

The Bryological Times

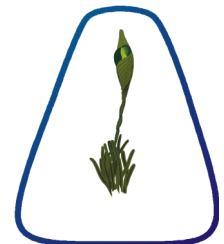
VOLUME 136

AUGUST 2012

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The Bryological Times

VOLUME 136

AUGUST 2012

From your Editor....

Thank you for picking up the latest issue of *The Bryological Times*. The summer edition is always a smaller volume due to people being busy at conferences, meetings, forays, or out doing field work. We at *The Bryological Times* hope it was a successful summer for all of you!

Please make sure to send us your updates and

reports on all of those exciting times and adventures. We would love to have your pictures, too. Just send your submission to DorothyBelle Poli at poli@roanoke.edu to get your submission into the next edition. *The Bryological Times* welcomes submissions from all subscribers and enjoys showing how bryophytes have

touched each of us in different ways.

As many get ready for new academic semesters to start, *The Bryological Times* also offers good luck to all gearing up to begin yet again. See you in the Fall!

SPECIAL POINTS OF INTEREST:

- Book reviews
- Websites that keep us up-to-date are announced
- Workshops and meetings

New Book on Canadian Bryophytes

Faubert, Jean, 2012. Flore des bryophytes du Québec-Labrador. Volume 1 : Anthocérotes et hépatiques. Société québécoise de bryologie, Saint-Valérien, Québec, xvii + 356 p., illus. Hardcover, 80 \$CAN plus shipping, Canada Post only. Payment through PayPal.

Flore des bryophytes du Québec-Labrador intends to survey, describe, and provide identification means to all mosses, liverworts and hornworts known to occur naturally in Quebec and Labrador. Identification keys to genera, species and infraspecific taxa are provided, and the following information is presented for each taxon :

- a short description with diagnostic characters,
- habitat and ecological preferences,
- a distribution map for Quebec and Labrador,
- additional comments,
- drawings pointing out characters useful or necessary for identification, and
- references to other relevant publications.

Many species which are likely to occur in Quebec and/or Labrador but have not yet been collected there are discussed or described. The book also includes photographs showing the general habit of each genus, artistic drawings depicting each family, an illustrated glossary, a bibliography, and an annex proposing French and English names.



Important Correction to Last Issue: Who are all of these important bryologists? When editing goes awry!



Due to editing too quickly, picture legends were lost in the last issue. Here are the pictures and legends as they should have appeared in issue 135.

Fig. 1. IAB executive committee meeting, St. Petersburg, 1975. From left: Peter Florschütz (vice-president), Robbert Gradstein (secretary-treasurer), Dorothy Steere, Bill Steere (president), Stanley Greene (vice-president). (Photograph taken by Zenonoske Iwatsuki).

Fig. 2. First IAB fieldtrip, Colorado 1973. From left: Eva Sobel, Patricia Nelson, Mark Seaward, Yolanda Alcorte, Gregory Kunkel, Robbert Gradstein, Marie-Claire Verdus, Willem Margadant, Ernest-J. Bonnot, Leila Shultz, Marie-Chantal Fabre, Kunito Nehira, Peter Florschütz, Norton Miller, Jeanne Florschütz, Andries Touw, Nancy Slack, Catharine Lafarge. (Photograph taken by fieldtrip organizer Bill Weber).



Fig. 3. Delegates at the IAB World Conference of Bryology, Tokyo, 1983 (scan).

IAB World Conference of Bryology, May 22-28, 1983, at National Science Museum, Tokyo



Fig. 4. Lewis Anderson (past-president) toasting at the World Conference in Tokyo. *On his right:* Jerzy Szweykowski, Rob Gradstein and others.

Fig. 5. Hiroshi Inoue (president) and Diana Horton dancing at the World Conference in Tokyo.



Fig. 6. Patricia Geissler, organizer of the taxonomic workshop in Geneva (1979), and Wolfram Schultze, editor of *Advances in Bryology*.

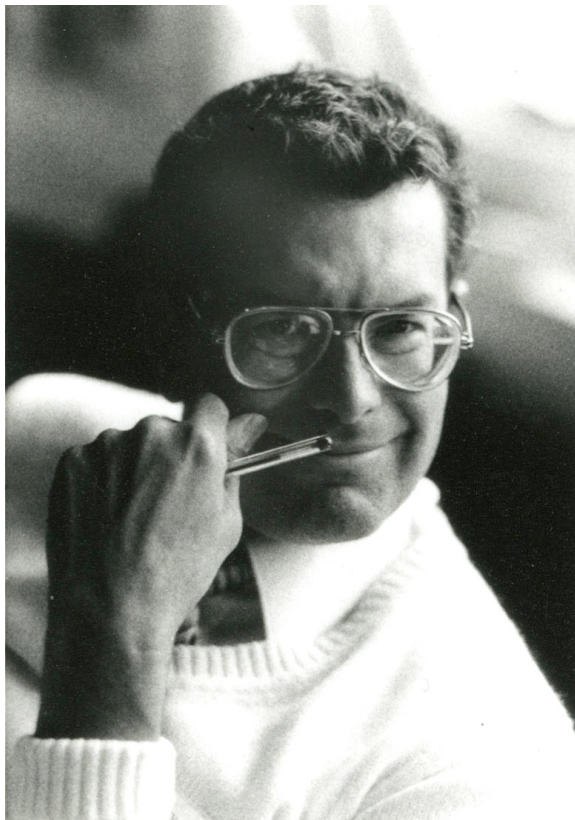


Fig. 7. Dale Vitt, secretary-treasurer of the IAB during 1987-2005.

From Panama

by Noris Salazar

On the 19th of July, two undergraduate students directed by Noris Salazar Allen, Maritza Moya and José A. Gudiño L., presented to the jury and general public their B.Sc. ("Licenciatura") senior research on the hornwort *Notothylas* and the thalloid liverwort *Dumortiera* respectively. The titles of their research were: Caracterización Morfológica de *Notothylas* de Panamá ("Morphologic characterization of *Notothylas* Sull. (Anthocerotophyta) of Panama") and Morfología y Ecología de *Dumortiera* *hirsuta* (Sw.) Nees (Dumortieraceae: Marchantiophyta) de la República de Panamá ("Morphology and Ecology of *Dumortiera* *hirsuta* (Sw.) Nees (Dumortieraceae: Marchantiophyta) in the Republic of Panama"). Both B.Sc. research thesis received an outstanding (grade A) evaluation by the three botany professors of the jury. After the oral presentation of their research, they answered questions posted by the jury and also by the general public, after which the jury deliberated and gave them their grades. This research thesis is the final requirement to obtain their undergraduate degree of Licenciado en Biología con orientación en Biología Vegetal (B.Sc. in Biology with major in Plant Biology).

Tools, Tips, and Techniques: Practical Indexing

by David Wagner

As a field botanist, one of my regular activities is identifying specimens or verifying species information by frequent consultation of a handful of references. My first foray into creative indexing was making a thumb index for my Flora of the Pacific Northwest. Considering how most dictionaries come with thumb indices, it seemed worth trying to make one that would have about 50 prominent vascular plant families indexed. The three or four hours of work it took to do this were amply justified. Not only did it save me hours of flipping through pages, it encouraged me to freely pick up the flora and verify instead of guessing. Accuracy of my work definitely increased.

