

# The Bryological Times

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Newsletter of the International Association of Bryologists

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Dear bryologists,

Let me first wish you all the best for 2006! After our successful symposia in Vienna last year, we invite you to attend and contribute to the next 2007 World Congress of Bryology. Our hosts, Professor Dr. Haji and his collaborators, have started with the preparation of the congress that will take place in Kuala Lumpur, discussed later in this issue. We have begun to gather text and images to introduce bryophytes on our website.

I am forming a new committee to organize this and would welcome volunteers for the committee and someone to chair that committee. Uwe Drehwald will be our webmaster and will place the material on the web. Please contact me (jmglime@mtu.edu) if you are willing to contribute to our educational webpage. If you have undergraduate or graduate students interested in bryophytes, please tell them about our first year of free student membership in IAB. They should contact Blanka Shaw (blanka@duke.edu) to become a member.

Janice M. Glime, president IAB

IAB



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The **International Association of Bryologists (IAB)** is an organisation open for all interested in bryophytes. For membership, contact Geert Raeymaekers or Blanka Shaw. Visit the IAB web site: <http://bryology.org> for further information.

The Bryological Times is issued 3 to 4 times per year.

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## OBITUARY

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### Hisatsugu Ando (1921 –2005)



It is with great sorrow that I write to inform fellow bryologists that Hisatsugu ANDO passed away on the 8th of September at the age of 83 from pneumonia.

In accordance with his wishes, his passing had not been made public by his family. For the past 8 years he had been under medical supervision, having suffered a stroke during the winter of 1997.

Many of you knew him well personally. He is remembered for his warm-hearted personality, his considerable bryological activity, his numerous publications, and as an expert on the genus *Hypnum*. He was also an enthusiastic philatelist and collector of biological stamps. He was a botanist and a bryologist with a gentle nature and a great sense of humour. Perhaps a less known feature of his life was his skill as a magician, seen at many a bryological gathering. With his enthusiasm and encouragement he attracted many

students to plant taxonomy and to bryology. He was always willing to share his knowledge and experience.

**He was one of the proposers for the establishment of the Bryological Society of Japan in 1972, and served as an Editor of the Proceedings of the Bryological Society, and was the 5th President of the Society.**

He also made a considerable contribution to the journal *Hikobia*, as Editor-in-chief and later as President. A full obituary and compilation of his bryological contributions will appear in *Hikobia* (Vol. 14, no. 4) next year.

Lastly, his family have asked not to receive any messages of condolence following this announcement. Instead, they have asked me to convey their heartfelt thanks to all persons who extended their friendship to him while he was alive.

The world has lost another distinguished bryologist, a mentor to students, a warm-hearted friend.

The caption of the photo: Hisatsugu Ando (1922.4.1-2005.9.8), at the *Hikobia* year-end dinner party held in Hiroshima City in Dec. 1982, where he gave a message of congratulations to the students who mounted the podium in the intra-laboratory bowling competition, a yearly event in those days.

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## IAB NEWS

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### A report on the World Conference of Bryology 2007 in Kuala Lumpur, Malaysia

By Haji Mohamed, Amru Nasrulhaq Boyce and Benito C. Tan

The year 2007 will see a world bryological conference focusing on the theme – “**Bryology in Asia in the New Millennium**” – to be organized by the Faculty of Science of the University of Malaya and the International Association of Bryologists (IAB). This international conference will be held in Kuala Lumpur of Malaysia from July 23-27 (Monday to Friday). It will be the second IAB conference held in Asia ten years after the Beijing meeting held in May of 1997.

The conference site is tentatively set at PJ Hilton Hotel near the campus of the University of Malaya in Kuala Lumpur. The registration fee is US \$250 per participant, with a discounted fee of US\$150 for students. Participants who pay the registration fee before the end of January of 2007 will enjoy an early bird discount and pay only US \$200. The registration fees will cover the costs of abstract booklet, daily snacks, lunches, welcoming party, certificate of attendance, and a free sightseeing tour around the city capitol of Kuala Lumpur.

The World Conference in Bryology 2007 has come up with a rich, diverse and colourful programme, which

includes several talks by invited speakers who are the authority in their respective fields of specialization in bryology. There will be a formal dinner banquet with Malaysian cuisine (separate payment), and a number of exciting pre- and post conference bryological excursions to well known mossy forest reserves in SE Asia, like Cameron Highlands in Peninsular Malaysia and the Mt Kinabalu Nature Park in Sabah State in northern Borneo. Participants in these bryological excursions will see a great number of local bryophytes and rare endemics, such as *Ephemeropsis tjiobodensis*, *Polytrichadelphus archboldii*, *Spiridens reinwardtii*, *Rhacocarpus alpinus*, *Dawsonia grandis*, *Takakia lepidozoides*, *Mizutania riccardioides*, and *Pleurozia gigantea*, to name a few.

The programme of World Conference of Bryology 2007 will have six sessions spread out into four meeting days, each with a theme of its own, which are: (1) Systematics and Biogeography of Asian Bryophytes, (2) Molecular Phylogeny of Bryophytes, (3) Bryophyte Eco-physiology, (4) Bryophyte Morphology, Ultrastructures and Ontogeny, (5) Bryophyte Genomic Project and Genomic Study, and (6) Bryophyte Conservation and Economic Importance.

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The keynote speaker for the conference will be Prof. Rob Gradstein from the University of Goettingen in Germany. Additionally, every session will have one invited plenary speaker. Individual oral and poster presentations revolving around the six session themes are welcome. The deadline for the submission of title and abstract of the oral and poster presentations is on 31 March 2007. There will be an award given to the best poster presentation, and another award given to the best oral presentation given by a student at the conference.

An announcement of a list of 3 to 4 stars hotels with discounted room charges for IAB participants at the world conference, and low cost hostel accommodation, will be made known in the next announcement of the conference.

Interested members who plan on attending this world conference in 2007 in Kuala Lumpur of Malaysia are urged to contact the host institution in Malaysia by emailing (see below) in order to receive the next circular which will be released with more information in February of 2007.

Professor Haji Mohamed Bin Abdul Majid, Dean, Faculty of Science, University Malaya, 50603 Kuala Lumpur, Malaysia. Email: [haji@um.edu.my](mailto:haji@um.edu.my); Prof. Dr. Amru Nasrulhaq Boyce, Institute of Biological Sciences, Faculty of Science, University of Malaya, Kuala Lumpur 50603, Malaysia. Email: [amru@um.edu.my](mailto:amru@um.edu.my); and Dr. Benito C. Tan, Department of Biological Sciences, National University of Singapore, Singapore, 119260.

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### **New Bryological Times' country contacts**

The editor is pleased to announce the new country contact for Austria. You may be contacted by Harald Zechmeister to contribute to the Bryological Times. Or take the initiative yourself and report to the country contacts any relevant bryological news.

#### **Dr. Harald G. Zechmeister**

I'm working as senior researcher and lecturer in a freelance position for more than twenty years at the Faculty of Life Sciences, Department for Conservation Biology, Vegetation- and Landscape Ecology, Vienna University.

My main research foci are: (1) Bioindication and biomonitoring by the use of bryophytes, especially regarding environmental pollution, e.g. the monitoring of heavy metals, PAH's and nitrogen deriving from various sources (e.g. industrial sites, traffic emission, overall deposition); (2) Studies on bryophyte diversity in various habitats, e.g. wetlands, dry grasslands or continental saline habitats. An emphasis is given on the influence of land-use intensity on species diversity in agriculturally used landscapes.

A new focus will be given on bryophytes (meta)population biology.

Picture taken during an excursion to Pb-Zn contaminated mining dumps at the Hochkönig, Salzburg, Austria.



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## **PERSONAL NEWS**

### **Request for contributions**

Have you taken up another position, received a grant, started a research project, moved office?

The editor greatly welcomes contributions from bryologists to this column so that our membership is informed of the whereabouts!

