampullaceum*, *S. sphaericum*, *Tetraplodon angustatus*, *T. mnioides*, *Thuidium delicatulum*, *Timmia austriaca*, *Tomenthypnum nitens*,

Trematodon ambiguus, *T. ambiguus*.

Pteridophyta

Asplenium septentrionale, *Alsophila australis*, *Blechnum brasiliense*, *Cyathea dealbata*, *Dicksonia sellowiana*, *D. antarctica*, *Dryopteris filix-mas*, *Elaphoglossum crinitum*, *Notholaenamamaranthae*, *Polystichum aculeatum*, *Polystichum lonchitis*, *Woodwardia radicans*.

References

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 PRÁT, S. [1948]. *Algarum, Hepaticarum, Muscorumque in culturis collectio. Plantarum physiologiae institutum Universitatis Carolinae. Preslia* (Praha) 22/23:1-12.

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in Asia, probably has the richest bryophyte flora in the world. When fully collected and studied, its bryoflora will no doubt prove to be highly diverse. Therefore, a Bryoflora of China in English, complete with synonymy, keys for identification and species descriptions, will be a significant contribution to Asiatic bryology. It will make available, for the first time to non-Chinese readers, a whole wealth of habitat and systematic information on Chinese bryophytes. Expectedly, a project of this nature needs international collaboration and support.

The central plan of the project is to complete the revision of all families of Chinese mosses and hepatics in about ten years. However, the project will also organize new expeditions to the interior and remote parts of China for additional bryophyte collections. To begin with, each family is assigned to a team composed of Chinese and non-Chinese bryologists. The pair of them will jointly study, revise and prepare the flora manuscript. The project will arrange for the Chinese counterpart to come and stay at the institution of the non-Chinese collaborator for a period of time to conduct taxonomic research based principally on the large Chinese collections borrowed from Chinese and western herbaria. After six months or a year, depending on the size of the family under study, the two collaborating authors are expected to accomplish the task and produce a familial treatment with illustrations ready for publication in a journal. At the end of the project, all publications, with further improvement and updates, will be organized into sequential volumes. The outcome will be four volumes for the mosses, and two for the hepatics.

At present, most large and medium size families of Chinese mosses have been assigned to Chinese and non-Chinese authors. However, colleagues who are interested in assisting in the study of a particular genus or a small family for the Chinese flora may still get in touch with the project coordinator for consideration. Authors for the hepatics

Flora News

The Bryoflora of China Project (English edition)

by

B.C. Tan and P.-C. Wu

July 29, 1991 may prove to be a memorable day for Asiatic bryology. On this day, a formal agreement was signed in Beijing, the capital of the People's Republic of China, between American and Chinese institutions to prepare an English edition of a new Bryoflora of China. The project, which was initiated a year ago by P.H. Raven and M.R. Crosby of the Missouri Botanical Garden, has now enlisted official participation from the Harvard University, the University of Helsinki in Fin-

land, Hiroshima University in Japan, and the University of Alberta in Canada. The two American institutions, MO and FH, together with the Chinese Academia Sinica, are the main organizers of this project. The English edition, with different management and funding, is not a translation of an ongoing project in Chinese with the same title.

With about 2100 species of mosses and 800 species of hepatics and hornworts, China, the largest country

groups will be decided later after the moss portion of the project has been completed.

Presently, the project is supervised by an international editorial board consisting of five Chinese and five non-Chinese members. They are: Chien Gao (Shenyang Institute of Applied Ecology), Ren-Liang Hu (Shanghai East China Normal University), Xing-Jiang Li (Kumming Institute of Botany), Zhi-Hua Li (Guangzhou Zhongshan University) and Pan-Cheng Wu (Beijing Institute of Botany), Timo Koponen (University of Helsinki, Finland), Zen Iwatsuki (Hiroshima University, Japan), Dale H. Vitt (University of Alberta, Canada), Marshall R. Crosby (Missouri Botanical Garden, USA) and Benito C. Tan (Farlow Herbarium of Harvard University, USA). The duties of the editorial board are to ensure the quality of taxonomic outputs and to secure financial support needed by the project.

To facilitate communication, P.-C. Wu and B.C. Tan were nominated as the two co-coordinators representing the Chinese and non-Chinese board members. Likewise, the Farlow Herbarium, with its strength in historical bryophyte collections and botanical literature, was designated project center to which all correspondence and enquiries should be directed. To better execute its role as project center, the Farlow Herbarium has decided to expand its current program of exchange of bryophyte specimens to include more herbaria in Asia. It also urges the bryological community to continue to deposit type materials of new taxa at FH for use in this Chinese bryoflora project.

