

# The Bryological Times

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## The Bryological Times Needs You! By Janice Glime

I am writing to you as your past president to share my bryological history and my history with the IAB.

I began my appreciation of bryophytes as an undergraduate. It wasn't their intricate structure or their diversity or their ability to live almost anywhere that first drew me to the bryophytes. I decided to study them because my biology teachers couldn't answer any of my questions about them. I decided they were neglected, and I did have a fascination with miniature worlds, so it was a natural marriage.

My first and only bryophyte course was primarily a course in bryophyte morphology. After that, I had a few bumpy starts into the

world of bryophyte taxonomy. While I was on the faculty of Plymouth State College in New Hampshire, I had no herbarium to work with and no complete keys for the area. There were no local forays, and I became discouraged about recognizing the bryophytes well enough to do community level studies. However, during my Ph. D. work on the insect communities associated with mountain stream bryophytes, I had developed sufficient confidence in my abilities with stream bryophytes to work with those and ignore the terrestrial ones. I was working in isolation, and I knew my limitations.

Now I don't give up easily if it is something I want and think is possi-

ble, so when I moved to Michigan's Upper Peninsula, I gave bryophyte identification another try. But this time, I had a herbarium. And this time, I had Howard Crum's *Mosses of the Great Lakes Forest*. And I had Bob Linn in the office next door with his interest in the bryophytes of Isle Royale. But something even more important happened. Nancy Slack organized the first A. Leroy Andrews Foray in New York. It was a 22-hour trip, but we packed 10 students and myself in two university vehicles and headed east. This experience changed my life. Not only did I learn to recognize a lot of bryophytes in the field, an essential ability for an ecologist, I learned that (see page 12)

## New York Botanical Garden Seeks Collections

The NYBG is actively soliciting correspondence and other kinds of archival material from botanists in general. Once incorporated into the Garden's archives, the material is cataloged and general information is available on the web, such as a list of

correspondents, the dates of such correspondence, and how much correspondence is involved. We already have the correspondence of a number of major North American bryologists, such as Howard Crum, Bill Steere, Lewis Anderson and Wilf Schofield.

We are currently incorporating the correspondence of Jan-Peter Frahm, who retires this month. If any bryologist is interested in depositing their correspondence, please contact Bill Buck for more information at [bbuck@nybg.org](mailto:bbuck@nybg.org).

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### SPECIAL POINTS OF INTEREST:

- *NYBG needs YOU*
- *MOSS 2010 date issues*
- *New research in the form of theses abstracts*
- *We need Bryophyte societies to help us out!*
- *Check out the latest from Mossin' Annie*
- *Latest in bryophyte links for your laptop*

## Moss 2010 in Sapporo, Japan : HOLD ON FOR NEWS

Tomomichi Fujita has agreed to host Moss 2010 in Sapporo. However, there has been an issue with the original dates of July 20—24, 2010. PLEASE do not book your dates until you double check with Tomomichi Fujita or hear more online through bryonet!

Tomomichi's contact details are:

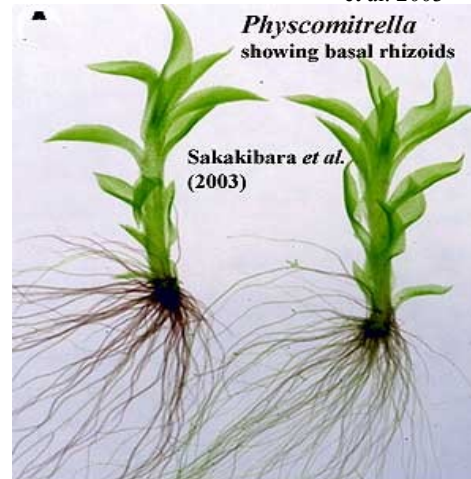
Faculty of Science, Hokkaido University, Sapporo 060-0810, Japan.

[tfujita@sci.hokudai.ac.jp](mailto:tfujita@sci.hokudai.ac.jp)

Phone: +81-11-706-2740

Don't book your flights just yet!!

Picture of *Physcomitrella* by Sakakibara et al. 2003



## Bryophyte Conservation in Brazil

by Denise Pinheiro da Costa

In the last years the Brazilian bryologists were actively involved in several bryophyte conservation actions. This resulted in a number of publications, which are presented here:

### Redlisting of Brazilian plant species

1) In 2005 a Brazilian red list of plants was elaborated and this list included 17 bryophyte species (<http://www.biodiversitas.org.br/floraBr/grupo3fim.asp>). Only part of this list was published in 2008 and formally recognized by the environment Brazilian Ministry as the official list of redlisted species (INSTRUÇÃO NORMATIVA Nº 6, DE 23 DE SETEMBRO DE 2008). All the bryophytes are included in the list recognized by MMA.

The following list includes 17 species that are considered threatened in Brazil (following the IUCN-Threat categories).

[Southbya organensis](#) - B2ab(iii) + D - CR

[Pringleella subulata](#) - B2ab(iii) - VU

[Atrectylocarpus brasiliensis](#) - B2ab(iii) + D2 - VU

[Atrectylocarpus longisetus](#) - B2ab(iii) + D2 - VU

[Campylopus densicomus](#) - B2ab(iii) - VU

[Leptoscyphus gibbosus](#) - B2ab(iii) + D2 - VU

[Jungermannia decolor](#) - B2ab(ii,iii,iv) - EN

[Blepharolejeunea securifolia](#) - B2ab(iii) - EN

[Bromeliophila natans](#) - B1ab(ii,iii) + D2 - VU

[Drepanolejeunea aculeata](#) - B1ab(iii) + B2ab(iii) - EN

[Myriocoleopsis fluviatilis](#) - B1b(iii)c(iv) - CR

[Paracromastigum dusenii](#) - B2ab(ii,iii) - VU

[Metzgeria hegewaldii](#) - B2ab(i,ii,iii) - CR

[Plagiochila boryana](#) - B2ab(iii) - CR

[Erythrophyllastrum andinum](#) - B1ab(iii) - CR

[Leptodontium wallisii](#) - B2ab(iii) - VU

[Riccia ridleyi](#) - B2ab(iii) - EN

### Regional Bryophyte assessments

1) Costa *et al.* (2005) published the first bryoflora evaluation from Rio de Janeiro state, in which they considered 155 species as being threatened in the state, including 64 hepatic species (53 VU and 11 EN). Later Costa & Farias (2008) published a paper about conservation priorities for the bryophytes of Rio de Janeiro state and in 2008, Costa & Santos (2009) evaluated again the *status* of the hepatics taxa in the state after several field trips and bryophyte collections studied in the RB herbarium. (see page 3)

## Brazil Conservation continued from page 2

The Costa & Santos (2009) assessment reassessed the 64 mentioned above. This resulted in a change in threat category of 10 species and 12 newly threatened species (1 EN and 11 VU).

VU - 53 taxa (here 6 changed, being 5 considered as NT and 1 as LC)

EN - 11 taxa (here 4 changed, being 2 considered as CR and 2 as VU).

In total, 71 hepatic species are now considered as threatened in the state of Rio de Janeiro (20% of the state hepatic flora), being 2 CR, 8 EN, and 61 VU, also 4 taxa considered as NT. The 10 taxa that changed their conservation status are:

**EN to CR:** *Bromeliophila natans* (Steph.) R.M. Schust.; *Southbya organensis* Herzog.

**EN to VU:** *Jensenia spinosa* (Lindenb. & Gottsche) Grolle; *Lejeunea grossiretis* (Steph.) E. Reiner & Goda.

**VU to NT:** *Calypogeia uncinulata* Herzog; *Cryptochila grandiflora* (Lindenb. & Gottsche) Grolle; *Heteroscyphus combinatorius* (Nees) Schiffn.; *Lophocolea mandonii* Steph.

**VU to LC:** *Plagiochila patula* (Sw.) Lindenb.

2) In 2008 the red list of plants from the state of Minas Gerais was published and this list included 36 bryophyte species. This list was published on-line in this year by the BIODIVERSITAS ([www.biodiversitas.org](http://www.biodiversitas.org)). See also D.P. Costa et al. 2008.

The bryoflora of Minas Gerais state is the third in number of bryophyte species in Brazil, with ca. 750 spp. and includes 36 spp. threatened according to the IUCN criteria (13 mosses and 23 hepatics), of which 23 species occur only in the Atlantic Rain Forest, 3 in Cerrado (Savanna), and 1 in both. The high number of species considered data deficient (DD), 214 species, reflects the lack of the knowledge of the bryoflora of the state. The following is the list of threatened bryophytes from Minas Gerais:

**CR (1)** - *Drepanocladus perplicatus* (Dusén) G. Roth.

**EN (9)** - *Adelothecium bogotense* (Hampe) Mitt., *Cephaloziella granatensis* (J.B. Jack) Fulford, *C. stellulifera* (Tayl.) Schiffn., *Marsupella microphylla* R.M. Schust., *Mnioloma cyclostipa* (Spruce) R.M. Schust., *Neesioscyphus bicuspidatus* (Steph.) Grolle, *Pringleella subulata* (Müll. Hal.) Broth., *Rhizogonium nova-hollandiae* (Brid.) Brid., *Rhynchostegium microthamnioides* Müll. Hal.

**VU (10)** - *Blepahrolejeunea incongrua* (Lindenb. & Gottsche) van

Slageren & Kruijt, *Itatiella ulei* (Broth.) G.L. Smith, *Jensenia difformis* (Nees) Grolle, *Lethocolea glossophylla* (Spruce) Grolle, *Chiloscyphus latifolius* (Nees) J.J. Engel & R.M. Schust., *C. quadridentatus* (Spruce) J.J. Engel & R.M. Schust., *Macromitrium podocarpi* Müll. Hal., *Micropterygium campanense* Spruce, *Paracromastigum pachyrhizum* (Nees) Fulford, *Stephaniella paraphyllina* J.B. Jack

**NT (4)** - *Aongstroemia julacea* (Hook.) Mitt., *Aptychopsis subpungifolia* (Broth.) Broth., *Daltonia stenophylla* Mitt., *Diplasiolejeunea pauckertii* (Nees) Steph.