Please do send short messages to the editor!

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## The ABLs presented the following awards in 2005

**A. J. Sharp Award** (best student presentation at the Annual Meeting, Austin, Texas), **Matthew P. Nelsen** (with Andrea Gargas) Univ. of Wisconsin, for his presentation, "Photobiont Diversity and Fungal Specificity in the Lichen Genera *Lepraria* and *Thamnolia*."

**Sullivant Award** (best bryophyte paper in *The Bryologist* for 2004), "Molecular, Morphological, and Phytochemical Evidence for a Broad Species Concept of *Plagiochila bifaria* (Hepaticae)." **Jochen Heinrichs**, **Henk Groth**,

**Melanie Lindner**, **Kathrin Feldberg**, and **David S. Rycroft**, *Bryologist* 107: 28–40.

**Tuckerman Award** (best lichen paper in *The Bryologist* for 2004), "Secondary Chemistry of Lichen-forming Fungi: Chemosyndromic Variation and DNA-analyses of Cultures and Chemotypes in the *Ramalina farinacea* Complex. **Elfie Stocker-Wörgötter**, **John A. Elix**, and **Martin Grube**, *Bryologist* 107: 152–162.

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## RESEARCH NEWS

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### Diversity of bryophytes in urban ecosystems – a new research project

Genetic diversity forms the basis for adaptation by natural selection. Large populations of naturally outbreeding species usually have extensive genetic diversity, but the level is usually reduced in populations and species of concern for conservation. Many plant species have declined as a result of human activities, such as habitat fragmentation and reduction, which have led to a decrease in population size and genetic diversity. Anthropogenic effects are generally most pronounced in urban ecosystems, where habitat fragmentation may be accompanied with major changes in the quality of the environment and possibly exposure to environmental contaminants. The extinction risks of species may be reduced by evolving suitable adaptive characteristics to survive in less favourable conditions. Yet, in many cases, active conservation actions are needed.

We have now initiated a project to investigate the population biological processes of bryophytes in urban ecosystems. For that purpose, we have received funding from the Maj and Tor Nessling Foundation, which allocates grants to environmental research in Finland. The project is planned to last for three years. The research concentrates on three species of bryophytes, the mosses *Pleurozium schreberi* (Willd. ex Brid.) Mitt. and *Rhytidiadelphus squarrosus* (Hedw.) Warnst., and the hepatic *Plagiochila asplenioides* (L.) Dumort., which are all common taxa and known to occur also in human-impacted habitats.

The general aim of the project is to investigate population processes, including genetic diversity, demographic structure and the role of selection in the maintenance of adaptive variation, and to find the causes influencing the performance of bryophyte populations occupying urban ecosystems when compared to populations inhabiting natural habitats. The two specific hypotheses are the following:

**(1) Plants in urban and natural habitats differ in the amount and distribution of genetic variation.** Since urban habitats are commonly limited and fragmented, the level of migration and gene flow between populations may become lower and populations may decrease in size. Consequently, chance events (genetic drift) may have a significant role in shaping the population genetic characteristics. A low level of variation, greater differentiation between populations and reduced adaptation ability may result. On the other hand, new adaptations may develop. Dispersal ability of the plants becomes especially important in fragmented habitats with increased distances between populations.

**(2) The characteristics of genetic variation are related to the prevalence and performance of the plant species in its habitat.** Research on the three bryophyte species will result in knowledge of the role of genetic diversity and differential gene expression in the adaptation of plant populations to urban ecosystems. We will also investigate the need of habitat corridors as dispersal corridors and landscape linkage to improve the success of plant propagation and genetic interchange.

During the project, population dynamics will be studied by monitoring selected populations for three subsequent years. Genetic assays include investigations on microsatellites, which are considered neutral and which generally possess considerable variation. We have already developed microsatellite markers for the three bryophyte taxa in connection with our previous projects. In addition, markers will be developed to study adaptive, gene-targeted variation in order to obtain information on functional variation and selection processes. The latter methods will still require considerable development work.

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## New research projects at Duke University, USA

Several new bryological research projects are currently getting started at Duke University, with support from the U.S. National Science Foundation.

**Phylogeny and speciation in *Sphagnum* section *Subsecunda*** -- The project has three major components. The first part involves a global analysis of peatmoss phylogeny in order to determine if genetic relationships reflect geographic proximity, or structural similarity among plants; that is, have similar morphologies in widely disjunct regions evolved convergently? The second part of the research investigates ecological, genetic, and morphological variation in a group of closely related species surrounding *S. subsecundum* s.s. that are widespread in North America, Europe, and Asia. The third portion uses DNA fingerprinting methods to study genetic patterns in populations where species occur sympatrically.

**NSF-PEET (Partnerships for Enhancing Expertise in Taxonomy): Systematics of the Daltoniaceae (Collaborative with W. R. Buck, New York Botanical Garden).** -- The Daltoniaceae are widespread in tropical and Southern Hemisphere regions and include 14 genera and some 215 species. This project will generate species-level monographs at its core, with supporting phylogenetic analyses based on DNA sequence data. The project includes funding for post-doc(s), graduate

student support and field-work. Dr. Gisela Olivan is joining us as a Post-doctoral Associate in January 2006. Applications for graduate work at Duke are invited! Prospective graduate student applicants should contact Jon Shaw.

**NSF-ATOL (Assembling the Tree of Life): Phylogeny of liverworts.** The project is a comprehensive collaborative investigation of liverwort phylogeny. The research team includes B. Goffinet (University of Connecticut: chloroplast genomics), Y. Qiu (University of Michigan: mitochondrial genomics), K. Renzaglia (Southern Illinois University: ultrastructural morphology), B. Crandall-Stotler & R. Stotler (Southern Illinois University: anatomy, morphology, taxonomy), J. Engel & M. von Konrat (specimen vouchering, taxonomy, educational outreach), N. Celine & R. Beaman (Yale University: informatics), D. Long (Edinburgh University), and J. Shaw (Duke University: nucleotide sequencing). Dr. Christine Davis will be working on the project as a Post-doctoral Associate as of January 2006. There is support for visitors to the lab who wish to work on liverwort groups of particular interest to them. Contact Jon Shaw if interested.

And for those of you who know her, we are happy to have Sandy Boles returning to the lab to work on the *Sphagnum* sect. *Subsecunda* project.

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## Bryology in Costa Rica 110 years ago: Life and Work of Adolphe Tonduz

I came across the name Adolphe Tonduz many times while preparing the Catalogue of Costa Rican Hepaticae and Anthocerotophyta. But Tonduz's name started to be more appealing to me when in one of the liverwort specimens he collected, I found what I think is a new *Harpalejeunea* species. The specimen was collected in Juan Viñas, Province of Cartago, Costa Rica, now an area of extensive sugarcane plantations, but at the time Tonduz collected it, the area was densely covered with forests of difficult access. In his travel relations he tells us of one of his bitter experiences<sup>1</sup>:

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<sup>1</sup> *From Santiago to Juan Viñas there is nothing particular to make notice of. Juan Viñas was earlier called Naranjo and all plants marked as coming from Naranjo are from Juan Viñas and not from other Naranjo in the Republic. Five years ago we had the chance to stay one week in this place, and it left us with mixed memories. By the time, the railroad didn't exist, and the roads were nothing but rivers of mud. We had to leave our horses stuck in these marshes until they could free themselves. One could easily imagine the grotesque and regrettable condition in which men and beasts arrived in town. In 1890 Juan Viñas, with its grass roofed houses showed certain analogy to the Indian towns. Just the huge metallic roof of the building of the Railroad Company showed off the ensemble. Around it swarmed in the mud the people of workers of all nations, employed in the railway construction. During the eight days I spent at Juan Viñas, there was no calm, the torrential showers followed each other from morning to evening. We were forced to hit on cryptogamy, and run to look for lichens*