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P.-C. Wu
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Flora of North America: Bryophytes

by Dale H. Vitt

Flora of North America is a collaborative project that has until now involved 22 institutions in a central way and hundreds of individuals and institutions as participants in the project. Bryophytes are now included in the project, and the Flora now welcomes the seven new institutions and eleven new editors involved in the bryophyte volume to Flora of North America. The organizational center for this project is at the Missouri Botanical Garden; the Hunt Institute for Botanical Documentation serves as the bibliographic center; and editorial committee members work at their home institutions throughout the U.S. and Canada. The project is funded by The Pew Charitable Trusts, the National Science Foundation, and other private foundations.

Flora of North America will appear in thirteen volumes (including comprehensive index and bibliography) over a period of twelve years and will include a comprehensive, computerized data base. Taxa will be arranged systematically. The Flora covers North America north of the U.S./Mexico political boundary, including Greenland, Saint Pierre and Miquelon, and the Aleutian Islands, and excluding the West Indies. We anticipate that the bryophytes will be treated in one volume to be completed in 1996.

The intent is to synthesize current knowledge of the North American flora. This will require critical evaluation of the literature and examination of herbarium specimens. The treatments will include brief discussion of problems or need for further research. Synonymy will not be exhaustive but will include names used in major floras of larger areas. Additional synonyms may be added in special cases, and we hope to eventually have full synonymy in the database. Basionyms will be cited, and types will be included in the data-

base when they are known. Distributions will be indicated on small outline maps, in state and province lists, and in short descriptive phrases if they are needed for greater precision. Complete state/province distributions will be enumerated in the data base as well. About one in three species will be illustrated by a professional illustrator working on the project.

The current editorial committee consists of:

Dr. William R. Buck
The New York Botanical Garden
Dr. Diana Horton
University of Iowa
Dr. Raymond E. Stotler
Southern Illinois University
Dr. Marshall R. Crosby
Missouri Botanical Garden
Dr. Norton G. Miller
New York State Museum
Dr. Barbara Thiers
The New York Botanical Garden
Dr. John J. Engel
Field Museum of Natural History
Dr. Barbara Murray
University of Alaska Herbarium
Dr. Dale H. Vitt
University of Alberta
Dr. Marie C. Hicks
Appalachian State University
Dr. William D. Reese
University of Southwestern
Louisiana

Anyone wishing further information should contact:

Dr. Nancy Morin
Convening Editor
Missouri Botanical Garden
P.O. Box 299
St. Louis, MO 63166, USA.

The International Bryological Information System (IBIS)

by Jan-Peter Frahm

Computer Techniques Column. Send contributions to the column editors: J.-P. Frahm, Universität Duisburg, Botanik, Postfach 101629, D-4100 Duisburg, Germany, or B. O'Shea, 131 Norwood Road, London SE24 9AF, U.K.

Computer networks allow an easy and inexpensive way for communication. Facilities for world-wide connections are provided by most universities free of charge. The requirements for participating in this service and two facilities to make use of such connection have already been described in *The Bryological Times*: the use of electronic mail (*Bryol. Times*, 62/63, Supplement) and the introduction of BRYONET (*Bryol. Times*, in press) as a conference medium for bryologists. But this is not all. The quick access to enormous masses of data over continents makes it possible to use these computer networks to make information on bryophytes widely available. For this purpose, a bryological data bank has been installed at one of the host computers at the university of Duisburg. As all services of the IAB computer working group, it is free of charge for members of the IAB. All you need to do to access the mainframe computer is to apply for a user code and a password by e-mail from J.-P. Frahm (hh216fr@unidui.uni-duisburg.de).

Access to the host is possible by the telnet command (use: telnet hostname or telnet IP number. The name of the host is duc220.uni-duisburg.de, IP number is 134.91.4.5), or with Datex-P (X29 connection) with the number 45050210410.

The bryological databank consists at present of all data files kept in the IAB software library. So far, no menu system, search or retrieval system or similar has been installed. After logging into the host computer, you will be in a subdirectory of an UNIX computer. With UNIX commands, you will be able to list data files. With the ftp command (from your host), the data

files can be downloaded for further use. The file transfer is as rapid as 0.5-1 Kbyte per second.

In the future, a search and retrieval system is planned, which will give the choice between different databases, and a keyword search within a database.

