



The Bryological Times



Volume 142



President's Message

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With the distribution of a new volume of *The Bryological Times*, the council of IAB looks forward to renew its commitments to the society and its members. I thank DorothyBelle for years of leadership as editor of our newsletter, Kristina Lugo for serving as interim editor and developing new content, and John Atwood for stepping up and embracing the opportunity to share with our members bryological events and news, highlight inspiring careers of established colleagues, and introduce promising new members of our society. 2016 is also marked by the announcement of a new logo for IAB (see p. 14), the adjudication of the first conservation research award in several years (see p. 20) and the preparation for our next meeting, which will be held in Shenzhen, China, during the XIX International Botanical Congress, between 23 and 29 July 2017. Several bryological symposia are organized (see p. 11), and an open call for abstracts is soon to be made. We look forward to meeting you there.

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I would like to thank the council members for their service and encourage all members to recruit their students and colleagues to join the society and engage in its activities. I hope you will enjoy the present issue and look forward to reading your future contributions.

La Réunion Island Bryological Field and Taxonomy workshop, May 2015

Claudine Ah-Peng¹ & Nicholas Wilding
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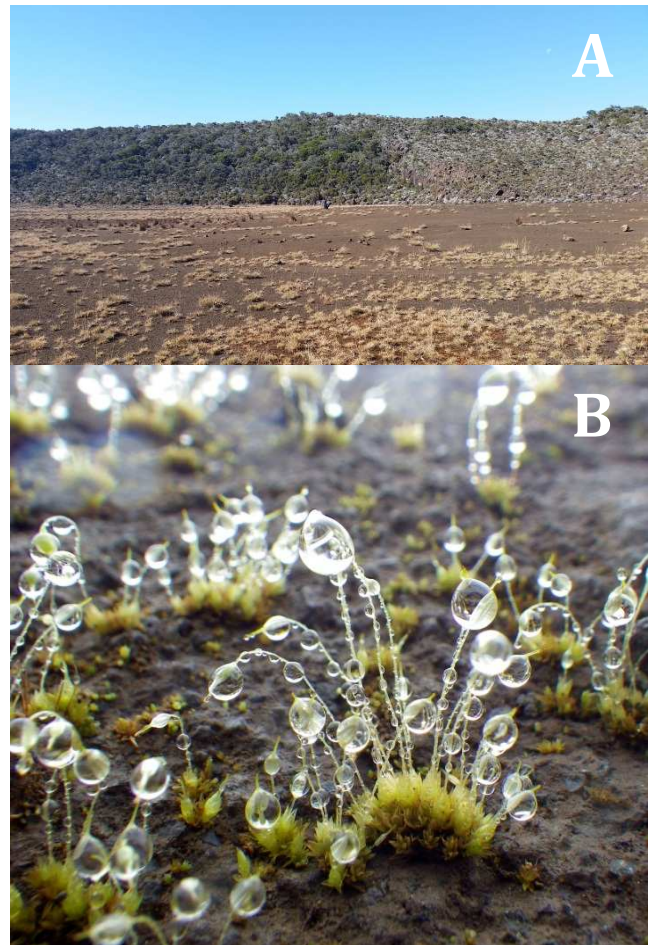
On May 25th – 31st 2015, bryologists from throughout the Southwest Indian Ocean gathered on the beautiful tropical volcanic island of La Réunion (France).

Bryologists from five countries in the region were present: Claudine Ah-Peng, Pierre Staménoff, Nicholas Wilding, Rémy Poncet (La Réunion, University of La Réunion), Roger Lala Andriamirisoa (Madagascar, Missouri Botanical Garden), Lova Marline (Madagascar, University of Cape Town), Terry Hedderson (South Africa, University of Cape Town), Nonkululo Phephu (South Africa, South African National Biodiversity Institute (SANBI)), Tarah Padayachi (Seychelles, Botanical Gardens) and Itambo Malombe (Kenya, East African Herbarium, National Museums of Kenya).

One of the aims of the workshop was to promote on going collaboration among bryologists from the different countries in the region and to share our expertise on bryophytes with each other, local botanists and officials. The focus for the meeting was on taxonomically difficult groups occurring on the island, particularly taxa in the Funariaceae, Leucobryaceae, Pottiaceae and Thuidiaceae.



