



The Bryological Times



Volume 144



President's Message

Bernard Goffinet | University of Connecticut | Storrs, U.S.A. | bernard.goffinet@uconn.edu

Members of IAB are invited to attend the meeting in Shenzhen, China, this coming July 23–29, when the Association meets on the occasion of the XIX International Botanical Congress. IAB has actively participated in each Congress since the 12th Congress in St. Petersburg, in 1975. The Association will host a reception on Thursday, July 27, at the Fairy Lake Botanical Garden, to which all bryologists are invited. The IAB council will meet on Tuesday July 25. If you have any topic you wish the council to discuss and address, please contact me or any council member (see newly elected council members below or at bryology.org).

Several symposia focus or include studies on bryophytes, promising much stimulation for discussion in between events. Dr. Lars Hedenäs (Swedish Museum of Natural History), the recipient in 2015 of the Richard Spruce award for important contributions to bryology in the first 25 years of his career, will present a Spruce lecture as part of the symposium on Biodiversity and phylogeography of bryophytes chaired by Lars Söderström on July 25. His lecture is entitled: “How molecular evidence transformed our understanding of bryophyte diversity and

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phylogeography in Europe, the bryologically best known continent”.

The following schedule lists the dates, times, titles, and organizers of bryological themed symposia at the IAB/IBC meeting.

If you registered to attend the meeting, be sure to request a letter from the organizers to support your application for a visa (link in the registration page). I am looking forward to meeting many of you in Shenzhen.

“Bryological” Symposia at the IAB/IBC:

July 24, 13:30–15:30 (Monday)

T6-06: Early land plants: from early adopters to transformative models for citizen science engagement connecting natural history collections to biodiversity research and education

Organizer: Matt von Konrat (The Field Museum, USA)

July 24, 13:30–15:30 (Monday)

T2-02: The moss tree of life: phylogenomic approaches to reconstruct moss evolution, diversification, biogeography and biotic interactions

Organizer: Bernard Goffinet (University Connecticut, USA) & Dietmar Quandt (University Bonn, Germany)

July 24, 16:00–18:00 (Monday)

T5-15: Biological studies of mosses and algae

Organizer: Jin-Dong Zhao (Institute of Hydrobiology / Peking University, China)

July 25, 13:30–15:30 (Tuesday)

T2-17: Biodiversity and phylogeography of bryophytes

Organizer: Lars Söderström (Norwegian University of Science and Technology, Norway)

July 27, 16:00–18:00 (Thursday)

T1-22: Microbiomes of bryophytes

Organizer: Silvia Pressel (The Natural History Museum, UK) & Jeffrey G Duckett (The Natural History Museum, UK)

July 27, 13:30–15:30 & 16:00–18:00 (Thursday)

T5-09: Plant organellar genomics and phylogenomics, driven by the NGS approaches (two sessions)

Organizer: Yang Liu (Shenzhen Fairy Lake Botanical Garden, China) & Bernard Goffinet (University of Connecticut, USA)

July 28, 13:30–15:30 & 16:00–18:00 (Friday)

T2-27: Asian and Chinese bryology (two sessions)

Organizer: Rui-Liang Zhu (East China Normal University, China) & Boon Chuan Ho (Singapore Botanic Gardens, Singapore)

Meet the new IAB officers



Yeliza Leon, Vice President

I am a full professor at the Universidad de Los Andes, and the Merida Botanical Garden Institute, Venezuela. I've been a biologist since 1992, and have a Master of Science degree from the University of Iowa; my advisor was Dr. Diana Horton. I obtained a Doctorate (Dr. rer. nat.) from the University of Bonn in 2001 under the supervision of Dr. Jan-Peter Frahm.

In 1996, I organized the Course of Tropical Bryology in Venezuela, and later in 2004 organized the XV World Congress of Bryologists. I have been actively involved with the Asociación Latinoamericana de Briología and with the International Association of Bryologists as a member of the council from 2012–2016.

I have been working on the floristic of Venezuela mosses, and the on line checklist of Venezuelan mosses. I was the Director of the Merida Botanical Garden and have been involved in public outreach specifically on education for bryophyte conservation in Venezuela.

As Vice President of IAB, I would like to support initiatives that would make possible the Global

Plan for Plant Conservation, so that by 2020 the diversity of bryophytes is well known and that strategies for conservation are shared with the public. I think that the IAB could evaluate the advances in bryophyte floristic research in different regions and promote activities amongst associates to get the target accomplished as a common goal.



Juliana Rosa Oliveira, Council Member

I am a professor of botany at the Federal University of Espírito Santo (UFES), Brazil. As such, I am actively teaching undergraduate students in general botany as well as supervising bachelor theses and conducting research in bryology. Additionally, I am currently the head of the Natural History Museum of Southern Espírito Santo (MUSES), which gives me the opportunity to share my interest in science with children of all ages.