When working with bryophytes I prefer to index the major genera. Figure 1 shows my copy of Paton's "The Liverwort Flora of the British

Isles." Figure 2 shows the thumb tabs in greater detail and Figure 3 shows the method. An index card is

used to make a template for the area to be cut out. A cutting mat is placed ON TOP OF the page to be indexed. I use a #11 scalpel blade to cut through forty pages (twenty sheets of paper). The important part is to plan which pages will be indexed. It is easy to want to do too many and run out of space on the outer margin of the book.



Figure 3



Figure 1

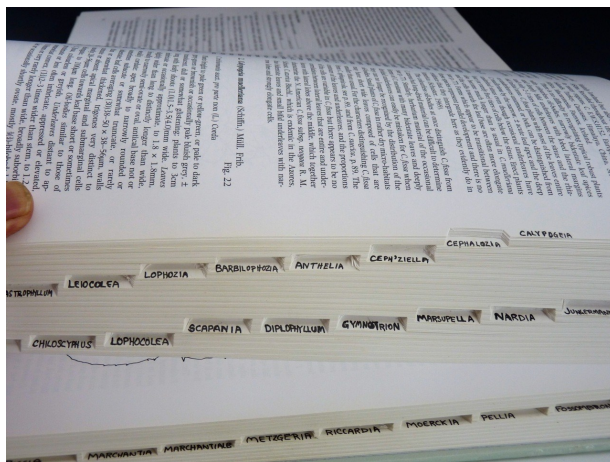


Figure 2

The second type of index I use is an invention that began with my address book. The index is printed on only one side of the paper and stapled on the right side. This might seem counterintuitive because most booklets have the binding on the left side when it is face up. However, because our writing is from left to right, it means the words to be indexed will appear lined up on the left side of a sheet. By staggering the sheets and trimming on the left, any item is quickly found. There are two examples here. The first (Figure 4) shows an index to the five most common references I use for liverworts, directing me to the pages for species of liverworts found in Oregon. The species are designated by six letter codes. This was printed out directly from an Excel file. It is much faster for me to find the page number of any particular species with this hard copy index than it is to open Excel, find the file,

Continue on page 7

and search out the page. This index sits right on top of the appropriate books on the bookshelf at my elbow.

The second example of this kind of index is an older one, made in 1998 when I was doing extensive cryptogam inventories in southwestern Oregon. It has all the mosses and liverworts known from the entire state, almost 700 names. I use it whenever I need to check spelling or authority of a name when typing memos, labels, or annotating. Again, the names are designated by six letter codes I have manufactured for rapid data entry both in field and when databasing. By using small type all 678 names fit onto 14 pages.

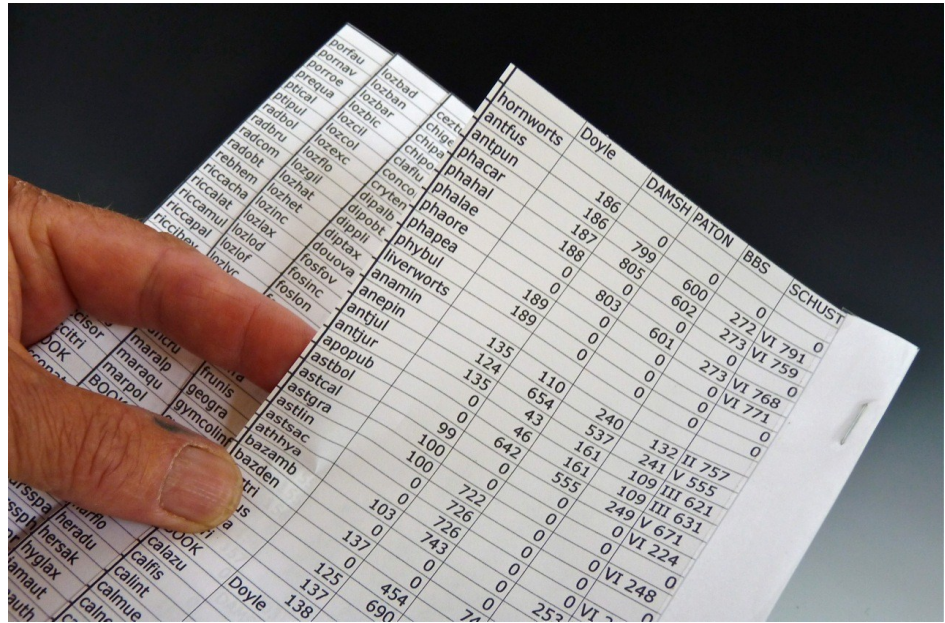


Figure 4

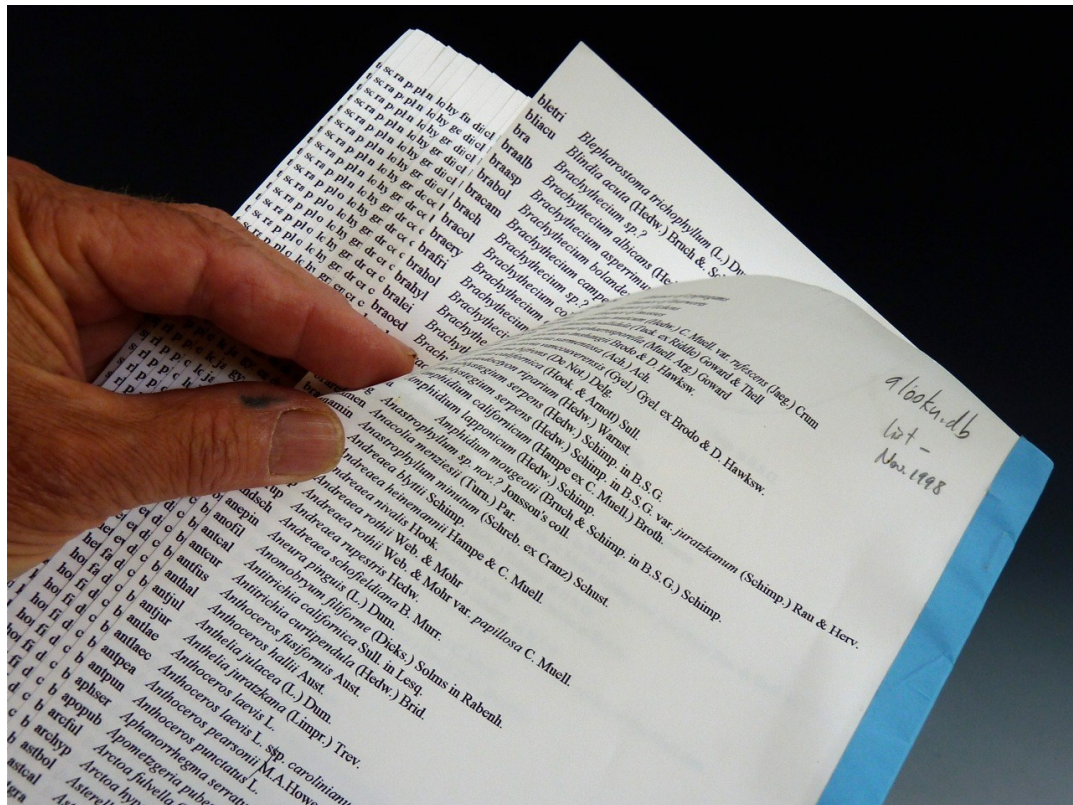


Figure 5

Review of 'Rare and threatened bryophytes of Ireland'

by Joanne Denyer

The island of Ireland (Republic of Ireland and Northern Ireland) has a rich bryophyte flora. The 835 bryophyte taxa comprise nearly 48% of Europe's bryoflora and bryophytes are a dominant vegetation component in many Irish habitats. However, a bryophyte Red List for Ireland has been long awaited by bryologists and conservationists. The recently published 'Rare and threatened bryophytes of Ireland' fills this Red List gap, but goes much further than simply producing a list of species with threat categories. It is beautifully produced, with over 500 photos of bryophytes and their habitats and covers the distribution, ecology and conservation status of threatened bryophytes in Ireland.