Bryologists in the field. From left to right: Itambo Malombe, Terry Hedderson, Roger Lala Andriamirisoa, Claudine Ah-Peng, Nonkululo Phephu, Tarah Padayachi, Lova Marline, Rémy Poncet, and Pierre Staménoff. Photo credit: Marine L.



(A) Habitat for the moss *Entosthodon pertenellus*. (B) *Entosthodon pertenellus* intercepting cloud water.

The five day workshop consisted of two and a half days of exploration and collecting in some of the many different habitats on the island (all with permits of course), and two and a half days of talks and specimen examination.

On the first day, the group explored the high montane cloud forest of Bebour, Belouve. The pristine forest of Bebour, within the National Park (a UNESCO site), is by far the most diverse habitat for bryophytes on the island, especially for leafy liverworts such as Lejeuneaceae.



Nicholas Wilding presenting on the Funariaceae with an emphasis on the genus *Enthostodon*.

Presentations and laboratory sessions were organized for the second day, however, a power outage at the Institut Universitaire de Technologies (IUT) meant that a change of plan was needed. Instead, a quick call to the local park officer at the forest reserve (Espace Naturel Sensible de Montvert) and the group was off to explore one of the rarest habitats on the island: the transitional semi-xerophilous and megatherme hygrophilous forest.

On the third day the group was accompanied by two officers from the National Park. Together we visited the Piton de La Fournaise, one of the most active shield type volcanoes in the world. The group had the opportunity to hear how this landscape was formed by successive eruptions, erosion and collapse over the past 3.2 million years. We finished the day at the cratère Commerson, above a sea of clouds.

The fourth and fifth day were dedicated to presentations at IUT given by Roger Lala (on Leucobryaceae), Nonkululo Phephu (on Thuidiaceae), Nicholas Wilding (on Funariaceae)



(A) Terry Hedderson examining bryophytes with Rémy Poncet.

(B) Entrance of a lava tube located on the 2004 lava flow of the Piton de La Fournaise volcano.

and Terry Hedderson (on Pottiaceae). The group also had time to curate their specimens and to discuss the different taxonomic groups.



View of Rivière des remparts. From left to right: David Fontaine (National Park Of Réunion), Rémy Poncet, Pierre Staménoff, Terry Hedderson, Claudine Ah-Peng, Lova Marline, Roger Lala Andriamirisoa, Tarah Padayachi, Nonkululo Phephu and Itambo Malombe.

The final day of the workshop was devoted to the bryological exploration of lava tubes along the east coast of the island. Due to recent seismic activity the previous day, and the imminent threat of a new eruption, our guides from RandoTrek thought it best to explore only a couple of the shorter lava tubes.

In the end this was best, not only in the interest of preserving the African bryologists (a rare variety) but also because bryophytes were typically found around the entrance to the tubes where light reaches.

The meeting and travel expenses for all participants were funded by the FEDER Biodiversity project 5.1, allocated to the University of La Réunion. In the future, we hope to have similar workshops on the other islands in the Western Indian Ocean, as well as in Africa, with the goal of training students in bryology and share our knowledge and expertise about this diverse flora with other bryologists.

9th Conference of European Committee for Conservation of Bryophytes (ECCB), 26–29 April 2016, Bečići, Montenegro

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I travelled to Montenegro with two colleagues from Ireland. On our arrival at the conference venue, held at the Hotel Iberostar in Bečići, we were very warmly welcomed by the hotel staff. They were most friendly and helpful and created a good impression on this, our first visit to Montenegro. The hotel itself was an ideal venue for the conference, with good conference facilities (wi-fi, etc.) and proved to be a good choice by the conference organisers because everything was included in the hotel price (all meals and accommodation). Costs were very reasonable and as most participants stayed at the same hotel, and

indeed stayed on for the conference excursions, there were plenty of opportunities for people to meet socially over mealtimes and in the evenings.

