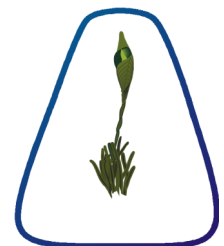


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**IAB**



# The Bryological Times

VOLUME 130

JULY 2010

## Special Issue: A Note from the Editor

By DorothyBelle Poli

To encourage bryologists that we can all learn from each other, this issue has two special parts. The feature article is by Annie Martin, "Mossin' Annie," to her friends. She is not at a research institution, but she is heavily vested in everything moss. She

brings a unique eye to bryology and has been a help to my own research. This issue of TBT features her article as a first in a two part series. In the next issue, we will learn some of her tips and techniques to moss garden!

The second special found in this issue relates to a column that will become a main portion of every issue! David Wagner has agreed to head a column based on some techniques and tips to help bryophyte research. Enjoy!

### SPECIAL POINTS OF INTEREST:

- *Check out the latest from Mossin' Annie*
- *Latest in bryophyte links for your laptop*
- *What's hot and new for workshops, trips, and meetings.*
- *Don't forget to learn a few new tips, tools, and techniques*

## Special Article: Enter the Magical World of Moss Gardens

By Annie Martin

### Mosses: Ancient Plants offering New "Green" Solutions for Today's Landscapes

The magical world of mosses is evidenced in verdant expanses that echo Earth's ancestry and our spiritual connection to nature. These ancient plants, dating back 450 million years, offer a vast array of "green" gardening alternatives in today's world. The year-round "green" appeal of bryophytes in sustainable landscapes is paralleled by the eco-friendly advantages of mosses and solutions they offer or many environmental challenges including air pollution and ground-water contamination. With consideration given to the extensive variety of bryophytes and following the horticultural

guideline, "right plant, right place," there is a "right moss for the right place." Botanical characteristics of mosses have implications for many "green" applications including moss lawns instead of grass; green roofs; moss instead of mulch; urban "greening" efforts, living walls, rain gardens, and water features as well as serene, green retreats associated with Japanese tea gardens or native restoration projects.

### Longevity and Sustainability of Moss Gardens

The grand moss gardens of Japan have attracted visitors for thousands of years. Their longevity confirms the sustainability of mosses in public gardens. In

America, bryophytes do appear in botanical gardens and arboreta yet their role is usually as an incidental groundcover or planting medium for orchids, not the featured plants. Although every other plant and tree is properly labeled with binomials and common names, rarely are the bryophyte plants identified with any signage. However, as bryologists extend their influence and share their expertise, mosses are gaining more recognition. One example is the Highlands Biological Station in Highlands, NC, a research facility affiliated with Western Carolina University, where they are now using permanent plant signage to identify bryophytes.

Continued p. 9-11

## MOSS 2010 in Japan but looking for the 2011 location

This year, MOSS 2010 will be held in Japan. It should be an exciting meeting and to learn more, please contact Tomomichi at

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

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

Phone: +81-11-706-2740

However, the next MOSS meeting still needs to be planned. It is Europe's turn and David Cove

has had several tentative offers and suggestions. He would now like somewhat firmer proposals from a potential local organizer, including possible dates and some idea of the cost.

Please send all questions, comments and proposals to David Cove at [d.j.cove@leeds.ac.uk](mailto:d.j.cove@leeds.ac.uk)

Once David has information, discussion of the possibilities will occur at Moss 2010.

Or the website

[www.ec-pro.co.jp/moss2010/welcomemessage.htm](http://www.ec-pro.co.jp/moss2010/welcomemessage.htm)

If you are interested in leading such an exciting meeting, please consider that July seems to be a good time, convenient to many, but that doesn't preclude other proposals.



## COSMOSS.org announces Workshop

The cosmoss.org team is pleased to announce the 3rd cosmoss.org *Physcomitrella* Genome Workshop from September 13th-15th 2010 in Freiburg, Germany.

Learn how to work with cosmoss.org and the *Physcomitrella patens* genome.

Find and annotate your gene(s) of interest. Get in touch with other people working with *Physcomitrella* and other bryophytes. Learn about genomics resources for other bryophytes.

All details can be found on this wiki page:

[https://www.cosmoss.org/physcome\\_project/wiki/Cosmoss\\_workshop](https://www.cosmoss.org/physcome_project/wiki/Cosmoss_workshop)

Due to space limitations in the computer lab the number of participants is limited.

Register until August 29th, 2010 on:

<http://www.cosmoss.org/register>

This year's special is a third day focusing especially on functional and structural gene annotation including a jamboree session.

See you in Freiburg!



## iPlant's DNA Subway is an easy way to teach genomics, annotation

(By DorothyBelle Poli)

In June I attended an iPlant Collaborative workshop about DNA Subway at Howard University in Washington DC (USA). iPlant is an initiative examining and developing an infrastructure necessary to study molecular biology in plants. Their goal is to make genomes accessible to all.

DNA Subway is a great tool to take into the classroom to teach gene annotation and genome prospecting because it streamlines the entire process! Prior to this program, teaching annotation was extremely confusing to the student because you had to jump between multiple websites to reach a final product. This website cuts down on that websurfing by pulling multiple programs into one place and putting them into a linear and logical fashion. DNA subway is optimized for plants at this time, and all of the typical model systems are included (for example, *Physcomitrella*). You can start with sequence or you can start with a genome. Researchers can also use this tool. Check it out today!



### DNA SUBWAY

Place students on fast track to  
gene annotation and genome comparison

Uwe Hilgert\*, Cornel Ghiban, Eun-Sook Jeong, David Micklos  
iPlant Collaborative/Dolan DNA Learning Center/Cold Spring Harbor Laboratory

\*contact: hilgert@cshl.edu, 1-516-367-5185 (O), 1-516-857-1693 (C)



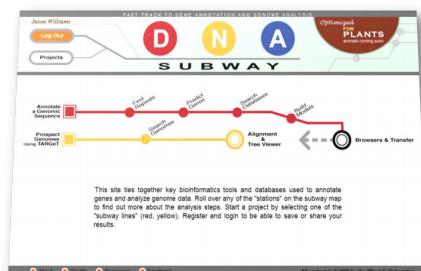
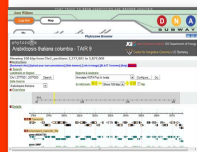
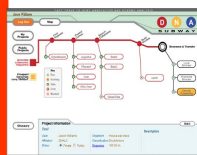
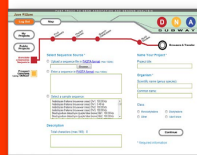
#### gene annotation

Create project  
Upload a sequence – or  
use one of the samples  
provided in DNA Subway.

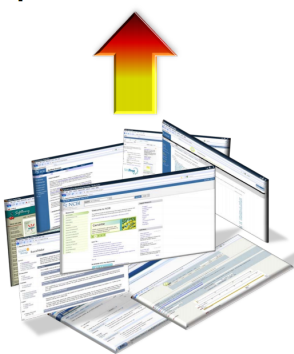
Gather evidence  
Use *de novo* gene  
prediction programs and  
UniGene/UniProt BLAST  
searches to generate  
evidence for genes.