This book is the product of a collaborative project between the National Parks and Wildlife Service in the Republic of Ireland and the Northern Ireland Environment Agency. The project was co-ordinated by Neil Lockhart of the NPWS with co-authors and surveyors Nick Hodgetts and David Holyoak. This is no slim volume and the nine chapters and 638 pages allow thorough coverage of several main bryophyte themes. The introductory chapters give an overview of bryophytes in Ireland: their distribution (past and present), habitats and the history of bryophyte recording in Ireland since the 1600s. Richly illustrated with beautiful photography, they fill me with the desire to go out mossing every time I open their pages! The authors write clearly and scientifically, with statements backed up by references which, as a scientist, it a pleasure to read.

The Red List itself occupies a mere 35 pages or so, but is underpinned by over 10 years of field work and revision of herbarium material and historic records by David and Nick. From 1999 to 2010, they undertook annual field surveys of 325 targeted bryophyte taxa. Two thirds of the survey time was spent revisiting historic sites, with a third of the time taken to explore new, potential localities for the target taxa. All Irish counties were visited, with the amount of time spent in each proportional to their richness. These records were supplemented by records from British Bryological Society summer meetings and additional recording by visiting BBS members (especially Sam Bosanquet and Chris Preston) and the newly formed BBS Dublin regional group. This data was used to produce a Red List of threatened bryophytes in Ireland, based on IUCN criteria. It is hoped that this will not only support the conservation and research of threatened taxa, but also encourage the inclusion of bryophytes in Ecological Impact Assessments in Ireland.

The third main theme of the book is the description of Important Bryophyte Areas (IBrAs) in Ireland. These are part of the Important Plant Area programme promoted by Plantlife International. IBrAs are selected solely for their importance for bryophytes. They do not offer protection to a site, but can be used to support conservation actions and initiatives. 47 IBrAs have been listed for Ireland and these are all described in this book. Each description includes a stunning landscape photo (many were taken by specially commissioned aircraft), a list of key taxa and protected and unprotected sites. It is hoped that in the future this part of the book could be produced as a downloadable PDF which could be taken into the field when visiting these areas. As with the Red List, it is hoped that the IBrAs will raise the profile of bryophytes in ecological studies and impact assessments.

The main section of the book is the 400 or so pages of species accounts. 251 taxa, including all rare and threatened bryophytes on the Red List, are given a full account. In addition there are short accounts for 146 taxa. In total, all Red List and nearly all Near Threatened taxa have a species account and there is a close up photo all 397 species. This is a great achievement and many photos were specially taken by the photographer Robert Thompson (who also designed the book), whilst others were donated by a range of bryologists. It is worth buying the book for the photos alone as many of these rare taxa are not covered in standard field guides and other publications. Species which have a full account also have very useful identification notes prepared by Nick and David, an Irish distribution map and text on the species' European distribution, ecology and biology. Ireland has no endemic bryophytes, so many of these species will be familiar to bryologists in Europe (and beyond) and this section of the book will have wide appeal.

The beautiful presentation of this book, wealth of data, scientific approach and photography mean that it will interest a diverse range of people. It is not an easily portable book and at just under 3.5kg it is likely to stay firmly on the coffee table. If the book is successful (which I don't doubt) then it is hoped that the publishers would consider producing a slim field volume with the species accounts and IBrA information. It would also be worth considering the publication (online or in paper form) of the Red List alone for easy reference by conservationists and ecological consultants.

Continued on page 9

Continued from previous page..."Rare and threatened bryophytes of Ireland"

As with all books of this nature, they are slightly out of date before they have left the printers and recent recording in Ireland has added several new species to the island list (both in the Republic and Northern Ireland) and many new records of rare and threatened taxa. A companion website to the book, on which regularly updated distribution maps could be displayed for the Red List taxa, would therefore be very useful.

There has been a recent resurgence of bryological recording in Ireland, with a growing group of keen resident bryologists. I'm sure that this book will be an inspiration to those bryologists and that bryophyte records will continue to flood in....

Dr Joanne Denyer

Dublin, 2012

joanne@denyerecology.com

A New Project on Bryophytes and Climate Change: MOVECLIM

This is to announce a new project that has just been launched for the next three years by the University of Réunion from the European NetBiome Call: "Montane vegetation as listening posts for climate change", where bryophytes and ferns will be used as model organisms to follow the effect of climate change on montane forests in islands.

This transnational project assembles bryologists and scientists from different archipelagos (Azores, Canaries, French Polynesia, Lesser Antilles, Mascarenes) and from mainland Europe. Four PhD students will be enrolled in this project.

The research group will be working on the diversity and distribution of bryophytes and ferns along altitudinal gradients on these high islands (Guadeloupe, Pico, La Palma, Réunion and Tahiti) coupled with fine scale climatic data.



gradients from lowland to summit and from the gene to community level, (2) Relate species diversity and distribution patterns to relevant life-history and functional traits, (3) Compare relationships between diversity and predictors across the islands, (4) Model species response to climate change in terms of range shifts, (5) Establish permanent plots for long-term vegetation monitoring. Scientific networking will include intensive sampling and environment monitoring across the islands. Novel modelling approaches will help infer the relationships between species performance and local conditions. The derived results will bring new evidence regarding species and community responses to climate change.

Overall, the results will be highly relevant for conservation managers and decision-makers. The original participation of local stakeholders (National Parks of Guadeloupe and Réunion) to a common research project will insure results transfer to conservation managers.

Visit our blog for more details:

<http://moveclim.blogspot.com>

Key words: rainforest, modelling, functional diversity, monitoring, ecosystem services, hot spot, permanent plots, biodiversity, altitudinal gradient, bryophytes, ferns, oceanic island

For more information, contact Dr. Claudine Ah-Peng (claudine.ahpeng@gmail.com).

The intended project specifically aims to: (1) Characterize bryophyte and fern diversity along altitudinal

**Conference & Workshop on
“Monitoring of Metals and Gases in Plants with Special Reference to Bryophyte Physiology & Climate Change”
(December 17 to 20, 2012)**

The Department of Botany of Bareilly College, Bareilly, India, a 175 year old prestigious institution of northern India, is organizing a conference & workshop on **Conference & Workshop on “Monitoring of Metals and Gases in Plants with Special Reference to Bryophyte Physiology & Climate Change”** from December 17 to 20, 2012.