I was introduced to the world of bryophytes in 2003 during my undergraduate studies at the University of Brasília (UnB), which was followed by a Master's degree from the Federal University of Pernambuco (UFPE). My research projects included extensive field trips, checklists and bryophyte ecology, specifically edge effects in bryophyte communities in the Atlantic rainforest. In 2013, I obtained my PhD from the UFPE under the supervision of Kátia C. Pôrto (UFPE), Dietmar Quandt (University of Bonn, Germany) and Sanna Huttunen (University of Turku, Finland), on the global revision of the genera *Papillaria* and *Toloxis* (Meteoriaceae). As a taxonomic project, the revision covered

morphological, biogeographical and phylogenetic analyses. My main research interests are the spatial distribution and microecology of mosses in the mountainous regions of south eastern Brazil as well as the taxonomy of Meteoriaceae in the Neotropics. I have been a member of the Brazilian Botanical Society (SBB) since 2003, when we signed the first petition to start the specialist group for bryophytes in Brazil (Nucleo de Especialistas em Briófitas), of which I am currently coordinator.

As a council member of the IAB, I hope to be a contact person for Brazil as well as to promote the collaborative studies of bryophytes, their taxonomy, morphology, ecology, biogeography and phylogenetic relationships.



Catherine Reeb, Council Member

My main skills are a long teaching career in biology, including plant biology, as well as evolution and ecology. I have also conducted voluntary associative activities for the last twenty years, mainly in natural history, and including bryophytes, but also in ecology. For the past six years, I've developed a research program in Bryology mainly around species delimitation in an integrative taxonomic and phylogenetic framework. After numerous collecting expeditions to Madagascar during the last ten years, I recently began a project on the Malagasy flora. The initial

part of the project is to inventory herbarium specimens at the Paris Museum in France, where only type specimens have so far been digitized.

Through IAB, I would like to promote interactions in Bryology in Europe, especially in France, and to promote the development of paleo-tropical bryology projects in Africa.

In France, several bryologists actively work but do not seem to be involved at the international level. Except at the local scale by a few active people, there are no strong structures where recent actions are being developed for training. It would be positive to develop the IAB involvement in continental France, as it has been done overseas by the work of Claudine Ah-Peng. Links among active European societies could also be promoted with the support of IAB. This could be initiated first by conferences that establish linkages and interactions among French bryologists. It could later be expanded to include international field sessions that may result on shared knowledge and publications on bryophytes.

Regarding paleotropical projects in bryology, I hope to promote local training of bryologists that would foster the development of bryology in these countries. The activities of the IAB would be instrumental for these initiatives. Specifically, I would like to develop a group to research Malagasy bryophytes in order to eventually prepare a flora for this country. The bryophytes of West African countries such as Senegal, Togo, and Cameroun, are some of the least known on the continent and need active collecting and studies. Since I have relationships with bryology students in some of these countries, I hope to promote the involvement of IAB for a better understanding of the overall flora.

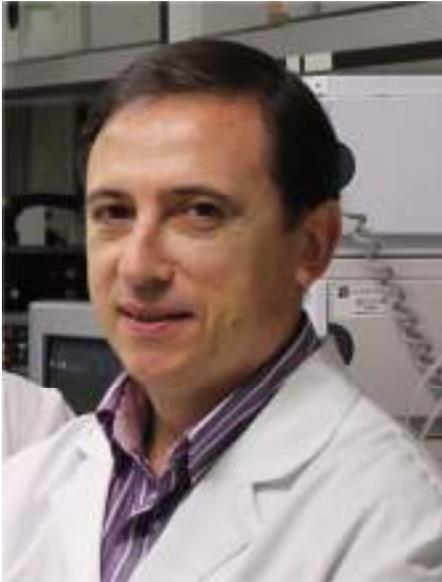


Isabel Draper, Council Member

Isabel Draper is a Spanish bryologist that obtained her doctoral degree at the Universidad Autónoma de Madrid in 2006, with her studies on the epiphytic bryophytes of Morocco. This research provided her with experience on the identification of Mediterranean mosses, as well as on the knowledge of their ecological affinities and distributional patterns. From 2006–2009 she worked as a post-doc at the Natural History Museum of Stockholm (Sweden) and at the Universidad de Murcia (Spain). During these periods, she focused her studies on taxonomy and species delimitation in the moss genus *Siurohypnum*, as well as on the analysis of the biogeographic history of some Macaronesian taxa. For these purposes, she applied phylogenetic techniques based on the combination of morphological and molecular data.

Since 2009, she has worked at the Universidad Autónoma de Madrid, where she is actively involved in teaching, including the supervision of students from undergraduate to PhD level. Her current research is focused on the family Orthotrichaceae, one of the most diverse and of ecological importance in the epiphytic environment in warm temperate and tropical montane climates. Within this family, she is especially interested on clarifying the phylogenetic relationships and biogeographic history of different complexes of taxa. In her research, she actively collaborates with an extensive network of bryologist. Moreover, she is the current Secretary of the Spanish Bryological Society that counts with over 100 bryologist of international award, and she has collaborated on the organization of several international scientific meetings. As an IAB

council member, she would like to promote further collaborations among professional and amateur bryologist worldwide.