“De Santiago à Juan Viñas, rien de particulier à noter. Juan Viñas portait anciennement le nom de Naranjo et toutes les plantes indiquées comme provenant de Naranjo sont de Juan Viñas et non des autres Naranjo de la République<sup>2</sup>. Nous avons eu il y a cinq ans l'occasion de séjourner une semaine dans cet endroit et nous en gardons un souvenir bien mélangé. A cette époque, le chemin de fer n'existait pas et les chemins n'étaient que des ruisseaux de boue. Il nous est arrivé d'être obligés d'abandonner notre monture dans ces marécages et d'attendre qu'elles pu se dégager. On peut aisément se figurer l'état aussi grotesque que lamentable dans lequel hommes et bêtes arrivaient au village. En 1890 Juan Viñas avec ses maisons aux toits de chaume présentait quelque analogie avec les villages indiens. Seule, l'immense baraque au toit métallique de la Compagnie de chemin de fer se détachait de l'ensemble. Autour d'elle

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*and mosses. For the latter, we had joyous hand, for we discovered a new genus, baptised by M. Cardot in this terms : "Hoc genus in memoriam professoris Louis Piré, de studiis bryologicis in Belgia meritissimi, instituo, et speciem adhuc unicam ejus filiae uxori meae, dedico" (Bull. de la Société Botanique de Belgique 32: 175).*

<sup>2</sup> *The Hacienda Naranjo was an earlier locality located ca. 1 km east of Juan Viñas. There are plant collections cited from there before the Juan Viñas existed. The locality referred in the text must be the train station at Infiernillo, next to the Rio Naranjo at 800-900 m elevation, called Juan Viñas (León, pers. comm.).*

pataugeait dans le borbier la foule bariolée d'ouvriers de toutes nations employés à la construction de la ligne. Durant les huit jours que je passai à Juan Viñas, il n'y eut guère d'accalmie, les averses torrentielles se succédèrent du matin jusqu'au soir. Nous dûmes forcément nous rabattre à la cryptogamie et enveloppé dans notre imperméable, courir à la recherche des lichens et des mousses. Pour ces dernières, nous eûmes la main heureuse, car nous découvrîmes un nouveau genre, que M. Cardot a baptisé en ces termes: «Hoc genus in memoriam professoris Louis Piré, de studiis bryologicis in Belgia meritissimi, instituo, et speciem adhuc unicam ejus filiae uxori meae, dedico» (Bull. de la Société Botanique de Belgique 32: 175. 1895)<sup>3</sup>.

After reading relations such as this, I was fascinated by the personage, and started to inquire about the life and work of this Swiss naturalist who has fallen into oblivion. Adolphe Tonduz was born in Pully, by the Lac Lemman on September 18<sup>th</sup>, 1862. I do not know much about his life in Switzerland (which I hope to investigate soon), but then he came to Costa Rica on June 17<sup>th</sup>, 1889, recommended by Schlechter to Henri Pittier as a botanist for his explorations in Costa Rica. That same year the Instituto Físico Geográfico Nacional was founded, and A. Tonduz was head of the botanical service, in charge of the herbarium, which then became the National Herbarium (CR). They did a good job, especially Tonduz, for within a few years, in 1904, CR contained 18 000 plant specimens including 5 000 species of phanerogams and cryptogams (Standley 1950). Tonduz continually suffered from the lack of consideration of his boss Henri Pittier, especially because he and T. Durand decided to delete his name from the plant collections (see Gómez 1977). That has certainly brought some confusion to the deeds of botanists dealing with taxa described in the *Primitiae Florae Costaricensis*.

Besides being a good collector and storyteller, Tonduz happened to know his bryophytes as well<sup>4</sup>:

«Comme au Costa Rica, le départ d'un train est annoncé un quart d'heure à l'avance par un sifflement prolongé: il est bien difficile de le manquer. Nous pouvons donc sans crainte nous écarter à une certaine distance sur la route de Guadalupe (sic). Sur les talus de cette route croissent deux mousses, *Funaria calvescens* Schwaegr. et *Philonotis nanodendra* C. Müll. C'est la station unique et classique de cette dernière nouvelle espèce. Une hépatique *Marchantia chenopoda* L. se trouve en quantité sur le même talus» (Tonduz 1895, p. 449)<sup>5</sup>

<sup>3</sup> This refers to the description of *Pirea* Cardot, Bull. Soc. Roy. Bot. Belgique 32: 175. 1894. Later transferred to *Pireella* Cardot, Rev. Bryol. 40: 17. 1913.

<sup>4</sup> "Since in Costa Rica a train departure is announced 15 minutes before by a long whistle, it is very hard to miss. We could then without fear walk some distance on the way to Guadalupe. On the cliffs of this way grow two mosses, *Funaria calvescens* Schwaegr. and *Philonotis nanodendra* C. Müll. It is the type and only known collection site of that last new species. A liverwort *Marchantia chenopoda* L. is found in great amount on the same cliff".

<sup>5</sup> It is considered a synonym of *Philonotis uncinata* (Schwaegr.) Brid. (Allen 2002).

Tonduz lived a strenuous life in Costa Rica: in his travel relations he tells about the difficulties travelling around on water ways and land in hard living conditions. He suffered from the lack of attention from Pittier and co-workers. And probably from himself: he was a heavy alcohol drinker, which made him sometimes abandon his duties. After 1905 as Henri Pittier left Costa Rica for Washington and then Venezuela, Tonduz's life in Costa Rica became very hazardous, and he had to go into several different activities, even as worker in coffee plantations, to survive. In his last years in Costa Rica he was devoted to plant pathology, doing research on coffee; he was then hired as plant pathologist at the Agriculture Direction in Guatemala in 1921. He died in December that year, and the place of his burial is uncertain (Jiménez 1971).

Tonduz collected a significant number of plant specimens on which many new species have been described, and corresponded from San José with the leading European botanists of his time, such as Engler, Urban, Weber, and Barbey. About 250 flowering plant species have been dedicated to Adolphe Tonduz, in addition to 9 moss species (Renauld & Cardot 1893, 1905), 2 liverworts (*Stephani*) and probably many lichens too. His collections represent therefore a cornerstone as the basis of the modern botanical nomenclature in the neotropics.

I am carrying on research on the life and work of this exemplary botanist. His work will be re-edited and partly translated into Spanish by the Editorial System of the Universidad de Costa Rica.

Acknowledgments: R. Dressler made comments on the text, and J. León helped clarifying the identity of some localities.

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## 50,000-year old moss exposed in a South American Glacier

An ancient clump of moss has something to tell us, says the scientist who found it last summer in Peru—the planet is warmer now than it has been since ice covered that plant 50,000 years ago.

Ohio State University glaciologist Lonnie Thompson delivered that message to a few hundred scientists who crowded a lecture hall at the December 2004 American Geophysical Union meeting in San Francisco. More than 11,000 scientists attended the annual meeting where Thompson gave several presentations (including one about drilling an ice core from the saddle between Mounts Bona and Churchill in Alaska) and was a featured speaker on National Public Radio's Science Friday.

In his lecture, Thompson, who holds a record for most days living above 18,000 feet, told about visiting Quelccaya ice cap in the Peruvian Andes, a tropical glacier system that formed at high elevation with its summit at about 18,600 feet. In 2002, he and his colleagues found a bed of plants recently exposed by melting of the ice cap. They sent the plants to be carbon-dated, and lab results suggested that the plants were alive about 5,200 years ago, when a growing Quelccaya entombed them in ice.

After learning of the date when the plants were frozen, Thompson spent time reading up on other examples of the same rapid cooling period, so quick it could freeze a green plant that would endure beneath an ice cap for thousands of years. One example was the "Ice Man" of the Austrian Alps that appeared recently from a melting ice field and whose frozen carcass was dated to 5,200



years before the present. Another clue was the fact that the narrowest tree rings in studies of ancient wood of Ireland and England appear about 5,200 years ago. Thompson spoke of several other examples of that abrupt climate change, which he said might have been caused by a sudden reduction in output from the sun.