You are cordially invited to participate in this event. Besides invited lectures the workshop will also provide practical on hand exposure on air and water quality analysis as well as operations of the instruments to measure status of health of plants during stress by *non invasive* tools

To register for the conference & workshop, you can use the pre-registration form attached with this mail or can be downloaded from the link given:

<http://www.bareillycollege.org/2012Climate.html>

confcc@hotmail.com

climaticchange2012@bareillycollege.org

Department of Botany, Bareilly College, Bareilly, UP, India

IMPORTANT DATES:

Last date for Abstract submission:	24 th October, 2012 (about one page/300 words including bar/table/histogram/maps)
Last date for Abstract acceptance:	30 th October, 2012
Last date for submission of full paper	30 th November, 2012
Notification of acceptance	31 st January, 2013
Publication of the proceedings and Copyright/Consent	31 st March, 2013

Themes

Our overall goal is to establish the future impact of the elevated CO₂ effect on the eco-physiological responses and bioindication value of pollution (metal and gas) in tolerant plants and mosses, their role in metal biomonitoring and C sequestration. Conference is aimed to identify the eco-physiological and eco-biochemical processes central to production and metal accumulation in tolerant plants and mosses under elevated CO₂ (which are likely to be affected by the doubling of the CO₂ concentration). The focus will be highlighting the investigations carry out with high CO₂ tolerant plants and mosses from natural habitat in forest vegetation in India.

Besides, being a Mega biodiversity Centre in having four biodiversity hot spot in the country, this Conference will also accommodate the contributions related to floristic and monographic studies of bryophytes from across the country.

Objectives

To highlight new knowledge related to Climatic changes and environmental sustainability.

To discuss issues concerning increase in CO₂ and response on metal tolerance, C sequestration and physiology of mosses.

Use of *non-invasive* tools (Photosynthetic Efficiency Analyzer) to measure the status of plants under elevated CO₂ and metals as well as screening for tolerant species.

To enhance collaboration and networking among experts in the various monitoring groups working towards environmental sustainability.

To provide a platform to the researchers involved in benchmark studies in India on the bryophytes (floristic, monographic studies etc.).



FLORE DES BRYOPHYTES DU QUÉBEC-LABRADOR Volume 1 : Anthocérotes et hépatiques

Auteur : Jean Faubert

RÉSUMÉ / Abstract

La Flore des bryophytes du Québec-Labrador se veut un recensement, une description et un moyen d'identification de toutes les mousses, hépatiques et anthocérotes qui croissent spontanément sur le territoire du Québec et du Labrador. On y trouve des clés d'identification des genres, des espèces et des taxons infraspecifics et, pour chaque taxon, une description suffisante pour sa reconnaissance, au moyen de traits saillants et caractéristiques; une indication de l'habitat et des préférences écologiques; une carte de la répartition connue au Québec-Labrador; des commentaires additionnels; une ou plusieurs illustrations montrant les caractères servant à l'identification et des références permettant l'approfondissement des connaissances.

Sont aussi discutés ou décrits plusieurs taxons qui sont encore inconnus sur le territoire considéré mais pourraient un jour y être découverts. L'ouvrage inclut également des photographies montrant l'aspect général de chaque genre, des illustrations présentant une interprétation artistique de chaque famille, un glossaire illustré, une bibliographie et une annexe proposant des noms français et anglais.

Flore des bryophytes du Québec-Labrador intends to survey, describe, and provide identification means to all mosses, liverworts and hornworts known to occur naturally in Quebec and Labrador. Identification keys to genera, species and infraspecific taxa are provided, and the following information is presented for each taxon: a short description with diagnostic characters, habitat and ecological preferences, a distribution map for Quebec and Labrador, additional comments, drawings pointing out characters useful or necessary for identification, and references to other relevant publications.

Many species which are likely to occur in Quebec and/or Labrador but have not yet been collected there are discussed or described. The book also includes photographs showing the general habit of each genus, artistic drawings depicting each family, an illustrated glossary, a bibliography, and an annex proposing French and English names.

INFORMATIONS TECHNIQUES

Citation recommandée : FAUBERT, JEAN, 2012. *Flore des bryophytes du Québec-Labrador, Volume 1 : Anthocérotes et hépatiques*. Société québécoise de bryologie, Saint-Valérien, Québec, xvii + 336 p., illus.

Parution : 06-2012

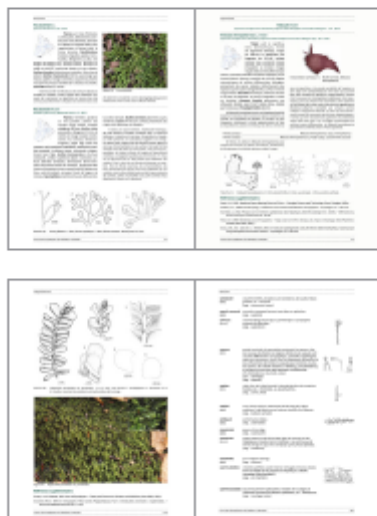
© Société québécoise de bryologie, 2012

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80,00 \$ CAD + frais d'expédition

Pour commander / to order : www.societequebecoisedebryologie.org/



L'AUTEUR

Jean Faubert est né en 1955 dans la banlieue sud de Montréal. Il est diplômé en biologie à l'Université du Québec à Rimouski. Au cours des années, il s'est constitué un herbier personnel de plus de 10 000 spécimens et travaille depuis quelques années comme consultant en botanique.

Il est l'auteur d'une trentaine de publications scientifiques portant sur la bryologie, de plusieurs textes de vulgarisation sur le même sujet, et contribue au projet *Bryophyte Flora of North America*. Président de la Société québécoise de bryologie, responsable du Comité bryologie de l'association *FloraQuebeca*, membre des associations *American Bryological and Lichenological Society* et *International Association of Bryologists*, il est aussi le rédacteur de la revue scientifique *Carnets de bryologie* qui a vu le jour en 2011.

Italian bryologist to the "Garden of the Gods"

by Carmine Colacino

From July 5-8, 2012 the Working Group for Bryology of the Italian Society of Botany held its excursion to the Pollino National Park in southern Italy, organized by members at the University of Basilicata-Potenza. We stayed in Terranova del Pollino (Province of Potenza - Basilicata) and visited a wind swept area on top of Serra di Crispo (about 2000 m a.s. l.) known as the "Garden of the Gods" characterized by the presence of Bosnian pines (*Pinus leucodermis**, endemics in southern Italy), these are among the oldest and bigger ones in the whole park with their stunted and deformed shapes molded by wind. The area has also krummholz of *Juniperus* and Mediterranean alpine meadows. Serpentine volcanic areas, as well as wet areas, were visited too. A report with a list of all bryophyte species collected in the area will be ready next September. We would like to thank the Park

Authorities and the Forest Guards for their assistance.

* The botanical name of the Bosnian Pine is *Pinus leucodermis* Antoine or *Pinus heldreichii* H. Christ. The two are considered synonyms by some, in this case the latter has priority, by others they are considered different species or subspecies of the same species).

It is a Balkan species relict in southern Italy. Also known in English, as Palebark pine. In Italian *pino loricato*, fr. *pin bosnique*, alb. *Rrobull*, pishë e kuqe. In Italy the scientific name *Pinus leucodermis* is more commonly used.



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by Bill Buck

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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/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 Matt von Konrat (mkonrat@fieldmuseum.org).

Averis, Allen Benjamin Godric. 1991. A survey of the bryophytes of 448 woods in the Scottish Highlands. M.Phil. thesis, University of Reading, England. [vii] 305 pp. In English. Address of author: Traprain Cottages, Haddington, East Lothian, EH41 4PY, U.K. E-mail: unknown.