**LC (12)** - *Brachythecium velutinum* (Hedw.) Schimp., *Bryopteris diffusa* (Sw.) Nees, *B. filicina* (Sw.) Nees, *Rosulabryum capillare* (Hedw.) J.R. Spence, *Cyclodictyon glaucifolium* (Müll. Hal.) Broth., *Helicodontium capillare* (Hedw.) A. Jaeger, *Kurzia capillaris* (Sw.) Grolle, *Plagiochila exigua* (J. Taylor) J. Taylor, *P. rutilans* Lindenb., *Porella brasiliensis* (Raddi) Schiffn., *Radula javanica* Gottsche, *Squamidium brasiliense* (Hornsch.) Broth.

The work on threatened bryophytes in this species-rich region resulted in the following recommendations to the state of Minas Gerais: 1) To create new Conservation Units in the state; 2) To increase the efforts of the floristic inventory work in the State; 3) To train and educational centres so that more specialists can obtain a graduate training in this group of plants in the state.

### Other conservation news

In 2005 Brazilian bryologists and Steven P. Churchill from the Missouri Botanical Garden began to work on the preparation of a Guide to Brazilian Mosses. At this moment, the first product is a moss checklist (*Synopsis of the Brazilian moss flora: checklist, synonyms, distribution and conservation*) that will be submitted for publication in 2010.

Then, the experts will focus their research activity on the production of the guide that hopefully will be completed by the end of 2010. With this publication, the Brazilian bryologists will have an important tool to further evaluate the conservation status of the Brazilian mosses. (see page 4)

## Brazil Conservation continued from page 3

In 2008, Denise Pinheiro Costa completed the monograph of Neotropical Metzgeriaceae (Costa, D.P. 2008). In this publication the conservation status of *Metzgeria* species in Tropical America is presented and 12 species are considered as threatened (1 EX, 1 CR, 2 EN, 8 VU).

In 2008 the INSTITUTO BIOMAS realized the workshop "Strategies and actions to conservation of the biodiversity on Rio de Janeiro state" and the results were published in a book. In the flora chapter one of the databases used to realize the analysis was the bryophyte database of Rio de Janeiro state (Scarano et al. 2009).

### Literature

- Costa, D.P. 2008. Flora Neotropica - Monografia - Metzgeriaceae. New York: The New York Botanical Garden Press, 102: 1-170.
- Costa, D.P. C. A. A. Imbassahy & V. P. A. V. Silva. 2005. Diversidade e importância das espécies de briófitas na conservação dos ecossistemas do estado do Rio de Janeiro. *Rodriguésia* 56: 13-49.

Costa, D.P. & Farias, C.P. 2008. Conservation priorities for the bryoflora of Rio de Janeiro state, Brazil. *Journal of Bryology*. 30: 133-142.

Costa, D.P., Pôrto, K.C., Yano, O. & Santos, N.D. 2008. As Briófitas. In: G.M. Drummond; A.B.M. Machado; C.S. Martins; M.P. Mendonça; J.R. Stehmann. (Org.). Listas vermelhas das espécies da fauna e flora ameaçadas de extinção em Minas Gerais. Belo Horizonte, FUNDAÇÃO BIODIVERSITAS. ([www.biodiversitas.org](http://www.biodiversitas.org)).

Costa, D.P. & Santos, N.D. 2009. Conservação de hepáticas na Mata Atlântica do sudeste do Brasil: uma análise regional no estado do Rio de Janeiro. *Acta Botânica Brasilica* 23(4): 913-922.

Scarano, Fábio R; Costa, D.P.; Freitas, L.; Lima, H.C.; Martinielli, G.; Nascimento, M.T.; Sá, C.F.C.; Salgueiro, F. 2009. Conservação da Flora do Estado do Rio de Janeiro: até onde a ciência pode ajudar. In: Bergallo, H.G.; Fidalgo, E.C.C.; Rocha, F.D.; Uzeda, M.C.; Costa, M.B.; Alves, M.A.S.; Sluys, M.V.; Santos, M.A.; Costa, T.C.C. & Coz, A.C.R. (orgs.). Estratégias e ações para a conservação da biodiversidade no estado do Rio de Janeiro, Rio de Janeiro, Instituto Biomas, 221-223.

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## International Bryoflora Conference in Russia

**International conference "Bryoflora of the Russian Far East: taxonomy, genesis, phytogeographic relations".** The 3-12th of September 2010, Vladivostok, Russia.

The flora of the Russian Far East demonstrates striking difference from the floras of the rest of Russia. These differences are especially visible in the southernmost of the area, in Primorsky Territory that belongs to Sino-Japanese floral region. The vascular flora of this region is extraordinarily rich in species and contains 14 endemic families and over 300 endemic genera (for comparison, endemic families lack in vast Circumboreal region, and the number of endemic genera just exceeds 40). The south of the Russian Far East is the only location in Russia for a great number of species (more than 80 species of liverworts, 120 of mosses and more than 500

species of vascular plants).

Broadleaved deciduous trees (3 species of linden (*Tilia*), 2 species of ash (*Fraxinus*), Amur cork-tree (*Phellodendron amurense*), Castor aralia (*Kalopanax septemlobum*), Manchurian walnut (*Juglans mandshurica*), 7 species of maple (*Acer*)) along with temperate dark coniferous trees (needle fir (*Abies holophylla*), Korean pine (*Pinus koraiensis*)) form forests astonishing in their composition and structure, with dense understorey of various Manchurian shrubs, interwoven with woody vines, such as actinidias (*Actinidia*), wild Amur grape (*Vitis amurensis*), Chinese magnolia (*Schizandra chinensis*), spindle-trees (*Celastrus*). The bryoflora of the south of the Russian Far East is also very peculiar.

For more information contact the Institute of Biology & Soil Science at [bryo-vlad@list.ru](mailto:bryo-vlad@list.ru) or visit them online at [www.biosoil.ru/bryo/index.html](http://www.biosoil.ru/bryo/index.html)

## NYBG presents two new books

submitted by Bill Buck

The New York Botanical Garden Press is pleased to offer two new titles for Fall 2009:

**Peat Mosses of the Southeastern United States** Lewis E. Anderson=86, A. Jonathan Shaw, and Blanka Shaw  
2009 / 126 pp. / \$42 / Order no. M10200

Sphagnum, commonly known as peat moss, is widely used in agriculture, horticulture, and floriculture. Living plants are colorful and add much to the beauty of wetlands. It takes little training to recognize the genus, and most of the sections are almost as easy to recognize. Yet they are scarcely noticed by field botanists, and even bryologists tend to avoid them; they have a reputation of being taxonomically difficult but this applies only to a subset.

There are few taxonomic treatments of Sphagnum in North America, yet it is a fascinating genus whose species comprise an integral part of nearly all fresh-water wetlands. Almost all significant critical taxonomic characters are microscopic and require dissections and staining, which can, with a little practice, be easily self-taught. Even with a moderate amount of field experience, however, a novice can learn to recognize sections and some species in the field with certainty (although there are many species that even experts cannot distinguish without a compound microscope). All field identifications need to be confirmed microscopically. This volume will aid those who venture into identifying peat mosses.

**Guide to the Plants of Central French Guiana, Part 4: Liverworts and Hornworts.** S. Robbert Gradstein and Anna Luiza Ilkiu-Borges  
2009 / 144 pp. / \$52 / Order no. M76P04

This hepatic flora of central French Guiana is based on the study of about 1500 collections made by many different collectors. All species are keyed, described, and illustrated. Brief descriptions of the habitats of the species and of the lowland cloud forest of central French Guiana are also provided.

The flora consists of 175 species of liverworts in 59 genera and 17 families and 2 species of hornworts (2 genera, 2 families). The Lejeuneaceae are the most important family with 117 species in 37 genera. Eight new taxa are introduced.

This much-anticipated volume is the fourth and final part of the Guide to the Plants of Central French Guiana.

In addition, NYBG Press is offering a very special price on the entire four-volume Guide to the Plants of Central French Guiana. Purchase all four books for \$128 -- a savings of \$62 over the list price of \$190. The set comprises 1,674 pages and 200 color plates. Part 1 treats pteridophytes, gymnosperms, and monocotyledons; Part 2 covers the dicotyledons; Part 3 deals with mosses; and the newly published Part 4 covers liverworts and hornworts.

To order, call 718/817.5992

## Review: Predicting extinction on oceanic islands by G. Raeymaekers

The Azores is one of the most isolated archipelagos on earth. In 1998 a group of scientists of the Azorean Biodiversity Group started with an in-depth inventory of the archipelago's biodiversity, with a special focus on bryophytes and arthropods, as the authors quote Edward Wilson, it are "the small things that run the world". The research resulted in numerous scientific reports (see [www.azoresbiportal.angra.uac.pt](http://www.azoresbiportal.angra.uac.pt) and [www.cita.angr.uac.pt](http://www.cita.angr.uac.pt)).

This nicely produced book is the result of 10 years of work on Azorean native forests (the Laurasilva) and celebrates the 2007 BES Award of Excellence in the Conservation of Biodiversity in Portugal. An award, which the Banco Espírito Santo, under a partnership with the Research Centre for Biodiversity and Genetic Resources (CIBIO), has launched.

The book is very good example to promote, vis-à-vis a wider public, the importance of bryological research for biodiversity conservation. Illustrations are consistently of very high quality and the texts illustrate the ecosystem value of the bryophytes on these island, the methods used to inventory the archipelago, the conservation needs for the threatened bryophytes, all this resulting from the detailed (500 x 500 m) grid based mapping. For those interested, the azoresportal mentioned above, provides also information to other species groups such as marine and terrestrial invertebrates (primarily terrestrial arthropods), vascular plants and lichens. Being also involved in marine conservation, I am also interested in these contributions.

If you wish to order a copy of this book, contact De. Rosalina Gabriel, Dept. Ciências Agrárias, Universidade de Açores, 9700-851 Angra do Heroísmo, Portugal. Email: [rgabriel@uac.pt](mailto:rgabriel@uac.pt).

Borges, P. and R. Gabriel. 2009. Predicting extinctions on oceanic islands: arthropods and bryophytes. BES Premio BioDiversidade. Universidade de Açores: 80 p. The book can be downloaded from [www.cita.angra.uac.pt](http://www.cita.angra.uac.pt).

