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Personal Commentary on the Colombian Moss Flora

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The following provides a somewhat personal account of my involvement with the Colombian moss flora and the various institutions and individuals that I have had the privilege to work with over the last eight years.

My involvement with Colombia was initiated in late 1984 with an invitation from Dr. Lucía Atahortua to visit and collect in the Departamento de Antioquia, which I did with Inés Sastre-De Jesús in 1985, and again in 1986, with the financial support of the New York Botanical Garden while both of us were graduate students at the Garden. That initial involvement has lead to a close association with the staff and students of the Universidad de Antioquia up to the present time. A further invitation was extended to me by Nubia Cardona de Hollaender to visit and collect in Valle del Cauca in 1987. Later, with the support of the Danish Research Council, I was able to initiate field work in the Departamento de Nariño in 1989, assisted initially by Dr. Olga De Benavides. Finally, in 1990 I received a National Science Foundation (NSF) grant that supported not only the preparation of the moss flora but to conduct extensive field work in Colombia. Another grant from NSF was awarded in 1992 and commenced in early 1993. This grant included an important A.I.D. (Aid for International Development) infrastructural support component to Colombian research institutions. This will provide

optical and computer equipment, herbarium cases, literature, miscellaneous supplies, and partial support for Dr. Edgar Linares C. (collaborator), and an assistant. Also included are funds for illustrations, which are being prepared by Gloria Mora of the Universidad de Antioquia.

Institutions

COL. The Herbario Nacional Colombiano, located in Bogotá was founded in 1931. This is the largest herbarium in Colombia. COL also contains the largest number of mosses with some 16,000 in the main herbarium (many identified only to genus), and some 4000-5000 unsorted collections. Thus there is a great amount of data to be derived from these collections that is presently unavailable. Several years of intensive curation will be required before access can be gained to the full resources at COL. The great strength of COL collections center around the Departamento de Cundinamarca, and the collaborative project between COL and Dutch botanists related to the ECOANDES project. Dr. Jaime Aguirre, the bryologist at COL, and now director of the Museo de Historia Natural, has had an active program with some 12 theses completed by students associated with COL, with particular emphasis on the environs of the Sabana de Bogotá.

CUVC. The Universidad del Valle herbarium, founded in 1966, is located in Cali, Departamento del Valle

del Cauca. Nuibia Cardona de Hollaender has for several years been collecting cryptogams in Valle. Drs. Jorge Ramos and Philp Silverstone-Sopkin have contributed mosses from their inventory study of the remnant Cauca valley forests, and from the biogeographical isolated and interesting Cerro de Torrá in the Departamento de Chocó of the western

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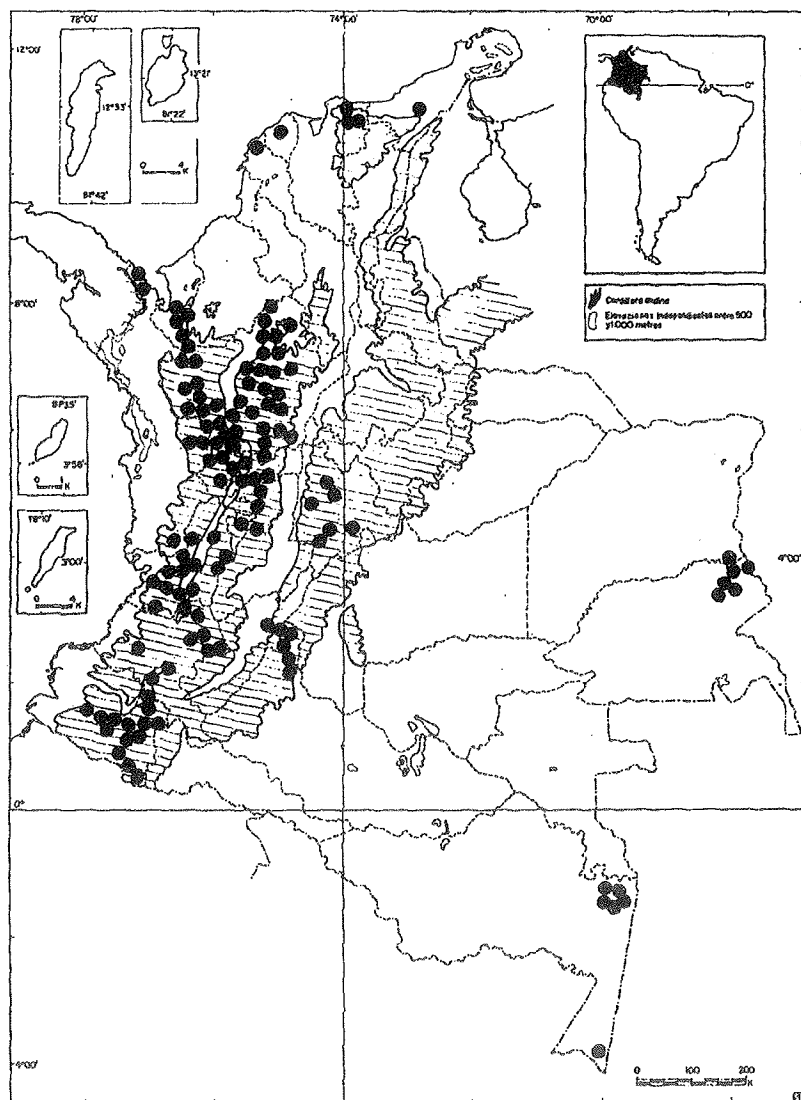


Fig. 1. Collection sites in Colombia

cordillera. During my first visit in 1987 I estimated that the number of mosses in CUVC numbered probably less than 50, now they have between 1000 and 1500.

HUA. The Universidad de Antioquia herbarium, founded in 1969, is located in Medellín, Departamento de Antioquia. HUA is the second largest herbarium in Colombia, and second largest with regard to moss collections, estimated now at just over 10,000. On my first visit to HUA in 1985, I estimated the moss holdings at about 100 collections. Although I have made many collections in Antio-

quia, an equal and impressive effort has been and continues to be made by staff and students at the university. Among the collectors, to name just a few, are Linda Albert de Escobar, Julio Betancur, Ricardo Callejas, Diego Giraldo Cañas, Margarita Escobar A., and Ramiro Fonnegra. Much of the effort and emphasis has been directed toward the continuing project - Flora de Antioquia, one of the most intensive departmental inventories in Colombia. However collecting has not only been confined to Antioquia, material has also been gathered from possibly half of the departments in

Colombia. Since my association with HUA, I have attempted to supply various bryological literature so that at this point in time the herbarium library contains nearly all available reprints and books. Given the extensive collections (including Bryophyta Neotropica Exsiccata) and literature, HUA is nearly self-sufficient to conduct bryological research in neotropical ecology and taxonomy.

MEDEL. Herbario Gabriel Gutiérrez V., Departamento de Biología, Universidad Nacional - Sede de Medellín is one of the oldest herbaria in Colombia, founded in 1927. The bryophyte collections are small, with ca. 300 mosses. These collections however are historically important for Antioquia, containing the early collections of Hermano Daniel and several of his colleagues associated with the Los Lasallistas. In recent years Dr. Darío Sánchez and students have been involved in several vascular plant inventory projects, particularly the very rich region of Murí associated with the Chocó forests on the slopes of the Cordillera Occidental. A small but important number of collections have been made during the course of this project.

PSO. The herbarium at the Universidad de Nariño, located in Pasto, was founded in 1962. Dr. Olga De Benavides, until her retirement, collected a number of bryophytes in the departments of Nariño and Putumayo. Recently Bernardo Ramírez P. commenced collecting bryophytes in Nariño, and has contributed many (ca. 1000) duplicates for the Colombian moss flora project. Sr. Ramírez P. and I are preparing a catalogue of the mosses of the Departamento de Nariño. PSO also maintains the collections from the Reserva La Planada, an excellent biological field station located at 1800 m elevation on the slopes of the Cordillera Occidental. Although PSO contained only some 50 or fewer mosses on my first visit in 1989, they now have approximately 2000.