The conference, attended by some 40 participants, was opened with some welcoming words by Ondrej Vizi, Director of the Natural History Museum of Montenegro, and by Dr Snežana Dragičević, principle organiser of the event. There followed a wide range of interesting presentations over the next two days covering topics on bryophyte conservation, including talks and posters on the current state of knowledge on the flora and distribution of bryophyte species in several European countries, bryophyte ecology in European wetlands, coastal systems and woodlands, agri-environment schemes, monitoring methods, *in vitro* and *ex situ* conservation techniques, cryptic species, the usefulness (or otherwise) of bryophytes as phytogeographical indicators and bryophyte Red Lists. The conference represented a truly international European perspective, with presentations from participants from Norway, Sweden, United Kingdom, Ireland, Hungary, Austria, Germany, Switzerland, Italy, Croatia, Portugal, Lithuania, Estonia, Bulgaria, Romania, Belarus, Turkey, as well as several from Serbia and, of course, Montenegro.

There was a particular focus on the new bryophyte Red List for Europe, a collaborative ECCB project commenced in 2015 with the International Union for Conservation of Nature (IUCN). This is partly funded by the European Union's LIFE programme, with contributions from several European countries. There are three stages envisaged for the project: (1) assignment of a draft threat assessment for each species on the European checklist; (2) organisation of a series of regional workshop meetings to examine the draft threat assessments and assign an agreed final assessment; (3) production and promotion of a Red List publication, with database work-sheets and a bryophyte page on the IUCN website. All species will be assessed according to IUCN Guidelines. Several ECCB members have already been trained by IUCN and designated as 'regional' assessors. Each regional assessor will work with ECCB members and other bryologists Europe-wide to co-ordinate the workshop meetings, in co-

operation with IUCN. The project is due to be completed by 2019.

A board meeting of the ECCB was held on the final evening. Beáta Papp stood down as chair of the ECCB and was warmly thanked for her term of office. Nick Hodgetts was voted in as new ECCB chair, with Beáta as vice-chair and Neil Lockhart as secretary. The conference concluded with an excellent Gala dinner, accompanied by a band playing popular hits that got (almost) everyone on the floor dancing – quite an achievement to see so many bryologists moving so quickly. An international table tennis tournament, played from the comfort of armchairs and sofas, was held on the final evening, with former ECCB 'chair' Lars Söderström a clear winner.

The final two days comprised excursions to some of Montenegro's finest locations for bryophytes, affording spectacular vistas of its beautiful landscape and scenery along the way. These excursions were exceptionally well planned and organised, with detailed printed itineraries for each day, including lists of bryophytes recorded from the areas visited. Snežana and her team had thought of everything, including snacks and refreshments on the bus. They even arranged the weather for our tour: rain at night to freshen up the bryophytes, mostly dry in the daytime to view them, and a rainbow at the end of the tour to finish off a perfect trip. There were cultural and natural heritage stops en route to the bryophyte hot spots, including a guided tour of Kotor, a visit to the Interpretive Centre at Vranjina, a boat journey from Vranjina to Rijika Crnojevića across the upper part of Skadar Lake, a visit to the Natural History Museum in Podgorica and an opportunity to sample some fine Montenegrin food at the excellent Restoran Izvor, near Zabljak. The highlight of the excursion for me was the visit to Durmitor National Park and Crna Poda, where we saw many interesting bryophyte species, including several that were new to me, including the rare and beautiful *Buxbaumia viridis*, a species listed on Annex II of the European Union Habitats Directive and on the Bern Convention.

The excursions undoubtedly highlighted the beauty and importance of Montenegro's landscapes, and with the expert guidance of

Snežana and her colleagues, it is clear that Montenegro holds an exceptionally rich bryophyte flora and is a priceless resource for its biodiversity in Europe, and indeed for the world. Conservation of this resource should be a priority for the country. Snežana and her organising team (including Marko Karaman, Suzana Malidžan, Ilinka Četković, Branka Knežević, Vera Biberdžić, Snežana Vuksanović and Marija Kojić) are to be warmly congratulated for arranging, planning and guiding this conference so professionally and in bringing it to a successful conclusion. Their enthusiasm for their country and its cultural and natural heritage were clearly evident. All participants went away with not just a greater understanding of Montenegro's complex history and its importance for bryophytes, but a love and affection for its people. I expect that many, like me, would like to come back for a return visit sometime soon.