Annotate sequence  
Use the Apollo Genome  
Annotation and Curation  
Tool to synthesize gene  
evidence into viable gene  
models.

Export results  
View evidence and  
annotations in a local  
version of GBrowse and  
export data to  
Phytozome.org.



One platform: DNA Subway



Disjointed tools & portals

DNA Subway integrates data with complex bioinformatics and visualization tools – predominantly open-source software – in an intuitive and appealing interface. Annotating and comparing genome sequences can bring to life elements of gene structure, function, and evolution that previously could only be approached as abstractions. By assembling gene models and comparing genomes, students engage in their own learning as they acquire a range of conceptual and process knowledge and begin to grasp the challenges and promises of a data-driven, modern biology.

Coming soon:

phylogenetics

next-gen analysis

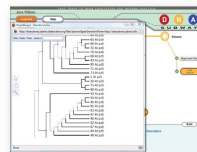
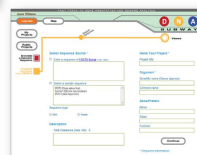
#### genome prospecting

Create project  
Upload a sequence – or  
use one of the samples  
provided in DNA Subway.

Search genomes  
Use TARGeT workflow  
(Tree Analysis of Related  
Genes and Transposons)  
to identify members of  
gene families in various  
plant genomes.

Analyze alignments  
View and edit TARGeT  
match sequence  
alignments in the Jalview  
Java Alignment Editor.

Examine relationships  
Examine relationships  
among TARGeT match  
sequences using  
PhyloWidget.



## 2010 National Symposium of the Bryological Society of China

The National Symposium of the Bryological Society of China will meet from 23—28 August at Guizhou Normal University in Guiyang city, Guizhou Province, P.R.China. The objective of the conference is to share and disseminate information on knowledge and scientific research work related to bryology. The symposium will provide the participants with opportunities for collaboration and networking among Chinese Universities and other scientific institutions to promote research and developing technologies in bryology. We want it to become one of the preeminent national forums for formal presentation and discussion of scientific advances concerning modern bryological sciences. The depth, breadth, and pace of scientific discoveries on the bryophyte biodiversity, ecology, taxonomy, biochemistry, biogeography, molecular biology, conservation and bryological education have increased enormously since 2000. The National Symposium of the Bryological Society of China will thus present a timely opportunity to stimulate and universalize the scientific studies on modern bryology sciences in China.

Guiyang, a unique destination in southwestern China, mingling rich multiculturalism, fascinating multi-millennial heritage and astonishing modernity. The 3.9 million people city of Guiyang is the vibrant capital of Guizhou province in Southwestern China. It lies at an average altitude of 1050m above sea level and its pleasant climate is characterized in June by an average daytime temperature of 22.3°C and moderate precipitation. The population of Guizhou is fascinatingly diverse with ethnic minorities making up 38% of the population (Miao, Buyi, Dong, Yi, Shui, Hui, Gelao, Zhuang, Yao, Man, Bai have kept their distinctive cultures alive.) The landscape of Guizhou province, in particular the immediate surroundings of Guiyang, are blessed by a very rich subtropical biodiversity, abundant forests alternating with stunning paddy fields and bucolic traditional rural villages. Major tourist attractions such as the Zhijin Cave, the largest cavern in China, and the Huangguoshu Falls, China's premier cascade, are within a few hours easy reach from Guiyang.

### AIMS OF BRYOLOGICAL SYMPOSIUM

- Experience exchange among researchers, teachers and students in Bryology in China.
- Role of Bryology in biodiversity conservation, ecology and environmentally sustainable development and human health preservation in China.
- To know more about the new technologies that participate in the development of bryological sciences.
- Authenticity the scientific cooperation among the Chinese universities and others all over the world.

- Awareness about the importance of bryological research and education in different fields and matching this with the Chinese job market



Guizhou Normal University

### HOT ISSUES IN BRYOLOGICAL SYMPOSIUM

The major hot themes are as follows:

- Field Bryology and Systematics
- Physiological and Molecular Biology of Bryophytes
- Population and Community of Bryophytes
- Small Animal-Bryophyte interactions and Evolution Ecology
- Urban Bryology and Environmental Monitoring
- Industrial Bryological Ecology and Mine Bryological Ecology
- Biodiversity and conservation of bryophytes in Chinese National Reserve
- Bryochemistry and Medicine Bryophyte Resources
- Landscape Bryophytes and Gardening Bryological Arts
- Bryology Education for Graduate Students and Bryology Science Popularizing in China

For more information please contact:

Prof. Zhang Zhaohui, PhD, School of Life Sciences, Guizhou Normal University, Guiyang 550001, Guizhou, P.R. China  
zhaozhang9@hotmail.com



Mt. Qianling National Park, Guiyang

## Shevock and Li Visit Guizhou Normal University

On 24-26 May 2010, James R. Shevock from the California Academy of Sciences of USA and Zhang Li from Shenzhen Fairy Lake Botanical Garden, Chinese Academy of Sciences were invited by Zhang Zhaohui from Guizhou Normal University to visit Guizhou Normal University.

In the morning of May 25, lectures with the themes of "The Gaoligongshan Project: The complexity, challenges and successes of collecting expeditions in Yunnan Province, China" and "Bryophytes of California: Landscapes influenced by the Californian, Great Basin and Desert Floristic Provinces" were given by Shevock. Another lecture, "The reproductive strategy of bryophytes" was given by Li. It was organized by Zhaohui and was attended by a lot of teachers and students of Guizhou Normal University.

Shevock introduced the expedition of Gaoligongshan and California bryophytes, bryophyte herbarium management, and so on. Li introduced the reproductive strategy of bryophytes and also talked about the photography of bryophytes. In the process of lectures, teachers and students had positive communication and lively discussion.

During their visit, bryophyte laboratory representatives of Guizhou Normal University and the representatives of California Academy of Sciences, Shenzhen Fairy Lake Botanical Garden investigated Qianling Park together. In the course of exchange visiting, Mr. James R. Shevock and Dr. Zhang Li fully affirmed the achievements in bryophyte Ecology and Systematics of Guizhou Normal University in recent years, talked about

some problems in the process of scientific research, and discussed building a broader platform for international academic communication.



James Shevock and bryophyte laboratory representatives investigate at Mt. Qianling National Park

## The National Inventory of Swiss Bryophytes by Hofmann and Schnyder

In 1984 E. Urmi, P. Geissler and others started a new standardised mapping project in Switzerland, called "National Inventory of Swiss Bryophytes, NISM". One of the first actions was the set-up of a database to store information on records of bryophyte. Today, 26 years later, this database contains more than 177,000 records of bryophytes from Switzerland and is the most important source for various conservation aspects and scientific investigations on bryophytes in Switzerland. The NISM database does not only contain records from 1984 onwards but also from the period between 1800 and 1984 (42,000 records). These records originate from herbarium specimens which have been thoroughly revised and georeferenced.