Field Work

Efforts with regards to my field work has resulted in nearly 6000 collections from about 200 sites in 14 departments, mostly from the western half of Colombia (Fig. 1). In addition to these, many duplicates, probably several thousand, have been contributed from various individuals and institutions as mentioned above. Field work has, and continues to be hampered by political and social unrest associated with various guerrilla groups often located in the best lowland and montane forests (one may even argue that this is as good a deterrent to deforestation as the more official conservation methods employed by the government), and naturally the more infamous cartel organizations, and not so well publicized para-military groups. This has created a serious problem for Colombian botany, and there is little likelihood that these problems will change in the near future. Outside of the general notoriety of the cartels occasionally given front page headlines in newspapers in, for example, the U.S.A., what is little understood by those residing in the Northern Hemisphere is the enormous cost to Colombians. Violence and corruption has exacted a great toll in the loss of lives and unceasing fears. No part of Colombian society has been untouched by these problems. However, Colombians, botanists included, are also resilient and determined. Field work continues, and one learns quickly that field related projects are possible but must be flexibly planned. It has been possible to avoid many of these problems by simply inquiring from the local campesinos about the safety of a particular area. Pleasantly, Colombians have a general interest in natural history, and they seldom think it odd that one studies mosses, unlike a number of farmers or ranchers I encountered in my past work in Nebraska and elsewhere in the Great Plains. Natural history is much respected by the general public, except for, as in

most countries, some bureaucrats and politicians. Although little may be known of the Colombian flora in general, the vascular flora is estimated at 35,000 species, there is now an increased concern for the loss of natural vegetation and the need to document the plant diversity by Colombian and collaborating North American and European botanists.

Future field work will be directed primarily toward the eastern half of Colombia. Primary emphasis will be in the Cordillera Oriental which is poorly known except for the Departamento de Cundinamarca. Largely based on our knowledge of vascular plants, and what we know of the mosses in Cundinamarca, this Cordillera is likely the richest mountain system in Colombia. Because of the immense size of the eastern lowlands and the amount of time and cost, only limited field inventory will be conducted in both the Amazonia forests and grassland and savannas of the llanos. As with previous field work, the principle effort is to survey as many vegetation zones within each of the departments in Colombia as possible.

As now required by most neotropical countries, the first set of my collections are deposited in Colombia, mainly at HUA and more recently at COL, or as in the cases of various departments with on-going inventory projects the first set retained there: Antioquia (HUA), Nariño (PSO), and Valle (CUVC). The second set of collections is deposited at NY, and remaining duplicates have been distributed to herbaria active in neotropical moss research, both among the temperate herbaria (e.g., H, MO, US) and Latin America herbaria (e.g., MEXU, PMA).

Flora Project

The present project is a collaborative effort, working with the various Colombian herbaria mentioned above, and with Dr. Edgar Linares C. as a co-investigator and author. Dr. Linares, previously associated with the

Jardín Botánico de Bogotá and more recently with the Pontificia Universidad Javeriana, and I began our association only in late 1991. This has and continues to be a rewarding interaction. The main flora project, funded by NSF, is divided into three stages. The first stage involves the production of a synoptic treatment in Spanish of the Colombian mosses. This is intended to meet the immediate needs of Colombian biologists, and should prove useful to those in Venezuela and Ecuador. To be included are full descriptions of families and genera, keys to all taxa (except some difficult genera where only the common species or other species known to us are keyed), and for species, ecology, elevational range, distribution by department and general extra-Colombian range, and limited synonymy. All genera, with a total of about half of all species, will be illustrated by Gloria Mora at the Universidad de Antioquia. The synopsis will serve as a template for the second stage, a full treatment, illustrations, and maps of all species in several volumes. This second stage will also include a data base of collections examined, although the citation in the actual publication will be very limited except for uncommon or rare species. At the completion of this stage, i.e., publication of the detailed flora in Spanish, the last stage will involve a concise treatment in English incorporating additional data and corrections.

Preliminary Results From the Synopsis

At present we can record ca. 880 species distributed among 250 genera and 68 families. The number of taxa recognized in the previous two checklists and the present estimate is given in Table 1. In comparing the development and differences one must keep in mind that these figures do not take into consideration the number of synonyms recognized since the time of their publication or changes in taxonomic concepts.

Table 2. Development of floristic inventory of Colombian mosses by political subdivision. Number of species reported by Florschütz-de Waard & Florschütz (1979), present number in synopsis as of 1993, and estimated number (see text).

Name	1979	1993	Est. No.
Amazonas	8	60	100
Antioquia	80	424	450
Atlántico	1	2	30
Arauca	23	56	200
Bolívar	0	3	100
Boyacá	121	205	400
Caldas	50	128	300
Caquetá	9	85	200
Casanare	0	8	200
Cauca	86	228	400
Cesar	0	0	200
Córdoba	0	1	50
Cundinamarca	498	489	500
Chocó	12	79	200
Guainía	0	25	50
Guaviare	1	2	100
Huila	7	49	300
La Guájira	3	11	200
Magdalena	105	209	300
Meta	49	149	200
Nariño	16	245	400
Norte de Santander	32	86	300
Putumayo	59	67	200
Quindío	0	16	200
Risaralda	0	88	200
San Andrés & Providencia	0	1	50
Santander	73	137	300
Sucre	0	0	50
Tolima	61	140	300
Valle	118	249	400
Vaupés	10	41	100
Vichada	2	8	50

Significant progress has been made in the inventory of Colombian mosses. The total number of species recorded for Colombia is only one element to gauge our understanding of diversity. Equally important is the distribution within Colombia for all species. Although rather artificial, I have used political subdivisions, i.e., departments, within Colombia as a gauge of what is known and to predict just how much further field and herbarium studies will be needed to complete the inventory, as reasonably as one can expect for a tropical country as diverse as Colombia (Table 2). Again, this

does not reflect new synonyms, excluded names, or additions. For example, in Cundinamarca the number of species listed in 1979 was greater than in 1989 due, in part, to a number of newly recognized synonyms, but has increased recently due to additional records for the department. Given what we know from well known inventoried departments and vegetation types associated with elevation, we can predict the estimated number of species after a "complete" inventory. Thus in 1979 there were ca. 1424 total species recorded for all departments. This number has increased to 3268 over the last 12 years. Given the estimated number of species expected (in many cases I have given what I guess is a minimum number) for each of the 32 political subdivisions an overall total of 6000 species records would likely produce a reasonable inventory. This "complete" inventory would likely provide a figure for total diversity of species and distributional patterns within Colombia. Thus the inventory of Colombian mosses then may be more than half completed.

The number of individuals, Colombian and non-Colombian, who have collected mosses in Colombia is just over 200, of which 20 can be categorized as bryologists, and of this latter figure about 10 have made a significant number of moss collections.

This project has also demonstrated in what manor moss diversity is partitioned (Churchill, 1991). We now know, at least in a preliminary way, that the greatest species richness, ca. 50%, is concentrated in a narrow area of the upper montane forest and transition to subpáramo. We also know in a relative way that while α -diversity (number of species at any given site) may be somewhat similar from lowland to highland, it is β -diversity (species turnover) that results in a significant increase in τ -diversity (regional species richness) that accounts for the species richness

associated with micro-habitat diversity and climatic conditions (in part) found in the high montane and subpáramo, and to a lesser extent, in the low and mid montane and páramo. This points to two very important aspects of diversity that differ from general trends observed in tropical organisms, 1) moss diversity does not exhibit a latitudinal increase in species richness trend from low to high latitudes, and 2) mosses do not decrease with increasing altitude, except above the high montane-páramo transition zone. This suggests that mosses are essentially moist temperate organisms, and lacking topographic relief diversity in the tropics would simply be unimpressive, except to a bryologist familiar with, for example, the Central Plains of North America.

With the publication of the synopsis, and later the multi-volume flora, both in Spanish, the stage should be set for continued field inventory and to address various taxonomic problems that simply can't be addressed in a flora. More importantly, this should finally allow the development of various studies in the comparative biology of mosses which is so conspicuously lacking in the Neotropics, and from which we have so much to gain in understanding the biology of these organisms.

This project owes no small amount of the progress already accomplished to various specialists who have given time and effort to provide determinations or comments on various taxonomic problems. No tropical flora can, with much success, be completed easily alone. While this has very

Table 1. Comparison of the number of families, genera, and species reported for Colombia by Florschütz-de Waard & Florschütz (1979), Churchill (1989), and the present number recorded in the synopsis.

Taxon	1979	1989	Present
Families	50	65	68
Genera	199	242	250
Species	750	877	880

much assisted the present project, even more important to the future of Colombians is to have material determined by specialists that they can refer to in their own herbaria. These specialists include: B. Allen, H. Ando, W. R. Buck, H. Crum, J.-P. Frahm, D. Griffin, III, J. Hyvönen, R. Ireland, J. Lewinsky, N. Nishimura, R. Pursell, W. Reese, J. Shaw, D. Vitt, and R. Zander.

Obviously much of the success has only been possible through the cooperation and interest by staff and students at several institutions in Colombia. This very factor assures that the future of Colombian bryology will flourish in time, given the proper resources to carry out research are provided. Hopefully this has been accomplished in part, by the significant increase in moss collections in several herbaria, reference literature that has or will be established at both COL and HUA, increased equipment, and finally the various treatments to be published in Spanish.