At present, the following data are available and grouped into the following subdirectories:

Literature

- recent literature on mosses/hepatics from 1988 onwards in dBase format and ASCII format.
- the bryological bibliography set up by Janice Glime with nearly 14,000 entries.
- a bibliography on the ecology of tropical bryophytes by J.-P. Frahm & S.R. Gradstein,
- a bibliography on Campylopus by J.-P. Frahm
- a bibliography on Pottiaceae by R.H. Zander
- a bibliography of bryological literature concerning China (P.L. Redfearn jr.)
- Quick reference list of basic literature to identify tropical African bryophytes by T. Pocs & B.J. O'Shea
- a bibliography on bryology of Germany from 1988 on by J.-P. Frahm.

Checklists

- list of UK bryophyte taxa by B.J. O'Shea
- list of Chinese mosses by P.L. Redfearn jr.
- list of North American Mosses by J. Glime
- list of European mosses by J. Glime
- list of Canadian mosses by R.R. Ireland et al.
- flora of the bryophytes of the Vosges

- Mountains, France by J.-P. Frahm
- Pottiaceae of North America North of Mexico by R.H. Zander
- checklist of the mosses of the Interior Highlands of North America by P.L. Redfearn, jr.
- list of the bryophytes of Kentucky by J.A. Snider et al.

Information

Here notes and news are posted.

So far, only data files of the IAB software library are stored here, but it is planned to expand the basis for information. Everybody is therefore asked to contribute data files. It is particularly intended to include available registers or type registers of herbaria. In this way it should be possible to get information instantaneously without writing and mailing letters, asking colleagues for help or information and receiving replies by mail, which can take weeks. In contrast, with the use of IBIS, valuable information can be obtained immediately when needed, in programs with multitasking facility even without leaving the word processor with which a manuscript is being prepared. IBIS will be extended in the future to become a pool of information for bryology and a source of information for every bryologist for taxonomic, floristic and bibliographic data.

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Fast Access to Programs of the IAB Software Library

by Jan-Peter Frahm

Ordering programs from the Software Library, although free of charge, requires you to mail diskettes, and if they are ordered from overseas in larger quantities and not mailed by air, this could take several weeks. On the other hand, most universities are connected to computer networks (BITNET, EARN, INTERNET etc.). These networks not only allow you to send and receive electronic mail (see 'IAB E-MAIL Directory on Disk' *Bryol. Times* 57/58:13, and 'How to make use of e-mail and electronic file transfer' *Bryol. Times*, 62/63, Supplement), or to set up a mailbox system (see 'Bryonet, - in press), but also to send and receive files. Programs can be downloaded within seconds from one continent to another. In addition it saves a lot of work for the keeper of the software library in copying, packing and mailing parcels.

To allow this to happen, part of the IAB Software Library has been put on the 10 Gigabyte CONVEX computer of the University of Duisburg. These are primarily programs that are not available from other sources such as PD and Shareware distributors, or - again via electronic networks - from file servers of public domain software. Since the computer network users of the IAB are still quite few, there is at present only a small selection of programs installed, which will however be extended in

time. In addition, the latest updated version of the software catalogue is also available. To download the programs:

- Login to your host computer
- By typing 'ftp 134.91.4.5' you will start the file transfer program, and will be connected to the University of Duisburg via INTERNET.
- You will then be asked for the user id and password. Access to this main-frame is strictly controlled, and there is no way in without a formally agreed user id and password. These are available on request, most easily by a short request to the author by e-mail (hh216fr@unidui.uniduisburg.de). It is not intended to publish them here to avoid computer kids or professional hackers entering the computer.
- By typing 'dir' you will get a list of available programs. With 'get <filename>' you can download a program within a few seconds. You may also send files from your computer with 'put <filename>'. Unfortunately the ftp (file transfer program) cannot display file contents for you, so you have to download them and have a look at them on your own computer.
- With 'exit' you can leave the ftp.

This is the most advanced, speedy and convenient way for software transfer, and herewith made available for all IAB members.

send your orders directly to the publisher:
Borntraeger
Verlagsbuchhandlung, Johannesstrasse
3A, D-7000 Stuttgart, Germany. Tel.
711-625001, FAX 711-625005. You
may also order from the US-agent:
Lubrecht & Cramer Ltd., RD 1, Box
244, Forestburgh, NY 12777, USA,
Tel. 914-7948539.