The data of the NISM database can be publicly accessed in the web at [www.nism.uzh.ch](http://www.nism.uzh.ch) where up to date distribution maps of all 1'100 species known from Switzerland can be viewed and further information on the mapping project and the origin of the data is given. We additionally provide access to the Red List of Swiss bryophytes, the list of nationally protected species with accompanying factsheets, a list of priority species for conservation and of course a checklist of bryophytes in Switzerland. Beside that you can download a poster with the 15 most frequent species and some keys on selected genera (in German). There are also pictures of most species which can be viewed in the online-atlas when a particular species has been selected. Major parts of the NISM-website have recently been translated into English and we now kindly invite you to explore Swiss bryophytes in the web. If you have any questions or remarks don't hesitate to contact us at [nism@systbot.uzh.ch](mailto:nism@systbot.uzh.ch).

Heike Hofmann & Norbert Schnyder, National Inventory of Swiss Bryophytes, Institute of Systematic Botany, University of Zurich, Zollikerstrasse 107, CH, 8008 Zurich, Switzerland, [nism@systbot.uzh.ch](mailto:nism@systbot.uzh.ch), [www.nism.uzh.ch](http://www.nism.uzh.ch)



## Bryology in Malaysia: First of its kind!

By Min S. Chuah

A Bryology workshop, the first of its kind in Malaysia, was organized by Min S. Chuah, School of Biological Sciences, Universiti Sains Malaysia. The sponsors of the workshop were the School of Biological Sciences and Unit Latihan of Universiti Sains Malaysia and the Ministry of Science and Technology, Malaysia.

The workshop was conducted from February 17-25, 2010. Two guest lecturers were invited namely, Prof. Tamas Pocs from Esterhazy Karoly College, Hungary and Prof. Haji Mohd. bn Abdul Majid from the



University of Brunei, Brunei to add on to the expertise of Dr. Chuah who also participated as an instructor.

Twelve participants from three countries (United States of America, Nigeria and Malaysia) and 5



institutions/research institutes (University of California, University of Lagos, Universiti Sains Malaysia, Forest Research Institute of Malaysia and Botanic Gardens of Penang) attended the Bryology Workshop. The Deputy Dean, Dr Siti Azizah Mohd. Nor, officially opened the workshop.

The workshop program consisted of lectures and practical sessions in the laboratory. Fresh specimens were presented for study. The course



programme included topics in diversity, taxonomy, ecology, dispersal and distribution, water retention and interception capacity of bryophytes, biomass. Phytogeography of Malaysian bryophytes, status of bryological exploration in Malaysia and the region were also treated during the workshop. Field work by participants and instructors was carried out in Gunung Jerai, Kedah.

## Trips, Excursions to Learn About Bryophytes

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

**Nancy Slack** is offering Bryophyte and Bryophyte Ecology at Eagle Hill, Steuben Maine from August 15-21, 2010. For more information:

<http://www.eaglehill.us/programs/nhs/nhs-calendar.shtml>

**Wilf Schofield Bryoforay** will be held August 20-22, 2010, on Vancouver Island, BC. For further information and to register, please visit <https://sites.google.com/site/wilfschofieldbryoforay/>. Registration closes August 15, 2010. For more information, please contact Karen.Golinski@gmail.com

**Andrews Foray.** will be held in upstate New York, USA September 17-

19, 2010. The details are listed on the website, found at the following link. <https://sites.google.com/site/andrewsforay/> Registration Deadline is August 1, 2010. Costs \$105 for full registration including lodging and meals, \$85 student rate, and \$65 for registration and meals only. Space is limited and on a first come-first served basis. Contact [kcbowman@syr.edu](mailto:kcbowman@syr.edu) for more questions.

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

## Mining the moss genome: 3<sup>rd</sup> International cosmoss.org *Physcomitrella* workshop in Freiburg, Germany (by Ralf Reski)

The Freiburg Institute for Advanced Studies (FRIAS) and the Chair Plant Biotechnology at the University of Freiburg invite to participate in a workshop on the annotation of the *Physcomitrella* genome to be held September 13<sup>th</sup> – 15<sup>th</sup>, 2010 in Freiburg, Germany.

The moss *Physcomitrella patens* has become a model organism in applied and in basic biology. Its genome was sequenced at the Joint Genome Institute (JGI) of the US Department of Energy and published in 2008 by a consortium of 70 researchers from 45 different laboratories. This publication was spear-headed by three scientists (PD Dr. Stefan A. Rensing, Dr. Daniel Lang, Andreas D. Zimmer) from the group of Prof. Dr. Ralf Reski who were instrumental in assembly, annotation and analyses of the genome sequences produced by the JGI. Funded by the German National Science Foundation (DFG) the Freiburg scientists developed the internet resource [www.cosmoss.org](http://www.cosmoss.org) for all information around the moss genome.

In their attempt to train newcomers in the field as well as to recruit researchers from all over the world to help in further annotation of moss genes, Reski and colleagues now invite to participate in the “3<sup>rd</sup> cosmoss.org *Physcomitrella* genome workshop” in Freiburg, Germany. “Based on our experiences with the preceeding two such workshops we will again provide the frame for a lively working atmosphere with ample space for hands-on mining and annotating the moss genome. In addition, this year we will provide insights into genomic resources for other bryophytes”, Ralf Reski says. This year, an extra day is included for community annotation where the participants can directly improve structural and functional annotation of those moss genes they are experts in.

To ensure a productive workshop the number of participants is limited to 50 and online registration via [www.cosmoss.org/register](http://www.cosmoss.org/register) is requested. The fast growing appreciation of moss research is evidenced by the support of this workshop from the Freiburg Institute for Advanced Studies and by dona-

tions from twelve different private companies.

For more information, please contact: Ralf Reski, Chair Plant Biotechnology, Faculty of Biology, University of Freiburg, Germany. Email: [pbt@biologie.uni-freiburg.de](mailto:pbt@biologie.uni-freiburg.de)

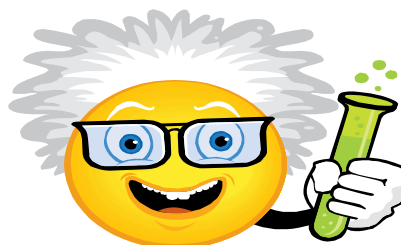


Spore capsule of the moss *Physcomitrella patens*. (Source: Wikipedia)

## ATTENTION All Bryological Societies...

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

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



## ...Continued from page 1: Mossin' Annie

Opportunities to marvel at mosses in public venues have existed in various locations, sometimes as temporary exhibits at major botanical gardens. In 1993, the Atlanta Botanical Garden featured a 750 sq ft moss garden created by Lynn Lucas, a local moss gardener. For a number of years, the New York Botanical Garden featured a moss and fern garden. If one travels across this country, mosses can be discovered in gardens from the Pacific Northwest to the East Coast. However, if you “google” the term, “moss gardens,” you'll not find any major garden in America touted as a “moss garden.”