Javier Martínez-Abaigar, Council Member

Born in Pamplona (Navarra, Spain, 1962). Graduate and PhD in Biology (Universidad de Navarra), Assistant professor (Universidad de Navarra), Associate professor (Universidad de Zaragoza) and at last permanent professor at Universidad de La Rioja (fortunately or not, the only University in the world more famous by wine than by science) since 1992 to present. Professor (Catedrático) of Botany at the Universidad de La Rioja since 2009. I mainly teach Botany (at least I try). My research is focused on: 1) bryophyte ecophysiology, mainly in relation to UV radiation; and 2) the use of mosses as pollution biomonitors. Former President of the Spanish Bryological Society (2009–2013) and former IAB country contact for Spain (2004–2014).

I have been a member of IAB since the last century (1990) and, in my opinion, the most appreciable characteristic of this organization is its third word: “bryologists”, not “bryology” (Rob Gradstein opened my eyes in this regard). This clearly means that we people, we bryologists, are the essential piece of this association. Maybe this spirit makes us be more friendly and collaborative than other scientific communities. Thus, this

would be my main objective within IAB: to promote every kind of collaboration (scientific, geographical, cultural, educative... even gastronomic!). I firmly believe that, ultimately, fruitful collaboration leads to explore a kind of hybrid science that results much more appealing, challenging and (also) publishable than conventional univocal science (and when I say “science” I also include amateur bryologists, whose scientific quality is out of doubt).

In addition, according to my origins, I cannot deny my admiration for the quality of Iberian (Spanish and Portuguese) bryology and bryologists (excluding me, of course!). In this sense, I would be proud to specifically contribute to IAB with a Mediterranean point of view, obviously in the context of an unequivocally universal concept of bryology.



Juan Carlos Villarreal, Council Member

Juan Carlos Villarreal completed his Bachelor at the University of Panama (Panama) earning a degree in Botany under the supervision of Noris Salazar Allen. Inspired by a field course led by Nancy Slack and Norton Miller (†), he completed a final thesis focused on the morphology of the hornwort *Nothoceros (Megaceros) vincentianus*. Juan Carlos then moved to the USA to join the laboratory of Karen Renzaglia, in Carbondale,

Southern Illinois University. His master's work dealt with the anatomy, development of the hornwort sporophyte and ultrastructure of the symbiosis between hornworts and cyanobacteria. In the year 2006, he joined the laboratory of Bernard Goffinet (U. of Connecticut) to work on the population genetics and phylogenetic affinities of the clonal hornwort *Nothoceros aenigmaticus* integrating morphology and DNA sequence-based inferences.

In 2012, Juan Carlos moved to Munich, Germany to work under the supervision of Susanne Renner at the Munich Botanical Garden. He obtained a DFG (German National Science Foundation) grant to work on the character evolution and biogeography of hornworts. In 2015, he obtained two fellowships, one to do a 6-month study on the phylogeny of complex thalloid liverworts at the Royal Botanic Garden of Edinburgh, in close collaboration with L. Forrest and D. Long. Almost simultaneously, Juan Carlos obtained a 3-year Tupper fellowship (Smithsonian Tropical Research Institute, Panama) to work on the genomic interactions between nitrogen-fixing bacteria and plants (emphasis on hornworts and cycads). Soon after, November 2015, he obtained his current position at Laval University (Québec, Canada). He will be in charge of the Louis Marie Herbarium (in 2018) and he teaches Plant diversity.

Juan Carlos had the opportunity to collect bryophytes in various countries, particularly Central and South America and India. Juan Carlos is interested in the evolution of plants and lichens. He uses electron microscopy, DNA sequences and genomic data to resolve deep and shallow divergences in plants. His recent interests are the functional genomics of cyanobacterial-plant symbioses, especially cycads (*Zamia*) and hornworts. He is developing genomic resources for hornworts, particularly species with separate sexes and sex chromosomes. He is also interested in plant-cyanobacterial symbiosis in Canadian Arctic bryophytes.

Juan Carlos seeks to be an advocate for bryology and provide opportunity to students all over the world. Juan Carlos is currently co-organizing, with Line Rochefort, a conference entitled: Future Arctic that will bring together 46 scientists for over

9 countries and 26 institutions to discuss the current topics on the biology of arctic bryophytes and lichens. Future Arctic is a concerted effort with Dr. Rochefort and her staff, to summarize current trends on arctic research and provide a glimpse of the numerous projects on arctic ecosystems currently conducted at Laval University.



Kien Thai Yong, Council Member

In 1998, my very first venture into the world of bryology was to document the moss diversity on a Malaysian mountain, Mount Nuang. Since then, I have been totally absorbed with this fascinating group of plants and have participated in many scientific excursions, collecting and studying bryophytes, both in Malaysia and in neighboring countries. I have been a lecturer in Ecology and Biodiversity in the Faculty of Science, University of Malaya since 2006 and in 2010, I obtained my Ph.D., my dissertation a taxonomic revision of Orthotrichaceae in Malaysia.

I am curator of both the vascular plant and bryophyte collections of the University of Malaya Herbarium (KLU) in Kuala Lumpur, and I am also involved in management of the university's botanical garden, Rimba Ilmu (www.rimba.um.edu.my), which serves as a conservation site for local and rare plant species, a center for botanical research and a facility for nature education for the wider community. Three

years ago, I started a small, living bryophyte collection in the botanical garden. Although the 'bryophyte house' is still being developed, I am experimenting with a diverse range of bryophyte species, a somewhat challenging task as it can be difficult to establish many upland bryophyte species in a man-made, lowland, tropical habitat.