The following new volumes have appeared in 1991:

R. FRITSCH. Index to Bryophyte chromosome counts. *Bryophytorum Bibliotheca* 40, 352 pages. ISBN 3-443-62012-4. Full Price DM 130.-

Since the publication of the last Index of bryophyte chromosome counts in 1982, numerous new data have been published. The present Index is a fully updated version and provides almost 6700 chromosome counts, with annotations, for ca. 830 taxa of liverworts and ca. 1550 taxa of mosses. A literature list of almost 900 titles, certainly the most complete bibliography on bryophyte karyology ever published, is also provided. The Index is an indispensable reference for all those interested in the cytology and genetics of bryophytes.

S.E. BARTHOLOMEW-BEGAN. A morphogenetic re-evaluation of *Haplomitrium* Nees (Hepatophyta). *Bryophytorum Bibliotheca* 41, 297 pages, 508 figures. ISBN 3-443-62013-2. Full Price 220.- / US \$ 128.-

This book provides a comprehensive analysis of the morphology and ontogeny of the genus *Haplomitrium* (Haplomitriales) using light and electron microscopy and experimental culture techniques. The various ultrastructural peculiarities of the genus are discussed in detail. *Haplomitrium* is perceived as a highly plastic, primitive taxon, probably of Gondwana origin and remotely allied to the Metzgeriales. Of 13 species previously recognized, only 7 are retained on a world-wide basis. The genus *Steeeromitrium* is shown to be a synonym of *Haplomitrium*.

New Publications

send items to the Editor of *The Bryological Times*, S. Rob Gradstein, Institute of Systematic Botany, Heidelberglaan 2, 3584 CS, Utrecht, The Netherlands

New volumes of BRYOPHYTORUM BIBLIOTHECA

The series *Bryophytorum Bibliotheca*, edited by Jan-Peter Frahm and S. Rob Gradstein, is being published by Borntraeger Verlagsbuchhandlung, Stuttgart under the aegis of the International Association of Bryologists. Based on an agreement between the publisher and the Association, all paid-up members of the I.A.B. may purchase individual volumes of this series at 25% discount. Please

A.K. ASTHANA & S.C. SRIVASTAVA. *Indian Hornworts* (A taxonomic study). Bryophytorum Bibliotheca 42, 158 pages, 49 plates. ISBN 3-443-62014-0. Full Price DM 120/US \$ 69.-

Anthocerotae are an important and diverse element in the Indian bryophyte flora. This work provides a first comprehensive taxonomic treatment for the region. Thirty-four species (in five genera) are recognized, each of which is fully described and illustrated. Special attention is given to spore characters using scanning electron microscopy. Besides a considerable reduction in the number of accepted species, the authors also present a new subgeneric classification of the genus *Notothylas*.

I. BISANG. *Biosystematische Studien an Lophozia subgen. Schistochilopsis* (Hepaticae). Bryophytorum Bibliotheca 43, 187 pages, numerous tables and figures. ISBN 3-443-62015-9. Full Price about DM 100.-

This book provides a detailed analysis of the morphological variation of the *Lophozia incisa/opacifolia* and *L. capitata/laxa* complexes (subgen. *Schistochilopsis*), using various statistical and cultivation methods. On a world-wide basis, eight species are recognized with the subgenus; their taxonomy, distribution and ecology is treated in detail. Starch gel electrophoresis of isoenzymes is shown to be a useful tool to characterize the subspecies of *Lophozia incisa*.

Other new titles

A.J.E. SMITH 1991. *The Liverworts of Britain and Ireland*, first paperback edition. Cambridge University Press, U.K., 362 pages. Price 16.95 pound sterling.

This is the long-awaited paperback edition of Dr. Smith's new British liverwort Flora.

U. DREHWALD & E. PREISING 1991. *Zur Syntaxonomie und Synsystematik der niedersächsischen Moosgesellschaften. Naturschutz und Landschaftspflege in Niedersachsen* 20/9, 202 pages. Published by the

Niedersächsisches Landesverwaltungsamt, Fachbehörde für Naturschutz, Postfach 107, 3000 Hannover 1, Germany. Price DM 13.- excluding postage.

While increasing attention is being paid to the problem of endangered bryophyte species, virtually nothing has been known about the endangerment of bryophytes at the community level. This book is probably the first one to publish a comprehensive "Red List" of the bryophyte communities of a particular region. More than one hundred communities, described and classified according to the Braun-Blanquet method, are treated in this monograph of the bryophyte communities of the German state of Niedersachsen. For each community, information is provided on physiognomy, floristic characteristics, habitat, distribution as well as its endangerment and conservation. A detailed literature list, with almost three hundred references, and several Indexes complete this very useful reference work.