# Theses in Bryology 22

Compiled by Bill Buck, NYBG

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As reported in a previous issue of *The Bryological Times* (99: 17. 1999), the International Association of Bryologists has decided to begin a repository of bryological theses. These theses are being housed in the Library of The New York Botanical Garden. They are available via inter-library loan. The NYBG Library online catalog (CATALPA) may be viewed at: <http://opac.nybg.org:211/screens/opacmenu.html>. As theses arrive, bibliographic data and a brief synopsis will be published in this column (see examples below). Bryological theses for any degree, covering any aspect of bryology, in any language, will be included. Please send theses to Bill Buck at the address above. Please refer to the preliminary notice (cited above) for information on financial assistance from IAB for reproduction of theses. The current IAB Treasurer is Jim Shevock ([jshevock@calacademy.org](mailto:jshevock@calacademy.org)).

**Aldana Munguía, Claudia Eliana.** 2008. Briofitas de los bosques de *Polylepis pepeii* (Provincia Murillo, La Paz - Bolivia): comunidades y ecología. Thesis for Licenciatura en Biología, Universidad Mayor de San Andrés, La Paz. vii + 71 pp. In Spanish. Address of author: unknown. E-mail: [aldana\\_clau@yahoo.com](mailto:aldana_clau@yahoo.com). The object of this study was to identify and interpret the ecological relations of the bryophyte communities in four habitats in the humid *Polylepis* forests in northwestern Bolivia. The four habitats were exposed rock beneath the forest, rock in open areas, branches of *Polylepis* and soil in open sites. A total of 19 communities were identified, only two of which were in all sites. Dicranaceae and Pottiaceae were the most common families represented. *Fabronia macroblepharis* is reported as new to Bolivia

**Blöcher, Rolf.** 2004. Molecular evolution, phylogenetics and biogeography in Southern Hemispheric bryophytes with special focus on Chilean taxa. Ph.D. dissertation, Rheinischen-Friedrich-Wilhelms-Universität Bonn. 169 pp. + 17 appendices on 30 pp. In English. Address of author: unknown. E-mail: [rolf.bloecher@gmx.de](mailto:rolf.bloecher@gmx.de). This doctoral dissertation focuses on the mosses that are disjunct between Chile and New Zealand. The study investigates the phylogenetic relationships within four such moss groups. The taxa considered are the families Lepyrodontaceae and Ptychomniaceae and the genera *Acrocladium* and *Catagonium*. The results are discussed within the context of historical and geological processes in order to test the hypothesis whether the distribution patterns can be attributed to a common Gondwanan origin or to long distance dispersal. Molecular phylogenetic analyses using molecular markers (ITS, *adk*, *trnL-F*, *rps4*) were conducted to reconstruct phylogenies. In the Ptychomniaceae, *Ptychomnion ptychocarpon* was determined not to belong to *Ptychomnion*, and that *Dichelodontium* belongs in the family. In the Lepyrodontaceae, genetic analyses showed that the two New Zealand/Australian species form a common clade and that the most closely related species originated from Chile. It is speculated that disjunct populations of *Lepyrodon tomentosus* probably became separated during the Tertiary. In *Acrocladium*, it was confirmed that the Chilean/Argentinean *A. auriculatum* is genetically distinct from the New Zealand/Australian *A. chlamydophyllum*. *Catagonium* was considered to occupy a very basal position within the Plagiotheciaceae. The current distribution of the genus is determined to be based on vicariance from when Gondwana split into Africa and South America. The dissertation is available online at [http://hss.ulb.uni-bonn.de/diss\\_online/math\\_nat\\_fak/2004/bloecher\\_rolf/index.htm](http://hss.ulb.uni-bonn.de/diss_online/math_nat_fak/2004/bloecher_rolf/index.htm).

**Bormann, Jennifer.** 2006. Molekulare Analysen und Biogeographie von *Poroathamnium* (C. Müll.) Fleisch. Diplomarbeit, Institut für Biologie, Systematische Botanik und Pflanzengeographie der Freien Universität Berlin. VI + 74 pp. + 9 pp. unpaginated appendices. In German. Address of author: unknown. This thesis used ITS1 and ITS2 to evaluate the relationships among the species of *Poroathamnium* in southern Chile. Additional species of *Poroathamnium* were examined from further north in South America, in Colombia and Peru. Analyses included maximum parsimony, maximum likelihood and neighbor joining. Many of the species, especially *P. leucocaulon*, proved not to be monophyletic. *Poroathamnium filiferum* + *P. natalense* (from South Africa) were sister to the rest of the South American material examined.

**Casado, Cristina M.** 2000. A taxonomic revision of *Streptopogon* Wils. (Pottiaceae). M.S. thesis, University of Missouri-St. Louis. 66 pp. + 15 figs. + 7 tabs. In English. Address of author: unknown. This master's thesis recognizes seven species of *Streptopogon*. The genus is recognized by frequently scabrous, mitrate calyptrae, short, twisted setae, exserted (emergent), wide, cylindrical capsules, a strong single costa with a single stereid band, absence of a stem central strand and smooth laminal cells. All species occur in the Neotropics, but some also reach to Africa and Asia (including Oceania). One species is described as new from Brazil, distinguished by a subpercurrent costa with propagula along the margins in the upper part of the leaf (rather than a percurrent costa with propagula all around the apex). A key is provided to the species. All species are described, illustrated and mapped.

**Cykowska, Beata.** 2009. Wątrobowce (Hepaticae) kęp torfowcowo-płonnikowych w Tatrach—różnorodność, rozmieszczenie i ekologia [Liverworts of the *Sphagnum-Polytrichum* hummocks in the Tatra Mountains—diversity, distribution and ecology. Doctoral thesis, Polish Academy of Sciences, Kraków, Poland. 247 pp. + 12 pp. of appendices (3) + 50 pp. of figs. + 56 color photos on 7 pp. + 10 tabs. in pocket. In Polish. Address of author: Institute of Botany, Polish Academy of Sciences, ul. Lubicz 46, 31-512 Kraków, Poland. E-mail: [b.cykowska@botany.pl](mailto:b.cykowska@botany.pl).

The aim of this thesis was to document the species diversity, distribution and ecology of liverworts growing on *Sphagnum-Polytrichum* hummocks in the Polish part of the Tatra Mountains. Special emphasis was given to ecological factors, which determine liverwort species richness and abundance. The study was conducted in 2004–2007 in the alpine and subalpine vegetation of Tatra National Park. During the research 50 hummocks were located and examined and 50 liverwort species were found and studied in detail, comprising over 27% of the liverworts known from the park, and about 21% of those known from Poland. *Barbilophozia binsteadii*, previously known from a single locality in central Europe, was recorded from eight new localities. The study clearly shows the importance of the hummocks as liverwort habitats.

**Decker Franco, Marcos.** 2004. Composición y diversidad de comunidades de musgos en tres localidades de la Siberia (Santa Cruz - Bolivia). The sis for Licenciatura en Biología, Universidad Mayor de San Simón, Cochabamba. ix + 154 pp. In Spanish. Address of author: unknown. E-mail: [viento\\_l@hotmail.com](mailto:viento_l@hotmail.com). This study examined the structure and composition of mosses in three localities in an area between Parque Nacional Carrasco and Parque Nacional Amboro in central Bolivia. Specimens were collected from 10 × 40 m plots and abundance was recorded for each species. A total of 597 specimens were collected, representing 132 species (in 32 families and 60 genera). The most abundant families were Meteoriaceae, Dicranaceae and Bryaceae.

**Djan-Chékar, Nathalie.** 1993. The bryophyte flora of Bridal Veil Falls, British Columbia: an analysis of its composition and diversity. M.S. thesis, University of British Columbia, Vancouver. ix + 134 pp. In English. Address of author: Herbarium, Natural History Unit, Provincial Museum of Newfoundland and Labrador, The Rooms, 9 Bonaventure Avenue, P.O. Box 1800, St. John's, Newfoundland and Labrador A1C 5P9 Canada. E-mail: [nathaliedjanchekar@therooms.ca](mailto:nathaliedjanchekar@therooms.ca). This master's thesis reports 150 mosses and 60 hepatics from a small provincial park in southwestern British Columbia, and an adjacent boulder slope. A key to the mosses is provided. *Barbula convoluta* var. *gallinula* is new to British Columbia. An analysis of bryophyte occurrence in habitats showed that high species diversity can be attributed to the wide variety of both habitats available at the site and microenvironments associated with these habitats. Variations in light, moisture and edaphic conditions were found to be generally important sources of diversity. The bryoflora of the area has a strong circumboreal element, as well as a large proportion of Pacific North American endemics.

**Harpel, Judith A.** 1980. A preliminary floristic study of the mosses in the San Jacinto Mountains. M.S. thesis, California State Polytechnic University, Pomona. vii + 119 pp. In English. Address of author: P.O. Box 490, Brush Prairie, WA 98606-0490, U.S.A. E-mail: [wjharpel@earthlink.net](mailto:wjharpel@earthlink.net). This master's thesis examined the mosses of a mountain range in Riverside County, California (33°50'N, 116°45'W). A total of 90 species in 36 genera and 20 families were identified. *Orthotrichum pumilum* is newly reported for California. *Isopterygium pulchellum* and *Mnium venustum* are new for southern California. Geographical, elevational distributions, substrate relations, as well as relations to higher plant communities, are discussed.

**Laenen, Benjamin.** 2009. Role of sexual determinism in the genetic structure and diversity of bryophytes: a model based on two sister taxa in the genus *Radula*. M.S. thesis, Université de Liège, Belgium. [iv] 47 pp. In English with French abstract. Address of author: rue H. Van der Wielen 9, 4690 Glons, Belgium. E-mail: [benjamin.laenen@student.ulg.ac.be](mailto:benjamin.laenen@student.ulg.ac.be). This master's thesis is a comparative study of *Radula complanata* and *R. lindenbergiana* in order to gain insight into the genetic structure of two bryophytes with different reproductive strategies but similar distribution ranges and ecological requirements. Two main differences in genetic diversity and structure were observed. The first main difference is the weakness of the geographic signal present in *R. complanata*, as evidenced by the marginally significant global *F*<sub>st</sub>, and the absence of any phylogeographic signal. Because of its autoicous sexuality, sporophytes are frequently produced. The absence of any trans-oceanic genetic differentiation in the species is suggestive of intense long-distance dispersal. In the dioicous *R. lindenbergiana* spatial patterns of genetic variation are completely different and suggestive of dispersal limitations by distance. It appears as if mutation rates are higher than dispersal rates in *R. lindenbergiana*. The presence of a phylogeographic signal is evident upon examination of the haplotype distribution map. The second major difference between the genetic patterns of *R. complanata* and *R. lindenbergiana* is the strikingly lower diversity of the former. Only eight haplotypes were found in *R. complanata*, but 21 in *R. lindenbergiana*. Macaronesia was particularly rich in haplotypes of the latter. This suggests that Macaronesia could have served as a potential refugium during Quaternary glaciations and as a potential sink for recolonization of Europe.