Acknowledgments. Needless to say, none of this would have been possible without the kindness extended to me by numerous Colombian colleagues providing assistance in the field and herbaria, especially to my coworker, Edgar Linares C., to all the specialists for assistance with collections, and finally to the National Science Foundation for financial support (DEB-8818051, DEB-9201281), and Aid for International Development for the support of infrastructural assistance to Colombian institutions.

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Florschütz-de Waard, J. and P. A. Florschütz. 1979. Estudios sobre criptógramas colombianas III. Lista comentada de los musgos de Colombia. Bryologist 82: 215-259.

A sub-aquaceous epiphyte from Malawi

Ecology column. Send contributions to the column editor: Janice M. Glime, Dept. of Biol. Sci., Michigan Techn. Univ., Houghton, Michigan 49931, U.S.A.

The majority of epiphytic bryophytes are either associated with woody plants, growing on bark as corticolous epiphytes, or they occur as epiphylls on leaf surfaces of plants having persistent leaves.

The roots of plants are not usually available for colonisation, unless exposed by erosion, although *Fontinalis* has been observed attached to the roots of *Salix*, etc. In general, however, the sub-aqueous environment is not one in which epiphytes are expected to occur.

Whilst searching for mosses besides the Chapaluka River, a tributary of the Likhubula, which drains the Chambe basin (part of the Mulanje Massif in southern Malawi), small tufts of a moss were observed, growing attached to stems of the tropical rheophyte *Podostemum*.

Mabberly (in Heywood 1978) notes that the Podostemaceae are a family of aquatic herbs resembling mosses. Seeds develop a thallus-like structure from which, subsequently, root-like haptera appear, which anchor the plants in the swiftly flowing waters they inhabit. The majority of the family are found in the tropics, *Podostemum* being the only genus to occur in Africa.

The moss which appears as an epiphyte on this "moss like" phanerogam is a species of *Philonotis*. Unfortunately, the African members of this

genus are not readily identifiable, so the precise identity of this plant is still unknown.

However, the fact that mosses can grow epiphytically on submerged plants is worthy of note, and workers in the tropics may find it worth investigating this habitat more thoroughly. And since the Podostemaceae are apparently annual, there would seem to be opportunities to make observations on growth rates in the moss species concerned. My specimens of *Philonotis* were growing near the ends of quite long stems. They must therefore have attached themselves, and grown, quite late in the growing season; since the longest moss stems were of the order of 15 mm, this suggests quite rapid growth rates.

Epiphyte: a plant growing on another plant, without being parasitic. [Chambers Dictionary]

References:

Heywood, V.H. (ed.) 1978. Flowering Plants of the World. Oxford.

C. Robin Stevenson, Norfolk College of Arts & Technology, Tennyson Avenue, King's Lynn, Norfolk PE 30 4DJ, U.K.

Note: I have likewise seen *Fontinalis duriaei* growing on roots and on submersed branches of *Alnus incana*. However, this is the first knowledge I have of growth of a bryophyte on an aquatic plant. I find the growth on young tissues of *Podostemum* to be especially noteworthy. [J. Glime]

New addresses:

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The moss collections of Prof. Deguchi from Chile in 1981 and 1985, and from Peru in 1985, are transferred from KOCH to HIRO.

The project "Bryophyte flora of the Huon Peninsula, Papua New Guinea"

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In 1981 D. H. Norris (then in Humboldt State University) and T. Koponen (University of Helsinki) made field excursions in New Guinea in order to collect bryophytes (Koponen & Norris 1983). The original idea was to publish a list of our collections. Since the forthcoming possibilities to get funding for the project were unknown, we selected the humble name: "Bryophyte flora of the Huon Peninsula, Papua New Guinea" for our forthcoming series of publications. In this we actually followed Fleischer's (1902-1923) hilarious naming of his Flora: "Die Musci der Flora von Buitenzorg. Zugleich Laubmoosflora von Java mit Berücksichti-

gung aller Familien und Gattungen der gesamten Laubmooswelt". However, our target gradually changed toward a complete flora of Western Melanesia; we include West Irian of Indonesia, Papua New Guinea and Solomon Islands. Norris and Koponen have been responsible for the study of the mosses in cooperation with many colleagues, and S. Piippo has organized the research and publishing of the liverworts.

The work begun by making checklists of the earlier published records from the area. Only the checklist of liverworts and hornworts has been published (Grolle & Piippo 1984). The checklist of mosses is being used

as a basis when giving the distributions within New Guinea. The methods of our work and the documentation have been described in the first, seventh and thirty-third parts of the series (Koponen & Norris 1983, Norris & Koponen 1985, 1990). Our collections are cited in the order of collection areas and collecting localities in a very abbreviated form. Principally it is possible to trace out from which habitat each of the specimens came. It may be emphasized that the nomenclature in the lists of synonyms of the mosses has been with very few exceptions checked from the original publications. So, if our information deviates from citing in "Index musco-

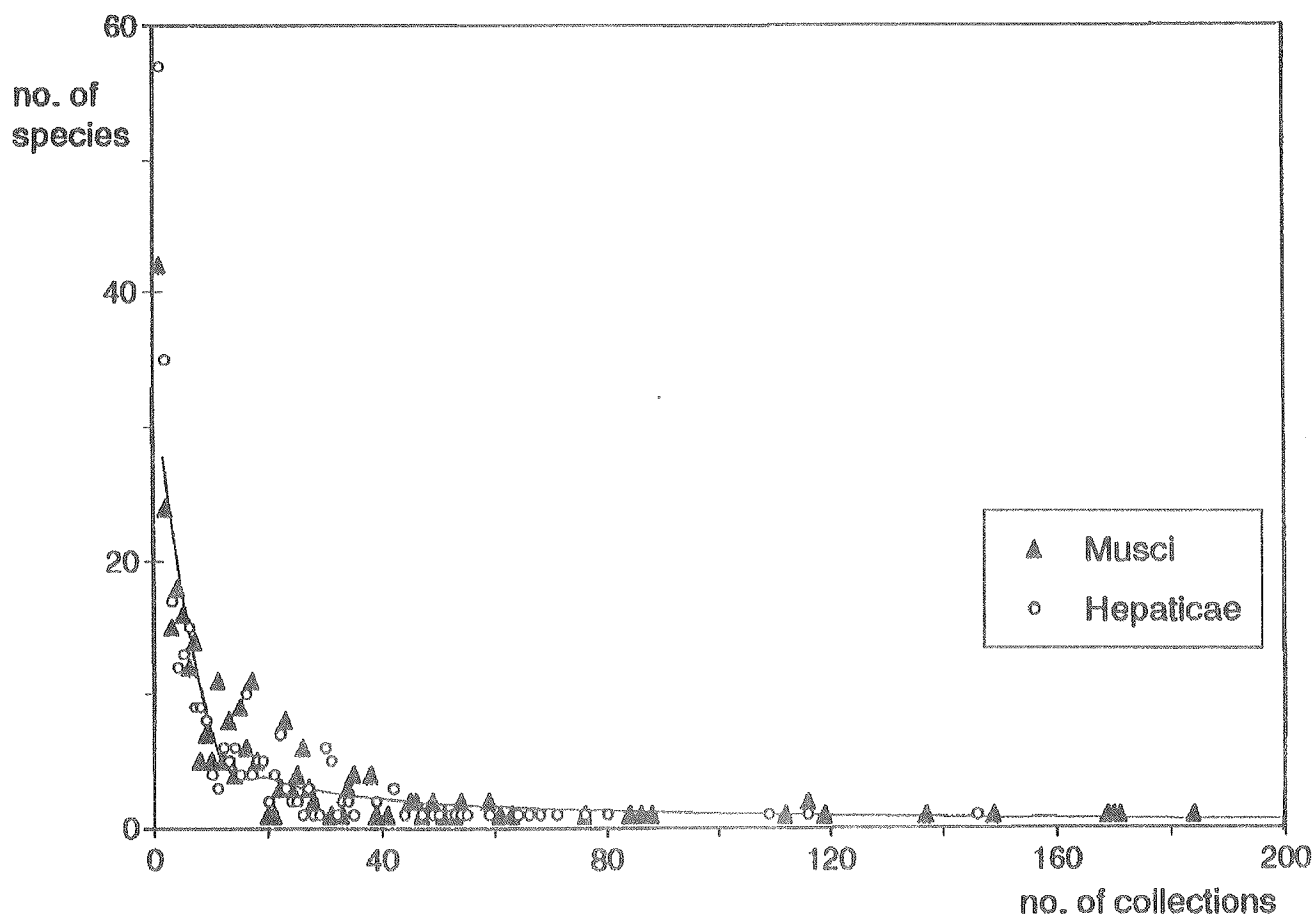


Fig. 1. Collecting frequencies of mosses and hepatics of Koponen-Norris expedition in New Guinea.

rum" or "Index of mosses", it is better to check the reference once more. Duplicates of specimens have been distributed on exchange basis to ca 70 different herbaria around the world.