Thank you to Snežana, and to all who helped to make this an unforgettable conference.

A book of conference abstracts (Dragičević 2016) has been published on the conference webpage (<http://www.eccb-bryo9-prmuzej.me>) and will shortly be available on the ECCB website (<http://eccbbryo.nhmus.hu>). Photographs of the conference by Michael Lüth, and of his journey through Albania to get there, can be viewed at Michael's webpage at <http://www.milueth.de/Moose/Dragičević>.

Literature cited:

Dragičević, S. (Ed.) 2016: *Bryophyte Conservation – Towards the new European Red List of Bryophytes. 9th Conference of European Committee for Conservation of Bryophytes*. Book of Abstracts. – Natural History Museum of Montenegro, Podgorica, 26pp.



Where Science Meets Art: The Botanical Illustrations of Rod Seppelt, Tasmanian Museum and Art Gallery, Dunn Place, Hobart 22 January – 1 May 2016

Alison Downing¹ and Lyn Cave²

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Rod Seppelt is known for his extensive studies of bryophytes and lichens in Antarctica and on many sub-Antarctic Islands. However, from time to time, Rod switched from these bitterly cold southern climes to distant lands of North America, principally Alaska, where his research and publications have included not only bryophytes, but also extended to fungi, lichens, algae and slime moulds!

However, Rod Seppelt, botanist, Antarctic and Arctic expeditioner, has not only studied the bryophytes, lichens, fungi and algae of climatic extremes, he has created an extensive portfolio of beautifully intricate scientific illustrations to accompany his scientific publications. His illustrations are not only exquisite but drawn with such accuracy that they have become an essential tool in the identification of this miniature flora.

The Tasmanian Museum and Art Gallery recently hosted an exhibition of Rod's work, drawn from bryophyte specimens in the Tasmanian Herbarium (HO), many collected by Rod himself while undertaking scientific studies in Antarctica, on subantarctic islands and in Tasmania. The exhibition also included displays which demonstrate some of the specimens illustrated, and some of the techniques employed in examining the plants and the process of producing the illustrations.



Professor Rod Seppelt at the opening of the exhibition, *Where Science Meets Art, the Botanical Illustration of Rod Seppelt*, Tasmanian Museum and Art Gallery, Hobart, Tasmania.

Janet Carding, Director of the Tasmanian Museum and Art Gallery, spoke at the opening of the exhibition on 22nd January, 2016:

“The Tasmanian Museum and Art Gallery is delighted to be hosting this exhibition – believed to be one of very few, if not the first exhibition of botanical art devoted entirely to mosses held anywhere in the world. Botanical illustrations record accurately all the features that are necessary for plant identification, including the plant’s overall appearance and structure. Such illustrations have been used to identify plants since the times of the ancient herbals, and to this day, botanical illustrations accompany and enhance written, often highly technical descriptions, help us to recognise and identify plants, and to communicate effectively about them. It is one medium that has certainly not been superseded by the digital world.”



Rod Seppelt with Dr. Tony Press and Gallery Director Janet Carding.

Rod’s generosity is well known to his Australian colleagues and to many overseas, not only in North America, but also in Europe, Japan and more recently in China. However, he has not only readily advised and assisted many colleagues with their research, he has made his illustrations of Australian mosses freely available to all, either directly or through the *Australian Mosses Online* website

http://www.anbg.gov.au/abrs/Mosses_online/.

He has assisted many by creating bryophyte illustrations specifically for our own taxonomic studies. Bryophytes are, for the most part, extremely small when compared to vascular plants, and the skill required to accurately reproduce on one page an image not just of the whole plant, which may be only a millimetre or two tall, but also of leaves, stems, propagules, sporophytes, spores and sections of many of these components, is awesome. Each one of Rod’s illustrations invariably includes a habit study, entire stem leaves and perichaetial leaves, detailed patterns of cells in leaves and leaf margins, transverse sections of