*A member of an Ohio State University glacier research team gathers samples of a moss from the genus *Breutelia* recently uncovered as the Quelccaya ice field in the Peruvian Andes retreated. Carbon-dating provided an age for the plants of at least 50,000 years. Photo courtesy of Lonnie Thompson*

Though not related to the use of fossil fuels that accelerate greenhouse warming, the big change 5,000 years ago shows that Earth's response to changes, natural or manmade, can be dramatic and quick, Thompson said.

"We live in a sensitive environment," he said.

Having made that point, Thompson told about returning to Quelccaya in August 2004 and finding more plants emerging from the ice. Two of them dated to about 5,200 years, the same as the plants he found in 2002. The third, a clump of moss, came back from the carbon dating center at Woods Hole Oceanographic Institute as being older than 48,000 years and close to the 50,000-year limit for reliable carbon-dating.

"When I first got this (age) from Woods Hole, I said 'It's got to be a mistake,'" Thompson said.

He sent the moss sample back for another test at Woods Hole and later to the Lawrence Livermore National Laboratory in California. Both labs came back with estimates that the moss was more than 50,000 years old.

"One interpretation is that this icefield has not been smaller than it is today for 50,000 years," Thompson said. "It had to be colder all the way back to the time it was frozen."

The message of the moss is not an isolated one, Thompson said. Quelccaya ice cap is melting 40 times faster than it was in 1963, and other scientists at the meeting showed examples of "phenomenal" melting of glaciers in Greenland along with accelerated recent melting of most large bodies of ice in the northern hemisphere, including most glaciers in Alaska (while citing the work of Keith Echelmeyer and others at UAF's Geophysical Institute).

The irony of Thompson's discovery of the 50,000 year old plant and much of the recent work on glaciers is that while the finds are both exciting and compelling, their silent message is that the world is getting warmer, fast.

"It isn't good," he said.

Copyright: Ned Rozell. Science writer at the Geophysical Institute, University of Alaska Fairbanks.

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## Research possibilities at Duke, USA

**As part of a six institution effort to generate a robust phylogeny for the liverworts based on morphology, development, genomic characters, and nucleotide sequencing, we here at Duke are working on the sequencing aspect of the project.**

Opportunities exist for a faculty member at an American undergraduate college or university to visit Duke for 1-2 months to work with us on this project. If you have a liverwort genus that is especially dear to your heart and you would like to work on phylogenetic relationships based on DNA sequences, I invite you to contact me. We can submit a supplement request to the main grant to

support your travel and living expenses, and all research costs. This could be accomplished during a sabbatical, or during the summer; molecular experience not required, if you're interested in learning.

This opportunity is limited (by NSF requirements) to faculty at U.S. colleges and / or universities that do not grant Ph.D. degrees.

Please contact Jonathan Shaw for additional information at 139 Biological Sciences Bldg., Box 90338, Department of Biology, Duke University, Durham, North Carolina 27708. Phone: 919 660-7344, Fax: 919 660-7293

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## COUNTRY REPORTS

### Bryological News from Spain

**At the last General Assembly of the Sociedad Española de Briología - Spanish Bryological Society (SEB), which took place during the XV Symposium of Cryptogamic Botany (Bilbao, September 2005), Felisa Puche (Universidad de Valencia) was elected as new president and Juana María González Mancebo (Universidad de La Laguna, Canary Islands) as new secretary. Thus, Ricardo Garilleti (Universidad de Valencia) completed his term as president. SEB has been in good health which is testified by the fact that the society has now reached 100 members, many of them from foreign countries.**

Three new fascicles of the Project "Flora Briofítica Ibérica" (Iberian Bryophyte Flora) have been distributed among members of the Sociedad Española de Briología - Spanish Bryological Society (SEB). They include the following genera of Pottiaceae: *Scopelophila* (authored by Alicia Ederra), *Anoetangium* (Juan Guerra and Montserrat Brugués), *Barbula* (Ricardo Garilleti), *Leptodontium* (Juan Guerra), *Triquetrella* (Juan Guerra), *Stegonia*, *Pottia* and *Microbryum* (all three by (Rosa Ros and Olaf Werner), *Timmiella* (Alicia Soria, D. Gómez, Eugenia Ron and Juan Guerra), *Bryoerythrophyllum* (Maite Gallego), *Cinclidotus* (Alicia Ederra), and *Dialytrichia* (Paco Lara). Fascicles are available from the SEB for every person interested, see:

(<http://www.uam.es/informacion/asociaciones/SEB/>).

They are free for SEB members, and for non-members the price is 10 € each fascicle.

To my knowledge, three new doctoral dissertations were presented along 2005 in Spain (sorry if I forget someone). All three were girls. María Arróniz-Crespo's thesis (Universidad de La Rioja) was entitled "Effects of ultraviolet-B radiation on aquatic bryophytes from mountain streams" and was supervised by Encarnación Núñez-Olivera and Javier Martínez-Abaigar. On January 2006 María will begin a two-year postdoctoral grant in Sheffield with Gareth Phoenix. The Ministry of Education and Science of Spain will finance her grant. Gisela Oliván's thesis (Universidad Complutense de Madrid) was entitled "Taxonomical and phytogeographical

revision of some genera of Amblystegiaceae (*Calliergon-Drepanocladus-Scorpidium* group and related genera) in the Iberian Peninsula" and was supervised by Esther Fuertes. Gisela will begin a two-year stay in Duke with John Shaw. Finally, Ruth Juaristi's thesis (Universidad de Navarra) was entitled "Moss flora of the Spanish Western Pyrenees" and it was supervised by Alicia Ederra.

More mobility news. Isabel Draper (Universidad Autónoma de Madrid) and Susana Rams (Universidad de Murcia) have completed their respective pre-doctoral research stays with Lars Hedenäs (may I ask what do you give Spanish girls, Lars?). Pleurocarpous mosses from Morocco and Sierra Nevada, respectively, were the subject of their research. Also, Saúl Otero (a boy from Universidad de La Rioja) has developed a 3-month predoctoral stay in Argentina (both in Buenos Aires and Tierra del Fuego) with Carlos Ballaré, with the objective of studying the effects of ultraviolet radiation on Fuegian bryophytes.

There are a number of 3-year bryological research projects in Spain (again, sorry if I forget some of them) financed by the Spanish Ministry of Education and Science. María Jesús Cano (Universidad de Murcia), together with Maite Gallego, M. Crosby and A. Newton, are carrying out the study "Taxonomic revision of the genera *Hennediella* Paris, *Syntrichia* Brid. and *Tortula* Hedw. (Pottiaceae, Bryophyta) in South America." They will study the main taxonomic characters of the three genera, drawings, nomenclature, typifications, dichotomous keys, updated descriptions, habitat and distribution of all taxa accepted in the territory. Moreover, the phylogeny of the three genera and other related ones represented in South America will be investigated by morphological and molecular characters. Rosa Ros leads another project at the Universidad de Murcia, which is entitled "Biogeography and evolutionary processes in bryophytes. Studies in the Macaronesian Islands." They will study the population structure of seven endemic bryophytes of Macaronesia and seven closely related but widely distributed species through DNA based methods (nrITS and chloroplastic sequences, ISSR), in order to analyze possible obstacles to gene flow due to the situation on islands. Furthermore, they will compare

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widespread species with endemic ones to test the hypothesis that endemic species have a more restricted gene flow than widespread species. Finally, Javier Martínez-Abaigar, together with Encarnación Núñez-Olivera, Rafael Tomás, Nathalie Beaucourt, María Arróniz-Crespo and Saúl Otero (Universidad de La Rioja), will develop the project entitled "Validation of an oromediterranean bioindication net of ultraviolet-B radiation using aquatic bryophytes." Their objective is to relate the temporal variations in natural ultraviolet-B levels to the changes in those physiological variables which presumably respond more specifically to UV-B in aquatic bryophytes: UV-B absorbing compounds and DNA damage. Field work will try to correlate seasonal and interannual UV-B variations, which will be measured continuously *in situ*, to changes in the abovementioned physiological variables.