Our taxonomic results have been frequently presented in bryological meetings and listed in print also in the *Bryological Times* (Koponen 1987). In Koponen (1990) there is a list of the papers published (nos 1-31) and the manuscripts ready on ca. May 31, 1989 of our series "Bryophyte flora of the Huon Peninsula", and an index to the genera which had been revised until that date. Koponen et al. (1991) listed the papers of the floristic "Frieda River" series and the papers nos 1-47 of the "Huon Peninsula" series and also gave an index to the genera and families dealt with so far. Koponen et al. (1992) reported the progress made and listed the non-

taxonomic papers, poster presentations and reviews given of our work. Since the latest listing of the Huon Peninsula papers (Koponen et al. 1991), the following papers have been published:

48. Enroth, J. 1991: Bryophyte flora of the Huon Peninsula, Papua New Guinea. XLVIII. Plagiotheciaceae (Musci). - *Ann. Bot. Fennici* 28: 111-115.

49. Piippo, S. 1991: Bryophyte flora of the Huon Peninsula, Papua New Guinea. XLIX. *Targionia* (Targioniaceae, Hepaticae). - *Ann. Bot. Fennici* 28: 273-276.

50. Bischler, H. & Piippo, S. 1991: Bryophyte flora of the Huon Peninsula, Papua New Guinea. L. Marchantiaceae (Hepaticae). - *Ann. Bot. Fennici* 28: 277-301.

51. Piippo, S. 1992: Bryophyte flora of the Huon Peninsula, Papua

New Guinea. LI. Additions and corrections to the Geocalycaceae (Hepaticae). - *Ann. Bot. Fennici* 29: 243-248.

52. Enroth, J. 1993: Bryophyte flora of the Huon Peninsula, Papua New Guinea. LII. *Homalothecium* (Brachytheciaceae, Musci). - *Acta Bot. Fennica* 148: 1-4.

53. Vitt, D. H., Koponen, T. & Norris, D. H. 1992: Bryophyte flora of the Huon Peninsula, Papua New Guinea. LIII. *Ulota* and *Schlotheimia* (Orthotrichaceae, Musci). - *Acta Bot. Fennica* 148: 5-25.

54. Piippo, S. 1993: Bryophyte flora of the Huon Peninsula, Papua New Guinea. LIV. Anthocerophyta. - *Acta Bot. Fennica* 148: 27-51.

As to the liverworts it is now easier to list what has not yet been done than what has been done. With the latest additions listed above only the genus *Bazzania* S. Gray and taxa of

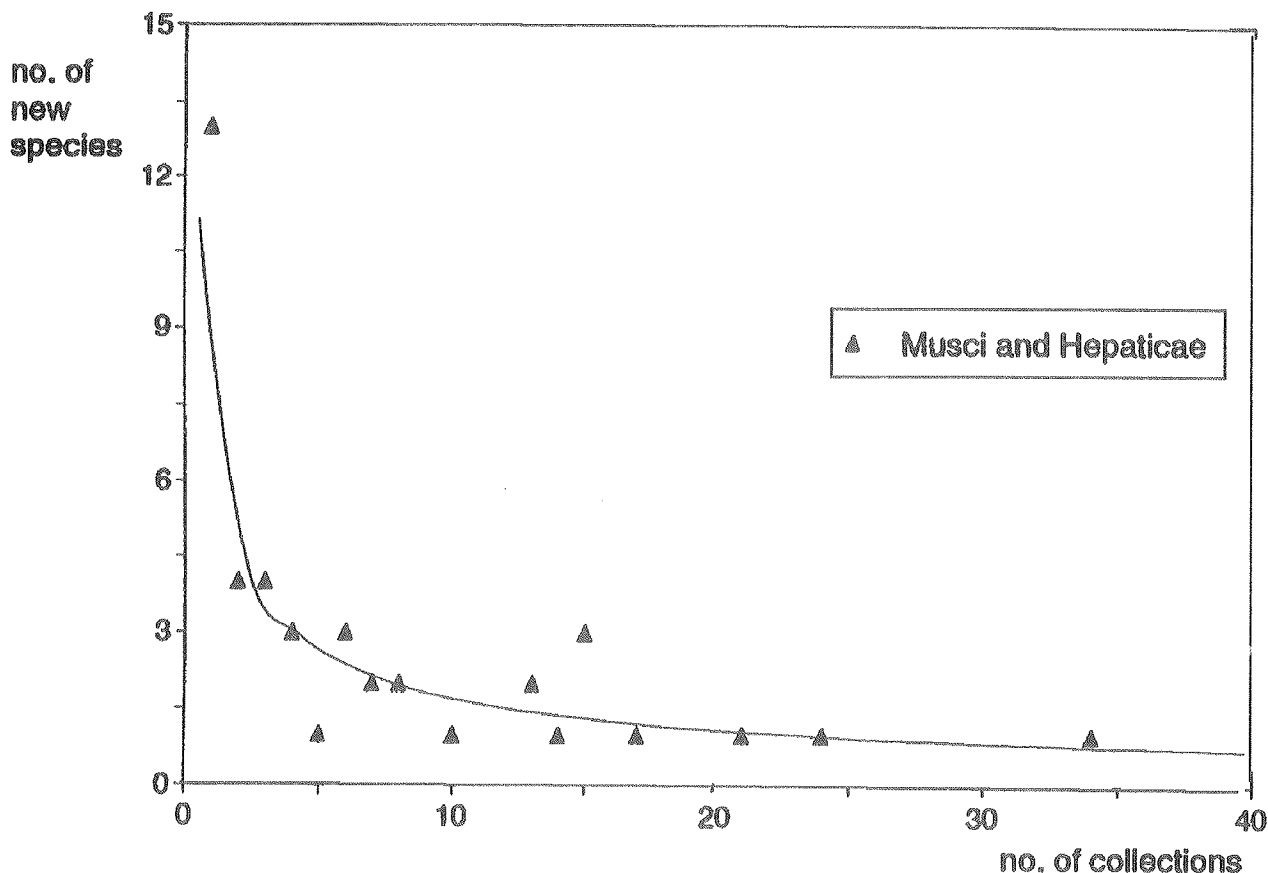


Fig. 2. Collecting frequencies of mosses and hepatics described as new to science and collected during Koponen-Norris expedition in New Guinea.

Aneuraceae are untouched. However, the main problem is the family Lejeuneaceae, which is currently being studied cooperatively by the specialists of that group (Piippo 1993a).

The situation with mosses is not yet as complete. The manuscripts of the genera *Philonotis* and *Macromitrium* are nearly ready and hopefully will be sent to the editor soon. Most of the large remaining families of Musci such as Bartramiaceae excluding *Philonotis*, Brachytheciaceae excluding *Palamocladium* and *Homalothecium*, Hypnaceae, Hypopterygiaceae, and Sematophyllaceae are currently under revision. Some smaller and taxonomically easier families can be completed rather quickly, and they simply await our decision to devote that time. We are still very optimistic, and believe we get the work completed within this decade.

Along with the progress of our work we have tried to study also other topics than taxonomy. Hyvönen (1989) and Enroth (1991) summarized the bryophyte distributions in relation to New Guinea, and Enroth (1990) studied the altitudinal distributions. Piippo (1992) made an analysis of the affinities of hepatic floras of New Zealand, Western Melanesia, Borneo, the Philippines, Bhutan, mainland China, Japan and Korea, and found out that Australia and New Zealand have a strikingly different hepatic flora with many endemic genera and species compared with the other areas.

The endemism and the human influence on the bryophyte flora in New Guinea have been studied by Piippo et al. (1985), Piippo (1993b), Hyvönen et al. (1985) and Norris (1990). These summaries emphasize that tropical environments and biota with rich bryophyte vegetation are endangered (see also Koponen 1992). This is obvious from Figs. 1 and 2 which are based on our collections dealt with in

fifty-one published papers of the Huon Peninsula series. Fig. 1 shows that there are a number of species, which were collected more than 10 times during our expedition. These species are common and have wide ranges on the Huon Peninsula. However, the number of species collected only once is surprisingly high. This means that on the basis of the our material many of the taxa are rare, and this means that their existence depends on whether their environments will remain untouched. The same trend is seen in the Fig. 2 showing the situation as to the species new to science described by us. Although some of these new taxa are rather common, 42 new mosses and 57 new hepatic species were collected only once by us.