Private moss gardens and moss retreats exist in lesser-known locations which confirm the sustainability of moss gardens over decades. These pristine escapes can be discovered where individuals have broken new ground with moss landscape designs that are now magnificent examples of moss lawns, paths and focal features. In the 1950s, Doan Ogden, a landscaper designer in my hometown of Asheville, NC, started his own moss legacy. The Kenilworth Moss Garden is over six acres and displays a 3000 sq ft lawn of *Dicranum scoparium* and 1.5 miles of mossy trails of *Leucobryum glaucum*, *Thuidium delicatulum*, various *Mniums*, and many more types. In Virginia, Nori Burnet, a retired school teacher, has created her own 2-acre moss retreat over the past couple of decades. In Wisconsin, Dale Sievert has enhanced his splendid gardens with moss focal features and containers. In Pennsylvania, Dave Benner's moss lawn continues to gain national attention. In the Northeast, Christine Cook's moss designs can be found in private gardens. Through networking, I've discovered many other moss retreats that grace the yards of people across America.

To the delight of some (moss lovers) and the consternation of others (turf grass lovers), bryophytes have been sneaking into the landscape of gardens across this country by natural processes. However, for the home gardener or professional landscaper wishing to intentionally introduce and encourage mosses, few references exist to provide guidance on the practical aspects of moss gardening.

### **The Information Challenge of Learning to Garden with Mosses**

Synthesizing the scientific research of bryologists, drawing conclusions and interpreting best horticultural practices into successful moss installations is a challenge that all serious moss gardeners face. In response to this information dilemma, many moss gardeners have gained knowledge and expertise from their own observations of mosses in natural settings and following the “trial and error” method in their own gardens. In an effort to build our body of knowledge, moss gardeners often share their moss gardening methodologies with each other. Mosses seem to innately inspire this good spirit attitude of sharing the joys of mosses.

Generalizations about mosses abound in the gardening world. “Moss” is the common reference for any and all moss types, even becoming the standard reference for the plural, “mosses.” The extensive types of bryophytes are not reflected in this singular terminology. Few folks even realize that mosses have liverwort and hornwort “cousins.” How can we determine how to use various moss types if they are all grouped together as one plant? To achieve success, it is critical to understand appropriate bryophyte types and their growth patterns related to various microclimates, substrates, weather patterns, sun exposures, pH requirements, rainwater runoff and erosion control issues.

Fascinated with mosses since childhood, my own moss journey has evolved from making terraria to moss dish gardens to moss-as-art creations to innovative moss installations in sustainable landscapes. Blessed to be living in an ideal climate in the mountains of western North Carolina which boasts over 450 indigenous bryophytes, I began introducing mosses at my own home in Pisgah Forest, NC over a decade ago. In the winter of 2008, I added another 650 sq ft by reclaiming an asphalt driveway and demonstrating that mosses don't follow typical horticultural guidelines regarding the winter season or cold temperatures. Planted in a contiguous manner that emphasizes the myriad of shapes, textures and shades of green, there is evidence that these mosses are not only surviving, but thriving. The sporophytic stages that occur from year to year, season to season, colony to colony are visible indications that my mosses are “happy campers.”

## **...Continued: Mossin' Annie**

### **Starting down the Moss Gardening Path**

Recognizing the value of scientific research and the expertise of other moss gardeners, my first inclination was to review the literature. To my dismay, only a handful of references exist regarding moss cultivation in landscapes. To interpret the research of bryologists presents a communication dilemma to understand scientific terminology. And, of course, there is the looming challenge to properly identify bryophyte types. In the field of bryology, there exist numerous field studies of bryophytes in nature and research conducted in laboratories. Drawing conclusions and understanding implications for cultivating mosses in landscapes requires careful analysis for bryophyte specific success. On the flip side, in the field of horticulture, mosses have not yet been explored or studied as a viable choice for gardeners. Thankfully, there are a handful of moss gardening books and that is where most moss gardeners turn for knowledge. Additionally, in this age of information, a number of Websites (e.g., Janice Glime's eBook, Bryophyte Ecology, academic sites, government data bases, moss businesses and moss lovers' sites from around the world) now provide additional insights valuable to moving forward systematically with moss gardening methodologies.

Given due diligence, there could be a wealth of information yet to be discovered in archival journals of landscape design architects such as Frederick Law Olmstead and Doan Ogden. As the network of moss gardeners grows and we share effective techniques with each other, the chasm is closing. My own contacts reach around the world including other moss lovers, gardeners, environmentalists, and of course, bryologists. Using email and social networking sites, we share our observations, practical applications, and coordinate our own research experiments as we begin acquiring data and replicating studies to move beyond anecdotal conclusions.

### **A Moss Gardener's Search of the Literature**

In moss gardening literature, there are several patriarchs that historically emerge as pivotal leaders in promoting mosses. We owe a debt of gratitude to this first generation of moss gardening advocates. Their practical experience and advice has provided the foundation of our basic knowledge. The best-selling book is Moss Gardening by George Schenck. It serves as an introduction for mosses in the landscape and for container gardening. It includes impressive photographs reflecting the splendor of Japanese moss gardens, alpine gardens and shade gardens. Michael Fletcher's Moss Grower's Handbook offers more specific guidelines for growing bryophyte types commonly found in the United Kingdom. Associated with the British Bryological Society, Fletcher takes moss gardeners to a more in-depth level of moss propagation by citing micronutrient requirements for optimal growth for a few individual bryophyte types. Dave Benner in Pennsylvania started his moss lawn 40 years ago, a living testament to his expertise. His handbook, Gardening With Moss: The Lawn of the Future provides advice on featuring shade mosses and integrating them with other native plants.

In the past couple of years, two new titles have appeared. New Methods in Moss Gardening: How to Grow Moss in Gardens and Landscapes by Richard Smith, offers his recommended methods for growing mosses on mats. William Cullina's, Native Ferns, Moss, and Grasses, is a welcome addition to the library of gardeners. The author of this article is currently writing her own book about moss gardening. Based upon academic research of bryologists and horticulturists as well as practical moss gardening experience, my upcoming book will address the "right moss, right place" concept reflecting successful techniques that I and others have developed.

As interest in mosses continues to increase, our body of moss gardening literature is growing. Articles are appearing in regional magazines, gardening forums and as feature stories in national newspapers (The New York Times, The Washington Post, The Plain Dealer). Websites with incredible photographic images and pertinent information emanate from all around the world. Some of the best Internet references originate at universities or botanical gardens with a research emphasis. Other informative sites have been posted by serious moss gardeners and amateur bryologists. Several businesses promote moss landscaping and provide moss plants for sale. A list of my favorite Web sites is provided in the bibliography.

## **...Continued: Mossin' Annie**

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## **Free IAB-membership for students**

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

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

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Please visit [www.synthesys.info](http://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.

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# International Symposium on Systematic Lichenology & Bryology

Hangzhou, China, October 15-20, 2010

Hosted by: The Editorial Committee of the Flora of the Cryptogamics, Chinese Academy of Sciences, Zhejiang University, and the Zhejiang Botanical Society

In the last 20-30 years, lichenology and bryology had been greatly improved in the world. The lichenologists and bryologists were not only interested in taxonomy and morphology, but also gave many contributions to cytology, physiology, molecular biology, biochemistry, reproductive biology, phyto-chemistry and others, as well as ecology.