In 2007, I was privileged to be a member of the secretariat that organized the IAB conference in Kuala Lumpur, Malaysia. I have also participated in and assisted with teaching in regional training workshops for cryptogamic plants, jointly organized by SEAMEO BIOTROP, Bogor Agricultural University and Georg-August-Universität, Göttingen. My bryophyte publications have included inventories, taxonomic studies, conservation and potential pharmaceutical uses. In 2013, I worked with Professor Haji Mohamed, the late Dr. Benito Tan, and Dr. Ho Boon Chuan, to produce a comprehensive moss checklist for Peninsular Malaysia. Currently I am working with Dr. Ho on the very first moss flora of Singapore.

In terms of both experience and location, I feel that I am in an ideal position to promote the study of bryophytes within the south-east Asian region and to encourage a dynamic interaction between bryologists and students, not just in this region but throughout the world. Many would be surprised at the amount of activity that has been directed towards bryophyte collecting in south-east Asia, as often the information has not been widely disseminated. Representing IAB, my aim is to compile and make known to the wider bryological community these resources, and also to actively encourage local researchers to report their findings, firstly as a way of recognizing their contributions to the understanding of the bryoflora, and secondly as a platform to promote their research activities.



***Ceratodon* leaf micrograph**

David H. Wagner | Northwest Botanical Institute | Eugene, OR, U.S.A. | davidwagner@mac.com

Ceratodon purpureus (Hedw.) Brid. is a common, weedy species throughout much of the world, but few guide books have adequate pictures of it. When working on sterile mosses growing in soil or odd weedy places, I've found it helpful to have close at hand a high resolution, stacked and scaled reference photo of the species. *Ceratodon purpureus* has leaves with smooth, quadrate leaf cells; recurved margins; and sparse denticulations at the apices.



Ceratodon purpureus leaf (Credit: D.H. Wagner)



Chien Gao (1929–2016)

Wei Li | Chinese Academy of Sciences |
Shenyang, Liaoning, China |
liw@iae.ac.cn



Chien Gao in 2013

Sadly, on 23rd November 2016, Chien Gao, professor of the Institute of Applied Ecology, Chinese Academy of Sciences, a leading bryologist in China, passed away at Liaoning Province Hospital in Shenyang, China, following a brief illness. He leaves behind his daughters Wei Gao, Yong-Hong Gao, Ji-Hong Gao, his son Wen-Sheng Gao, two granddaughters, two grandsons, many close relatives, friends and colleagues.

Born in Xinzhong, Ning'an County, Heilongjiang Province, China on the 19th January 1929, Professor Gao finished his early education in Yilangang Elementary and Ning'an High School in Heilongjiang Province. In 1952 he graduated from Northeastern University (now Northeast Normal University) after four years of study in the biology department, and received his vice-doctorate in bryology at the Institute of Forestry and Soil Science (now the Institute of Applied Ecology), Chinese Academy of Sciences in 1961. Since then, he contributed his life to bryology in China.

Professor Gao made tremendous contributions to the development of bryology in China as well as the world. During his sixty years in the field, together with his students and colleagues, he collected bryophytes in almost all of the main mountains, plains and islands in the 29 provinces

(including Hongkong, Macau and Taiwan) in China, collecting more than one hundred and twenty-five thousand bryophyte specimens in China, and more than thirty-five thousand bryophyte specimens around the world. Additionally, he was the founder of the bryophyte herbarium at the Institute of Applied Ecology, which is recognized as one of the top bryological research centers in East Asia.

Professor Gao published twelve books and more than one hundred research articles in the field of bryology. Some of his books were the first publication of such kinds in China. Example include: *Flora Muscorum Chinae Boreali-Orientalis*, published in 1977 and the first regional moss flora in China; *Flora Hepaticarum Chinae Boreali-Orientalis*, published in 1981 and the first regional hepatic flora in China; *Moss Flora of China (Volume 1)*, published in 1994 and the first moss flora; *Hepatiaceae of China (Volume 9)*, the first hepatic flora and published in 1999; and *Illustrations of Bryophytes of China*, the first illustrated flora, published in 2003. Professor Gao also visited the Botany Department of the University of Alberta, Canada, from September 1994 to March 1995, and cooperated with Professor D. Vitt to publish the *Moss Flora of China, English Version 1* in 1999.

As an active bryologist in China, Professor Gao supervised seven graduate students and many visiting scholars, most of which are now active bryologists in China and around the world.

The leading contributions of Professor Gao to Chinese bryology are highly recognized. In 1977, *Flora Muscorum Chinae Boreali-Orientalis* was selected as a “Major Achievements in Science and Technology in Liaoning Province”. In 1981, *Flora Hepaticarum Chinae Boreali-Orientalis* was selected as “Second-Class Scientific and Technological Achievements of Liaoning Province”. Furthermore, Professor Gao was named as a “Significant Contributor to the Development of Science and Research in China” by the State Council of China in 1991. Later, his *Taxonomy of Sphagnales- Pottiales in China* was awarded the “Second Award for Natural Science” by the Chinese Academy of Sciences in 1995. Also, his *Study on Chinese Bryophytes* was awarded the “First Prize of Liaoning Province Natural Science

Award” in 2004, and “Second Class National Natural Science Award” in 2008, making Professor Gao was the No. 1 achiever respectively. Among these awards and recognitions, “Second Class National Natural Science Award” is the highest award in field of Bryology in China.