## Theses in Bryology 22 Continued

**Li, Fen-xia.** 2006. Species and ecosystem diversity of bryophyte in Foping Nature Reserve [Foping Guojia Ziran Baohuqu tai xian zhi wu di wu zhong ji sheng tai xi tong duo yang xing]. Ph.D. dissertation, East China Normal University, Shanghai, China. 127 pp. In Chinese with English abstract. Address of author: Institute of Botany, Chinese Academy of Sciences, 20 Nanxincun, Xiangshan, Beijing, China 100093. E-mail: [lifenxia@ibcas.ac.cn](mailto:lifenxia@ibcas.ac.cn). This doctoral dissertation examines the bryophyte species diversity and the ecosystem diversity of bryophytes in the Foping Nature Reserve in the Qinling Mountains of Shaanxi Province (33°33–46°N, 107°40–55°E). A total of 364 moss taxa and 111 hepatic taxa were identified from the reserve, which lies in the transition zone between temperate and subtropical areas. The most abundant family in terms of species was the Brachytheciaceae. Habitats were surveyed to determine which contained the most bryophyte diversity. The deciduous oak (*Quercus*) forest was the most bryophyte-rich habitat, followed by the deciduous birch (*Betula*) forest and the bamboo forest. The lowest diversity occurred in the *Rhododendron* shrub ecosystem.

**Lozano Ajata, Reinaldo.** 2005. Aporte al conocimiento de la riqueza y composición de la flora de musgos del bosque Tucumano-Boliviano, Comunidad de Nuevo Mundo (Provincia Belisario Boeto, Depto. de Chuquisaca). Thesis for Ingeniero Agrónomo, Universidad Mayor Real y Pontificia de San Francisco Xavier de Chuquisaca, Sucre. viii + 74 pp. In Spanish with English abstract. Address of author: unknown. E-mail: [mussreyvaldo@gmail.com](mailto:mussreyvaldo@gmail.com). This study examined the moss diversity of the Tucumano-Boliviano forest in south-central Bolivia. This is a semi-humid, (semi-) deciduous forest at 800–3900 m, with 700–2000 mm of precipitation annually. The primary wood plants are *Blepharocalyx salicifolius* and *Myrcianthes* spp. (Myrtaceae), Lauraceae, *Podocarpus parlatorei*, *Alnus acuminata* and *Polylepis cristagalli*. A total of 79 species of mosses were found, with the Meteoriaceae, Neckeraceae and Cryphaeaceae best represented. *Macrocoma tenuis* and *Microdus lindigianus* are reported as new to Bolivia.

**McMullan-Fisher, Sapphire J. M.** 2008. Surrogates for cryptogam conservation—associations between mosses, macrofungi, vascular plants and environmental variables. Ph.D. thesis, University of Tasmania. vi + 214 pp. + 217 pp. appendices. In English. Address of author: P.O. Box 1251, Tewantin, QLD 4565, Australia. E-mail: [sapphire@flyangler.com.au](mailto:sapphire@flyangler.com.au). This doctoral thesis attempts to remedy the seldom inclusion of cryptogams in conservation planning and management by providing data on mosses and macrofungi. It was tested whether vascular plants and environmental variables could be used as surrogates for cryptogams, in order to achieve satisfactory conservation outcomes. Four vegetation types were surveyed in the Hobart region of Tasmania, Australia, over several years for vascular plants, mosses and epigeous macrofungi, using permanent plots. A total of 284 vascular plants, 71 mosses and 233 macrofungi were recorded. All taxonomic groups showed that the four vegetation types were different. Canopy cover was the best single predictor of most biotic groups. However, some combinations of environmental variables were also useful, such as a combination of altitude, canopy cover and geology. Mosses and macrofungi exhibited high substrate fidelity across time and space. Mosses in wet forests occurred on a wider range of substrates than the same species in other vegetation types. The results suggest that coarse scale conservation of vegetation types with reservation of at least 30% of their area should conserve common mosses and macrofungi. However, at the site scale, uncommon taxa of mosses and macrofungi are not concordant with vascular plants.

**Mogro Colque, Faviana Inés.** 2008. Diversidad de musgos en un gradiente altitudinal Parque Nacional Carrasco (PNC), Cochabamba - Bolivia. Thesis for Licenciatura en Biología, Universidad Mayor de San Simón, Cochabamba. VII + 93 pp. In Spanish. Address of author: unknown. E-mail: [favi\\_mogro@hotmail.com](mailto:favi_mogro@hotmail.com). This study examined the diversity of mosses along an altitudinal gradient of 500–2000 m in a national park in central Bolivia. At each elevation studied (500 m, 1000 m, 1500 m, 2000 m), six plots of 10 × 40 m were examined for the number of species and their abundance. The data were statistically analyzed. The most diversity was found at the highest elevation. From a total of 715 specimens, 251 species were identified (83 families, 142 genera). The families most numerous were Pilotrichaceae, Dicranaceae, Hypnaceae and Meteoriaceae. Epiphytism was the most common life form.

**Pawlak, Cathrin.** 2006. Molekular Systematik und Biogeografie paläoaustralier *Hypnodendron*-Taxa (Hypnodendraceae, Bryophytina). Diplomarbeit, Institut für Biologie, Systematische Botanik und Pflanzengeographie der Freien Universität Berlin. IV + 87 pp. + 25 pp. unpaginated appendices. In German. Address of author: unknown. This thesis used the *trnL* intron and the *atpB-rbcL* spacer to evaluate relationships among the Gondwanan species of *Hypnodendron*, and to determine their divergence from *H. microstictum* and *H. spininervium*. *Hypnodendron* sect. *Hypnodendron* was emphasized. The analyses indicate that *Hypnodendron* is paraphyletic, including *Bescherellia*, *Cyrtopus* and *Spiridens*. These genera are included in the clade with *Hypnodendron* sects. *Hypnodendron*, *Lindbergiodendron* and *Tristichophyllum*. The other major clade in the genus includes sects. *Phoenicobryum*, *Leiocarpos*, *Pseudomniodendron* and *Comosa*.



**Poli, DorothyBelle.** 2005. The role of auxin on the evolution of embryo development and axis formation in land plants. Ph.D. dissertation, University of Maryland, College Park. xii + 201 pp. In English. Address of author: Department of Biology, Roanoke College, 221 College Lane, Salem, VA 24153-3794, U.S.A. e-mail: [poli@roanoke.edu](mailto:poli@roanoke.edu). This doctoral thesis examined the role of auxin in the evolution of land plants. Several approaches were used to study how auxin regulated the development in bryophyte sporophytes. The altered growth of isolated young sporophytes exposed to applied auxin (indole-3-acetic acid) or an auxin antagonist (*p*-chlorophenoxyisobutyric acid) suggested that endogenous auxin regulates the rates of axial growth in all bryophytes. In *Phaeoceros pearsonii* auxin moved at very low fluxes, was insensitive to an auxin-transport inhibitor (N-[1-naphthyl]phthalamic acid), and exhibited a polarity ratio close to 1.0, implying that auxin moves by simple diffusion. *Pellia epiphylla* exhibited somewhat higher auxin fluxes, which were sensitive to transport inhibitors but lacked any measurable polarity. Thus, auxin movement in liverwort sporophytes appears to result from facilitated diffusion. In *Polytrichum ohioense* auxin movement was predominantly basipetal in young sporophytes and occurred at high fluxes exceeding those measured in maize coleoptiles. In older sporophytes, acropetal auxin flux had increased beyond the level measured for basipetal flux in the specimens observed in several, but not all, seasons. The evidence from both inhibitor treatments and isolated tissues was consistent with the interpretation that the cortex carries out basipetal transport in both younger and older sporophytes, whereas the central vascular tissues carries out basipetal transport in younger sporophytes and acropetal flux in older sporophytes. Given the significant differences in fall rainfall in the collection years, the purported sensitivity of vascular tissue development may account for the seasonal variation observed in these experiments. Auxin regulators and polar transport were also used to study the regulation of embryogenesis of the fern *Marsilea vestita*. In conclusion, the evidence suggests that auxin is ultimately involved in the establishment of the body plans in all land plant sporophytes.

**Pollawatn, Rossarin.** 2008. Systematic treatment of Sematophyllaceae (Musci) in Thailand. Ph.D. dissertation, Rheinischen-Friedrich-Wilhelms-Universität Bonn. 262 pp. + 14 unnumbered pp. indices and appendices. In English. Address of author: Nees-Institut für Biodiversität der Pflanzen, Rheinischen-Friedrich-Wilhelms-Universität Bonn, Meckenheimer Allee 170, D-53115 Bonn, Germany. E-mail: [rossarin.p@chula.ac.th](mailto:rossarin.p@chula.ac.th).

This doctoral dissertation treats the Sematophyllaceae to the species level for Thailand. An artificial key, description, distribution, ecology, illustrations and photos of each species are provided. Included are 24 genera, 97 species, 5 varieties and 1 form. *Pseudotrismegistia*, *Heterophyllum* and *Pylaisiadelphina* are new to Thailand, as well as six species: *Acroporium rufum*, *A. sigmatodontium*, *Brotherella erythrocaulis*, *Chionostomum baolcense*, *C. inicola* and *Rhapidostichum piliferum*. New for Indochina are *Acroporium johannis-winkleri*, *Aptychella speciosa*, *Hageniella assamica*, *Taxithelium parvulum* and *Wijkia hornsuschii*. Eleven species and two varieties are considered endemic to Thailand. It is confirmed that phyto-geographically Thailand forms a bridge between the Malayan-Philippine and Sino-Himalayan floras. The dissertation is available online at [http://hss.ulb.uni-bonn.de/diss\\_online/math\\_nat\\_fak/2008/pollawatn\\_rossarin/index.htm](http://hss.ulb.uni-bonn.de/diss_online/math_nat_fak/2008/pollawatn_rossarin/index.htm).