Acta Bryolichenologica Asiatica, Vol. 2, Nrs. 1 & 2. 1990. Published by the Asian Bryological and Lichenological Club and sponsored by the Finnish-Chinese Botanical Foundation, c/o P.O.Box 1-4, Sanchung, Taiwan 24199.

Contains bryological articles by e.g. T. Cao & C. Gao on a new species of *Encalypta*, by T. Koponen on the genus *Thuidium*, by M.S. Ignatov on mosses from the Altai, by P.-C. Wu and R.E. Magill on the bryofloras of the *Metasequoia* region in China and the *Taxodium* region of the USA, and a very useful review of "Current Chinese bryological literature" by T. Gao et al.

Z. IWATSUKI 1991. *Catalog of the Mosses of Japan*, 182 pages. Published by and to be ordered from the Hattori Botanical Laboratory, Obi, Nichinan-shi, Miyazaki-ken, 889-25 Japan. Price US \$ 22.- including postage.

This catalogue is divided into two chapters: 1. *Checklist of Japanese mosses* (p. 3-34), including 1180 species belonging to 321 genera. 2. *Al-*

phabetical list of species (p. 35-173), including a statement on the distribution of the species in Japan. The book will prove to be invaluable for all botanists and students interested in Asiatic mosses.

S. JOVET-AST 1991. *Riccia d'Amerique Latine; Taxons du sous-genre Riccia*. *Cryptogamie, Bryologie-Lichénologie* 12 (3): 189-370. Price 180 francs. To be ordered from: *Cryptogamie, Bryol.-Lichenol*, 12 Rue Buffon, 75005 Paris.

This work provides a first comprehensive taxonomic revision of the genus *Riccia* subgenus *Riccia* in Latin America. All 38 species (including 9 new ones) of the region are fully described and illustrated. Various biological data, distribution maps and scanning electron micrographs of spores are also provided. The work is a sequel to Dr. Jovet-Ast's revision of the Mediterranean *Riccia*'s, published in *Cryptogamie, Bryologie-Lichénologie* 7 (suppl.), 1986. The latter volume may also be ordered at the address given above, at the price of 180 francs.

Best Book Buys

Still the only moss flora for any Central American country, Edwin Bartram's 'Mosses of Guatemala' is a basic reference for anyone studying mosses in the Neotropics. This 442 page flora treats over 500 species with keys, descriptions, and simple drawings and was originally published in *Fieldiana* in 1949. In 1972, it was reprinted with the aid of the Donald Richards Fund from the Field Museum in Chicago. This reprint is still available from the Missouri Botanical Garden for the great price of US\$ 10.00 plus postage and handling (US\$ 2.75 for US orders; US\$ 3.75 for non-US orders). The reference is Bartram, E.B. 1949. *Mosses of Guatemala*. *Fieldiana: Botany* 25: 1-442. Order from Department Eleven, Missouri Botanical Garden, P.O. Box 299, St. Louis, Missouri 63166-0299, USA.

Colophon

The Bryological Times, founded in 1980 by Stanley Wilson Greene (1928–1989), is the bimonthly newsletter of the INTERNATIONAL ASSOCIATION OF BRYOLOGISTS. It is published in Edmonton (Canada) and distributed from Canberra (Australia), Edmonton (Canada), Eger (Hungary), Geneva (Switzerland), Hiroshima (Japan), Moscow (U.S.S.R.), Praha (Czechoslovakia) and St. Louis (U.S.A.).

Important change from no. 57/58 onwards: all items for publication in *The Bryological Times* are to be sent, preferably on diskette, to the Managing Editor, Guido B.A. van Reenen, University of Amsterdam, Hugo de Vries-laboratorium, Kruislaan 318, 1098 SM Amsterdam, the Netherlands, **except** those for the regular columns, which may go **direct** to the column editors.

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Column Editors

W.R. Buck & J. Vána (floristics and phytogeography); J.-P. Frahm & B. O'Shea (computer techniques); J.M. Glime (ecology); R. Mues & J.G. Duckett (research and development); M.L. Sargent (techniques); E. Urmi & T. Hallingbäck (endangered bryophytes); D.H. Vitt (diary, best book buys, taxonomy); G. Zijlstra (nomenclature)

Correspondents

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

For details regarding membership of the INTERNATIONAL ASSOCIATION OF BRYOLOGISTS (currently US \$10.00 p.a.) write to the Honorary Secretary, Dale H. Vitt, Department of Botany, University of Alberta, Edmonton, Alberta, Canada T6G 2E9. All correspondence concerning mailing to Sandi Vitt at the same address.