Report from the recipient of the 2015 Stanley Greene Award: *Briófitos del complejo de páramos Tota-Bijagual-Mamapacha (Boyacá- Colombia) y fitogeografía*

**Jorge Hernán Jácome Reyes |
Sistemática Biológica | Herbario UPTC
| Universidad Pedagógica y
Tecnológica de Colombia | Colombia
jorge.gil@uptc.edu.co**

Briófitos del complejo de páramos Tota-Bijagual-Mamapacha (Boyacá-Colombia) y fitogeografía. M.S. Thesis in Spanish. Directed by María Eugenia Morales Puentes and Jorge Hernán Jácome Reyes.

In the páramo environments, some essential characteristics are required for the establishment of non-vascular plants (mosses and hepatics) that can colonize almost any type of substrate. The department of Boyacá is privileged because it contains 60% of the páramo ecosystem in Colombia. However, for one of the largest complexes, the Tota-Bijagual-Mamapacha (TBM), little is known about the bryophyte diversity. The main objective of this research project was to study the biogeographic patterns of bryophytes in the TBM complex. A total of 220 species (145 mosses and 74 hepatics) were determined, of which approximately 39% have a Neotropical distribution. Approximately 18% of the species are endemic to the Andean Mountains, of which 3% occur exclusively in the páramo, and about 2% are endemic within it. As a result of this study, *Platycaulis renifolia* Schust was recorded for

the first time for Colombia, while *Lejeunea elongella* Gottsche. was rediscovered. This study was conducted with help from the delimitación de páramos project (UPTC-IAvH), and the 2015 Stanley Greene Award from the International Association of Bryologists (IAB). The Stanley Greene Award made possible the examination of , Colombian páramos specimens, in the herbarium of the Field Museum of Natural History.



Report from the recipient of the 2015 Stanley Greene Award: *A taxonomic revision of Malaysian Acroporium*

**Chua Mung Seng | Fairy Lake
Botanical Garden | Shenzhen, China |
mvonkonrat@fieldmuseum.org**

A taxonomic revision of Malaysian Acroporium. Due to the nature of research, my previous proposal was unable to proceed and I moved to the current topic: A taxonomic revision of Malaysian *Acroporium*. Frahm’s (2003) Type specimen oriented method was adopted for this study. My research began with specimen loans from 15 herbaria representative of either where types were located, or large collections from the Malaysian region. According to the latest data from Tropicos (tropicos.org), there are 68 legitimate *Acroporium* species, and roughly 27 species from the Malaysian region. Out of the total 1,929 loan specimens received, about 369 specimens are labeled as types, although the exact number is somewhat less than this due to unpublished duplicates and names already synonymized. So far, most published Malaysian type specimens of this genus have been reviewed morphologically, but some types have either yet to be borrowed or may be lost. Herbarium non-type specimens are still in examination and several complex species groups may demand further molecular analysis. Because of the scholarship from the 2015 Stanley Greene Award, a short research visit to BORH (University

William R. Buck | New York Botanical Garden | Bronx, NY | wbuck@nybg.org

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://www.nybg.org/library/>. 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 (iab@fieldmuseum.org; mvonkonrat@fieldmuseum.org).

Alonso García, Marta. 2016. The genera *Chionoloma*, *Oxystegus*, *Pachyneuroopsis* and *Pseudosymblepharis* (Pottiaceae, Bryophyta): taxonomy and phylogenetic relationships. Ph.D. dissertation, University of Murcia, Spain. [viii] 283 pp. In English with Spanish summary. E-mail of author: m.alonsogarcia@um.es.



Leaf of *Sematophyllum obscurum* with rhizoids on the surface (Isotype of *Acroporium downii* from herbarium H)

Malaysia Sabah) was made during the last few months. Loaned specimens from two Malaysian herbaria were studied while at BORH. I am grateful for the curators and staff at the following herbaria for making specimens available for loan: BM, BO, BORH, E, F, FH, H, JE, KLU, L, MICH, MO, NY, PC, and UBC.

Literature cited:

Frahm, J.-P. 2003. Manual of tropical bryology. *Tropical Bryology* 23: 1–195.

This doctoral dissertation revises four genera in the Pottiaceae subfam. Trichostomoideae: *Chionoloma* Dixon, *Oxystegus* (Limpr.) Hilp., *Pachyneuroopsis* H.A.Mill. and *Pseudosymblepharis* Broth. *Chionoloma* was described to include three species from Southeast Asia. *Oxystegus* has a cosmopolitan distribution and was originally described as a subgenus of *Trichostomum*. *Pachyneuroopsis* has two species in East Asia. *Pseudosymblepharis* is pantropical. In this dissertation *Oxystegus* and *Pseudosymblepharis* are synonymized with *Chionoloma*. *Streptocalypta* is considered the sister genus to *Chionoloma*. New lectotypes are provided for 69 taxa and *Chionoloma* is considered to consist of 22 species and one variety. Eighteen

new combinations are provided in *Chionoloma* and one new species, *C. fractum*, is described from Brazilian material but occurs throughout much of Latin America and in China. Fifty-six names are synonymized in *Chionoloma*. *Pachyneuropsis* still consists of only two species, but a new combination is provided for one of them. The mitochondrial genome for *Chionoloma tenuirostre* was assembled.