The main aim of this master's thesis was to make a bryophyte species list for each wood, and to identify sites of importance for nature conservation. The survey provided an opportunity to examine the associations between bryophytes and environmental factors (climate, habitats, management history and atmospheric pollution). In this thesis there is a strong emphasis on oceanic bryophytes. They are closely associated with a humid, equable climate, and many species are therefore globally rare.

Brealey, Helen. 1996. Bryophyte community structure on granite boulders at Wistman's Wood, Dartmoor. B.Sc. thesis, University of Reading. iii + 79 pp. In English. Address of author: unknown. E-mail: unknown.

In this bachelor's thesis, patterns of community structure and the spatial distribution of saxicolous bryophytes were investigated with respect to boulder-surface microhabitat parameters, aspect and inclination in Wistman's Wood Forest Nature Reserve in the Dartmoor National Park between September and October 1995. Patterns of associations between species were analyzed using a plotless sampling technique which operates at the scale of the individual. Fourteen species of bryophytes were recorded, of which 12 had a cover value greater than 1%. In comparing species associations between aspects it was seen that only three relationships remained constant. These changes in species associations with aspect were explained in terms of the mosses' morphological and physiological adaptation to their environment. It was concluded that species which co-occurred significantly more often than expected in this study must be separated by other niche factors, the precise nature of which remained to be elucidated.

Budke, Jessica Meridith. 2011. Examining the gametophytic calyptra and its role in sporophyte development of the moss *Furnaria hygrometrica* Hedw. Ph.D. dissertation, University of Connecticut, Storrs, CT. viii + 106 pp. In English. Address of author: Department of Ecology and Evolutionary Biology, 75 North Eagleville Road, University of Connecticut, Storrs, CT 06269-3043, U.S.A. E-mail: jessica.budke@uconn.edu.

This doctoral dissertation focuses on the hypothesis that the calyptra is covered by a cuticle and functions to prevent desiccation of the moss sporophyte apex. It was observed that the calyptra has a cuticle that is multi-layered and thicker than the cuticle on either the leafy gametophyte or sporophyte. The calyptra cuticle develops precociously relative to sporophyte cuticle development. Experimental removal of the calyptra cuticle negatively affects sporophyte reproductive fitness. The findings support the hypothesis that the calyptra and its cuticle play an influential functional role in desiccation protection during moss sporophyte development.

Crowe, Joan M. 1975. An hepatic flora of southwest Thunder Bay District, Ontario. M.S. thesis, University of Manitoba, Winnipeg, Canada. [vi] iii + 277 pp. In English. Address of author: unknown. E-mail: unknown.

A checklist is provided in this master's thesis to the hepatics recorded from an area of 15,700km² adjacent to the northwest shore of Lake Superior, based on extensive field sampling and an examination of literature and collections. Of the 94 species known from the area, 75 were collected. The majority of species have boreal affinities and there are small arctic and temperate elements. An artificial key to all species is included, as well as local distribution maps.

Larraín Benoit, Juan Bernardo. 2012. Filogenia del género *Racomitrium* Brid. (Bryophyta, Grimmiaceae) y taxonomía de las especies latinoamericanas. Ph.D. thesis, Universidad de Concepción, Chile. vi + 293 pp. In Spanish (but one chapter in English), with English abstract. Address of author: Departamento de Botánica, Universidad de Concepción, Casilla 160-C, Concepción, Chile. E-mail: musgoschiloe@gmail.com.

The primary objection of this doctoral study was to reconstruct the phylogeny of *Racomitrium s.lato* (including *Racomitrium s.str.*, *Niphotrichum*, *Codriophorus* and *Bucklandiella*) using nuclear and chloroplast genetic markers, comparing the results with the morphological traits in the segregate genera, testing the monophyly of these four taxonomic entities. Additionally, a taxonomic revision of the Latin American species of the group is presented, testing the practical usefulness of the generic segregates at a local scale. For this purpose, the ITS region, *rps4-trnL* and *trnK/matK-psbA* were sequenced, including as many species as possible. It was found due to paraphyly, that a inclusive *Racomitrium s.lato* was the best taxonomic solution. Otherwise, to make all genera monophyletic, several additional genera would have to be described, yet all are part of a

Theses continued.....from page 13

monophyletic *Racomitrium s.lato*. Twenty-one species of *Racomitrium* are recognized for Latin America.

Medina Bujalance, Rafael. 2012. Estudios de taxonomía integrativa en el género *Orthotrichum* Hedw., subgenera *Pulchella* (Schimp.) Vitt (Bryophyta). Ph.D. thesis, Universidad Autónoma de Madrid, Spain. 220 pp. In Spanish. Address of author: Departamento de Biología, Universidad Autónoma de Madrid, Madrid, Spain. E-mail: Rafael.medina@uam.es.

This doctoral thesis had as its objective to use an integrative approach to understand the relationships within *Orthotrichum* subg. *Pulchella*. This focused on three species complexes, based around *O. scanicum*, *O. consimile* and *O. tenellum*. In addition to the examination of more than 750 herbarium specimens, several molecular markers (*atpB-rbcL*, *rps4*, *trnG*, *trnL-F*, *AdK*, *ort-Lfy*) were used for preparation of a molecular phylogeny. New synonymy is proposed and seven species are described as new to science, mostly from California.

Pokorny Montero, Cristina Isabel. 2012. Pleurocarpous mosses in space and time: biogeography and evolution of the Hookeriales.

Ph.D. dissertation, Duke University, Durham, NC, U.S.A. xx + 164 pp. In English. Address of author: Department of Biology, Duke University, Durham, NC. E-mail: pokorny@duke.edu.

In this doctoral dissertation, the Hookeriales provide a model for comparing morphological evolution in gametophytes and sporophytes, and its impact on alternative classification systems. The placement of *Calypstrochaeta* within the order is challenging even at the molecular level. The author studied diversification dynamics in this genus to elucidate possible mechanisms obscuring its placement and addressed biogeographic questions using the Tropical Conservatism scenario as the null hypothesis. Additionally, infraspecific molecular patterns in two species of *Calypstrochaeta*, *C. apiculata* and *C. asplenioides*, was compared to understand the disjunct distributions and whether they are the result of vicariance or long-distance dispersal. To understand the phylogeny of *Calypstrochaeta* and its allies, six molecular markers were explored from all three genomic compartments. The results indicate that the Hookeriales are monophyletic. Long-distance dispersal is the best explanation for the current distributions of *C. apiculata* and *C. asplenioides*.

8th Conference of the European Committee for Conservation of Bryophytes

By Neil Lockhart

The 8th Conference of the European Committee for Conservation of Bryophytes (ECCB) took place recently in Budapest, Hungary (from 18th-21st April, 2012). Hosted by the Hungarian Natural History Museum, the meeting was attended by over 60 delegates from 25 countries from all across Europe, with a strong representation from the Balkan states. The meeting was opened by Museum General Director, Dr István Matskási, and delegates were welcomed to the meeting by Dr Rozália Szekeres Érdiné, on behalf of the Hungarian Ministry of Rural Development, and by Dr Beáta Papp, Department of Botany, Hungarian Natural History Museum, who was principal organiser of the conference.