This symposium will be more concentrated on the systematics of lichens and bryophytes. Lichenologists and bryologists can use any branch field of lichenology and bryology with the different methods and techniques to discuss the systematic of lichens and bryophytes dealing with the relationships of species level, genus level and more higher systematic level concerning the groups of branching lichens and thallus lichens and the groups of acrocarpous or pleurocarpous mosses, or between the relationships of hornworts, hepatics, Takakiopsida and mosses.

Using the scientific evidences and the effective materials to discuss the different levels of the systematics of lichens and bryophytes are one of the main purposes of this symposium.

For more interesting to the young lichenologists and bryologists, we would like to invite the world famous lichenologists and bryologists and the domestic lichenologists and bryologists to give the main lectures, meanwhile the young lichenologists and bryologists will play an important roles on this lichenological and bryological symposium.

Zhejiang University, located at the west of Hangzhou city, is one of the oldest universities in China. Dealing with the weather of Hangzhou, October is the middle of autumn, which is usually has temperatures around 20 C and sometimes with small rain. West Tianmo Mt. is situated at northwest of Hangzhou and its highest peak is 1506 meters above sea level. From Hangzhou to West Tianmo Mt., it takes about 2 hours by bus.

Chairman: Jiang-Chun Wei, Member of the Chinese Academy of Sciences

**Main Topics of the Symposium:** Fossils, Morphology and Anatomy, Taxonomy, Molecular Biology, Systematics, Phytochemistry, Ecology, and Phytogeography

## Estimated Costs

### Symposium Fees (Oct. 15-20, 2010)

|                      |      |        |
|----------------------|------|--------|
| Full memberships     | US\$ | 100.00 |
| Student memberships  | US\$ | 50.00  |
| Accompanying persons | US\$ | 50.00  |

### Accommodation Fees

|                     |      |              |
|---------------------|------|--------------|
| Standard rooms      | US\$ | 38 / per day |
| Single person rooms | US\$ | 25 / per day |

### Field Tour (Oct. 18-20, 2010)

|                                                      |      |                  |
|------------------------------------------------------|------|------------------|
| West Tianmo Mt. National Natural Conservation Region | US\$ | 200 / per person |
|------------------------------------------------------|------|------------------|

## International Symposium on Systematic Lichenology and Bryology

(The second Circular)

Surname: \_\_\_\_\_ Given Name: \_\_\_\_\_ Sex: \_\_\_\_\_

Title of Position: \_\_\_\_\_

Organization: \_\_\_\_\_

Address: \_\_\_\_\_

Tel.: \_\_\_\_\_ Fax: \_\_\_\_\_

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Accompanied by Name: \_\_\_\_\_

I intend to attend the symposium

I intend to present abstracts related to

Topic No. \_\_\_\_\_ Entitled: \_\_\_\_\_

I will join post-symposium tour:

Date: \_\_\_\_\_

Signature \_\_\_\_\_

## Book Review: “California Mosses” by Malcom, Malcom, Shevock, and Norris

**Malcolm, B., Malcolm, N., Shevock, J. & Norris, D. 2009: California Mosses. 430 pp., with c. 2200 color photographs and 1100 black-and-white illustrations. Micro-Optics Press. Hardback, ISBN 0-9582224-5-2. Available from the California Native Plant Society, [www.cnps.org](http://www.cnps.org). Advertised price US\$ 68 plus postage.**

California has more than 600 moss species in 176 genera, and all but five of the species are illustrated in this book, which has been in preparation for some decades. Obviously, its format and concept have thoroughly changed over the years. The final product by the working combo is a visually absolutely fantastic volume. Bill and Nancy Malcolm are well known among the bryologist circles from the two editions of the invaluable illustrated bryological glossaries, and the authors Jim Shevock and Dan Norris need no introduction either.

After first just leafing through the book I was in sore straits realizing there was no identification key, but upon reading the Introduction I found relief: the key, as well as a catalogue of California's moss species have been published elsewhere (Norris & Shevock 2004 a, 2004b); I just wasn't aware of that. In fact, also the liverwort and hornwort keys and catalogues have been published (Doyle & Stotler 2006). All of these can be purchased for US\$ 15 each at <http://www.calbotsoc.org/madrono.html>

The Introduction to the book is also an introduction of how to study mosses: what equipment one needs, how to collect mosses, how to remove leaves, and so on. Then the reader is instructed to compare the removed leaf with the color plates and black-and-white leaf thumbnails in the upper right corner of each plate. Near the end of the book those thumbnails and many additional ones are displayed again, categorized under

some easily observable character, such as “leaf asymmetric” or “leaf bordered”. This “visual identification key” is very useful, if one has a typical leaf of the species at hand and the leaf shape does not vary too much. Since the thumbnails form a key element in the book, it is good that they are indexed on p. 13. The pages 14–21 display in color photographs 24 mosses widespread in California.

The arrangement of the plates follows the current (and fluctuating) systematic concept. The plates are informative, as well as technically amazing and admirable - just beautiful! The characters verbally described are exactly the same for each species: form, habitat, leaf length & shape, tip, base, nerve, border, margin, cells, capsule length, shape, and brief comments. This format is very tight and schematic; however it works most of the time. A clear disadvantage is that the comments are sometimes a bit vague; there is no room for real discussion that some species would need.

The bryological expertise of Norris and Shevock guarantee that this is surely a reliable, perhaps even an impeccable, volume. Yet all great things deserve a truly critical eye, don't they? How else can we know they are great? Thus, I learned from Timo Koponen that *Rhizomnium punctatum* does not occur in California (see also Koponen 1973); the leaf on p. 334 probably represents *R. nudum*. I observed that *Cynodontium jenneri*, treated on p. 99, clearly differs from the European concept of that species (cf. p. 281 in Hallingbäck et al. 2006). *Alsia* and *Metaneckera* are treated as monospecific genera endemic to the region. There never was any justification for recognizing *Metaneckera* in the first place; *Alsia* is another matter from the morphological point of view - but our molecular analyses confirm both of them must be synonymized with *Neckera*.

Petty complaints indeed, those; just a

dog barking. This is a great book. I would say that it is worth its weight in gold for the professional and the amateur alike. And it is a heavy book for its size, printed on high-quality glossy paper. The Introduction outlays the purpose of the book: “With this guide, we hope to encourage both amateur and professional botanists to take up an interest in mosses”. If this book will not encourage people to look at mosses, then I cannot imagine what will. Thank you Dan, Jim, Nancy and Bill for this treat!

By Johannes Enroth

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## Book Review: The Intricate Beauty of Sphagnum Mosses

Laine, J., Harju, P., Timonen, T., Laine, A., Tuittila, E.-S., Minkkinen, K. & Vasander, H. 2009: *The intricate beauty of Sphagnum mosses – a Finnish guide to identification*. 190 pp., dozens of color photographs and micrographs. Soft cover, ISBN 978-952-10-5617-8. University of Helsinki Department of Forest Ecology Publications 39. Available from the Department, please e-mail [varpu.heliara@helsinki.fi](mailto:varpu.heliara@helsinki.fi). Price (incl. postage) 49,50 €.