Carreño Ponce, Suely. 2017. Riqueza de musgos en un bosque Tucumano-Boliviano de la provincia Vallegrande, Santa Cruz, Bolivia. B.S. thesis, Universidad Autónoma “Gabriel René Moreno”, Santa Cruz de la Sierra, Bolivia. x + 57 pp. + 10 anexos on 32 pp. In Spanish. Address of author: unknown.

This thesis for a Licenciada en Biología looked at ten localities in Prov. Vallegrande, Bolivia, in an altitudinal range of 1700–2900 m, to determine moss richness in a Tucumano-Boliviano forest. In total 238 species were found (in 107 genera and 38 families). Maximum diversity was found at 1700–2300 m. The most species (133) grew on soil, followed by rock (130 spp.), epiphytes (122 spp.), rotten trunks (103 spp.) and humus (37 spp.).

Norhazrina Binti Nik Mohd Kamil, Nik. 2016. Ecological and evolutionary processes in the pantropical moss genus *Pelekium*. Ph.D. thesis, University of Liège, Belgium. 103 pp. In English. Address of author: unknown. E-mail: nikriena@gmail.com.

This doctoral thesis uses *Pelekium* to look at ecological and evolutionary processes. Bryophytes offer an original model to address questions on patterns of floristic diversity in the tropics because their distribution patterns and dispersal syndromes strikingly differ from those exhibited by angiosperms. Thus, lowland tropical bryophytes have typically been perceived as excellent dispersers, and differences in species richness among tropical bryophyte floras are as not as conspicuous as in angiosperms. Here a multidisciplinary approach utilizing

macroecological analyses of species assemblages and historical biogeographical analyses is implemented based on a molecular phylogeny to test the hypothesis that the balanced patterns of tropical bryophyte species richness result from the high dispersal capacities of the group. The two following questions are addressed: (i) Do the comparatively balanced patterns of moss species richness across tropical areas result from the high dispersal capacities of tropical bryophytes? The hypothesis that tropical mosses are such effective dispersers that their distribution patterns are shaped by regional environmental differences within continents rather than by geographic isolation among continents was tested. In particular, the question was addressed of whether the high dispersal capacities of tropical mosses erase any historical signal of extinctions in sub-Saharan Africa, resulting in the observed balanced patterns of moss species richness among tropical areas. (ii) Do the high dispersal capacities of tropical bryophytes account for balanced patterns of anagenetic speciation among tropical regions? Global beta diversity was slightly, but significantly, higher among than within tropical regions. This indicates that, although instances of transoceanic dispersal among tropical regions were recurrently inferred from species-level phylogenies, oceans act as a barrier to routine dispersal, in contrast with the hypothesis that tropical bryophytes are better dispersers than extra-tropical ones based on their syndromes for high long-distance dispersal capacities. Evidence for long-distance dispersal limitations in the present study suggests that the high levels of homogeneity in tropical bryophyte community composition at regional scales rather reflects the homogeneity of ecological conditions that prevail at a very large scale in lowland tropical areas such as Amazonia than an actual increase in dispersal capacities in tropical bryophytes. Despite this, the fact that tropical Africa exhibited the poorer moss species assemblages as compared to other tropical regions could not be explained by a higher contribution of nestedness than species turnover in that continent, refuting the hypothesis of an ordered loss of species due to delays in the recolonization of formerly savannah areas from refugia and the slow post-glacial spread from ice age refugia. Rather, the significantly higher levels of global beta diversity within Sub-Saharan Africa than within the Neotropics and tropical Asia

suggests that the low species richness observed in some African areas has been caused by shifts towards specialized, but species-poor communities that shift spatially along the sharp ecological gradients that characterize tropical Africa. In line with the significant variation in beta diversity among tropical moss assemblages of the world, a significant phylogeographical signal was found in the phylogeny of the pantropical moss genus *Pelekiium*. This result evidences that diversification takes place at a faster rate than intercontinental migration, and involves that there is a tendency for within-continent diversification rather than recurrent anagenesis. This tendency is illustrated by the analysis of ancestral area estimation, wherein accessions from the same continent indeed tend to cluster together. In fact, the polyphyly of species formerly considered as widely distributed suggests that the notion that bryophyte species typically exhibit, due to their high long-distance dispersal capacities, large, transcontinental distribution ranges, and hence, strikingly low levels of endemism, needs to be revised. The shape of the *Pelekiium* phylogeny, along with the selection of a constant-rate model of diversification among species in the genus, suggests, however, that the cladogenetic speciation patterns observed within tropical areas in *Pelekiium* are not comparable to some of the spectacular examples of tropical radiations reported in angiosperms. Rather, the results presented here point to the constant accumulation of diversity in *Pelekiium* through time. This finding, combined with evidence for long-distance dispersal limitations in the genus, suggests that the balanced patterns of species richness among tropical areas are better explained in terms of comparable rates of diversification across tropical regions than by the homogenization of species richness by recurrent migrations.