After presenting her Ph.D. in 2003, Graciela Calabrese is working at the Real Jardín Botánico in Madrid. She is investigating the taxonomy of the genus *Zygodon* in the Holarctic region.

The XIV Symposium of Cryptogamic Botany was held in the Universidad del País Vasco at Bilbao in September 2005. In its bryological part, it was organized by Patxi Heras and Marta Infante (Museo de Ciencias Naturales de Álava). Almost 200 cryptogamists, 162 presentations (32 of them with a bryological content) and 5 plenary conferences (among them a superb one by Jeff Duckett on the phylogeny of bryophytes and vascular plants) contributed to the success of the congress. The notable

presence of young people and Portuguese bryologists must be highlighted. Presentations were related to all the main topics of present bryology: floristics, taxonomy, molecular biology, physiology, ecology, bioindication, conservation, etc. In the social part of the congress, we could taste typical basque food and wines, and visit the Guggenheim Museum.

The XX Bryological Meeting was held on February 2005 in San Sebastián, La Gomera (Canary Islands, Spain). Juana María González-Mancebo, Ana Losada-Lima and Jairo Patiño-Llorente (Universidad de La Laguna) were the local organizers, and the National Park of Garajonay was especially visited. The localities sampled covered a good summary of the botanical diversity of this island, with heathlands, lauroid forests and mountains ("roques"). Some abroad colleagues attended the Meeting. Nine bryological contributions were also presented.

In 2005 the issues 26/27 of the SEB's Bulletin have been published. The SEB's past President, Ricardo Garilleti, has acted as editor. Contents were related to the 5th European Bryophyte Conservation Conference, which was held in the Botanic Garden of Valencia in September 2004. It was organized by the ECCB (European Committee for the Conservation of Bryophytes) and Felisa Puche from the University of Valencia.

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## MEETING REPORTS

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### Nordic Bryological Society excursion in Bulgaria

In 2005 the Nordic Bryological Society held its annual excursion in Bulgaria (SE Europe). From 9 to 19 July 22 bryologists took part in the field trip in the southern and southwestern part of Bulgaria. The main group was from Sweden: Nils Cronberg, the President of the Society, Leif Appelgren, Per Darell, Karin Wiklund, Helena Persson, Niklas Lönnell, Bo Karlsson, Daniel Thorell, Örjan Fritz, a lichenologist who joined the bryological team, Berit and Björn Hallenberg, amateur bryologists who became more and more familiar with mosses as the days passed. From Norway: Lars Söderström, Arne Pedersen, Svein Olav Drangeid. From The Netherlands: Heinjo During and his wife Dinnie During, Huub van Melick and his son Peter (who enjoyed bird watching and drawing), From Germany: Michael Lüth – we are looking forward to his professional pictures, and Florian Hans. From Poland: Jakub Sawicki and Mirosław Szczepanski, sorry Mirek if I wrote your family name wrong. Bulgarian group was: Anna Ganeva and Rayna Natcheva from the Institute of Botany in Sofia, Gana Gecheva, Plovdiv University, and Geko Spiridonov, the President of Wilderness Fund (NGO).

Vitosha Mt. and Vitosha Nature Park was visited first. This mountain is in the close vicinity of the capital town, Sofia, with the highest peak Cherni vrh (2293 m). The bryophyte species reported from Vitosha Mt. up to now are 313. Some of them (*Paraleucobryum sauterii*,

*Polytrichum longisetum*) are listed in the Bulgarian Bryophyte Red List.

The group visited the city center and left to the south, to Rila Mt. with the highest peak on the Balkan Peninsula, Mussala, 2925 m. Bryologists collected mosses and liverworts in Malyovitsa locality, in different kinds of habitats. The forest path led us through spruce forest along the river Malyovitsa up to the mountain pine (*Pinus mugo*) zone and to the subalpine region where waterlogged places along the river and streams were a gift to all *Sphagnum*-fans. Another picturesque place in Rila Mt. is the valley of Rilska River with beech (*Fagus sylvatica*) forests, oak forests (*Quercus daleshampi*, *Q. cerris*, *Q. protoroburoides*) and spruce (*Picea abies*) forests at the higher altitudes. Rila National Park and Rila Monastery Nature Park give refuge to forests of which 95% are of natural origin. The bryophytes species of Rila Mt. were found to be 382. *Barbilophozia attenuata*, *Cephalozia loilesbergeri*, *Cephalozia hampeana*, *Eremonotus myriocarpus*, *Gymnomitrium coralloides*, *Scapania crassiretis*, *Cynodontium fallax*, *C. strumiferum*, *Dicranella subulata*, *Dicranum brevifolium*, *Grimmia longirostris*, *Plagiobryum demissum*, *Scorpidium revolvens*, *Sphagnum riparium*, *Tortula mucronifolia* were reported for the present only from Rila Mts.

Before leaving to the south to Pirin Mt., bryologists had a little rest in Rila Monastery, the largest monument of the

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Bulgarian Renaissance, UNESCO cultural and historical heritage.

Pirin Mt. is another high mountain in Bulgaria. Part of it is calcareous and it was a good opportunity to collect bryophytes in such area. Looking for saxicolous species some of the bryologists almost "touched" the highest peak Vihren (2914 m). The reserve Bayuvi Dupki-Dzhindzhiritsa was declared in 1934 for the purpose of protecting the relict forests of Rumelian and Bosnian pine, and the large diversity of plant and animal species. In 1977, the UNESCO Man and Biosphere Program consolidated it as a biosphere reserve. Bryophyte flora of the Pirin Mts. comprises 362 species (92 liverworts and 270 mosses). This mountain is the only one locality for the present for *Anastrophyllum michauxii*, *Cephalozia ambigua*, *Lophozia decolorans*, *Marsupella brevissima*, *Scapania helvetica*, *S. scandica*, *Tritomaria execta*, *Brachythecium glaciale*, *Bryum creberrimum*, *Fissidens incurvus*, *Isopterygiopsis muelleriana*, *Polytrichum perigoniale*, *Ptychodium plicatum*, *Syntrichia princeps*, *Tayloria froelichiana*, *Tortella fragilis*.

The next mountain area to visit was the Rhodopes Mts. It covers about 18,000 km<sup>2</sup> to the east of Rila and Pirin. This mountain is also a part of the Thracian-Macedonian

massif in the central part of the Balkan Peninsula. The bryoflora is better studied in the western and central parts of the mountain and comprises about 260 species. There are species reported up to now only from the Rhodopes: *Barbula crocea*, *Bryum stirtonii*, *Didymodon ferrugineus*, *Grimmia crassifolia*, *G. muehlenbeckii*, *Gymnostomum viridulum*, *Seligeria campylopoda*, *S. donniana*, *S. pusilla*, *Sphagnum angustifolium*, *S. obtusum*, *Syntrichia latifolia*. The excursion route passed from western to the central part of the mountain. Considerably drier calcareous areas with petrifying springs and beech-silver fir forests considered relict from the Tertiary followed pine-spruce forests and peat areas in the most western parts of the mountain.

The last evening spent in the town of Chepelare was time for closing discussions, testing Bulgarian dishes and wine and making plans for next year's excursion.

The collected specimens wait for identification. New localities and also new species to Bulgaria are expected. There is agreement to publish a list of all collected species with names of the persons and their notes. Hope it will be ready soon.