**Sabovljević, Marko.** 2006. Genetic distances and phylogeography of selected disjunct moss populations in Europe. Ph.D. dissertation, Rheinischen-Friedrich-Wilhelms-Universität Bonn. 173 pp. In English. Address of author: Herbarium, Faculty of Biology, Institute of Botany and Botanical Garden, University of Belgrade, Takovska 43, 11 000 Beograd, Serbia and Montenegro. E-mail: [marko@bfbot.bg.ac.yu](mailto:marko@bfbot.bg.ac.yu). This doctoral dissertation tests whether current disjunct distributions of mosses in Europe is the result of a disruption of former continuous ranges or the result of long-distance dispersal. Five moss species were chosen: *Campylopus oerstedianus*, *Hilpertia velenovskyi*, *Isothecium holtii*, *Rhytidium rugosum* and *Dichelyma capillaceum*. For the determination of genetic distances between populations ITS and *trnL-F* were used. *Campylopus oerstedianus* is only known sterile and populations in the Pyrenees, southern Alps and Greece have no genetic exchange and therefore possibly have been isolated for a long time. In *Hilpertia velenovskyi* Saxon populations are related to Czech populations. There is evidence that the current distribution of the species might be the first molecular proof of a glacial relict among bryophytes. *Isothecium holtii* was determined to be a good species and that it is closer to *I. myosuroides* than to *I. alopecuroides*. The current distribution is considered to be a relict of a former continuous range. *Rhytidium rugosum* is considered to be a glacial relict because of its wide but scattered Holarctic range. Based on haplotypes, the range of the species in Europe is a result of migrations, range extension, colonization and spreading events. There is high genetic diversity in the species from throughout its range. The German population of *Dichelyma capillaceum* is genetically long-separated from the primary Swedish populations and appears to be a result of long-distance dispersal. The Scandinavian populations seem to be derived from North America. The dissertation is available online at [http://hss.ulb.uni-bonn.de/diss\\_online/math\\_nat\\_fak/2006/sabovljevic\\_marko/index.htm](http://hss.ulb.uni-bonn.de/diss_online/math_nat_fak/2006/sabovljevic_marko/index.htm)

**Sanjines Asturizaga, Ninel Nadeska.** 2004. Briofitos terrestres en el páramo yungueño del cerro Hornuni-Cotapata: especies y comunidades. The sis for Licenciatura en Biología, Universidad Mayor de San Andrés, La Paz. vi + 82 pp. In Spanish. Address of author: unknown. E-mail: [ninelsanjinnes@hotmail.com](mailto:ninelsanjinnes@hotmail.com). This study was done at the Parque Nacional y Área Natural de Manejo Integrado - Cotapata in west-central Bolivia, in a páramo at elevations of 3000–3400 m. A total of 56 species of hepatics and 23 species of mosses were found. *Nowellia curvifolia*, *Pleurozia paradoxa* and *Bryum leptotorquescens* are reported new to Bolivia. Diversity was found to be dependent on the direction of slope, with southeast providing the most number of species. A phytosociological analysis identified nine groups.

**Uzawa, Mihoko.** 2008. Study on the morphogenesis of the sporophyte-gametophyte junction in mosses. Master's dissertation, University of Tokyo. Iii + 57 pp. In English. Address of author: Department of Botany, National Museum of Nature and Science, 4-1-1 Amakubo, Tsukuba, Ibaraki 305-0005, Japan. E-mail: [uzawa@kahaku.go.jp](mailto:uzawa@kahaku.go.jp). This master's thesis examined the various developmental stages of the sporophyte-gametophyte junction in seven species of mosses using anatomical methods, in order to describe the process of differentiation of the junction, and to show the universality and diversity of morphogenesis of the junction in mosses. The junction is divided into two types, based on the degree of foot penetration in the gametophyte tissue. In the first type, with a "true" vaginula, the lower part of the gametophytic epigonium grows by intercalary meristematic activity after fertilization and subsequently degeneration of gametophyte cells adjacent to the proximal end of the sporophyte causes penetration of the sporophyte into the lower part of the epigonium. In the second type, with a "pseudo-vaginula," the junction is formed below the innermost perichaetial leaves and is accompanied by differentiation of fragile cells internally and the sporophyte penetrates into this region of fragile cells, thus entering stem tissue. Immersed capsules are highly correlated with a deep penetration of the foot into stem tissue. This variation in foot penetration may give mosses the ability to adapt to special habitats.

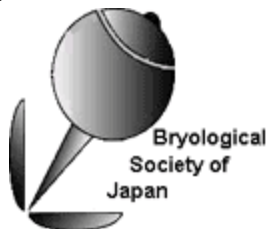
## News From The Bryological Society of Japan

by Masaki Shimamura

The Bryological Society of Japan (BSJ) has elected new officers for January 2010 – December 2011. President: M. Higuchi (National Museum of Nature and Science, Tokyo). Secretary: T. Yamaguchi (Hiroshima Univ.). Treasurer: H. Tsubota (Hiroshima Univ.). Auditor: H. Kiguchi (Saitama Prefectural Showa High School). Editor: T. Arikawa (Tottori Prefectural Museum). Associate Editors: H. Akiyama (Museum of Nature and Human Activities, Hyogo), T. Furuki (Natural History Museum and Institute, Chiba), M. Shimamura (Hiroshima Univ.). All communications should be addressed to the Secretary: Bryological Society of Japan, Department of Biological Science, Graduate School of Science, Hiroshima

University, Kagamiyama, Higashi-Hiroshima, 739-8526 Japan, e-mail: yamatom@hiroshima-u.ac.jp.

The 38th Annual meeting of BSJ was held on 18 – 20 August 2009 at Rissho University, Kumagaya campus in Saitama Prefecture. More than 70 members attended from all over Japan as well as attendee from Spain. The events include (1) a symposium on the biology of *Sphagnum* (2) a paper reading session with 12 presentations,



including a series of papers on biology of *Scopelophila* (3) a poster session with 5 posters, including some taxonomic studies of the Antarctic mosses (4) an excursion to Oku-Chichibu area in Saitama Prefecture, which is well known to Japanese bryologists for its rich bryoflora.

The 39th meeting will be held at Iwakuni-shi, Yamaguchi Prefecture, 18 – 20 August, 2010. All inquiries about the meeting should be addressed to T. Yamaguchi (e-mail: yamatom@hiroshima-u.ac.jp) or M. Shimamura (e-mail: mshima@hiroshima-u.ac.jp).

## Land Use and Carbon Analysis Systems in New Zealand

by Matt Renner

The LUCAS (Land Use and Carbon Analysis System), previously CMS (Carbon Monitoring System) survey covers all 6.25 million hectares of indigenous forest, and 2.65 million hectares of shrubland in New Zealand. The survey is a plotting network based on an 8km<sup>2</sup> grid network, resulting in 1372 grid intersects with indigenous forest and shrubland. At each intersect a 20x20 metre plot (0.04 ha) was established between 2002 and 2007. In addition to carbon accounting, biodiversity monitoring is a core component of the survey, and for the first time in New Zealand protocols for sampling non-vascular plants were included in the plotting methodology. One component is general collecting with the aim of compiling complete species lists for each plot. The collections underlying this aim continue to contribute to our knowledge of the composition and distribution of New Zealand's bryophyte flora. Interesting records made during the plot establishment and first measurement included *Mnioloma* new for New Zealand, and the new species *Nephelolejeunea carcharias*, and *Zoopsis matawaia*. Wildlands Consultants Ltd are undertaking the first re-measurement of the LUCAS plot network, which began in February 2009 and is anticipated to

take five years. During the first re-measurement field season 99 plots were completed, from which 3845 bryophyte samples were processed and identified, and I am glad to report that new and interesting collections are still coming to light.

Among these interesting collections include: the sixth known collection of *Anastrophyllum novae-zelandiae*.

Collections of *Bazzania engelii* from three additional locations on the west coast of the South Island.

The first collection of *Cephaloziella subspinosa* from New Zealand's South Island, a range extension some 600 km south.

The southern-most collection of *Radula splendida*, from Fiordland National Park. (this species is being described formally in the February 2010 issue of *Nova Hedwigia* and is *nomen nudum* till then).

The detection of an apparently undescribed species of *Cololejeunea* subg. *Cololejeunea* which appears to be a specialist epimuscicole on old shoot

sectors of *Weymouthia cochlearifolia* and *Papillaria* spp. wefts.

The identification of a new locality for the critically endangered *Isolembidium anomalum* (Rodway) Grolle var. *anomalum*

The fourth known locality for *Lepidozia novae-zelandiae* Steph. var. *minima* R.M. Schust.

The second collection of *Telaranea granulata* J.J. Engel from the South Island.

The collection of a plant belonging to either Adelanthaceae or Marsupidiaceae, that is not assignable to any species known from New Zealand, and may be new. The identity of this plant is being resolved in collaboration with Drs David Glenny (Christchurch) and X.-L. He (Helinski).

Identification of bryophytes from the Year 2 plots, (c.130 in total) is ongoing, so far only 1949 collections have been processed, but interesting records include: (see page 11)

## LUCAS continued from page 10

An additional location for *Cololejeunea floccosa* in the north of the North Island.

*Physcomitrella patens* subsp. *readeri* from Northland,

Another species of *Cheilolejeunea* subg. *Xenolejeunea* in New Zealand, collected in Northland. Previously this subgenus was represented by a plant collected on the Kermadec Islands conferred to *C. imbricata*. Like the Kermadec Island material, the identity of the Northland plant is unknown. The plants grew terrestrially on friable orange-brown clay beneath secondary forest at 2 masl, an unusual habitat.

Collection of an indeterminate *Porella* in the Golden Bay region, northern South Island. Similar plants have been collected in the Wairarapa region of the North Island, and this plant may be

referable to *P. pulcherrima*, currently considered a synonym of *P. elegantula*. This material is being fed into a revision of the genus *Porella* in New Zealand being led by Dr David Glenny.