Several decades ago the identification manuals of *Sphagna* were almost always printed in black and white. Many characters of these beautiful plants, like color, gloss, variegation, overall texture and ‘evenness’ of branches and leaves were expressed just in words, which are obviously not the best tool for delivering information on such characters. Recent advance in polygraphic and photo techniques transform the dream of complete illustration of species of *Sphagna* to reality. The present publication is an example of how that can be done.

The 190 pages of the book are covered by color pictures for no less than 60%. First glance on this beauty gives the impression of an unusual and free style of presentation. Certainly, to bring the photographs to a strict standard is more difficult than even with line drawings. But soon looking through the book one may notice a rather well defined set and order of pictures for each species, forming a ‘species description’ by a series of illustrations.

Each such ‘species description’ includes text with characteristics of the species and pictures in four pages forming two pairs of facing pages. The text in a condensed style characterizes the morphology, provides differentiation from similar species, and comments on the ecology and distribution. Being rather short and not over-weighted by e.g. dimensional characteristics, these

short paragraphs nevertheless include all essential features of the species. Photographs display the general habit and a further one provides a close-up view of 2–3 capitula (usually in picture of 10 x 16 cm, with excellent focus in most cases); sometimes are shown also plants from shady places and in other cases the typical habitats of the species are illustrated. The second pair of facing pages demonstrates important cellular details, how they can be seen under the microscope. Those include stem and branch leaf shapes, cross sections showing hyalodermis and branch leaf cross sections, side view of branch with leaves removed, and on a separate page two large pictures of branch leaves from adaxial (concave) and abaxial (convex) surfaces. The latter are a standard to illustrate for *Sphagna*, but in most books the area of leaf is rather limited while here a quite expanded piece of a leaf is shown, and the pictures are unusually sharp when one thinks that a concave/convex area of such size is shown.

Species are grouped in eight sections following the Russow classification, traditionally used in many European *Sphagnum* manuals, and within these groups the species are arranged alphabetically.

A key is given to sections, while the identification within the sections can be done not by dichotomous keys, but by (1) a plate with outline sketches of the stem leaves in a given section, and (2) by polytomic key, a table for all species where they are characterized by 30 characters. A supplementary X-Y graph arranges the species according to their nutrient and moisture requirements. A disadvantage of the latter is the lack of ranges of tolerance, so the eurytrophic species, like *Sphagnum squarrosum*, are absent among eutrophic species.

Regarding pictures I have a number of comments. Though the border in stem leaves is usually clearly shown, in case of *S. subnitens* it is well seen in photo and is much narrower in the line

drawing, and the text does not comment on this incongruence. The lack of information about the border absence in the stem leaves of *S. teres* does not help easy recognition of this species. Pores and fibrils in the upper part of a stem leaf are shown for *S. molle* and some other species, but they are not illustrated for, say, *S. capillifolium*, where this character is rather important. Papillae in the inner surface of cell walls are not ideally visible in the photos of *S. papillosum*.

However such imperfect cases are few, and there are much more pictures where the species views are exceedingly suggestive, leaving a deep imprint in the memory for both, the species and the character; an example could be the quinquefarious branch leaves in *Sphagnum lindbergii* and *S. pulchrum*. The color is printed quite exactly in almost all cases (only one picture of *S. flexuosum* is poor), thus the book manages to spread the quite important information of the habit, and is definitely raising the readers’ ability for species recognition in the field.

The book title is double: “The intricate Beauty of *Sphagnum* Mosses” and the subtitle “a Finnish Guide to Identification”. Obviously, the book will be useful in a much broader geographical range as within several thousand km from Finland to the east the species composition of *Sphagna* remains almost unchanged, and in Europe there are very few additional taxa, usually of quite rare occurrences. Thus the restriction to “Finnish” in the subtitle seems too modest and the guide will serve a much broader international audience well. I expect that more than one edition of the book will appear, and then adding a few items, like synonyms, keys for the species within sections, and maybe several leaf outlines per species showing the variation better might ‘universalize’ this beauty about beauty.

By Michael S. Ignatov

## Tips, Tools, and Techniques

by David Wagner

Please send David your tips, so that we can keep this useful column going. Everyone has something to contribute.! His first entry is from a bryonet post. Keep an eye out for new and exciting tips, tools, and techniques in each issue of *The Bryological Times*.

One of the wonderful things about teaching is learning from your students. In the past year or two, I've picked up three good lab hints that are worth sharing with bryonettors.

The first is the needle dropper bottle brought to one of my workshops by a clever participant. A picture is attached. Cost is \$3 to \$4 each. These are made by Gaunt Industries and available directly from them:

[http://www.gauntindustries.com/2\\_Ounce\\_Products-HYPO\\_25.html](http://www.gauntindustries.com/2_Ounce_Products-HYPO_25.html)

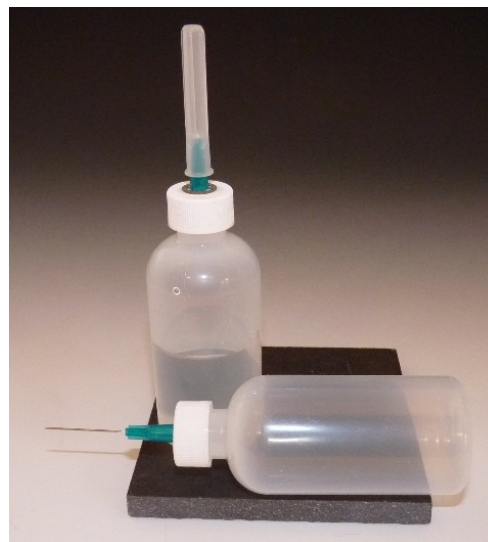
Or from a plastics fabrication store such as Tap Plastics (21 stores in Pacific States):

<http://www.tapplastics.com/shop/product.php?pid=409&>

or from art supply stores. Ceramic stores tend to have bottles with large diameter needles but the ones with 23 gauge needles are best. I keep one each for plain water and for Pohlstoffe (water with wetting agent). They allow precise placement of a small amount of water on a slide or controlled application of Pohlstoffe on a dry specimen. One great benefit is that if you knock a bottle over, liquid is not spilled all over your microscope bench.

Pohlstoffe is an informal name for a wetting agent concocted from a Fisher Science product called Aerosol OT. A half dropper of their 10% solution in a dropping bottle of water (ca. 50 ml) is excellent for wetting bryophyte specimens, especially useful for capsules and other hard-to-moisten parts (Wagner, D.H. 1981. Pohlstoffe, a good wetting agent for Bryophytes. *The Bryologist* 84: 253.) The Fisher proprietary solution is not always easy for amateurs to obtain. But one of my students pointed out that the critical substance is also known as docusate sodium, the active ingredient of stool softener! I went to the local discount drug store and bought a 60 caplet bottle for less than \$5. A little testing showed that one caplet (100 mg docusate sodium) punctured and squeezed into one ounce (25 ml) of water makes a very satisfactory Pohlstoffe! The tiny amount of carriers (glycerine, gelatin, propylene glycol, polyethylene glycol) leaves no noticeable residue.