Anna Ganeva

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## LITERATURE COLUMN

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### Key to the liverworts of Europe

**Identification Keys to the Liverworts and Hornworts of Europe and Macaronesia (Distribution and Status). Second fully revised and updated edition by R. Schumacker & J. Vána.**

The first edition of the "Identification keys to liverworts and hornworts of Europe and Macaronesia" published in 2000 was very successful : some 400 copies were sold. Thanks to comments, remarks, questions of many users encountering difficulties - especially in the keys to genera or in some keys for large genera, from students, beginners, experimented hobby and professional bryologists, as to recently published books and papers, we started since 2003 to prepare a 2nd fully revised and updated edition.

This 2nd edition, carefully edited by SORUS/Poznan, provides, a.o., new (or partly new) keys for *Conocephalum*, *Fossombronia*, *Herbertus*, *Lepidozia*, *Lophozia*, *Plagiochila*, *Riccia*, *Scapania*, *Telaranea*, etc., numerous new keys for subspecies or varieties, updated distribution data, many corrections to patronyms, an impressive number (ca. 300!) of new synonyms in the corpus as in the index and many new useful references to literature and illustrations until August 2005.

The book is provided with a metallic spiral binding. The price (including mailing costs) is 30 € (Europe) and 35 €

for other areas. A special student price at 25 € (Europe) or 30 € (outside Europe) can be given to students requesting one personal copy. For 10 copies or more a reduction of 10% will be considered. If you need an invoice, it will be sent after reception of your payment. If necessary (for institutions) a pro-format invoice will be delivered.

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Orders from Poland, should be addressed directly to [sorus@sorus.com.pl](mailto:sorus@sorus.com.pl)

R. Schumacker: Liège University, Department of Environmental Sciences B-4000, Sart-Tilman, B22, Belgium. Jiri Vána: Charles University, Department of Botany, Benátská 2, CZ-128 01 Praha 2, Czech Republic

## Bryophytes of the Piemonte, Italy

Pistarino, A, L. Miserere, R. Schumacker, S. D'Andrea, S. Zdeněk. 2005. *Briofite del Piemonte: la collezione della Val Sangone (Alpi occidentali, Torino)*. *Musea Regionale di Scienze Naturali - Torino. Cataloghi XV: 458 pgs, 336 maps, 179 figs. (hardbound). ISBN 88-86041-62-4.*

The Museo Regionale di Scienze Naturali of Torino (Northern Italy) published this catalogue of the bryophytes of the Sangone Valley. The Sangone river has its source in the eastern slopes of the Alps near the French-Italian border and flows from west to east until the city of Torino, where it sheds its water into the Po. The watershed is circa 270 Km<sup>2</sup> large and covers a wide range of habitats such as sedge-dominated grassland, calcareous grasslands, different heathland types and *Rhododendron ferrugineum* communities, several forest types (alder, beech, chestnut, hornbeam, larch forests), alpine communities and the various aquatic river communities.

The catalogue provides an introduction to the bryological exploration of the valley (dating back to the 18<sup>th</sup> century), to its geography, geology, climate and vegetation and devotes a special chapter to the bryological collections of the Botanical Garden of Rea, and in particular to the collection of G.G. Bellia, the former garden's director and first source of this catalogue. The next chapter compiles the bryological information (collectors, herbaria, inventoried locations, new finds for the area, red-listed species, and chorological and ecological information of the species).

For this catalogue, the authors completed the information of this collection with data from other herbaria (Civic Museum of Natural History of Verona, Herbarium of the University of Torino) and with literature data between 1785 (!) and 1981. The authors together with C. Cortini Pedrotti and J. Vana checked all herbaria specimens.

The present database upon which this catalogue is based contains over 6000 data of 55 liverworts and 290 moss species. In total 75% of the catalogue is based upon herbaria data. The catalogue lists all the species alphabetically per genus and for each species the following information is given: per herbarium (complete label information - locality, altitude, collection date, geographical grids including UTM), notes by the authors on distribution, rarity, threat, ....), a dot map and a colour picture of the species.

The catalogue is a very detailed contribution to the bryoflora of a relatively small area and is an interesting source of information for the bryoflora of Northern Italy and for bryologists willing to explore similar biotopes in this parts of the Alpine range.

To order: Museo Regionale di Scienze naturali, Via Giolitti 36, I-10123 Torino, Italy. 40 €.

G. Raeymaekers

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## Robert Ireland's Moss Flora of the Maritime Provinces

Alissa L. Feldmann announced on Bryonet that she found a source for photocopied (high quality) versions of Robert Ireland's Moss Flora of the Maritime Provinces and that she is taking orders. The price will be \$187 a copy (which includes shipping within North America), assuming a bulk order of 10+ books. All copies are printed on archival

acid-free paper and are casebound (hardcover) with a leatherette cover and the title embossed on the cover and spine. Contact Aissa L. Feldmann, ecologist, New York Natural Heritage Program, 625 Broadway, 5th Floor; Albany, NY 12233. Phone: 518-402-8946 or Fax: 518-402-8725. <http://www.nynhp.org>

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## TECHNIQUES COLUMN

### Filmmakers Miniaturise Moss

Why would anyone want to make miniature moss? Isn't the green stuff small enough already? Apparently not for the makers of the recent Hollywood blockbuster "King Kong." The film tells the fictional story of the discovery of a giant gorilla on a remote oceanic island. Much of the action takes place in a prehistoric jungle, which was recreated in the studio at a reduced scale for some scenes. This verdant setting was made of model trees and shrubs, landscape features such as fallen logs and miniature moss.

Real moss was not an option presumably because it would have been at the wrong scale compared with the other forest plants and would have dried out too rapidly under the studio lights. Instead the model makers employed a technique used to produce surfaces on a range of items including upholstery, carpeting and greetings cards. Called "flocking," the method involves the application of tiny synthetic fibres (flock) to an adhesive-coated surface using an electrostatic charge. Flock fibres can be just a few millimetres long and are ideal for creating the appearance of tiny shoots.

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The miniature moss for "King Kong" was made by the model crew at Big Primate Pictures Limited, a company set up for "King Kong." Jenny Morgan, who works for Weta Workshop, another company that contributed to the film, said that the filmmakers purchased bags of pre-coloured flocking and attached it to Dacron, a proprietary polyester.

"The organic quality [was] then enhanced in places by burning some of it with a gas torch," she said. "Then the combination of other departments input such as lighting, physical special effects and of course the director of photography and camera crew, make for convincing genuine moss."

"King Kong" was directed by Peter Jackson whose previous credits include the "Lord of the Rings" trilogy. Fans of those movies might recall a climactic scene in the

first film in that series in which a member of the Fellowship of the Ring dies on a bed of pleurocarpous moss at the base of a tree. That time the stuff was real.

Jackson's new film doesn't mark the first time that flocking has been used by the entertainment industry to make moss. The 1980s popular superhero series "Masters of the Universe" included a character called MossMan. As his name suggests, he was made of moss. When American toy company Mattel decided to issue a model of the character, they created his mossy look by coating him in green flock.

The making of miniature moss for "King Kong" was mentioned in a video diary initially available on the internet at [www.kongisking.net](http://www.kongisking.net). It was later released on the DVD "King Kong: Peter Jackson's Production Diaries."

Michael Simpson, e-mail: [mjs14@ualberta.ca](mailto:mjs14@ualberta.ca)

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## MEETINGS

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### International Symbiosis Congress

We are very excited about our next international symbiosis congress, organised by the International Symbiosis Society (ISS).