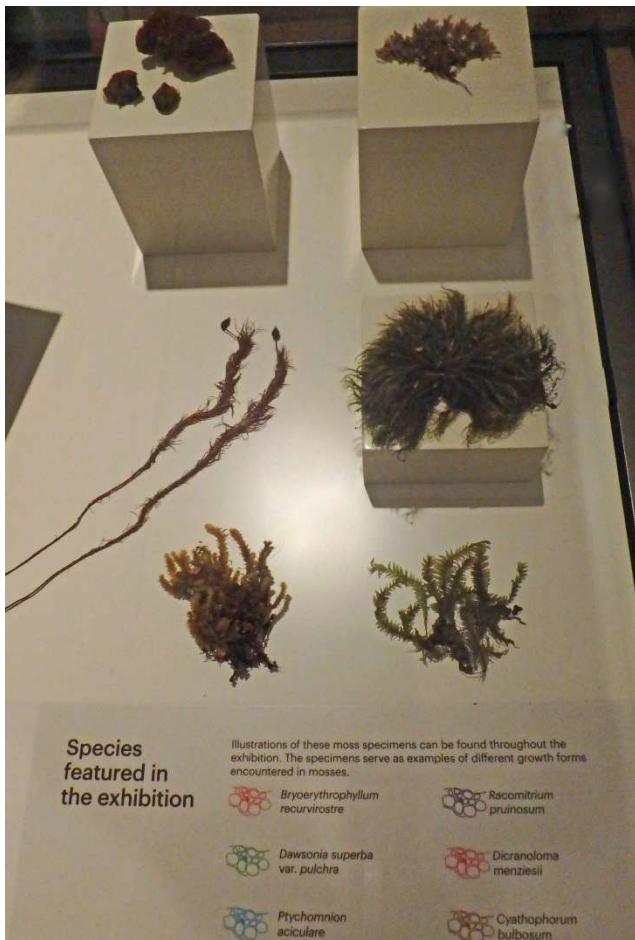
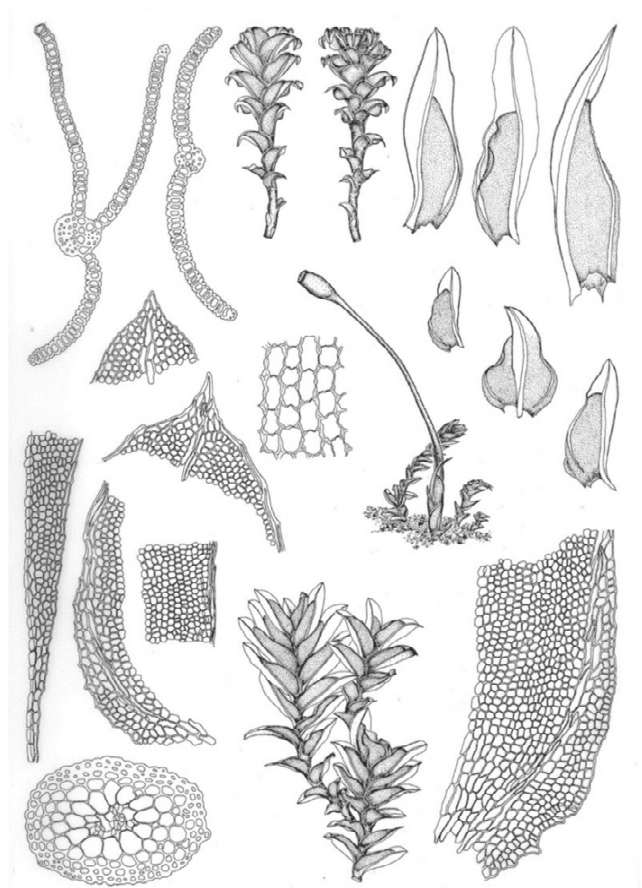


Table display of species featured in the exhibition.

stems and leaves, sporophyte including seta, capsule, calyptra and operculum, all at different elegance, each one a remarkable achievement.