The third hint also relates to a simple source of a good stain for Sphagnum, Methylene Blue. This is used by fish fanciers as antibiotic to stave off infections when hatching fertile fish eggs and is readily available at tropical fish stores. A 1/2 ounce bottle (ca. 12 ml) of a VERY concentrated solution cost \$4.25, a lifetime supply for me.



I use polyethylene dropping bottles for KOH, ones with a cap on the nozzle. Polyethylene is very resistant to caustic, probably also with lactic acid but I don't have experience with it. In general, I'd avoid metal needles with corrosives.

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## Bryological Theses

(by Bill Buck)

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 Jim Shevock ([jshevock@calacademy.org](mailto:jshevock@calacademy.org)).

Chantanaorrapint, Sahut. 2010. Ecological studies of epiphytic bryophytes along altitudinal gradients in southern Thailand. Ph.D. dissertation, Rheinische Friedrich-Wilhelms-Universität, Bonn. V + 107 pp. In English. Address of author: unknown. E-mail: [chantanaorrapint@gmail.com](mailto:chantanaorrapint@gmail.com).

This doctoral dissertation examines the diversity and ecology of epiphytic bryophytes along altitudinal gradients in southern Thailand. The purpose of the study is to determine species richness and community composition of epiphytic bryophytes and to correlate them with some selected ecological parameters, such as altitude, temperature and air humidity. Additionally, the pH of bark of host trees was measured, as well as bryophyte biomass, water storing capacity, and percentage cover. The study was carried out in slightly disturbed tropical forests in peninsular Thailand. A quantitative analysis of the vegetation environment relationships consistently showed that the distributions of epiphytic bryophytes were affected by a complex set of factors, related to the altitudinal gradient, such as light intensity, air temperature and relative humidity. Characteristics of the host plant species were probably minor factors.

Ho, Boon Chuan. 2010. Evolution and diversification of the Hookeriales (Bryopsida) with emphasis on *Distichophyllum* (Daltoniaceae) and its allied genera. Ph.D. dissertation, Rheinische Friedrich-Wilhelms-Universität, Bonn. IV + 154 pp. In English. Address of author: unknown. E-mail: [calypetrochaeta@yahoo.com](mailto:calypetrochaeta@yahoo.com).

This doctoral dissertation confirms the monophyly of the Hookeriales as currently circumscribed, with a sampling size of 122 taxa and five-gene sequence data. The Hypopterygiaceae are confirmed in the order. The relationships of the families are mostly resolved. At the generic level, several larger genera, especially within the Daltoniaceae and Pilotrichaceae, are shown to not be monophyletic. Six morphological characters were scored to determine ancestral state reconstruction. The common ancestor of the Hookeriales was reconstructed to have elimbate leaves, a single costa, and nonfurrowed, striate

exostome teeth. Gametophytic features were better in defining supported clades than sporophytic ones. *Achrophyllum* and *Calypetrochaeta* were both shown to be monophyletic. Because of polyphyly in *Distichophyllum* and other large Daltoniaceae genera, new combinations (not valid in thesis) are proposed in *Beeveria*, *Daltonia*, *Distichophyllum* and *Leskeodon*. New synonymy is proposed in *Distichophyllum*.

Jofre Acevedo, Jocelyn. 2008. Fenología del musgo *Tayloria dubyi* en las turberas de la Reserva de Biosfera Cabo de Hornos: ¿Un case de entomofilia? Master's thesis, Universidad de Magallanes, Punta Arenas, Chile. 111 pp. In Spanish. Address of author: unknown.

In this master's thesis, *Tayloria dubyi*, a moss endemic to southern South America, and which typically grows in *Sphagnum* bogs, is examined to see if it, like many of its Northern Hemisphere congeneric species, is entomophilous. Specifically it was tested to see if flies disperse the spores, and are attracted to the capsules by odors emitted from the apophysis. The study was conducted on two sites on Isla Navarino, in Prov. Antártica Chilena. Most typically the plants grow on the dung of the snow goose, *Chloephaga picta*. Sporophytes emerge, mature and senesce during November to March. They have capsules with masses of brightly colored, sticky spores, which are primarily dispersed in December and January. All flies captured were obligately confined to the *Tayloria* colonies. When spores were germinated in the laboratory, they grew much better on snow goose dung than on dung of horses and cattle.

Olsson, Sanna. 2008. Evolution of the Neckeraceae (Bryopsida). Ph.D. dissertation, Technischen Universität Dresden. 163 pp. In English. Address of author: unknown. E-mail: [sanna.olsson@helsinki.fi](mailto:sanna.olsson@helsinki.fi).

This doctoral dissertation examines the idea that many supposedly widely distributed genera of several species that seem to be morphologically coherent (*Echinodium*, *Homalia*, *Thamnobryum*, partly *Neckera*), are, in fact, polyphyletic. They are replaced with smaller, geographically more restricted genera that at least in some cases (e.g., *Thamnomaia*, *Homalia* s.str., *Neckera* s.str.) seem to be morphologically heterogeneous. In other words, morphology can be misleading in the Neckeraceae even at the genus level and convergent evolution in both morphological and sequence level characters are common within the family. As a result, *Alsia* is synonymized with *Neckera* and *Cryptoleptodon* with *Leptodon*. *Thamnomaia* is described to accommodate taxa previously placed in *Homalia* and *Thamnobryum*. *Echinodiopsis* is described for the Macaronesian species of *Echinodium*. *Touwia* is expanded to include two species previously placed in *Thamnobryum*. *Circulifolium* is described for some species previously placed in *Homaliodendron*. *Taiwanobryum* is greatly expanded to include species formerly found in *Pinnatella*, *Shevockia*, *Caduciella* and *Neckera*. Special habitat conditions have been shown to result in similar morphological structures

## Bryological Theses (continued)

also in several other moss groups. This kind of convergent evolution has been shown to occur in aquatic moss species and seems to apply also in the case of *Thamnobryum alopecurum* and its endemic allies. However, similar morphological structures in similar aquatic habitats can naturally also be due to true phylogenetic relationships as is the case within Neckeraceae with *Handeliobryum sikkimense* and *Hydrocryphaea wardii*, or the three species of *Tourwia* (*T. laticostata*, *T. negrosense* and *T. ellipticum*). The geographical patterns and grouping seem to have more phylogenetic significance than thought before.

Poppenhäger, Meike. 2008. Phylogenetic investigation of the *Grimmia montana* aggregate (Grimmiaceae; Bryophyta) in western North America. Diplomarbeit, Universität Kassel. [vi] 113 pp. In English. Address of author: unknown. E-mail: meike.poppenhaeger@gmx.de.