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Bryological expeditions to China by botanists from the Missouri Botanical Garden, University of South-western Louisiana and Southwest Missouri State University, 1984-1990

Paul L. Redfearn, Jr., Department of Biology, Southwest Missouri State University, Springfield, MO 65804-0095

This note summarises information about four collecting expeditions from 1984 to 1990 to China to collect bryophytes (mainly mosses), by Bruce Allen, Marshall Crosby, and Robert Magill from the Missouri Botanical Garden, William D. Reese from University of South-western Louisiana and myself from Southwest Missouri State University. Co-operative arrangements with the Institute of Botany in Beijing, the Institute of Botany in Kunming, the South China Institute of Botany in Guangdong, and the Institute of Biology in Chengdu made these expeditions possible. Logistical support in China was arranged with these organisations by P.-C. Wu. While in China we were accompanied at one time or another by P.-C. Wu, Si He, J.-S. Lou and M.-Z. Wang from Beijing, Y.-G. Su and L.-S. Wang from Kunming, P.-J. Lin and Z. Li from Guangdong, and Pu Fa-ting from Chengdu.

Financial support for these collecting expeditions was provided by the National Geographic Society, the National Science Foundation, Southwest Missouri State University, the Missouri Botanical Garden and the co-operating Institutes in China.

Collections by Allen, Magill and Redfearn are sorted to probable genus and duplicate sets are deposited at MO & SMS. A sorted set of Reese's collections is also deposited at MO. A limited number of duplicates are also deposited in other herbaria (CAS, FH, H, HIRO, NY). Duplicates of U. S. collections made in Yunnan and Xishuangbanna are also deposited at Kunming (KUN) and Beijing (PE). It is anticipated that these collections, along with a database on the mosses of China (see below), will be useful for bryologists preparing a Moss Flora

of China in English.

The localities in China where collections were made are:

Yunnan Province (1984) - Yangbi, Diacang, Xiagyum, Lufeng, Songming, Lunan Counties and Kunming Municipality during the Sino American Botanical Expedition arranged by Bruce Bartholomew, California Academy of Science, and David Boufford, Harvard University. Collectors: Si He, Y.-G. Su, L.-S. Wang, P. Redfearn.

Xishuangbanna (1986-87) - Mengla, Jinghong, and Menghai Counties. **Yunnan Province:** Auning County. **Guangdong Province:** (1987) - Ding Hu Shan Nature Preserve, Bolo County. Collectors: M. Crosby, R. Magill, P. Redfearn, P.-C. Wu, J.-S. Lou, M.-Z. Wang, P.-J. Lin (Guangdong).

Sichuan Province: (1988) - Emei, Li, Markam, Songpan, Nanping, and Wenchuan Counties. Collectors: B. Allen, P. Redfearn, P.-C. Wu, Pu Fating.

Hainan Island (1990) - Haiko City, Bawabglin Forest Station, Jiangfengling Forest Conservancy, Changjian, Ledong, Lichui and San Jian Counties. Collectors: W. D. Reese, P. Redfearn, P.-C. Wu, M.-Z. Wang, P.-J. Lin and Z. Li.

An outgrowth of these collecting forays to China has been the preparation of a Database on Chinese Mosses written in the Tropicos Format by P. Redfearn. This database presently lists 2473 accepted taxa and 1920 synonyms derived from over 440 references and our collections from China. Few attempts have been made to make assessments about the accuracy and/or taxonomic judgements for the taxa cited in these references. Distribution of taxa in the Provinces of China is

also included. Copies of this database are available from the Ozarks Regional Herbarium, Department of Biology, Southwest Missouri State University, Springfield, MO 65904-0095, USA.

Problems with customs

In many cases, bryophyte specimens are mailed with a custom declaration "dried plants for scientific study" or similar phrases. Experiences with German customs during the past time revealed, that such definition can cause trouble. The customs have to pay attention whether the contents of the parcel consists of protected plants. Such plants may be orchids, cacti or tillandsias and therefore a check of the parcel is necessary, especially if the parcels come from the tropics. Therefore the formulation "plants" is too general and may be misleading in this case. The formulation "dried herbarium specimens" seems to be better and in addition, a detailed declaration that the contents consists of mosses and/or hepatics will show the customers that these are plants which are not on the CITES list. Maybe the addition "bryophytes, not protected by national or international law" will even make the matter more clear and avoid problems, at least as long as bryophytes are not on the CITES list. If they will be included (and I fear that this will be in the future), (1) mailing of protected plants will no more be possible, and (2) the recipient has to demonstrate that there are no protected species in this parcel. This will be funny.

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New publications

Sérgio, C., Sim-Sim, M. & Figueira, R. 1993. Quantificação da deposição de metais pesados em Portugal, através da análise de briófitos. Direcção Geral da Qualidade do Ambiente. Lisboa. Available from: Serviço de Publicações, Direcção Geral da Qualidade do Ambiente, Av. Gago Coutinho, 1000 Lisboa, Portugal. ISBN 972-9392-07-2. Price: c. Ptes. 2000:-.

This work presents the results of a systematic survey of the concentrations of heavy metals in the bryophytes *Hypnum cupressiforme* Hedw., *Scleropodium touretii* (Brid.) L. Koch and *Frullania dilatata* (L.) Dum. from 179 (the mosses) and 134 (*Frullania*) localities all over Portugal. Maps are presented, showing the concentrations of Cd, Cr, Cu, Fe, Mn, Ni, Pb and Zn in these bryophytes in different parts of Portugal. This is another example of the usefulness of bryophytes in environmental work. [LH]

Lewinsky, J. 1993. Monographic studies on *Orthotrichum* (Musci). Bryobrothera, Vol. 2. Available from: Tiedekirja, Kirkkokatu 14, FIN-00170 Helsinki, Finland (Fax: +358 0 635017). ISBN 9519647511 (ISSN 1235-3949). Price: FIM 150:- + postage.

In this new volume of Bryobrothera, where all contributions are by Jette Lewinsky, the main part is devoted to a synthesis of more than 15 years of studies of the moss genus *Orthotrichum* Hedw. After thorough revisions, 116 species and eleven varieties are accepted in seven subgenera, two of the latter further subdivided into sections. Keys are given to all subgenera, sections and species of *Orthotrichum* in the world. The variation in morphology and anatomy of *Orthotrichum* species is described, and their habitat preferences and geographical distribution is discussed. Total distribution maps for the subgenera and sections

are provided, and in these maps the distributions of many species are also given. The relationships to other Orthotrichaceous genera are discussed and the phylogenetic relationships between the different subgenera and sections within *Orthotrichum* are illustrated with a handmade cladogram. This is a work of importance to all bryologists interested in the genus *Orthotrichum*, no matter what aspects or where he or she lives.

In the two other papers of this volume, the Hawaiian *Orthotrichum* species are revised and a number of *Orthotrichum* names from Europe, Caucasus and North Africa are discussed. [LH]

Kutzelnigg, H., Ostendorp, W. & Düll, R. 1993. Moosbibliographie Zentraleuropas/Bibliography of Bryological Literature of Central Europe. IDH-Verlag. ISBN 3-925425-09-8. Available from: IDH-Verlag, Funkenstraße 13, D-53902 Bad Münstereifel, Germany.

This new bibliography is comprised of 7520 citations. It is primarily concerned with papers on the flora, ecology, and phytosociology of Germany, Austria and Switzerland and surrounding areas. Many of these papers have not been included in international bibliographies. Central European and international publications on taxonomy, morphology, physiology, genetics and paleobotany of mosses and liverworts growing in Central Europe are listed. Keywords are added to all citations in German and English. A disc with the bibliographical database can be ordered from the publisher but only in connection with the book.

Nyholm, E. 1993. Illustrated flora of Nordic mosses. Fasc. 3. Bryaceae - Rhodobryaceae - Mnuciaceae - Cinclidiaceae - Plagiomniaceae. Nordic Bryological Society, Copenhagen and Lund. Available from: Editorial Office, Ecology Building, S-223 62 Lund, Sweden.

Price: DKK 180:-, including postage and handling.

Course in Tropical Bryology

October 11-23, 1993, an Erasmus Intensive Course in "Tropical Bryology" took place in Helsinki organised by the Department of Botany, University of Helsinki. Twenty students from eight countries (of 3 continents!) participated. The teachers were representatives of the contemporary bryological topics, D. H. Vitt, D. H. Norris, S. R. Gradstein, A. M. Cleef, T. Pócs, J. Váňa, J. Lewinsky and the hosts, bryologists from the University of Helsinki headed by the main organiser of the course, Prof. T. Koponen. The program was composed of morning lectures (taxonomy, ecology, bryogeography, evolution and conservation of the tropical bryophytes) and afternoon practicals (which often ended in late evenings). Also an excursion to Lammi Biological Station was prepared for us, with the inevitable Finnish Sauna. This was, naturally, followed by a (Finnish) party.