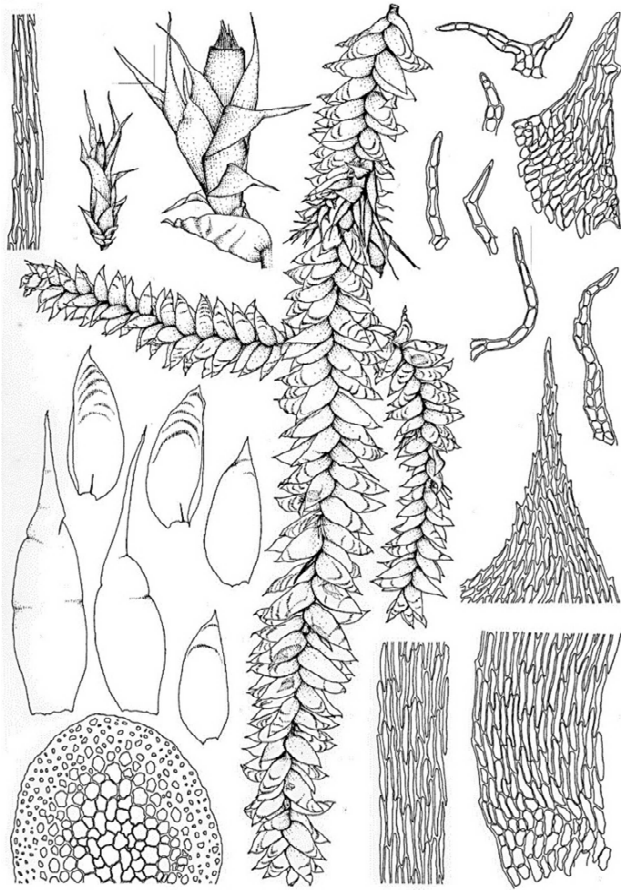
The process required to combine scientifically accurate morphology and anatomy in an aesthetically pleasing illustration is quite complex and involves moistening plants for many hours, drawing first habit studies, then dissecting stems and leaves, cutting thin sections, and use of both binocular dissecting and compound microscopes fitted with camera lucida drawing attachments, and ultimately composing and inking completed plates onto polyester film. In Rod's words:

“Scientific illustration should include not only an accurate representation of the subject plant, but also include all the necessary detail to enable unequivocal identification.”



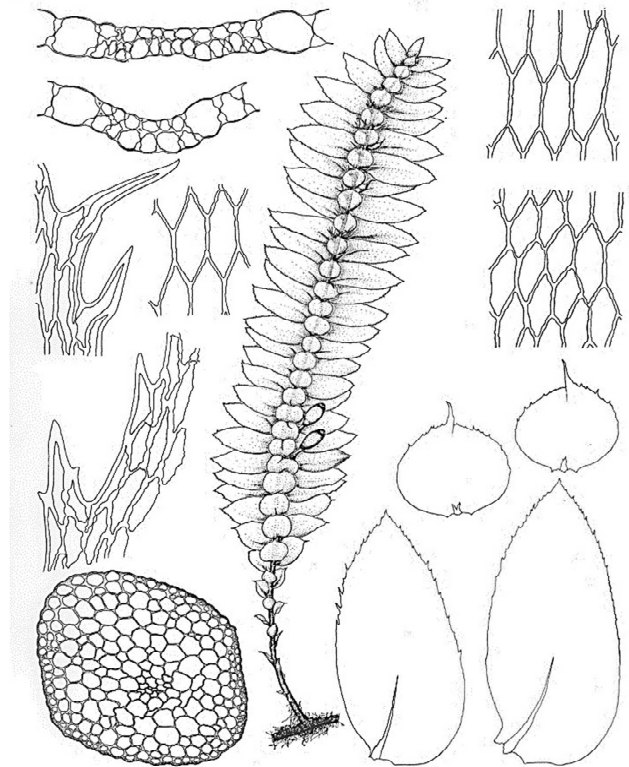
***Fissidens megalotis* drawn from 3 specimens: Talarook, G. Stone 9330 (MEL 2216515); Glenorchy, Near Elwick (Tasmania), 24 Jul 1901, W. A. Weymouth 2834 (HO 73490); North of Yass, I. G. Stone 21684 (MEL 2261953).**

This exhibition includes four main groups of illustrations: *Mosses of Tasmanian Bushland*, including, appropriately, *Tayloria gunnii* (Tasmanian endemic) and *Tayloria tasmanica* (known only from Tasmania and Stewart Island in New Zealand); *Mosses from Macquarie Island*, including three elusive Pottiaceae, *Syntrichia anderssonii*, *Syntrichia rubra* and *Bryoerythrophyllum recurvirostre*; *Illustrations for the Flora of Australia* with illustrations of four *Fissidens* species; and a wonderful category, *Botanical Art to Hang on a Fireplace Wall*, including one of our all-time favourites, *Rhabdodontium bufonii*.