This equivalent of a bachelor's thesis examines the hypothesis that, based on morphological observations, episodes of allopolyploidy and various hybridization events could have triggered speciation in *Grimmia*. To examine this, phylogenetic relationships within the *Grimmia montana* aggregate (subgen. *Orthogrimmia*, sect. *Montanae*) were studied with molecular methods, with a special focus on putative reticulation events. The primary question asked was whether the morphological variation in sporophytes of *G. mariniana* and *G. nevadensis* could be the result of hybridization and subsequent stabilized hybrids. If this was true, then are the parents *G. montana* and *G. ungeri*, which show the closest morphological affinities? To answer the question, genetic relationships among the group were assessed using sequence data of plastid (*trnT-F*) and nuclear ribosomal (ITS 1 & 2) DNA as well as with the DNA fingerprinting method of AFLPs. The chloroplast data resolve *G. mariniana* as sister to *G. reflexidens* in a grade with *G. caespiticia*, clearly separated from all *G. montana* and *G. ungeri* samples. Therefore *G. reflexidens* and *G. caespiticia* emerged as potential material parents of *G. mariniana*. Multiple ITS copies in *G. mariniana* could be an indicator of hybridization in the species. AFLP data support the phylogenetic data that *G. mariniana* and *G. nevadensis* are independent species. It appears as if speciation in *G. mariniana* is still in progress and that the evolutionary history cannot be explained by a single hybridization event.

Rudolphi, Jörgen. 2007. Bryophytes, lichens and dead wood in young managed boreal forests. Doctoral thesis, Swedish University of Agricultural Sciences, Uppsala. 32 pp. + 1 reprint (8 pp.) + 3 manuscripts (24, 10, 21 pp.). In English. Address of author: Department of Ecology, Swedish University of Agricultural Sciences, Box 7044, S-750 07 Uppsala, Sweden. E-mail: [Jorgen.Rudolphi@ekol.slu.se](mailto:Jorgen.Rudolphi@ekol.slu.se).

The objective of this doctoral thesis is to provide a deeper understanding of the production of forest landscape, with special focus on young forests and to increase the knowledge about man-made substrates. The thesis investigates the long-term survival chances of forest bryophytes and lichens, and gives insights into the dispersal biology of bryophytes. Results show that the effect on dead wood supply of harvesting slash for biofuel is most significant for slash and logs. On stumps bryophytes showed a tendency to increase in richness over time, whereas lichens colonized stands in early succession more rapidly and had an earlier peak in species richness. Ants are shown as a bryophyte dispersal agent. In conclusion, young forests have the potential to host a high diversity of species.

Suárez, Guillermo Martín. 2008. Sistemática y filogenia de las especies neotropicales del género *Pohlia* (Musci). Ph.D. thesis, Universidad Nacional de Tucumán, Argentina. [vi] 261 pp. In Spanish with English abstract. Address of author: Área Botánica Fundación Miguel Lillo, Miguel Lillo 251, 4000 San Miguel de Tucumán, Tucumán, Argentina. E-mail: [suarezgm@hotmail.com](mailto:suarezgm@hotmail.com).

This doctoral study examined the 36 names of *Pohlia* in the Neotropics. Thirty new synonyms are proposed, 17 new lectotypifications are designated, and one new combination, *Pohlia wilsonii* (Mitt.), is introduced. For each of the 22 recognized names, keys, illustrations, descriptions, and distribution is provided. *Pohlia* is considered not to be monophyletic based on a morphological analysis. However, inclusion of *Leptobryum wilsonii* and *Pseudopohlia didymontia* makes *Pohlia* monophyletic. Inclusion of *Mniobryum* and *Webera* in *Pohlia* is confirmed.

**Note: issues of *The Bryological Times* will be scheduled to come out in March, June/July, September, and December. All submissions are due to DB Poli by the first week of publishing months! Consider sending in your announcements, fellowships, grant opportunities, quick links, or tips. We want it all!!**

## BRYOLAT Field Work in Madagascar

(by Min S. Chauh)

BRYOLAT Project entitled: 'Diversity and distribution of bryophyte communities in the Western Indian Ocean' continued to gather data on the island of Madagascar in the Marojezy National Park situated in north-eastern Madagascar. Fieldwork was carried out from 21<sup>st</sup> November to 10<sup>th</sup> December 2009. International participants were Dr. Claudine AhPeng (University of La Reunion, France-Project co-ordinator), Jacques Bardat (Museum of Natural History, Paris, France), Terry Hedder-son and Nicolas Wilding (University of Cape Town, South Africa) and Min S. Chuah-Petiot (Universiti Sains Malaysia, Malaysia). Two collaborators from the University of Antananarivo, namely, Roger Andriamiarisoa and Marline Iova participated in the expedition. Project sponsor: French Institute of Biodiversity

BRYOLAT Team members



Jacques reaching out for bryophytes



Bryolat Marojezy collections

### Space for Hire

### Space for Hire

### Space for Hire

If you do not like looking at blank spots in *The Bryological Times*, think about how you can contribute to the group. Everyone has a story, a trip, a piece of data, or even a tip to share. Don't be shy about submitting...just do it! What do you have to lose? Absolutely nothing. Jump in and take an active role by submitting a piece about your favorite moss, cause, or research. Anything bryological is possible. Submit your ideas to DorothyBelle Poli (poli@roanoke.edu) today! Without your help, there will be a lot of empty space!

Bryophytes want this space!  
Bryophytes want this space!

## Computers and Bryophytes: Look Here

A website on the bryophyte genus *Grimmia* Hedw. has been published: [www.grimmiasoftheworld.com](http://www.grimmiasoftheworld.com) <<http://www.grimmiasoftheworld.com>>

with more than 2000 macro- and micro-  
scopic photos of all 96 recognized species. The site also contains a European checklist, a world checklist, a table with the world distribution and major ecological and morphological characters of all recognized 96 *Grimmia* species. (Submitted by Henk Greven)

Interesting bryological rap music video on YouTube <http://www.youtube.com/watch?v=PsqGFer6-iM&feature> (Submitted by Marshall Robert Crosby)

An article about *Physcomitrella* becoming the moss model system <http://www.bio-pro.de/magazin/wirtschaft/>

[index.html?lang=en&artikelid=/artikel/05167/index.html](http://index.html?lang=en&artikelid=/artikel/05167/index.html)

(submitted by Ralf Reski)



Send us your bryophyte links today!

A web gallery of photos of bryophytes that are either rare or scarce within Britain. These are species that have been recorded from less than 100 10x10km

squares since 1950 (i.e. <3.5% of the possible 2837 hectads). The images are located at: <http://www.flickr.com/photos/bryophytes>. All images are free for anyone to use for whatever purpose. High-resolution versions of the images are also available for free upon request.

(submitted by Des Callaghan  
[des.callaghan@ecostudy.co.uk])

Keep up with the latest at the International Botanical Congress. Visit <http://www.abc2011.com/Symposia.htm> for more information

Free to download. It is "Mosses Liverworts and Hornworts" By Hallingback and Hodgetts <http://data.iucn.org/dbtw-wpd/edocs/2000-074.pdf> (submitted by Jack Honeycutt)

## Subscribing to Bryonet-l

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scribe. If you wish to change email addresses, you can do it in the same message.

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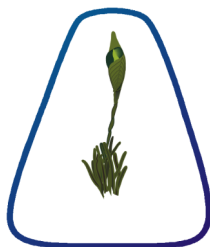
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**IAB is on the Web:**  
**<http://bryology.org>**

**IAB**



*The International Association of Bryologists (IAB) is an organization open for all interested in bryophytes. For membership contact Jim Shevock at*

*jshevock@calacademy.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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