Prof. Tamás Pócs, and presentations on the status of bryophyte Red Lists from delegates from a range of countries, including Hungary, Spain, Russia, Turkey, the Balkans, Estonia and Cyprus. Perhaps the keynote address was from Nick Hodgetts, who presented the findings of a feasibility study 'Towards a new bryophyte Red List for Europe'. This study was commissioned by the Irish National Parks and Wildlife Service and the Swedish Environmental Protection Agency and discussed the need for a new European Red List, noting the advances in knowledge of taxonomy and distribution of bryophytes in Europe since the last Red List was published in 1995. The study reviewed the status of checklists and Red Data lists, on a country by country basis, and identified gaps in the information resource. The need for a new Red List for Europe was unanimously endorsed by the conference delegates.

The first day afternoon session dealt with current research towards ex situ conservation of rare and threatened bryophytes, with interesting presentations

European Committee for
Conservation of Bryophytes



The theme of the first morning session was on the importance of national bryophyte checklists and distribution maps, with an opening contribution from the eminent

Returning Loans or Sending Plant Specimens to Australia and New Zealand

by Rod Seppelt

There is a regular exchange of plant specimens between Australian, New Zealand and world herbaria. For this to occur, there are clear guidelines regarding handling of specimens and for their return to either Australia or New Zealand.

From time to time specimens are also sent by individuals to either Herbaria or individual researchers in Australia and New Zealand.

In order to maintain the highest level of border security in both countries there are clear guidelines to facilitate the entry of plant, animal, soil and microbiological samples. These guide-

lines have been developed in close cooperation and collaboration between Collection Managers of Australasian Herbaria and the respective Quarantine Inspection Service (formerly AQIS, now DAFF, in Australia; and MAFF in New Zealand).

All Herbaria in Australia and New Zealand have detailed guidelines readily available for any Herbaria or individuals intending to ship specimens to Australasia.

Failure to comply with these guidelines results either in seizure and probable destruction of the specimens or, if accepted by the addressee, considerable

financial burden before the material is released.

It is essential, therefore, that any Herbaria or individuals contemplating forwarding biological materials to Australia or New Zealand contact a Herbarium in either country to obtain details of how to forward the material. The necessary paperwork (full list of contents, details of required treatment to prevent the unwanted transfer of potential pathogens or harmful organisms, responsible forwarding person or institution, CITES numbers, etc.) must accompany any shipment.

All Over the World: Bryophytes, Workshops and Societies

Washington Native Plant Society and the Burke Museum, U. of Washington is sponsoring David Wagner to teach an intensive bryophyte workshop in September. Visit <http://www.wnps.org/bryophytes-workshop/index.html>

Romania Bryophyte Home Page:

<http://www.ibiol.ro/bucegia/index.htm>

British Bryological Society Workshops and Meetings <http://rbg-web2.rbge.org.uk/bbs/meetings/mtgsoth.htm>

Czeck Botanical Society <http://botanika.bf.jcu.cz/bls/english/index.html>

American Bryological and Lichenological Society <http://www.abls.org/>

The Nordic Bryological Society <http://www.sbf.c.se/NBS/Root.htm>



IAB on the Web: NEW ADDRESS

The new IAB site would be: <http://iab-bryologists-website.blogspot.com/> Change those bookmarks!

Free IAB-membership for students

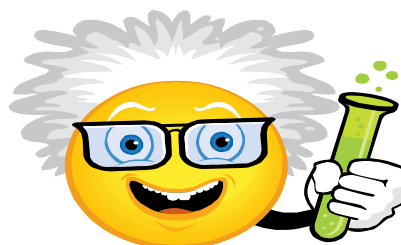
This is just a reminder that students can join the International Association of Bryologists (IAB) free for one year. Full information is on the website <http://www.bryology.org/> under the “How to Join” button. The new treasurer is Matt von Konrat. Email him at mvonkonrat@fieldmuseum.org



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

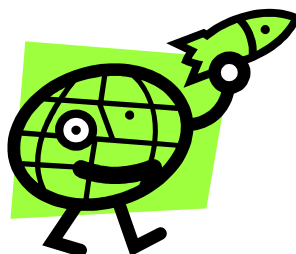
meetings, field trips, grants and awards, etc. If you have a BT country contact (see the last page), please have them communicate with DB Poli at poli@roanoke.edu to ensure all contact information is up-to-date. We look forward to hearing from you! Thank you!



Country Contacts Help: Speak up for your part of the World

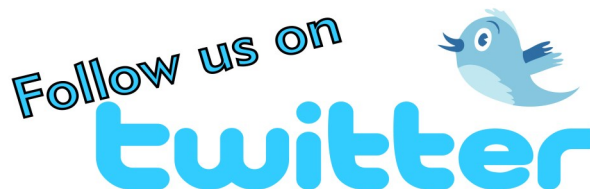
IAB and *The Bryological Times* is asking all of you to take on a leadership role to help all bryologists! Help us learn what the world's bryologists are doing by helping to communicate your country's news to DorothyBelle Poli at poli@roanoke.edu. DorothyBelle is looking to learn which countries are still not represented on our back page and then would like to find people to help with those bryological “holes.” Volunteer to help fill-in the world!

If your country is not listed on our list, please let DorothyBelle know. If you would be interested in being your country's contact or would like to find a replacement, again, please contact DorothyBelle today!



IAB on Twitter: Follow us TODAY!

You have TWO ways to follow IAB on Twitter...look for IAB by following @IAB_Bryology and by following @TheBryoTimes. Following these two accounts will keep you up-to-date on the latest happenings, society news, latest issues of *The Bryological Times*, and other bryophyte internet leads. We follow back, so follow us today!



Captain Obvious Strikes Again: Using Cell Phones to Learn!

By DorothyBelle Poli

For many of us, learning lab material has always involved drawing structures, observing them under a microscope, and drawing some more. As microscope cameras developed, teachers and students would benefit from the added ease to view microscopic images. We have learned how to incorporate those expensive tools into our classrooms and into our research. So what is the new part?

My story starts at the Humboldt Institute in Steuben, Maine this past August at the class “Ferns and their Allies” by Robbin Morran and W. Carl Taylor. During the lab portion of the course, I saw people using their fancy cameras to take pictures through the microscope eyepieces. This was working for most, but my own camera was not doing such a good job. I was upset and desperate to find a way to record my observations like everyone else. I remembered that I had my iPhone and it possessed a camera option. I thought, “why not try it?” all the while thinking it would be uneventful. Really, how could a cam-

era phone accomplish such a task? What I found was astounding! The iPhone worked! It let me take pictures that were of high quality (images between 1.5-3 Mb in size) but still manageable to send by email or to use in a PowerPoint presentation. I was even able to take videos of spores dehiscing with an easy way of modifying and disseminating the work! As the week progressed, I used my phone to take field photos and herbarium sheet pictures. Others began to do the same; many phones were not iPhones but they began to have success too. None of us thought to use this technology prior to “my discovery.”

Upon arriving back at Roanoke College, I found myself at the very beginning of a semester. Students began coming back into my office to talk about their summer adventures and I began telling them about my phone experience. I was so proud of myself... pioneering in such a cutting edge sort of way. Most of my students looked at me as if to say, “Doc, you are a little slow! We do this already.”