The fifteenth (or thereabouts) known collection of *Syrhodon armatus* from New Zealand, made in regenerating kauri (*Agathis australis*) forest in Northland, on a mainland site adjacent the Poor Knights Islands, a previously known location for this species (Dr Allan Fife *pers. comm.*).

Six additional localities for *Lepidozia fugax* J.J. Engel, known from only two collections at the time of publication of volume one of The Liverwort Flora of New Zealand.

From a bryological perspective, the LUCAS plotting network provides extensive coverage of New Zealand by including a wide range of habitat types, many in remote highly inaccessible locations. The value of the survey can be measured in terms of its ability to detect species previously unknown to science, and to contribute significant range extensions within New Zealand for poorly known taxa. However, only c.37 ha of New Zealand is physically included within the LUCAS survey plots. That leaves c. 268,020,963 ha of who knows what else is out there, in a country whose liverwort flora is arguable the best known in the southern hemisphere.

Matt Renner is at:

Wildland Consultants Ltd

99 Sala Street, Whakarewarewa Rotorua 3010, New Zealand

PO Box 7137, Te Ngae, Rotorua 3042

Ph 0064 7 3439017, Fax 0064 7 3439018

## BT Editors Change Places and the Newsletter's Look

This is the first issue of *The Bryological Times* for DorothyBelle (DB) Poli as lead editor. Geert Raeymaekers is still around as co-editor to help DB break-in to her new role.

IAB would like to thank Geert for his hard work and dedication to *The Bryological Times* over the years.

His time and efforts are commended and IAB is indebt to Geert. DorothyBelle would like to say thank you to Geert too, without his guidance and time, the BT would still be "in transition!"

We hope that everyone is enjoying this issue of *The Bryological Times* and the newsletter's new layout! Geert and

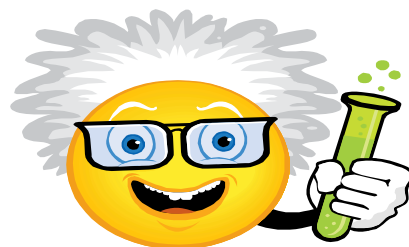
DB are looking forward to your comments, please send those comments, good or bad, to DB Poli (poli@roanoke.edu) or Geert Raeymaekers (geert.raeymaekers@skynet.be).

Submissions to *The Bryological Times* are due the first week of March, June, September, and December!

## ATTENTION All Bryological Societies...

IAB would like to keep up with all of the Bryological Societies that exist. Please help report your information in *The Bryological Times* by supplying the editors with a contact for your society. Column space is available and we would love to showcase what your group is doing. Report local

meetings, field trips, grants and awards, etc. If you have a BT contact, please have them communicate with DB Poli at poli@roanoke.edu to ensure all contact information is up-to-date. We look forward to hearing from you! Thank you!



## ...Continued from page 1: The Bryological Times Needs You!

even the very best bryologists can't recognize everything. They debate with themselves and each other over the identity of any number of species. Realizing this was an important contribution to my self confidence.

It is with this background that I wish to discuss with you the role of IAB.

Contact with other persons in your field is essential. But often we are intimidated (I was) because we might look ignorant or stupid when we ask a question for which we think we should already know the answer. Or we may be using a language where we are not comfortable. But my greatest learning experiences occurred after I ignored those fears and asked away. (And we wonder why our students won't answer questions in class!)

One spring I was fortunate enough to spend three months in Europe. My home port was with Martin Bopp at the University of Heidelberg. I was going to teach a plant physiology course in my department and needed to learn lab techniques. I decided to learn them for bryophytes at the same time. While I was in Europe, I attended five bryological forays in five different countries. How great it was to be able to travel so easily to so many countries and cultures. The approaches to the forays were different in each country, but in every case the interactions with fellow bryologists with different perspectives was wonderfully refreshing and inspiring.

Most of us work where we are the only bryologist, except for our own students. Our need to interact is strong. It is one of the most effective means of learning we have. And an international organization like IAB is the optimum opportunity to interact one-on-one with people from all over the world. Our founding fathers recognized this importance when they created IAB.

One of my early experiences with international bryology was during a visit to Japan. I was in the field with Mr. Igi, who spoke little English. Soon we were pointing to bryophytes, sometimes with a question in our voices, sometimes with a teaching tone. But the Latin names were universal. We understood each other. That night he told my Japanese friend that when you talk to bryologists you don't need to know English. You can converse with the Latin names of the bryophytes.

Another example of our fear of embarrassing ourselves with our knowledge of a language also came to me in Japan. I was on a 4-day Japanese foray. It was the third night and we were together (about 30 of us) for dinner. The person in charge asked us to go around the table and tell a little about ourselves. I was at the end of the long table, and the mini-speeches began across the table from me, placing me last to speak. Some spoke in English, others in Japanese. While they talked, I mentally practiced my own speech – in Japanese. At that time I knew about 500 words of Japanese, so my speech was simple and limited. And I didn't know grammar. Until that night, only a few Japanese, those who had been to English-speaking countries, had talked to me, but the next morning, a number of Japanese came and talked to me. I realized then that they had been self-conscious about their English, but when they realized my effort to speak Japanese, with my poor grammar and limited vocabulary, they were willing to speak with their much superior Eng-

lish to me. Dr. Ando (who had not been afraid to talk to me) said "You spoke little bit strange Japanese, but I understood you."

I have the feeling that many IAB members are afraid to contribute to IAB projects because they fear their English is not good enough. There are many members of IAB willing to help with English, and our new president has even suggested that we run English workshops to help those who want to improve their written English communication skills. But even if your English is insufficient, there are many ways you can contribute.

Bryonet has shown how wonderful bryologists are in trying to help each other. My own project in writing my online book (encyclopedia?) on Bryophyte Ecology has demonstrated very vividly how helpful bryologists are. All I need to do is ask for a photo, a paper, or an example and many people jump in with what I need. Few questions or requests from beginning amateurs to seasoned professionals go unanswered.

IAB offers many services and support to its members. It provides small seed grants and support for beginning bryologists and bryologists working in developing countries. It provides international recognition for outstanding contributions of members through the Hedwig Medal, Spruce Plaque, Hattori Prize, and Grolle Plaque. It provides awards for student presentations at the meetings. Our new president, Jeff Duckett, has suggested co-sponsoring awards for students at national or regional meetings as well. And we hope to provide modest travel funds to students making presentations at IAB meetings. (We need more members so we can afford to support more students.). We offer The Bryological Times, sponsor Bryonet, co-sponsor the online Bryophyte Ecology book series, provide valuable information to the IUCN committee on bryophytes, and provide free memberships for one year to students. Members of IAB receive a 25% discount for purchase of *Bryophytorum Bibliotheca*. Perhaps most importantly, IAB sponsors an international meeting every two years, accompanied by one or more field trips in bryologically interesting places. It sponsors and co-sponsors workshops on specific topics, such as the methods workshop held in Mainz, *Sphagnum* workshops, and workshops based on regional needs. It provides an online list of members and their interests, available only to members.

We need to share our talents, and bryologists have much to share. There are ways that you can help. Let us know Jeff Duckett (president) <j.g.duckett@qmul.ac.uk>, DorothyBelle Poli (BT Editor) <poli@roanoke.edu>, Geert Raeymaekers (BT co-editor) <geert.raeymaekers@skynet.be>, or Janice Glime (past president) <jmglime@mtu.edu>.

## Eagle Hill Spotlight Seminar

Eagle Hill seminar spotlight ...



\*Introduction to Modern Phylogenetic Methods\*

Dates: May 30 - June 5, 2010

Instructors: Brigid O'Donnell and Hillary McManus

Contacts: [bcodon-nell@mail.plymouth.edu](mailto:bcodon-nell@mail.plymouth.edu), [hilarym-cmanus@gmail.com](mailto:hilarym-cmanus@gmail.com)

Location: Humboldt Institute, Steuben, Maine (Between Acadia National Park and Petit Manan National Wildlife Refuge)

This intensive one week seminar is of special interest to graduate students and professionals who are considering becoming involved in phylogenetic research and/or who would like to have a of better understanding for reading articles about phylogenetics. The instructors welcome questions from potential participants about their special interests. Participants can elect to bring their own datasets or work with datasets provided by the instructors. There will be guest lectures by researchers using phylogenetic methods (to be announced).\* The

following hotlinked file provides an overview of the seminar and the instructors.\* A full syllabus is available.

<http://www.eaglehill.us/programs/nhs/seminar-flyer-pdfs/Phylogenetic.pdf>

## Other Trips, Excursions to Learn About Bryophytes

**David Wagner** is giving a course on the genus *Racomitrium* at Life Sciences Building, UC Berkeley and East Bay Regional Parks on April 17-18, 2010. This workshop will emphasize preparing leaf sections for keying using vegetative characters, with special focus on an illustrated HTML key developed by the instructor.

Copious practice material will be provided; participants are encouraged to bring their own specimens for supervised keying.

Participants are also encouraged to bring their personal laptops for using the HTML keys on the lab bench. Course fee \$235/\$260 See: <http://ucjeps.berkeley.edu/workshops/2010/index.html> for registration information.

**Alison C. Dibble**, Conservation Biologist and avid bryophyte hunter, will offer a beginning-level field and microscopy course at Eagle Hill, Humboldt Research Station, Steuben, Maine, from May 23-29, 2010. The course is designed for students, natural resource managers, naturalists, and anyone who is intrigued by tiny plants. Further details can be obtained at [www.eaglehill.us/programs/nhs/seminar-flyer-pdfs/Intro%20to%20Bryophytes.pdf](http://www.eaglehill.us/programs/nhs/seminar-flyer-pdfs/Intro%20to%20Bryophytes.pdf)

To obtain the syllabus or to sign up, contact [office@eaglehill.us](mailto:office@eaglehill.us).

**Jon and Blanka Shaw** will be offering a 3-day workshop on field identification and ecology of mosses and liverworts in Wrangell Mountains Center, McCarthy, AK, July 26-28, 2010. Cost is \$175, for more information contact Blanka ([blanka@duke.edu](mailto:blanka@duke.edu)) or Jon Shaw ([shaw@duke.edu](mailto:shaw@duke.edu)).