The Fifth International Symbiosis Society Congress is set for the University of Vienna, Vienna, Austria from August 4 - 10, 2006. The Society Congress is unique in that it brings together a collection of researchers representing a broad array of symbiotic systems, including mycorrhizal associations, coral-dinoflagellates, hydrothermal vent organisms, lichens, Wolbachia and other insect-microflora, cyano-based n-fixers, and so on. Featured keynote speakers include Margaret McFall-Ngai, Lynn Margulis, Colleen Cavanaugh, Todd Lajeunesse, Luis Villareal, et al. For more information, including registration and the process for submitting

contributing papers or posters, please access :  
<http://people.bu.edu/iss> <http://www.isscongress2006.com>  
or e-mail ISS president Douglas Zook at [dzook@bu.edu](mailto:dzook@bu.edu)  
or chief organizer/host Monika Bright at [monika.bright@univie.ac.at](mailto:monika.bright@univie.ac.at).

For additional information, please consult the website: <http://people.bu.edu/iss>, the Society's journal "Symbiosis International", or contact Dr. Douglas Zook, president of the International Symbiosis Society, Boston University, Two Sherborn Street, Boston, MA 02215, USA. E-mail: [dzook@bu.edu](mailto:dzook@bu.edu)

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Mires (bogs and fens) are often bryophyte-dominated ecosystems. The International Mire Conservation Group (IMCG) is an international network of specialists who promote, encourage and, where appropriate, co-ordinate the conservation of mires and related ecosystems. The IMCG's aim is also to enhance the exchange of information and experience relating to mires and factors affecting them.

The network encompasses a wide spectrum of expertise and interests, from research scientists to consultants, government agency specialists to peatland site managers. The network currently has over 400 contacts in almost 60 countries

The newsletter of the IMCG as well as a wide array of useful information can be downloaded from the organisation's website ([www.imcg.net](http://www.imcg.net)).

Hans Joosten, IMCG secretary-general ([joosten@uni-greifswald.de](mailto:joosten@uni-greifswald.de))

## WEB NEWS

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### FLORKART – a mapping programme

The recording program FLORKART was introduced in one of the last issues of the Bryological Times (n°14 of December 2004) with a map module, in which the location of geographical co-ordinates or grid numbers is displayed. The Bryological and Lichenological Working Group of Central Europe has decided to provide it for free through the internet. It can be downloaded from <http://ds9.botanik.uni-bonn.de/frahm>. It comes with a manual as pdf-file (212 Kb, in German) and the zipped program (12 MB).

The program is designed for mapping projects in Germany. It comes with a scroll list of all German bryophyte species. If one species is selected, the red list values are displayed automatically for all states of Germany. Also the maps provided are from Germany. Nevertheless the program can easily be modified for other mapping projects. The menu can be changed into another language and the maps can be exchanged. The co-ordinate system works as well and the grid system can also be adapted.

Jan-Peter Frahm

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### Index of Bryophytes, 2001—2004

Bob Magill & Marshall Crosby have compiled and had printed an Index of Bryophytes, 2001–2004, in which we attempt to list all names for mosses and hepatics published during this period. Citations are in an abbreviated form, and a bibliography of the publications in which the names were published is included in the Index. We have a limited number of printed (31 pages) copies available for distribution while the supply lasts.

and use the link to "Bryophyte Names Authority List". On that page there is a button to download the pdf of the Index of Bryophytes 2000-2004.

To obtain a hard copy, contact Marshall Crosby ([marshall.crosby@mobot.org](mailto:marshall.crosby@mobot.org)).

Robert Magill and Marshall Crosby

The Index may also be downloaded as a pdf file. Go to <http://www.mobot.org/mobot/tropicos/most/welcome.shtml>

## THESES IN BRYOLOGY 15

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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 interlibrary 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 Blanka Shaw ([blanka@duke.edu](mailto:blanka@duke.edu)).

**Carroll, Dawn M. 2003. Bryophytes as indicators of water level and salinity change along the Northeast Cape Fear River. Master of Science thesis, University of North Carolina at Wilmington. In English. vi + 42 pp. + 10 pp. appendix. Address of author: Dawn York, 116 Shorewood Hill Drive, Wilmington, NC 28409, U.S.A. E-mail: [dmc8183@hotmail.com](mailto:dmc8183@hotmail.com).**

This master's thesis focuses on the identification and description of bryophyte-environment relationships in wetland swamp forests of the tidally-influenced Northeast Cape Fear River in southeastern North Carolina, U.S.A. A total of 39 mosses and 21 liverworts were identified. *Cololejeunea setiloba* was new to the state. Bryophyte density and species richness were compared to flood depth relative to the swamp surface, salinity, and elevation of the swamp surface for three sites from riverbank to upland edge. There was a general trend of an increase in bryophyte

density and species richness as flood depth and salinity decreased. *Fontinalis sullivantii* was found to tolerate low levels of salinity in the range of 5–15 ppt. The species was also able to tolerate some desiccation but was physiologically challenged by it.

**Leblond, Sébastien. 2004. Étude pluridisciplinaire du transfert des métaux de l'atmosphère vers les mousses (*Scleropodium purum* (Hedw.) Limpr.): Suivi sur un site rural (Vouzon, France). Thèse de Doctorat, Université Paris 7 – Denis Diderot, Paris, France. [iii] 214 pp. In French with English summary. Address of author: Muséum National d'Histoire Naturelle, USM 505 Ecosystèmes et Interactions toxiques, 57 rue Cuvier, Case 39, 75231 Paris cedex 05, France. E-mail: [sleblond@mnhn.fr](mailto:sleblond@mnhn.fr).**

This doctoral thesis examined the use of mosses as bioindicators of atmospheric metallic pollution and how to convert moss concentrations of these metals into bulk depositional rates. The study was carried out in a rural area in central France, during one annual cycle (Oct 2001–2002), and focused on one moss species, *Pseudoscleropodium purum*. At the species level, a temporal monitoring of the shoot elongation and biomass production as well as chlorophyll degradation provided knowledge about the biology of *P. purum*. Seventeen metals were assayed, with moss uptake and retention greatest for Mn and K, and least for Na, Al and Si. A specific accumulation of nutrients (Na, Mg, P, K, Ca, Mn, Cu, Zn, Sr) is observed in the youngest tissues of the plant. Internal redistribution of elements between different parts of the moss may explain this distribution pattern. The physio-chemical state of an element could influence its capture by, and retention within the moss. It appears that particulate deposition is not captured as efficiently as soluble input. Temporal variations, and particularly seasonal differences, of bulk depositional rates and elemental concentrations in moss are significantly correlated.

**Nair, Manju C. 2005. Eco-systematic studies on bryophytes of Wayanad, Kerala. Ph.D. Thesis, University of Calicut, Kerala, India. In English. [vi] iii + 415 [+ 26] pp. + 2 reprints. Address of author: Botany Department, Calicut University, Malappuram Dist. 673 635, Kerala, India. E-mail: mossmoss@rediffmail.com.**

The doctoral thesis examines the bryophytes of the Wayanad District of Kerala State in the Western Ghats of northwestern India. It includes the Nilgiri Biosphere Reserve. The area has peaks from 700 m to 2100 m, with the natural vegetation consisting of tropical wet evergreen forests, tropical semi-evergreen forests, tropical moist deciduous forests and montane wet temperate forests. The majority of the thesis is a taxonomic treatment of the bryophytes of Wayanad, including keys, descriptions, specimen citations, line-drawings and color habit photographs. In total, 111 taxa of mosses (in 74 genera and 29 families), 53 species of hepatics (in 28 genera and 16 families) and five species of anthocerotous (in four genera and two families) are treated. The ecology of the flora is discussed in terms of vegetation and substrate preferences.

**Oliván Martínez, Gisela. 1999. Estudio de la flora briológica de la Sierra de Peña Sagra (Cordillera Cantábrica, Cantabria). Tesina de Licenciatura, Facultad de Ciencias Biológicas de la Universidad Complutense de Madrid. In Spanish. [v] 182 pp. Address of author: Magallanes 21 5C, 28015 Madrid, Spain. E-mail: giselaolivan@hotmail.com.**

This master's thesis examined the bryoflora of an area in northern Spain. A total of 246 bryophytes were found, 68 hepatics and 178 mosses. *Anastrepta orcadensis*, *Plagiochila spinulosa* and *Ctenidium molluscum* var. *sylvaticum* are newly reported from the Iberian Peninsula. Many species are new for the Province of Cantabria. The flora is dominated by species that are shade- and moisture-loving. Because of the predominance of acidic substrates, the bryoflora is mostly acidophilic. The biogeographic affinities of the flora are analyzed.