For me, and certainly also for the other students of the course, those two weeks were a fantastic occasion to be in contact with the best specialists in the fields, and to learn about the amazing but still poorly explored world of the tropical bryophytes. I just had to admire the tremendous work that must have been done by Prof. Koponen and his team to put the course together, from getting all those busy people to Helsinki for two weeks, to the role of a brilliant host at the beautiful farewell party.

Hopefully the final effect of this course will be that some of us are doing some work useful for the knowledge of one of the most important ecological systems - the tropical rain forests.

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A paperless journal?

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Today, floristic contributions are out of fashion. One will hardly find a journal now that accepts floristic contributions. In the past, floristic observations were even published as books. 150 years ago, Milde published his bryoflora of Silesia as book. A hundred years ago, Loeske could produce his bryophyte flora of the Harz mountains in Germany as a book. Today these authors would be unlikely to find a publisher for them. Even in the "Bryophytorum Bibliotheca", such a paper would have no chance because of its purely local interest. However, we are thankful today to have these old data. Such books are an incredible source of vivid pictures of the ancient bryofloras, and the descriptions gave a very vivid impression of the former bryoflora. From such sources, we can easily see of what the bryoflora a hundred years ago was composed, which species have disappeared, which species not, and which species had not been found or recognized at that time. In the first half of this century, journals of bryological societies published many floristic observations. Although space was limited, local floras such as the bryoflora of Bavaria by Familler were published, but gradually the likelihood of floristic contributions getting published got smaller and smaller. Societies journals developed to journals "of international standard" which do not any more publish the contributions of their (mostly amateur) members but only those of professional bryologists. To fill the gap, small newsletters such as *Evansia* or the *Bulletin of the British Bryological Society* were established. Subsequently numerous small newsletters were founded such as *Muscillanea* and the *Nowellia Bryologica* in Belgium, *Myrinia* in Sweden, *Bryologische Rundbriefe* in Germany, *Bryonora* in Czechoslovakia, *Meylania* in Switzerland, *Buxbaumiella* in the Netherlands, and others. But they are

all limited in space. This is frustrating for the amateur and may curtail his activities, since the most obvious reward for all his work is a publication under his own name. A lengthy description of the bryoflora of an area is no longer possible. Lists, checklists or enumerations are published instead. It may be possible that new state or vice county records have a chance to be published, and such data may be useful in filling distribution gaps and extending our knowledge of ranges. However, they cannot give information about the frequency of species, the presence of sporophytes, the preference of habitats, all of which can change over time. Regrettably, such floristic papers are often regarded as unscientific and too simple. But they can contain new scientific discoveries, they provide a picture of the present structure and composition of the bryoflora and preserve the data for the future. In fifty years, (I suppose, even sooner), even simple floristic observations may be of high interest. But then we will have either no information or just a few grid maps. Today floristic studies consist mostly of "mapping", and "mapping" is the keyword for amateur bryological activities. But this reduces bryological observations to checkmarking. They produce lots of dots, but these rather dead maps do not give any idea of how the interior of a forest looks like today, which species are still able to produce sporophytes despite the acid rain, which ones develop stress forms with abundant propagules, which ones grow on concrete instead of bark for the same reasons. Floristic papers in the old style contain, however, not only floristic data but also valuable ecological information. It is easy to forget that our knowledge of the ecology of bryophytes species in Central and North Europe is mostly based on field observations of old bryologists, on merely descriptive, narrative in-

formation. These old authors did not know Chi-Square test, Correlation tests, Association Tables etc., but our knowledge of the ecology of species is based on their descriptions. This does not mean that everything is now known about the ecology of our bryoflora. There are many regions (e.g. the Alps of Europe), in which the ecology of many species is insufficiently known. In many regions, amateurs accumulate detailed knowledge over the years in the field, but are not able to pass it forward to future bryologists. Therefore, I would like to see a renaissance of 'old fashioned' floristic descriptions. Apparently, there is no chance. At least not in printed form. But does a paper need to be printed today?

What if it is stored on disk and made available in this form? In this way the contents of a book of 1400 pages can be stored on one 3,5" disk, and copied for fifty cents. Such publications on disk could be stored in a library, similar to the IAB software library. A catalogue would show what is available, and instead of Xeroxing a book at high cost, a copy of the data can be made within a minute for the cost of one disk. The paperless journal doesn't only make sense with regard to the costs; it even saves paper and that means forests. Why not establish BRYODAT, a library of bryological papers on disk? It is even possible for an ISSN number to be obtained for this purpose, so that all entries to this kind of library are officially published. It would conserve bryological data for the future, data which would otherwise be lost, data which will be more and more valuable with age like vintage wine. Data, which could be stored on a fileserver like IBIS and downloaded by everybody who needs it. Data published in a disk based journal, of which the subscription would cost no more than the cost of a disk. A solution for ever-increasing

printing and mailing costs, and bank charges which at present sometimes exceed the cost of the journal. The IAB could perhaps be an pioneer in this development. Just as with the IAB software library, which provides programs and data on disk for free, publications could now be made available for free.

The Australasian Bryophyte Herbarium of Professor Alan Burges

News from the Herbaria. Send contributions to the column editor: A. R. Perry, Department of Botany, National Museum of Wales, Cardiff, CF1 3NP, Wales, United Kingdom

The National Museums and Galleries on Merseyside (N.M.G.M.) recently acquired a set of 1833 packets of bryophytes from Dr Alan Burges C.B.E., the former vice-chancellor of the New University of Ulster, Coleraine, Northern Ireland. Dr Burges is now retired, but is still active in the Flora Europaea organisation as chairman of its editorial committee. He held the Holbrook Gaskell Chair in Botany at the University of Liverpool from 1952 to 1966, and was previously Professor of Botany at the University of Sydney, Australia from 1947 to 1952.

The herbarium consists mainly of mosses from Australia and Fiji; in addition to the packeted material there is a collection of slide-mounted specimens and an extensive set of reprints of Australian bryological literature. As well as Professor Burges' own specimens which came mainly from New South Wales, Tasmania and Queensland in the 1930s, the herbarium contains a significant number of other collections. These include specimens gathered by W.F.N. Greenwood and co-workers (including A.C. Smith) in Fiji, Queensland material collected by E.B. Carrick and H. Jarvis, and the herbarium of the Cheshire-born Thomas Whitelegge,

the co-author of *Census Muscorum Australiensium*, who worked mainly in New South Wales and Tasmania. The Whitelegge herbarium, which includes some type material, also contains specimens from a significant number of other late-19th century Australian collectors, the extent of which is now being documented.

The collection has recently been curated, and its composition listed, by Dr M.E. Newton. Loans are now being arranged from herb. LIV to bryologists working in recognised institutions, and we expect these will be particularly useful to systematists who are preparing accounts for the bryophyte volumes of *Flora of Australia*.

Dr John Edmondson, Curator of Botany, Liverpool Museum, William Brown Street, Liverpool L3 8EN, U.K.

Best Book Buys

North America has been blessed by a good number of state or regional floras that document the local flora and make available the necessary background literature to identify the flora of the area. Notable among these state floras are Darlington for Michigan, Jennings for Pennsylvania, Redfearn for the Ozarks, Breen for Florida and Welch for Indiana. Unfortunately most of these are out-of-print and unavailable. However, sometimes it turns out that hard to access supplies do exist. For example, see The Bryological Times No. 61 for the availability of Darlington. All of these deserve to be in the library of all bryologists, especially when one sees the prices for which they can still be obtained.

My offering this time is a bargain. About 20 years ago I purchased several copies of Winona Welch's "Mosses of Indiana" from the original publisher - The Indiana Department of Conservation. About five years ago, I wrote for another copy, but their reply was "Out of print". However, recently Bill McKnight has found another

supply of copies and these are now available as follows:

W. Welch. 1957. Mosses of Indiana. 478 pages including figures, keys and descriptions. Price including postage is \$22 US for US addresses, \$23.50 US for other addresses. Order from Bill McKnight, IAS Publications, 1102 North Butler Ave., Indianapolis, IN 46219. Fax: (317) 254-2714. Prepayment required.

This is a nicely prepared flora that represents the diligent work of the author. I think it belongs on the bookshelves of all serious bryologists.

Dale H. Vitt.

Call for important projects

The IUCN (International Union for Conservation of Nature) is looking for suitable bryophyte projects to endorse.

The projects can either be in a very early stage of planning or they can be due to start very soon. With this advertisement, we in the IUCN bryophyte specialist group encourage you to send information about such plans.