The more I chatted with students the more I realized I should begin to find ways to officially incorporate the use of this technology. For sure (and sadly) the art of drawing to learn seems to be dying. Microscope cameras can be expensive, but the student already has a camera phone! Studying for the elusive lab practical may be easier if the student is forced to use their own phone to begin to create a digital study guide for themselves. What if a contest was set up to capture the “best bryophyte in action” but they could only use a cell phone? The possibilities are endless once you start to think about how to use this tool!

I hope this quick blurb about phones has started your own mind to ring (sorry, I could not resist!). Sometimes we just need to be taught by the student; my goal was to share the lesson. Give this technology a try and send your own “phone photos” to *The Bryological Times* for the next issue.

Research funding opportunity for European natural history scientists



Europe's leading centres for systematics-related research invite scientists based at European institutes to access their collections and facilities with support from in-house researchers and curators.

Nineteen partner institutions collaborate to create an integrated European resource for researchers in the natural sciences in Europe and globally. As one important element, **SYNTHESYS** comprises a visiting scientist programme: Ten national Taxonomic Access Facilities (TAF; consisting of 16 of the partners) offer access – both physical and digital – to

- Collections comprising more than half of the world's natural history specimens
- World class libraries
- Facilities for state-of-the-art microscopy, chemical and isotope analysis and molecular laboratories, including qualified support
- Internationally renowned competence in the research fields of the participating institutions.

The institutions also collaborate in **Network activities** aiming to improve the management and preservation of and to advance the information network for European natural history collections.

A **Joint research activity** will develop non-invasive tools for optimal extraction of ancient and more modern DNA from natural history specimens.

The SYNTHESYS visiting scientist programme covers the costs for access to the facilities and logistical support at the host institution, international travel, local accommodation and provides a per diem to contribute towards living costs during short visits (maximum of 60 working days) at one or more TAF.

Please visit www.synthesys.info for full details on how to apply for funding, the list of all SYNTHESYS partners and their facilities, applicant eligibility criteria, and the application form.

**Call 4 for applications is open. Deadline
5 October 2012 (5 pm GMT)**

Please note that the project ends 31 August 2013 and all visits need to be finalized by **3 August 2013**.

SYNTHESYS was initiated by the Consortium of European Taxonomic Facilities (CETAF).

SYNTHESYS2 is a four-year, EC-funded Research Infrastructure Activity under the FP7 "Capacities" scheme.

Continued from page 14...8th Conference of the ECCB

on cryopreservation methods in the UK and in Norway, and in vitro cultivation techniques and growth experiments on rare bryophytes in Ireland. A poster session with over 30 exhibits took place in the Museum foyer prior to an ECCB board meeting. The board elected Dr Beáta Papp as new chairperson of the ECCB, with Tomas Hallingbäck as vice-chair and Nick Hodgetts as secretary. A further 12 delegates were elected as members of the board and the meeting thanked Prof. Lars Söderström as outgoing chairman for his long service and stewardship of the ECCB over many years. A steering group consisting of Beáta Papp, Tomas Hallingbäck and Neil Lockhart was elected to raise funds and oversee the implementation of recommendations towards a new Red List for Europe.

The second days' sessions covered a range of topics, including a fascinating multi-lingual presentation on progress towards a global unification of nomenclature, taxonomy and distribution data for liverworts and hornworts; attractive presentations on the bryophytes of the Madeira Archipelago; research into the potential response of montane oceanic bryophyte communities to climate change in Ireland; monitoring of hornworts as indicators of the effectiveness (or otherwise) of 'agri-environmental' schemes in Switzerland and Germany; the distribution of *Sphagnum* species in Croatia; field experiments on establishment by

spore dispersal in *Discelium nudum* in Sweden; and diversity, composition and occurrence patterns in woodland bryophytes in Hungary and Romania.

Most of the delegates stayed on for the two days of excursions from Budapest, led by Péter Ódor, Beáta Papp and Tamás Pócs, ably assisted by several of their Hungarian colleagues. The first excursion travelled northwards to the Pannonian oak-hornbeam woodlands of Vértes Mountains, where shaded

limestone rocks in Fejér County held populations of several species of *Anomodon*, including the rare *A. rostratus*. Nearby calcareous grassland and exposed rocks supported a rich diversity of bryophytes (and vascular plants), of which *Astellia saccata* and *Mania fragrans* attracted much attention. A short bus journey to Komárom-Esztergom County in the Gerecse Mountains took us to another exposure of limestone grassland, with many of the same bryophyte species, but with the addition of the recently discovered population of *Pyramidula tetragona*. Despite the very dry conditions, a good candidate for *Pyramidula*, with a single dehiscent capsule, was spotted.

The second excursion headed southwards from Budapest to the Great Hungarian Plain. Saline grassland on the Danube-Tisza Interfluvium, in Bács-Kiskun County, supported good populations of the rare *Entosthodon*



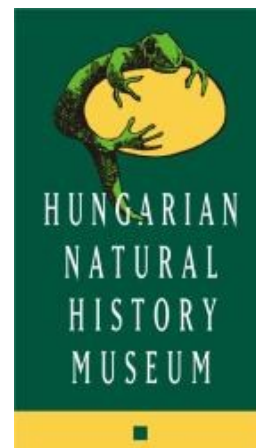
8th Conference of ECCB, Budapest, Hungary 2012

Continued from page 19....ECCB

hungaricus, with abundant sporophytes. A short stop at the sandy vegetation in Bács-Kiskun County showed the damage caused by invasive species, such as *Asclepias syriaca* in the open grasslands. En route to the Danube at Tolna County, we were privileged and enthralled to hear Tamás Pócs describe the history of the formation of the loess deposits that occur as cliffs along some parts of the river in this area. With the aid of Tamás's expert eye, and Norbert Schnyder's water spray bottle (much in demand), we were shown the rare *Hilpertia velenovskyi*, amongst several other diminutive xerophyte bryophytes that typify these cliffs.

The party returned by bus to Budapest and said their farewells outside the Natural History Museum with a commitment to continue work towards a new Red List for Europe and with the promise of another ECCB conference in Montenegro in 2016. Our thanks go to Beáta Papp and her colleagues for organizing such an interesting, enjoyable and fruitful conference in Budapest.

Neil Lockhart
National Parks and Wildlife Service,
7 Ely Place,
Dublin,
Ireland



Bryophytes in pictures

by Peggy Edwards



Please submit your own photographs to The Bryological Times. We would love to help share the beauty and diversity that exists around the world! Find a new species...send us a picture! Find one in a unique arrangement, send it along. Help us fill in this space, but to also make our publication beautiful!

Chlorophyll fluorescence measurements for validating metal tolerance moss to be used for atmospheric elemental monitoring

Dinesh K. Saxena, ¹Hazem M. Kalaji, Dheeraj Gahtori
dinesh.botany@gmail.com

Bryology laboratory, Department of Botany, Bareilly College, Bareilly, UP, India

¹Department of Plant Physiology, Faculty of Agriculture and Biology, Warsaw University of Life Science, Warsaw, Poland

There are many traditional studies on monitoring of the atmospheric metal contamination, but most of them have been limited by high cost and the difficulty in carrying out expansive sampling equipment's in terms of both time and space. There is, thus, an ever increasing interest in using mosses as inexpensive monitoring tools that can provide temporal atmospheric elemental profile.