**Peralta, Denilson Fernandes. 2005. Musgos (Bryophyta) do Parque Estadual da Ilha Anchieta (PEIA), São Paulo, Brasil. Dissertação de Mestre, Instituto de Botânica, São Paulo, Brazil. [ix] 212 pp. In Portuguese with**

**English abstract. Address of author: Instituto de Botânica, Caixa Postal 4005, 01061-970 São Paulo – SP, Brazil. E-mail: denilsonfp@yahoo.com.br.**

This master's thesis treats 129 taxa of mosses in 66 genera and 30 families from a state park in the state of São Paulo in southeastern Brazil. All taxa are keyed, described and illustrated. Three species are cited as new to Brazil: *Lepidopilidium portoricense*, *Macromitrium contextum* and *Rhynchostegium riparioides*. Twenty-two taxa are new to the state of São Paulo. The highest diversity in the park were found in the Atlantic forest and the restinga (white sand forest). Most taxa were epiphytic or saxicolous.

**Singh, Ajit Pratap. 2002. Studies on liverworts (Bryophyta) of Khasi and Jaintia Hills: Meghalaya. Ph.D. thesis, Dr. Ram Manohar Lohia Avadh University, Faizabad, U.P., India. In English. 321 pp. Address of author: National Botanical Research Institute, Lucknow, 226 001, U.P. India. E-mail: ajitpsingh2000@yahoo.com.**

This doctoral thesis is a liverwort flora of a region in northeastern India. It treats 247 species in 59 genera and 23 families. Over 2/3 of the flora is newly reported for the region. The largest family is the Lejeuneaceae with 52 species, but *Frullania* is the largest genus with 31 species, followed by *Plagiochila* with 21 species. Quite a large number of "new" species are proposed, but are invalid in the thesis format, plus there are no type designations, although Latin diagnoses are provided. All species are keyed and described; many are illustrated. Twelve species are new to the Indian bryoflora, primarily in *Plagiochila* and the Lejeuneaceae.

**Streiff, Anne. 2005. Phylogenetic study of the *Grimmia* Hedw. (Grimmiales, Bryopsida) based on a combination of morphological and molecular characters. Thèse de Doctorat ès Sciences de la Vie (PhD), Université de Lausanne, Lausanne, Switzerland. In English with French abstract. ix + 125 pp. + 13 appendices (each paginated separately) + CD with gene matrices. Address of author: Conservatoire et Jardin botaniques de la Ville de Genève, ch. de l'Impératrice 1, case postale 60, 1292 Chambésy, Switzerland. E-mail: Anne.Streiff@cjb.ville-ge.ch.**

This doctoral thesis examined 40 species of *Grimmia*, representing the majority of those found in Eurasia. For the morphological analysis, 52 morphological/anatomical characters (33 gametophytic and 19 sporophytic) were used. *Grimmia*, as currently defined, was found to be paraphyletic. Three clades, corresponding to the subgenera *Rhabdogrimmia*, *Litoneuron* and *Gasterogrimmia*, were stable while the remainder of the *Grimmia* species formed an unresolved group indistinct from other Grimmiaceae. Chloroplast DNA sequences (*trnL-trnF*, *rps4*) were combined with the morphology to reconstruct a phylogeny of the genus. The trees supported the monophyly of Grimmiaceae and reinforced the paraphyly of *Grimmia*. Two main clades were resolved, *Rhabdogrimmia* and *Grimmia*.

**Zartman, Charles Eugene. 2004. Epiphyllous bryophytes and habitat fragmentation in the forests of central Amazonia. Ph.D. dissertation, Duke University, Durham, NC, U.S.A. In English. xi + 245 pp. + 2 tabs. Address of author: L. E. Anderson Herbarium, Department of Biology, Duke University, Box 90338, Durham, NC 27708-0338, U.S.A. E-mail: cez2@duke.edu.**

This doctoral dissertation is divided into five chapters, with the first one being a bit more than half the entire

dissertation. It is a floristic treatment of the epiphyllous bryophytes in the Biological Dynamics of Forest Fragmentation Project in Manaus, Brazil. There is a key to the taxa and descriptions and illustrations of the hepatics. The epiphyllous mosses are only keyed out. The illustrations are magnificent. The second chapter, "Habitat fragmentation and epiphyllous bryophyte communities in central Amazonia," was published in *Ecology* 84: 948–954 (2003). Chapter 3 is "Impacts of habitat insularity on metacommunity dynamics: Evidence from epiphylls in Amazonian forest fragments" and was published in *Biological Conservation*. The fourth and fifth chapters are in

review. Chapter 4 is "Non-equilibrium metapopulation dynamics in Amazonian forest fragments" (in review in *American Naturalist*) and chapter 5 is "Drift dodgers: High genetic variation and low structure in fragmented populations of the haploid epiphyllous liverwort *Radula flaccida*" (in review in *Molecular Ecology*).

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**UPCOMING MEETINGS**

**2006**

**March 11-12:** BBS-workshop, Ascot; inaugural meeting of the BBS Bryophyte Ecology Group. Contact: [J.bates@imperial.ac.uk](mailto:J.bates@imperial.ac.uk)

**March 11:** Annual Lecture day organised by the BLWG (Dutch Bryological and Lichenological Society. See [www.blwg.nl](http://www.blwg.nl))

**April 6 – 10:** BBS Spring field meeting: Straffordshire. Contact: Martin Godfrey: [marinandrosie@AOL.com](mailto:marinandrosie@AOL.com)

**April 28 – 30.** Blomquist Bryological Foray. Contact person: Molly McMullen, Cryptogamic Herbarium, Department of Biology, Box 90338, Duke University, Durham NC.

**June 26-27:** University of California, Berkeley: hands-on workshop in conjunction with the Joint Genome Institute oriented towards annotation of the *Physcomitrella* genome (see next for info)

**June 29 - July 1:** Moss 2006. University of California, Berkeley. Pre-registration by 17 February. please inform Brent Mishler (please copy your to both [bmishler@berkeley.edu](mailto:bmishler@berkeley.edu) & [sonia1@berkeley.edu](mailto:sonia1@berkeley.edu) and include travel days.

**July 1 - 13:** BBS Summer field meeting. East Sutherland and Orkney. Contact Mark Lowley (East Sutherland) at [m.lawley@virgin.net](mailto:m.lawley@virgin.net) or Rosemary McCance (Orkney) at [armccance@beeb.net](mailto:armccance@beeb.net)

**July 28 – August 3:** ABLs-Meeting. Chico, California. Info at: [www.abls.org](http://www.abls.org)

**Aug 4 – 10:** 5<sup>th</sup> Congress International Symbiosis Society, Vienna <http://www.isscongress2006.com>

**Sept. 8 – 9:** Annual general meeting and Bryological Symposium, Hatfield, Herfordshire. Contact. Drs. M.A.S. Burton at [m.a.Burton@herts.ac.uk](mailto:m.a.Burton@herts.ac.uk)

**2007**

**April 14-15:** BBS Spring field meeting, Northampshire (exact date to be confirmed). Contact: [joan.james1@virgin.net](mailto:joan.james1@virgin.net)

**July 23-27 IAB meeting in Kuala Lumpur, Malaysia.** See this issue of the BT (page 2). Organizers: Dr. Haji Mohamed and Dr. Amru N. Boyce, Fac. of Science, University of Malaya, Kuala Lumpur 50603

**August 12-16: ABLs meeting:** Xalapa, Mexico. See [www.abls.org](http://www.abls.org)