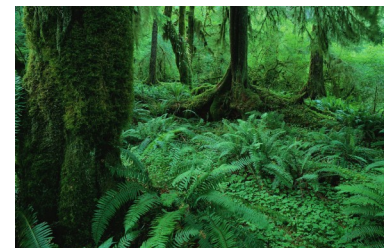
**Jon and Blanka Shaw** will be offering a workshop on the identification of peatland bryophytes in Fairbanks, Alaska August 5-7 or 8-10, 2010. Participants can expect to learn how to recognize many species of Sphagnum and other bryophytes in the field, and develop skills necessary to identify plants using keys and microscopic Characters. Cost is \$250, for more information, contact Blanka ([blanka@duke.edu](mailto:blanka@duke.edu)) or Jon Shaw ([shaw@duke.edu](mailto:shaw@duke.edu)).

**Nancy Slack** is offering Bryophyte and Bryophyte Ecology at Eagle Hill, Steuben Maine from August 15-21, 2010. For more information: <http://www.eaglehill.us/programs/nhs/nhs-calendar.shtml>

**3rd Physcomitrella Genome Workshop** in Frieberg, Germany from September 13-15, 2010. Learn how to work with [cosmos.org](http://cosmos.org) and the *Physcomitrella patens* genome. Find and annotate your gene(s) of interest. Get in touch with other people working with *Physcomitrella* and other bryophytes. Learn about genomics resources for other bryophytes...More details on:

[https://www.cosmos.org/physcome\\_project/wiki/Cosmos\\_workshop](https://www.cosmos.org/physcome_project/wiki/Cosmos_workshop)

**The Crum Workshop** will be held this year in Tobermory, Ontario, Canada, at the very tip of the Bruce Peninsula, sticking out into Lake Huron, on September 23-28, 2010. Save the dates!



# Bryophilous parasitic species on mosses (Krasnoyarsk District, Russia)

By Tatyana Otnyukova

## 1. Fungi parasitic species (Ascomycota, Discomycetes) on the moss *Entodon schleicheri*

This interesting first finding of a parasitic fungal species (Ascomycota, Discomycetes) on the moss *Entodon schleicheri* was made in an old birch forest park in the city of Krasnoyarsk (South Siberia, Russia). Among epiphytic moss species (*Bryoerythryllum recurvirostrum*, *Entodon schleicheri*, *Orthotrichum speciosum*, *O. obtusifolium*, *Pylaisia polyantha*, *P. selwynii*, *Platygyrium repens*, *Schistidium pulchrum*) growing on old birch tree trunks, I noticed some morphotypes of mosses that had unusual appearance. These were pleurocarpous, much larger in size than surrounding plants of *Pylaisia polyantha*, and having ascending branches as is usual in *Leucodon sciuroides*. But the unusual feature for the former were some new formations among leaves, at first glance looking like immersed sporophytes with red (orange and yellow with age) capsule and red peristome teeth. Because of that, my second idea was that this new formation in leaf axils might be agglomerations of red propagules. In any case this finding was very interesting to study.

Under a binocular microscope, a cup-looking formation with a very hard consistency was found which could be cut by razor blade and crushed under preparation. Under the microscope I expected to find large amounts of propagules and I was very surprised to find that this cup-looking formation was a little fungus apothecium with numerous asci, each of them having 8 spores.

The moss species hosted by fungi I have recognized as *Entodon schleicheri*. Branches that are hosted by fungi differ somewhat morphologically from the main parent plants. Whereas in healthy plants of *Entodon schleicheri* lateral branches were compressed and all leaves had a long-triangular alar cell zone, infected branches became ascending and more densely leaved, and leaves became wider and had a rounder alar cell zone. Without a parent stem (after its dying) it is problematic to identify the infected branches as belonging to *Entodon schleicheri*.

Interestingly, branches hosted by fungi are not depressed in appearance and they look healthy and flourish. Fungal hyphae surrounding the stem like a cocoon form apothecia only in leaf axils. Siberian mycologist Natalia Kutafjeva has confirmed my assumption on Pezizales and she has recognized this bryophilous fungus species as belonging to Pyrenomataceae. We consulted specialist Dr Benkert; he assumed that we 'found an undescribed species/possibly genus'.

Fungal parasites on mosses are known elsewhere in the world (Benkert and Krieglsteiner 2006; Boros 1926; Döbbeler 1978, 2001, 2002, 2006; Felix 1988; Fisk 2000; Grasso and Scheirer 1981; Greenfield 1983; Itzerott and Döbbeler 1982; Martínez-Abaigar et al. 2005; Prior 1966; Scheirer and Dolan 1983; Senn-Irlet 1988; Singh and Pavgi 1979; Zang 1991, 1992).

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## 2. Parasitic species of Heterobasidiomycetes and Heterobasidolichens on mosses *Pylaisia polyantha* (as well *P. selwynii*, *Platygyrium repens* and *Leskea polycarpa*)

## Bryophylis, mosses continued from page 14

After the first remarkable finding of parasitic discomycetes on mosses I goal-orientedly began to study all unusual new formations on bryophytes. In summer-autumn 2009 in an old birch forest park in the city of Krasnoyarsk there were a lot infections of epiphytic bryophytes by white hair-looking fungi/lichen species/formations. Microscopic study showed that there were three bryophilous parasitic species, affecting young sporophytes mainly of *Pylaisia polyantha*, rarely *P. selwynii*, *Platygyrium repens*, and *Leskea polycarpa*. Parasitic species are successful when fungi hyphae capture young sporophytes in the stage having calyptra, ignoring leaves, archegonia and rhizoids. Practically everywhere in the study birch forest *Pylaisia polyantha* were hosting parasites, but mosses were not looking depressed. It will be interesting to monitor the populations of *Pylaisia polyantha* next year.

Siberian mycologist Natalia Kutafjeva has recognized all parasitic species as belonging to Heterobasidiomycetes. One of these bryophilous species is well a known parasitic heterobasidiomycetes *Eocronartium muscicola* (Boehn and McLaughlin 1988, 1989; Fitzpatrick 1918; Frieders and McLaughlin 2001; Frieders and McLaughlin 2001). *Eocronartium muscicola* (Fig. 2), also found in the study area on *Pylaisia polyantha*, rarely on *Leskea polycarpa*.

Incredibly, the other two bryophilous species on *Pylaisia polyantha*, rarely on *P. selwynii* and *Platygyrium repens*, were the lichenized heterobasidiolichens (Fig. 3 and 4). As lichenized mycetes these species had green algae irregularly dispersed in the sterile part of the thallus from below to upper, sometimes occurring in the fertile part under the hymenium layer. It is interesting that heterobasidiomycetes have never been previously reported in the literature as lichenized fungi (genus and species apparently to be described as new to science).

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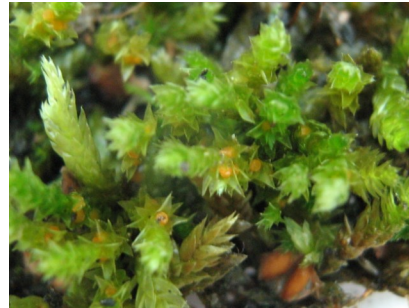


Fig. 1. Fungi parasitic species (Ascomycota, Discomycetes) on the moss *Entodon schleicheri* with numerous cap-looking yellow-orange apothecia in leaf axils.



Fig. 2. Heterobasidiomycetes *Eocronartium muscicola* on young gametophytes of *Pylaisia polyantha*.



Fig. 3. Lichenized heterobasidiomycetes, *Sp. 1*, on young gametophytes of *Pylaisia polyantha*.



Fig. 4. Lichenized heterobasidiomycetes, *Sp. 2*, on young gametophytes of *Pylaisia polyantha*.

## News from Mountainmoss.com

As I continue on my journey to promote mosses, I wanted to share my progress with my bryologist friends this holiday season. My version of the Yule Log was on the air the 22<sup>nd</sup> of December 2009 (on WLOS-TV in Asheville, NC). If you have miss it live, then it can be accessed later at Web site. Other segments already aired can be viewed:

**Holiday Moss Centerpiece** [http://wlos.com/newsroom/craft\\_corner/vid\\_371.shtml](http://wlos.com/newsroom/craft_corner/vid_371.shtml)

**Moss Fairy Garden** [http://wlos.com/newsroom/craft\\_corner/vid\\_300.shtml](http://wlos.com/newsroom/craft_corner/vid_300.shtml)

**Zen Moss Garden**  
[http://wlos.com/newsroom/craft\\_corner/vid\\_319.shtml](http://wlos.com/newsroom/craft_corner/vid_319.shtml)

**Moss Birdhouses**  
[http://wlos.com/newsroom/craft\\_corner/vid\\_310.shtml](http://wlos.com/newsroom/craft_corner/vid_310.shtml)

On a more academic note, I've added LOTS of photographs to my bryophyte gallery at my Web site:

<http://www.mountainmoss.com/gallery>

Since I am focused on mosses that have horticultural applications in sustainable landscapes, you'll find examples of

“weedy” mosses – those that grow quickly and are tolerant of both shade and sun exposures. I have captured images of mosses in a variety of growth stages and sporophytic states. Also, I've posted some Before/After shots of moss garden features. Finally, I'm adding documentation of the expansion of my moss garden installed last winter between Thanksgiving and New Year's. Indeed, moss gardening in the winter can result in success for year-round enjoyment. As always, I welcome your feedback or comments.

Mountain Moss Enterprises offers educational programs and a full range of services as part of my commitment to promoting the advantages of mosses. So, I keep trekking along my path toward my moss goals with:

Lectures and workshops providing guidelines for moss gardening and insight about common bryophyte types.

Creative moss installations transforming basic landscapes into verdant green moss features to enjoy through all the seasons. The latest feature in Cashiers, NC was a Christmas present and surprise... luckily, completed before the snow blanketed western

by Annie Martin

North Carolina last week.

My own moss propagation experiment.

Prototype rainwater harvesting/solar power/misting irrigation system for a sustainable approach to moss gardening.

While relaxing yesterday, I ran across this quote and wanted to share it with you.