Amongst plant materials, use of mosses as bio-monitor is very apt method to quantify the atmospheric elements and its trend due of their active and passive accumulation potentials. Bryophytes have played prominent role in air pollution studies (metal, nitrogen and ozone) throughout the world (ICP, Brasi-ca, Italy, 2012). Thus, there is a potential for the use of mosses for monitoring pollution at local, regional and national level. Bryophytes have two major advantages over conventional techniques involving precipitation collector to study atmospheric deposition. In mosses, metals are deposited in very high concentrations (Ruhling and Tyler, 1968, Saxena et al., 2010) without impairing physiological processes, and they retain them for quite a long time. Secondly, the low cost allows a greater number of sampling sites to be included (Zechmeister et al 2003, Saxena et al. 2010).

For atmospheric metal monitoring, common and widely distributed native species would be the best choice. However, one cannot rule out the sensitivity of species towards the metal concentration. As a result such species may not accumulate as much amount of metal as the tolerant ones and therefore they cannot be the best choice for monitoring purposes in the atmospheric metal monitoring program. It is difficult and cumbersome to identify such species without destroying them or examine the health status (photosynthetic performance) during metal stress and no photosynthetic performance of plants under field conditions seems complete without fluorescence data. To omit out sensitive species from the biomonitoring program, it is necessary to identify them using alternative *non invasive* tools in the field by estimating their photosynthetic efficiency based on measuring chlorophyll fluorescence signals, using Photosynthetic Efficiency Analyzer (PEA) before and after metal treatment. (Papageorgiou and Govindjee, 2004). Chlorophyll fluorescence analysis is one of the most powerful and widely used techniques available to plant physiologists and ecophysiologists. A number of excellent reviews exist that discuss the background of both measurement and analysis by eco-physiological point of view (Horton and Bowyer, 1990; Krause and Weis, 1991; Govindjee, 1995).

Such trials can be carried out in the field in a short duration (~30-40 minutes) by spraying different metal concentration on mosses. By estimating their maximal photosynthetic efficiency values through chlo-

Continued research blurb

rophyll fluorescence analyzer (HandyPEA), it is possible to check the physiological status of the mosses upon metal treatment since F_v/F_m (F_0 , F_v , F_m , variable to maximum chlorophyll a fluorescence) is related to photosynthetic efficiency. In healthy plants such measurements are close to .7-.8. As a result, a tolerant species can be identified in the field rather quickly by a non invasive approach and the same can be used for the atmospheric metal monitoring program. This concept is being proposed for all metal monitoring labs to validate the tolerant species amongst the common available species before inducting large scale metal biomonitoring program. This is important because, there are a number of moss species which are common and widely distributed, and can accumulate atmospheric metals depending on their accumulation potentials, which, in turn, depends upon the metabolic processes of the plant. It is not advisable to use all the moss species for bio-monitoring as their accumulation factor varies due to their differential response to metal toxicity.

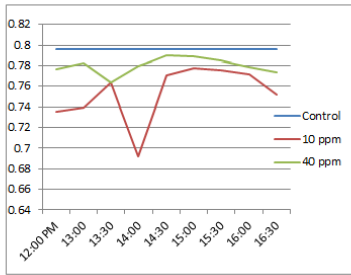
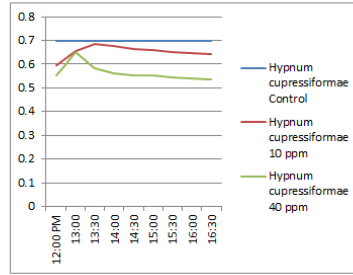
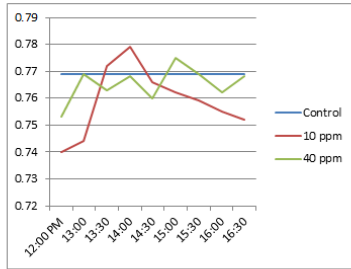
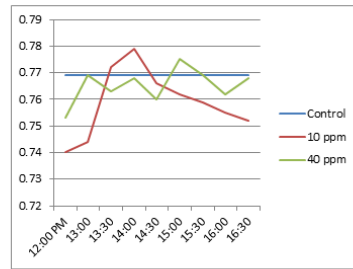
Therefore, to validate tolerant species it is desirable to validate the common available moss species by a *non invasive* tool by estimating photosynthetic efficiency, via chlorophyll a fluorescence measurements, because of the least effect of elevated metal on their physiology as well as on photosynthesis.

Proposed technique may be an alternative as well as a *non invasive* tool for the calibration purpose; it will be of great use in the biomonitoring program at national and international levels.

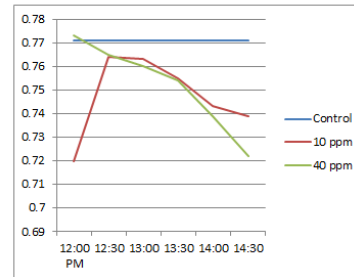
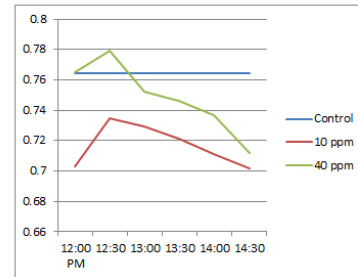
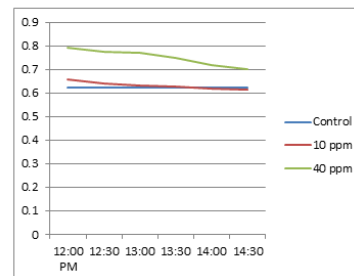
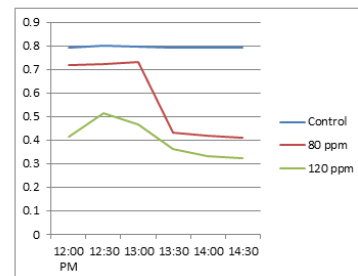
Reference:

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Effect of Zinc on different mosses:

*Thuidium cyanifolium**Hypnum cupressiformae**Dicranum scoparium**Rhodobryum gigantum*

Effect of Copper on different mosses:

*Thuidium cyanifolium**Hypnum cupressiformae**Dicranum scoparium**Rhodobryum gigantum*

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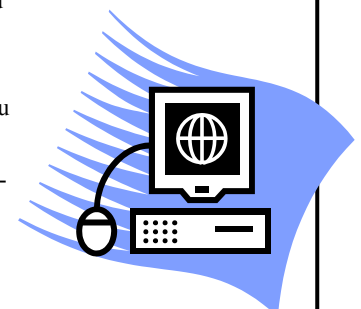
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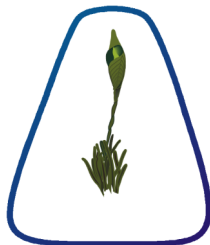
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IAB is on the Web:
<http://bryology.org>

IAB



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The International Association of Bryologists (IAB) is an organization open for all interested in bryophytes. For membership contact Matt von Konrat at mvonkonrat@fieldmuseum.org. Visit the IAB website: <http://bryology.org> for further information or to pay using PayPal.

The Bryological Times was founded in 1980 by S. W. Greene (1928-1989) as a newsletter published for the IAB. Items for publication in The Bryological Times are to be sent to the Editors, Regional Editors, or to the Column Editors. The newsletter is issued 3 to 4 times per year.

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