Tabua Katafono, Mereia. 2015. Trunk-inhabiting bryophyte diversity on two common native trees along an altitudinal gradient on Viti Levu, Fiji. M.S. thesis, University of the South Pacific, Suva, Fiji. x + 107 pp. In English. Address of author: South Pacific Regional Herbarium, Institute of Applied Sciences, University of the South Pacific, Private Mail Bag,

Laucala Campus, Suva, Fiji; e-mail: mereia.tabua@usp.ac.fj.

This master's thesis examines the epiphytic bryophytes on tree trunks in the South Pacific. Fiji has a rich biodiversity in tropical wet forests on high oceanic islands in the Pacific. Bryophytes form a very important component of the vegetation and play a significant role in soil erosion prevention, nutrient cycling and forest hydrology. This research focused on the ecology of bryophytes on the lower trunks of two host tree species. Current theory suggests important factors that influence the total species richness of epiphytic bryophytes include the elevation range of the sites being studied, the physiochemical characteristics of host trees, the height along the host tree stem, and the number and surface area of tree stems (i.e., habitat area) studied. This study tests if these factors influenced bryophyte species richness in Fiji by assessing bryophyte species presence/absence on the lower stems of *Calophyllum* spp. (Calophyllaceae, previously Clusiaceae) trees and tree ferns at three elevations (~160m, 590m and 1260m) on the island of Viti Levu, Republic of Fiji. A total of 9210 specimens were identified, resulting in 143 taxa. There were two main findings that emerged from the analysis. Firstly, there was a humped distribution of bryophyte taxa richness with peak species richness observed at mid-elevation or in the upland forest. Secondly, the bryophyte communities showed good separation at both host tree level and at the site level, reflecting the ecological differences between the host trees and between the three sites along the altitudinal gradient. Additionally, eight new liverwort records were identified, one of which (*Cephalozjiella*) was a new genus record for Fiji. This ecological study is the first of its kind for Fiji and the islands of the South Pacific and it serves as groundwork for any future bryological research. While bryology is a fairly new field for Fiji, the results from this baseline survey alone suggest the need for priority to be given to upland forest protection and conservation. It also demonstrates the usefulness of bryophyte communities in discerning forests of different environmental and microclimatic conditions along an altitudinal gradient. This would be of value for long-term monitoring of changes in environmental conditions within these forests.

Wilding, Nicholas. 2015. Systematics, biogeography and morphological evolution in *Entosthodon* Schwägr. (Bryopsida, Funariaceae) with a revision of the genus in Africa. Ph.D. thesis, University of Cape Town, South Africa. xxi + 330 pp. In English. Address of author: Université de La Réunion, UMR PVBMT, Pôle de Protection des Plantes, Pôle Forêt, 7 Chemin de l'IRAT, 97410 Saint-Pierre, Ile de La Réunion; e-mail: nicholaswilding@gmail.com.

This doctoral thesis examines *Entosthodon* Schwägr. (Funariaceae), a genus of soil-inhabiting, annual to biennial mosses occurring worldwide in temperate to tropical-montane climates. Recent work on the Funariaceae suggests that the sporophytes, long used as the main basis for classification and identification in the group, exhibit high levels of homoplasy and that *Entosthodon* is paraphyletic as currently circumscribed. The monophyly of *Entosthodon*, and its relationships to other members of the Funarioideae, is further tested through phylogenetic analysis of DNA sequences from four chloroplast regions. These analyses included 45 *Entosthodon* species (ca. 50 % of those currently recognised), as well as an additional 22 species comprising representatives of all genera of the subfamily (except the rare, monotypic genera *Cygnicollum*, *Clavitheca*, *Nanomitrella* and *Brachymeniopsis* and the recently described monotypic *Afoninia*). Bayesian analyses of these data strongly contradict the monophyly of *Entosthodon*, and it is instead resolved as paraphyletic to a large clade comprising mostly members of *Physcomitrium* and *Physcomitrella*. Within this grade, five well-supported lineages are resolved. Based on the phylogeny, a new classification of *Entosthodon* sensu lato is proposed. The genus is split into four genera (*Amphoritheca*, *Fifeobryum* gen nov., *Funariella* and *Entosthodon* sens. str.) and the monophyletic *Physcomitrellopsis* is also maintained. Because of a lack of diagnostic morphological taxonomic characters this new classification is based largely on the molecular circumscription of clades. Nonetheless, particular character combinations do largely characterise most of these genera, albeit that frequent reversals

render particular character states non-diagnostic. A revision of these five genera for Africa results in the recognition of 26 species in total: 3 in *Amphoritheca*, 12 in *Entosthodon*, 1 in *Physcomitrellopsis*, 1 in *Fifeobryum*, and 9 in *Funariella*. Six of these species, 4 in *Entosthodon* and 2 in *Funariella*, are newly described based on specimens from East and southern Africa. A key to the sub-Saharan species is provided, and each is fully described, mapped and illustrated. To better understand the global diversification of the three main *Entosthodon* lineages, ancestral area and climatic niche were reconstructed in a temporal setting. Divergence time estimates place the origins of the main lineages of *Entosthodon* s.l. during the Late Oligocene to Middle Miocene 12.6-27.6 Ma, supporting a recent and rapid diversification within most of these clades. The biogeographic origins of the lineages are reconstructed. The reduction of sporophyte morphology is an important evolutionary trend in the Funarioideae. Ancestral states of the seta, peristome and capsule shape were reconstructed in the Funarioideae. Long distance dispersal of spores and lability of the climatic niche are likely to have strongly contributed towards the contemporary distribution of *Entosthodon* s.l. and may in part explain the group's rapid diversification.