“It is remarkable how little any but a lichenist will observe on the bark of trees. The mass of men have but the vaguest and most indefinite notion of mosses, as a sort of shreds and fringes, and the world in which the lichenist dwells is much further from theirs than one side of the earth from the other. They see bark as if they saw it not.”  
Henry David Thoreau, Journal, November 8, 1858

Annie Martin

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## An alternative for Hoyer's Solution

Hoyer's Solution may be best for bryophytes with firm, small leaf cells that do not collapse in glycerin. I recommend, however, for all-around goodness Glycerin Jelly, an ancient method that has several good points.

See:

<http://www.mobot.org/plantscience/ResBot/Meth/GlycerinJelly.htm> for discussion.

Technique with Mniaceae and other large-celled bryophytes: strip leaves in water or Pohlstoffe solution or 2% KOH, then add 2 tiny drops of pure

glycerin to the water or solution mount. Do cross sections and arrange leaves nicely in the unmixed water/glycerine mount, add a fingernail sized clod of glycerin jelly, heat with one of those butane lighters with the nice torch flame taking care to heat the slide fairly evenly so it does not break, heating until the glycerin jelly just melts or before it is completely melted, rearrange the leaves and whatever else is on the slide, pop on a cover slip, and after it cools it is solid and ready to mail or bang around the lab without drying. Don't use 2% KOH with liverworts as the leaf cell

walls are attacked.

Mounting in water and glycerin first, then heating plumps up the leaf cells with glycerin, then add the glycerine jelly. The slides are permanent if you keep them in a sealed cabinet with a small dish of glycerin to saturate the air with glycerin.

Richard H. Zander  
Missouri Botanical Garden

[richard.zander@mobot.org](mailto:richard.zander@mobot.org)

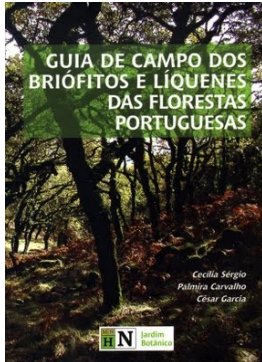


## Two recent local bryophyte guides

by G. Raeymaekers

**Sergio, C., P. Carvalho and C. Garcia. 2009. Guia de campo dos briófitos e líquenes das florestas Portuguesas. Ed. Jardim Botânico, Museu Nacional de Historia Natural, Lisboa (Portugal), ISBN 978-972-96491-9-6: 119 pg.**

This beautifully produced guide presents and summarises over 70 of the most common bryophytes and lichens of Portuguese forest types. The species were selected on the basis of their rarity and ecological indicator value for these forests. Each species is illustrated by one or more photographs, scientific and vernacular names are given as well as morphological charac-



teristics (in relation to similar species), data on distribution and ecology.

**Hallingbäck, T., P. Carlsson, P. Johansson, G. Kristensson, and P. Sögar. 2008. Göteborgstraktens Mossor. Föreningen Mossornas Vänner. Uppsala. ISBN 978-91-633-2359-1:128 pg.**

An equally high-quality local guide to the mosses and liverworts of the Göteborg area, an area of ca 5.400 km<sup>2</sup> in the southwest of Sweden. The focus of this publication is the distribution data of 594 bryophyte species (several with distribution maps), most of these collected and field-noted



by various amateur and professional bryologists since the 1970-ies. The guide is completed by an informative introduction with a phytogeographic discussion of the local bryoflora, information on threatened bryophytes (red-listing), neophytes, and a description of the bryological importance of the various biotopes of this region of Sweden.

**Malcolm, B., Malcolm N., Shevock, J., and D. Norris. 2010. California Mosses. \$ 68 USD.**

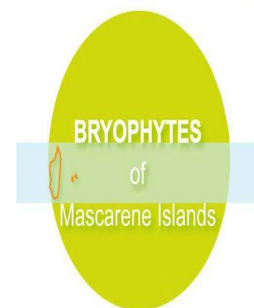
California mosses is a 430 page hard-back book containing 300 color plates and approx. 2,200 color images. Every genus of moss occurring in California receives a color plate. A more detailed announcement is attached, but in the event you are not able to open it, you can go directly to the California Native Plant Society (CNPS) website at [www.cnps.org](http://www.cnps.org) and access the information there and see the book cover image. Click on the on-line store icon, then books, then new titles. Credit cards accepted.

## Moss Flora of the Mascarenes

After having published the moss flora of the Seychelles (AfB 38) and Mauritius (AfB 51), an evaluation of the moss floras of the Mascarenes (the latter plus Reunion) has been made, which show striking differences. The article can, as ever, be downloaded for free from [www.archive-for-bryology.com](http://www.archive-for-bryology.com). Everybody interested can also get the spreadsheet with the actual lists of species upon request.

For more information please contact,

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[www.bryologie.uni-bonn.de](http://www.bryologie.uni-bonn.de)



## Free IAB-membership for students

This is just a reminder that students can join the International Association of Bryologists (IAB) free for one year. Full information is on the website <http://www.bryology.org/> under the How to Join button. The new treasurer is Jim Shevock. Send it to:

Jim Shevock, Research Associate & Fellow, California Academy of Sciences, Botany, 55 Music Concourse Dr., Golden Gate Park, San Francisco, California 94118 USA or email him at [jshevock@calacademy.org](mailto:jshevock@calacademy.org)

# H.M. Burkill Research Fellowship (Singapore Botanic Gardens)

The Singapore Botanic Gardens is pleased to offer an annual Humphrey Morrison Burkill Research Fellowship on a competitive basis to a qualified botanist with special interest in the flora of South East Asia.

The H.M. Burkill Research Fellowship is a generous bequest from Peter Burkill and Linda Upfill, the children of H. M. Burkill to honour their father and grandfather, I. H. Burkill. The senior Burkills were both former directors of the Singapore Botanic Gardens: I. H. Burkill (1912-1925) and H.M. Burkill (1957-1969). Its primary aim is to help promising young botanists to develop a career in tropical botany.

The yearly H.M. Burkill Research Fellowship offers the successful applicant a one-time sum of up to S\$4,500. The money is to be used for a proposed period of up to three weeks stay in Singapore to carry out research in the Singapore Botanic Gardens. The funds may be used for research related costs, including airfare, food and living expenses in Singapore.

The proposed research project submitted for consideration must be based on the resources of the Singapore Botanic Gardens including the herbarium.

## How to apply?

Interested applicants shall send their application letter, together with the research proposal and an updated cv, by email or air mail to Dr. Chin See Chung, Director, Singapore Botanic Gardens, 1 Cluny Road, Singapore 259569; email address; chin\_see\_chung@nparks.gov.sg

The proposal should state the proposed period of stay in Singapore and the requested amount of financial support up to a maximum of S\$4,500.

## Requirements

The Research Fellow shall submit a report on the research accomplishments before departing Singapore. He/she shall acknowledge the H. M. Burkill Research Fellowship and the Singapore Botanic Gardens in any subsequent publications that use information generated during the period of the award. The deadline for the submission of applications for the first award of the H. M. Burkill Research Fellowship is March 31, 2010. The selected recipient will be informed duly in writing.

# Spring fieldtrip in SW-Germany at Freiburg by Michael Lueth

From 17 to 23 April 2010, there will be a Bryophyte Excursion near Freiburg for the members of NBS (Nordic Bryological Society) and guests. There are some free places, so everybody, who is interested, can take place, until the limit of participants (20) has reached.

We will see many different sites, loess areas with Mediterranean species also as mountain areas in Black Forest. Some of the species, that we will see: *Brachydontium trichodes*, *Campylostelium saxicola*, *Cinclidotus danubius*, *Dialytrichia mucronata*, *Dicranum viride*, *Orthotrichum rogeri*, *Pterygoneurum lamellatum*, *P. subsessile*, *Sematophyllum demissum*, *Sphaerocarpus michelii*,

*Tortula brevissima*, *T. vahliana*, *Ulotia coarctata*

You can see the detailed programme on <http://www.milueth.de/Moose>

If you are interested to take part, please send me a note soon and I put you on a list. The final registration you have to do before 15. January.

I'm looking forward to see you in Freiburg

Michael Lueth

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**Note: issues of *The Bryological Times* will be scheduled to come out in March, June, September, and December. All submissions are due to DB Poli by the first week of publishing months!**

## Computers and Bryophytes: Look Here

A tribute to moss on You Tube: <http://www.youtube.com/watch?m=MWRazeUhg44&NR=1>

Video of Ralph S. Quatrano talking on "the biological mechanisms that allow desiccated mosses to revive" on the IAB blog spot: <http://internationalassociationofbryologists.blogspot.com/2010/02/contact-diana-lutz-dlutzwustl.html>

David Wagner shows us how he folds bryophyte packets in this video <http://homepage.mac.com/davidwagner/FernZenMosses/PhotoAlbum8.html>

Mueller, F. 2009. An updated checklist of the mosses of Chile. 124 pp. Download for free from [www.archive-for-bryology.com](http://www.archive-for-bryology.com)

[www.archive-for-bryology.com](http://www.archive-for-bryology.com) <<http://www.archive-for-bryology.com>>



*Send us your bryophyte links today!*

A new website, <http://bryolog.com> devoted to all things in western North American bryology, with a strong bent towards beginners by Ken Kellman. He would like

contributions for the advances page: updated BFNA keys, unpublished generic treatments, or pages that will illuminate difficult morphological features (similar to the hydroid page). Suggestions and comments are also welcome on any other aspect of the site.

A major bryological study on Science Daily: <http://www.sciencedaily.com/releases/2007/10/071024123233.htm>

## Subscribing to Bryonet-l

### **To subscribe:**

Contact the list owner and request to be added to the list following this pattern:

*To: bryonet-L-owner@mtu.edu*

Include a message with your full name and address and the email address you wish to subscribe.

One way is to send an email message [sympa@mtu.edu](mailto:sympa@mtu.edu) with the subscribe request in the subject.

*Subject: subscribe bryonet-L  
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Substitute your own name for the example name of Leslie Jones shown above. This list will require the approval of the list owner. Once you are approved for the list you will receive a confirmation email.

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Include a message with your name and the email address you wish to unsubscribe. If you wish to change email addresses, you can do it in the same message.

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**IAB is on the Web:  
<http://bryology.org>**



*The International Association of Bryologists (IAB) is an organization open for all in-*

*terested in bryophytes. For membership contact Jim Shevock at*

*jshevock@calacademy.org. Visit the IAB website: <http://bryology.org> for further infor-*  
*mation.*

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