The aim of your project/s should include a considerable element of nature conservation or should aim to add important information to science about at least one of the following: threats to bryophytes, endangered species, narrow endemics, high bryophyte diversity, important floras, hot spots, threatened sites etc.

If the IUCN finds your project/s important from a nature conservation point of views, we will most probably try to include it/them in our forthcoming Action Plan.

Send your proposals or questions to: Tomas Hallingbäck, Threatened Species Unit, The Swedish University of Agricultural Sciences (chair. of the IUCN bryophyte specialist group)

T. Hallingbäck

A Successful Bryological Symposium/ Workshop Held in Shanghai

At the request of the Committee on Bryophytes of Chinese Botanical Society (aka, Chinese Association of Bryologists), a mini bryological symposium organized by Prof. Ren-Liang Hu and his associates at East China Normal University, notably Mrs. You-Fang Wang and Mr. Rui-Liang Zhu, was held in Shanghai from August 22 to 27, 1993. The execution of the program was ably assisted by Mr. Zhong-Ling Liu of Shanghai Museum of Natural History. The idea of having a local symposium in China prior to the XV International Botanical Congress in Japan was discussed in Beijing in 1992 during the first Chinese national bryological congress (see *Bryological Times* no. 70).

The symposium was attended by no less than 30 participants from seven provinces and two chartered cities (Beijing and Shanghai). The widow of late Prof. Pan-Chieh Chen, Mrs. Zong-Ling Wan, also participated. A large number of participants are young bryologists, either teaching botany and biology in colleges and universities, or researching in botanical institutions or gardens. Although four were invited, only three non-Chinese participants from the United States and the Philippines attended the symposium as lecturers. Altogether, a wide range of current topics in Bryology were discussed.

Highlights of the first day activities included the opening and congratulatory remarks offered by Prof. Dr. Rui-Kun Chang, the President of East China Normal University, Dr. Xin-Qiao He, the deputy Director of Shanghai Museum of Natural History, and Prof. Hong-Fa Xu of the Research Office of the East China Normal University. This was followed by Prof. Ming-Jou Lai of Tunghai University, Taiwan, who presented an interesting lecture on the uses of mosses in land-

scaping and their cultivation in gardening. Mr. Xue-Dong Li of Beijing Normal University presented an updated report on the bryological researches accomplished by the Chinese Antarctic Research Team.

A visit to Shanghai Botanical Garden and the nearby herbarium of the Shanghai Museum of Natural History on the second day offered a nice break and a good opportunity for the participants to witness the fast changing facade of a booming metropolitan and its rich cultural heritage.

The whole third day was heavily packed with lectures and discussions. In the morning, Dr. W. R. Buck of the New York Botanical Garden presented a well-argued and often thought-provoking scheme to reclassify the pleurocarpous mosses based primarily on gametophytic attributes. This was followed by Prof. Tong Cao of Shenyang Institute of Applied Ecology who gave a personal evaluation on the progress and limitation of bryoeological studies conducted in China.

The afternoon session saw Dr. A. T. Wittermore of Missouri Bot. Garden reviewing the current system of classification of Marchantoid liverworts, and Dr. B. C. Tan discussing the procedures of manuscript preparation for publication consideration in various non-Chinese bryological journals.

Owing to the public enthusiasm, a few impromptu and informal talks were added during the day and in the evening to allow full exchange of opinions and ideas. These include the inspirational reminiscences of Prof. R.-L. Hu, the symposium organizer, and Prof. Pang-Juan Lin of South China Botanical Garden, upon the early difficult days of their bryological careers. Likewise, Prof. T. Cao was asked to report on the outcomes of his research visit to North America this year in connection with his participation in the Bryoflora of China (English Edition) Project. As an entertaining number, Dr. Tan showed his beautiful slides on the natural history of the Philippine Islands.

To conclude the symposium, a two day field trip to West Tianmu Mountain in the neighboring Zhejiang Province was organized. This lofty mountain, owing to its past religious association, has a large tract of well preserved evergreen forest which is uncommon in East China today. Underneath the huge canopy of *Cryptomeria-Acer* forest, numerous bryophytes of Sino-Japanese affinity abound. In fact, the field experience proved to be more meaningful to non-Chinese visitors in the group who have had no previous exposure to the rich bryoflora of the region.

Inspired by the experiences, a novice who is a biology teacher from a provincial college remarked, while on Mt. Tianmu, that the mere meeting with many bryologists from other parts of the country had greatly reinforced his commitment to pursue his interest in studying the bryophytes of his province. Many other participants expressed a common desire to have a similar mini or regional symposium, possibly once every two years, if only to foster a closer professional link among colleagues and to provide each other with mutual encouragement and moral support.

The 1993 Shanghai symposium is truly a success according to many participants. The credit and honor, no doubt, should go to Prof. Hu and members of his organizing committee in Shanghai who had worked hard to make the symposium a memorable reality. Lastly, the symposium organizers wish to acknowledge the financial supports received from East China Normal University, Finnish-Chinese Botanical Foundation and National Geographic Society.

Reported by: B. C. Tan, Farlow Herbarium, HUH, Cambridge, Ma., U.S.A.

IBIS files accessible by gopher

The contents of IBIS, the International Bryological Information Service, stored at a mainframe computer of the University of Duisburg, Germany, were only accessible so far for members of the International Association of Bryologists. It has now been made available by a gopher server for every botanist.

IBIS contains:

1. files of bryological contents, e.g. checklists of various parts of the world, bibliographies for certain regions, genera or families or general, the address list of the IAB etc. etc. The files can be displayed and read on screen and also downloaded. A retrieval system to search for items (e.g. authors in bibliographies) is in preparation.

2. Botanical programs. It is presumably the largest collection of botanical software in the world, extracted from the 450 disks of the IAB software library. The programs are grouped into the subdirectories labels, taxonomy, herbaria, mapping, ecology and identification. They contain numerous programs for cladistics, multivariate statistics, cluster analysis, identification, herbarium labels, herbarium management, herbarium loans etc. etc., all for MS-DOS computers. All programs are compressed and usually self-extracting. They can be downloaded free of charge.

The contents of IBIS is listed in the file *ibis.txt* in the subdirectory information.

IBIS can be accessed by gopher unidui.uni-duisburg.de

Jan-Peter Frahm

frahm@uni-duisburg.de

IAB Resolutions

At the IAB Business Meeting in Tokyo, Sept. 1993, the following resolutions were approved.

The situation at the British Museum

The International Association of Bryologists recognises the extreme international importance of the bryophyte collections at the Natural History Museum London in relation to the documentation and conservation of biodiversity, notes with concern the problems currently faced by the Museum in funding its research activities, and urges the Museum nevertheless to maintain and strengthen its programme of bryological research.

Individual bryologists are encouraged to write to Dr. Neil Chalmers, Director, Natural History Museum, Cromwell Road, London SW7 5BD, U.K. and to Mr. Peter Brook, Secretary of State, Department of National Heritage, 2-4 Cockspur Street, London SW1Y 4DH, U.K.

The situation at the Canadian Museum of Nature

The International Association of Bryologists recognises the extreme importance of bryophytes to the Canadian environment and the international significance of the bryophyte collections at the Canadian Museum of Nature in relation to the documentation and conservation of biodiversity. We also recognise the financial problems the Museum has in current funding of its conservation and research activities. The association urges the Museum to maintain and strengthen its programme in Bryology.

Individual bryologists are encouraged to write to Honourable Monique Landey, Minister of Communications, House of Commons, Ottawa K1A 0A6, Canada.

Flora projects in Europe

The International Association of Bryologists strongly supports the proposed Bryophyte Flora Project, which it considers will be of great value in

pan-European floristic and ecological studies and in the conservation of bryological diversity.

Course on Taxonomy and Ecology of Nordic Peatland Bryophytes

NorFa Researcher Network of Nordic Bryologists arranged a course on Taxonomy and Ecology of Nordic Peatland Bryophytes in August 1993. Prof. Kjell-Ivar Flatberg (*Sphagnum*), Prof. Pekka Isoviita (*Sphagnum*), Dr. Harri Vasander (mire ecology in Finland), Dr. Sinnika Piippo (Hepaticae), Dr. Lars Hedenäs (Amblystegiaceae), Prof. Timo Koponen (Mniaceae) and Prof. Asbjørn Moen (mire ecology in Norway) were teachers during the course 8 Aug. - 17 Aug. The 17 participants came from Norway, Sweden, Finland, Denmark, Germany, Switzerland, Austria and Canada.