2017 Stanley Greene Award, call for proposals

The International Association of Bryologists is pleased to announce that it is now accepting research proposals in bryology for the Stanley Greene Award. The award will be presented during the The International Botanical Congress (IBC) conference in Shenzhen, China. The award is chaired by the Secretary-Treasurer (Dr. Matt von Konrat), and two members that were appointed by the IAB council, Dr. Claudine Ah-Peng and Dr. Annick Lang. The award amount is for \$1,500 USD. Priority will be given to those bryologists early in their career. Please use the attached form at the end of this newsletter. The proposal must be no longer than two pages. Please send proposals to: mvonkonrat@fieldmuseum.org.

Administrative Information

IAB Officers & Council

President

Bernard Goffinet
Dept. of Ecology and Evolutionary
Biology, 75 North Eagleville Road,
University of Connecticut,
Storrs, CT, 06269-3043
United States of America

Editor of Bryophyte Diversity and Evolution

Dietmar Quandt
Nees-Institut für Biodiversität der
Pflanzen, Meckenheimer Allee 170
D-53115, Bonn
Germany

Council Member

Juan Larraín
Instituto de Biología
Pontificia Universidad Católica
de Valparaíso
Campus Curauma
Chile

Council Member

Michael Stech
Naturalis Biodiversity Center
PO Box 9517
NL-2300 RA
Leiden
Netherlands

1st Vice-President

Lars Söderström
Dept. of Biology, Norwegian
University of Science and Technology,
N-7491 Trondheim,
Norway

Editor of The Bryological Times

John Atwood
Missouri Botanical Garden, PO
Box 299, St. Louis, MO 63166-0299
United States of America

Council Member

Javier Martínez-Abaigar
Universidad de La Rioja
Madre de Dios 51, 26006
Logroño, La Rioja,
Spain

Council Member

Kien Thai Yong
Institute of Biological Sciences
University of Malaya
50603 Kuala Lumpur
Malaysia

2nd Vice-President

Rui-Liang Zhu
Dept. of Biology, School of Life
Sciences, East China Normal
University, 3663 Zhong Shan North
Road, Shanghai 200062,
China

Council Member

Claudine Ah-Peng
University of La Réunion
UMR PVBMT, BP 7151
15 Avenue René Cassin
97715 Saint-Denis
France

Council Member

Denise Pinheiro da Costa
Instituto de Pesquisas Jardim
Botânico do Rio de Janeiro
Rua Pacheco Leão 915
22460-030, Rio de Janeiro, RJ
Brazil

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Yelitza León
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Apartado 52 La Hechicera
Mérida 5101
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Spain

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Évolution Biodiversité
UMR 7205, Muséum National
d'Histoire Naturelle, Paris,
France

Website Coordinator

Efraín De Luna
Departamento de Biodiversidad y
Sistemática, Instituto de Ecología,
AC, Xalapa, Veracruz 91000
México

Secretary-Treasurer

Matt von Konrat
Dept. of Science and Education,
Field Museum, 1400 South Lake Shore
Drive, Chicago, IL 60605-2496,
United States of America

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Jeff Duckett
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Council Member

Juliana Rosa Oliveira
University of Brasília
Dep. Botany, Caixa Postal 04457
Brasília, DF.
Brazil

Newsletter Column Editors

Conservation Column Editor: Tomas Hallingbäck,
Tomas.Hallingback@ARData.slu.se

Literature: Johannes Enroth,

Theses: William R. Buck, wbuck@nybg.org

Tropical Biology: Tamás Pócs, colura@cbello.hu

Association Objectives

The objectives of the International Association of Bryologists (IAB) is to promote international co-operation and communication among persons interested in bryophytes.

Next Meeting

The next IAB meeting will be held jointly with the XIX International Botanical Congress meeting in Shenzhen, China on 23--29 July 2017.

Call for Submissions

The Bryological Times was founded in 1980 by S. W. Greene (1928--1989) as a newsletter published for the IAB.

The Bryological Times welcomes announcements and summaries of bryological conferences, workshops, and fieldtrips; book reviews and notices of publications; and original articles, artwork and photography. Please send submissions to the editor: john.atwood@mobot.org.

All submissions will be acknowledged by email. Contributors will be asked to review their submissions before publication.

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Stanley Greene Award
Call for proposals, 2017**

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TITLE of the proposal

NAME of the candidate

PROPOSAL (2 pages maximum)

1 – Objectives

(Font 11)

2- The significance and its impact on bryology

3 – Its urgency

4– Budget

5– Literature cited

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