Diary

Send contributions to D.H. Vitt,
University of Alberta, Department of Botany, Edmonton, Alberta, Canada T6G 2E9.

1992

Spring. Bryologisch-lichenologische Arbeitsgemeinschaft excursion to western Anatolia, Turkey. Inquiries: Dr. V. John, Pfalz museum, Hermann-Schäfer-Str., D-6702 Bad Dürkheim, Germany.

April 8-15. BBS Spring Field Meeting, Oswestry, United Kingdom. Inquiries: Ron Shoubridge, 8 Mary Elizabeth Road, Ludlow, Shropshire SY8 1LW, U.K.

April 29-May 3. Dutch Bryological and Lichenological Society excursion to Luxemburg, Berdort and vicinity. Inquiries: André Aptroot, W. van Velzenstraat 11, 1962 WS Heemskerk, The Netherlands.

June 22-24. 8th Meeting of The Central European Bryological Working Group, Eger. Inquiries: Sándor Orbán, Eszterházy Károly Teachers' Training College, Eger, Eszterházy tér 1., Pf.: 43, H-3300 Hungary.

July 13-17. III Latin American Symposium of Bryology, Mexico City, Mexico, covering all aspects of Neotropical bryology with lectures and contributed papers and two short field trips. Inquiries: Claudio Delgadillo M., III Simposio Latinoamericano de Briología, Apartado Postal 70-367, Delegación Coyoacán, 04510 México, D.F. Mexico.

July 27-August 5. Dutch Bryological and Lichenological Society excursion to France, Pyrenees, near Tardets. Inquiries: André Aptroot, W. van Velzenstraat 11, 1962 WS Heemskerk, The Netherlands.

July 29-August 12. BBS Summer Field Meeting, Ullapool and the Uists. Inquiries: Gordon Rothero, Stronlach, Glenmassan, by Dunoon, Argyll PA23 8RA, and Peter Pitkin, Nature Conservancy Council Scotland, 2/5 Anderson Place, Edinburgh EH6 5NP, U.K.

August 3-9. Nordic Bryological Society Annual Meeting and excursion in Kilpisjärvi, extreme NW Finland. Preliminary registration and further information from Krister Karttunen, Department of Botany, University of Helsinki, Unioninkatu 44, SF-00170, Finland. FAX: 358 0 708 4830; Telephone: 358 0 708 4725/4724

August 9-13. ABLS, Honolulu, Hawaii. Annual meeting in conjunction with American Institute of Biological Science annual meetings. Inquiries: Vernon Ahmadian, Clark University, Department of Biology, Worcester, MA 01610-1477. USA.

September 26-27. BBS Annual General Meeting and Symposium Meeting, East Sussex. Inquiries: David Streeter, Sussex House, Falmer, Brighton, Sussex BN19RH, U.K.

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

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

1993

Spring. BBS Spring Field Meeting, Brittany, France. Inquiries: J.W. Bates, Imperial College Field Station, Silwood park, Ascot, Berkshire SL5 7PY, U.K.

August 28-September 3. XV International Botanical Congress, including IAB general meeting. Tokyo, Japan. Inquiries: Zennoske Iwatsuki, Hiroshima University, Botanical Institute, Higashi-senda-machi, Japan.

Call for nominations for the World Red List of endangered species!

As was discussed in The Bryological Times No. 62/63 1991 p. 9, one way to draw the attention of conservationists and governments to the existence of bryophytes is to compile a World Red List.

We fully realize the scientific limitations of this exercise. However, we believe that having a relatively short Red List of endangered bryophytes will be an invaluable tool for bryophyte conservation. Therefore, please suggest below "candidate species" for a World Red List of endangered bryophytes, according to the following criteria:

- 1) The species must be threatened on a worldwide scale.
- 2) The species must be confined to a threatened habitat.
- 3) The species should be narrowly distributed (and this is not due to undercollection in neighbouring areas).

And finally, please explain in a few words why you have chosen each species.

Species:

Why?

Contribution from:

name: _____ address: _____

Please send mosses to:

Dr. Benito Tan, Harvard University, 22 Divinity Ave. Cambridge, Mass. 02138, USA.

hepatics and hornworts to:

Dr. Patricia Geissler, Herbarium Conservatoire et Jardin Botaniques, Case postale 60, CH-1292 Chambésy/Genève, SWITZERLAND.