The course which reached over three countries started at Lammi Biological Station in SW Finland. There five days was used for lessons in mire ecology, taxonomic studies of wetland bryophytes and several field trips to different mires. Both an ombrotrophic bog and different types of minerotrophic fens such as mineral poor fen, mineral rich fen and nutrient rich fen, also a spring influenced mire and swampy forest were visited. To realise the continental influence on these mires the whole course travelled westwards by boat and train to the area N of Östersund in the province of Jämtland in Sweden. Here we visited a rich fen and an extreme rich fen. Thereafter we continued the travel to the area W of Trondheim in Norway. There we visited some rather oceanic influenced mires of different types. A lecture on mire ecology and vegetation in Norway was also held.

The main theme of the course was naturally ecology and taxonomy of the genus *Sphagnum* as these species are the most common ones in mire ecosystems. Lectures were held on the

taxonomy and ecology of other, more or less common wetland groups, such as Amblystegiaceae, Mniaceae and Hepaticae.

From all participants I would like to send a collective thanks to all teachers for a well arranged and very interesting course with an inspiring atmosphere.

Henrik Weibull, Fårtickegängen 44,
S-135 33 Tyresö, SWEDEN.

Monograph of *Grimmia* in Europe in preparation

Since 1991 I am working on a monograph of the European *Grimmia* Ehrh. species. This project was started after the discovery of some *Grimmia* species new to The Netherlands (Greven 1990, 1991, 1992), and the conclusion that the monograph of Loeske (1930) was badly in need of updating. Recently, revisions of *Grimmia*, combined with *Schistidium* Brid., were made for Japan (Deguchi 1978) and China (Cao & Vitt 1986). The present study deals with *Grimmia* exclusively while a revision of *Schistidium* is in preparation by Hans Blom (Trondheim, Norway). The planned monograph is based to a large degree on field work in the most important mountain areas in Europe. I am also cooperating with Jesús Muñoz (Pravia, Spain), who studies the *Grimmia alpestris* complex. Included are also studies of material from the herbaria in Leiden and Groningen (The Netherlands) and, for certain taxa, also from other European herbaria (including private ones). While I have no possibilities to revise the entire *Grimmia* material in all European herbaria, I would appreciate if You could send me problematic specimens for revision, while these problematic specimens often provide better insights into this difficult genus. Please send the material to: Henk Greven, DLO Institute for Forestry and Nature Research, P.O. Box 23, NL-6700 AA Wageningen, The Netherlands.

Preliminary programme

Monday, 5th Sept.: 1st session: The scientific basis of bryophyte conservation.

Suggested topics: biological background (e.g. population dynamics, life strategies, ecology) and habitat conditions of endangered bryophytes; reports on individual sites of endangered populations.

Tuesday, 6th Sept.: 2nd session: The practice of bryophyte conservation.

Suggested topics: conservation strategies, particular conservation measures and their effects, reports on successful or unsuccessful programmes, monitoring of the threat status of bryophytes.

Wednesday, 7th Sept.: Excursion to the Swiss Alps.

Thursday, 8th Sept.: 3rd session: The realisation of conservation programmes.

This will be a workshop dealing with the psychological, juridical, political, and educational aspects in conservation of lower plants.

For further information and an application form write to Dr. E. Urmi, c/o Congress Secretariat, Institut für Systematische Botanik der Universität, Zollikerstr. 107, CH-8008 Zürich, Switzerland. Tel. 01/3854411 or 3854441, Fax 01/3854403. Last day for definite application is 31st March 1994.

References

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- Greven, H. C. 1990. *Grimmia ovalis* (Hedw.) Lindb. and *G. orbicularis* Bruch ex Wils., two epilithic moss species new for The Netherlands. Lindbergia 16: 19-21.
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Loeske, L. 1930. Monographie der Europäischen Grimmiaceen. Stuttgart.

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Conservation of Bryophytes in Europe

2nd Symposium on Endangered Bryophytes
Zürich, Switzerland, 4th-8th September 1994

The European Committee for Conservation of Bryophytes (ECCB), the Swiss Bryological and Lichenological Society (SVBL), and the International Association of Bryologists (IAB) invite to the second international symposium on Endangered Bryophytes in Europe. The first congress on Endangered Bryophytes was held in Uppsala, Sweden in 1990. This first meeting was a great success and clearly showed the need for the importance of the conservation of bryophytes. Whereas in 1990 the main objective was to ascertain the threats to bryophytes, the second congress in 1994 will be focused on the scientific foundation of bryophyte conservation and the realisation of conservation programmes.

COLOPHON

Items for publication in *The Bryological Times* are to be sent to the Editors (preferably LH), **except** for those for the regular columns, which may go **direct** to the column editors.

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The Bryological Times, founded in 1980 by Stanley Wilson Greene (1928-1989), is a newsletter of the *International Association of Bryologists*. It is distributed from Beijing (China), Canberra (Australia), Edmonton (Canada), Eger (Hungary), Geneva (Switzerland), Hiroshima (Japan), Moscow (Russia), Praha (Czech republic), St. Louis (USA) and Trondheim (Norway).

Production

Lars Söderström, Trondheim

For details regarding membership of to *International Association of Bryologists* (currently US \$ 10.- per year) write to Dale H. Vitt, Department of Botany, University of Alberta, Edmonton, Alberta, Canada T6G 2E9.

Deadlines for material to the *Bryol. Times* will be January 15, March 15, May 15, July 15, September 15 and November 15 with the publication shortly afterwards. Shorter notes may be accepted later if there is still space.

DIARY

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

1994

April (date not yet fixed). Sociedad Española de Briología: "XIV Reunión de Briología", incl. SEB General Meeting. The objective is to study the rich bryophyte flora of Liébana valley (Cantabria, north Spain). Further information from Jesús Muñoz, IATEV, Apdo 8, E-33120 Pravia, Spain. Phone +34-8-5822977.

April 30-May 1. Excursion to Gori (the Netherlands) with the Dutch Bryological and Lichenological Society to look at inland forests and heathland. Contact the secretary of DBLS, Dr. A. Aptroot, G. v. d. Veenstr. 107, NL-3762 XK Soest, the Netherlands. All DBLS excursions are open for non-members.

June 1-6. Annual assembly of the Swiss Bryological and Lichenological Association, with paper reading sessions and excursions to Bondo, Val Bregaglia (Southeastern Swiss Alps). Further information from Patricia Geissler, Cons. & Jardin Botaniques, Case postale 60, CH-1292-Chambésy, Switzerland.

July 4-11. Australian Bryological Society Conference on "Australian Tropics". Lake Tinaroo (Atherton Tableland west of Cairns). Further information from Elisabeth Brown or Helen Ramsay, Nat. Herb. of New South Wales, Royal Botanical Gardens, Sydney N. S. W., Australia 2000. Fax (61) (02) 251 4403.

July 10-15 (tentative). Workshop on Chinese Bryophytes and Lichens. Place: Shengyang, China. Contact Officers: Cao Tong, Department of Plant Resources, Institute of Applied Ecology, Academia Sinica, Shenyang 110015, China and Lai Ming-Jou, Institute of Landscape Architecture, Tunghai University, P. O. Box 1-4, Sanchung, Taiwan 241.

July 18-28. The 1994 field meeting of the Dutch Bryologische en Lichenologische Werkgroep van de KNNV will be held in SW Carinthia, Austria. The meeting will be based at Weissbriach, c. 15 km W of Villach in the Gailtaler Alpen. Excursions will be extended to the Karnische Alpen, near the Italian border, and to the Kreuzeckgruppe of Hohe Tauern in the north. Further information from Leo Spier, Kon. Arthurpad 8, 3813 HD Amersfoort, The Netherlands, or Othmar Breuß, Naturhistorisches Museum Wien, Botan. Abt., Burgerring 7, Wien, Austria.

September 4-9. International Symposium: Endangered Bryophytes II, together with the meeting of the European Committee of Conservation of Bryophytes. Zürich. For information contact: E. Urmi, Inst. für Systematische Botanik, Zollikerstr. 107, CH-8008 Zürich. Phone: (41)1/385.44.41. Fax: (41) 1 385 42 04.

September 9-12. Excursion to Wägital (Schwyz, northern prealps) with the Swiss Bryological and Lichenological Association's annual field trip. Further information from Patricia Geissler, Cons. & Jardin Botaniques, Case postale 60, CH-1292-Chambésy, Switzerland.

September 10-11. Excursion to Schonne (the Netherlands) with the Dutch Bryological and Lichenological Society to look at coastal dunes. Contact Dr. A. Aptroot (address see 30 May-1 April 1994)

October 2-8. VI Congreso Latinoamericano de Botanica to be held at Mar del Plata, Argentina. Further information from Celina M. Matteri, Museo Arg. Cs. Nat. B. Rivadavia, Av Angel Gallardo 470, C.C. 220, 1405 Buenos Aires, Argentina. Fax: (54) 1 9824494.