Alleniella hymenodonta drawn from Gordon Road (Tasmania), 8 Feb 2014, J. Jarman s.n. (HO 572027).

Botanists Matt Baker and Lyn Cave from the Tasmanian Herbarium were the instigators of this exhibition, which they felt was a way to focus attention on the more than 35,000 botanical specimens from Antarctica and subantarctic islands held by the Tasmanian Herbarium and, in particular, on the scientific work of Rod Seppelt himself. The exhibition was officially opened by Dr. Tony Press, Director of the Australian Antarctic Division from 1998 to 2008. Dr. Press commented that when the Australian Antarctic Division was relocated from Melbourne on the Australian mainland to Hobart in Tasmania, so great was Rod's commitment to this organisation that he was one of the very first scientists to move his household to Hobart. Rod's first voyage to Antarctica was on board the *Nella Dan* in 1971; the objective of his first voyage to identify the lichens and mosses growing there, and to record detailed information on where they grew. He has since travelled to Antarctica more than 40 times.



Cyathophorum bulbosum drawn from the Arve River (Tasmania), 11 Feb 2013, R. D. Seppelt 29420 (HO 571974).

Bryophyte Symposium at the VIII Southern Connection Congress, 2016

Juan Larraín
Pontificia Universidad Católica de Valparaíso, Campus Curauma, Chile

The VIII Southern Connection Congress was held in the southern Chilean city of Punta Arenas, capital of the Magallanes Region, and located on the Strait of Magellan from 18th – 23rd January 2016. The symposium, “Phytogeography and ecology of bryophytes in the Southern Hemisphere” was organised by Lily Lewis (USA) and Elisabeth Biersma (UK) and included presentations on a wide range of topics, with speakers from both hemispheres and from many different countries.

The first speaker, Juan Larraín (Chile), presented details of the ongoing Cape Horn bryoflora project, which has been led by William Buck, John

Engel and Matt von Konrat. This is a collaborative project with contributions from specialists worldwide, with the main goal of producing a current moss and liverwort flora for this part of the world. The combination of scientific expertise together with political and logistical support from individuals, authorities, institutions, organizations, and the Chilean government and its agencies, has contributed to the successful completion of an inventory of bryophytes of the Cape Horn Archipelago. More than 15,000 bryophyte collections have been made during four years of concerted and intense field work.

Claudine Ah-Peng (Réunion) presented her work on the functional diversity of epiphytic liverwort communities in tropical regions, principally from studies in La Réunion Island, although Claudine and her colleagues have also worked in a number of diverse tropical and sub-tropical locations in the Southern Hemisphere. The project aims at defining how functional traits respond to different abiotic variables such as altitude, rainfall and sun exposure. Results of this study will shed light on the drivers of community assemblages of liverworts on islands and the role of liverworts in insular ecosystem processes. This study provides a framework and detailed methodology for conducting similar studies elsewhere and the development of a standardized methodology will allow for cross-comparisons and data sharing.

Ross Peacock (Australia) discussed the use of bryophytes as indicators of vegetation condition in high elevation cool temperate eastern Australian *Nothofagus moorei* rainforests subject to selective logging since the 1960s, and then left undisturbed. He and his collaborator found 120 bryophyte species, an almost complete absence of soil colonising bryophytes, and a greater number of species present in rainforests with a history of selective logging compared to the undisturbed stands. Leafy liverworts are especially dependent on unlogged forests. The absence of soil colonizing bryophytes is believed to be, in part, a result of high levels of aluminium in the soils.

Eric Karlin (USA) has been studying the double allopolyploid *Sphagnum* × *falcatum*. He presented data on the population genetics of this austral taxon, using both stable and hypervariable

microsatellite markers across its distributional range, and exposed the difficulties in comparing populations with completely different histories. The populations from Tierra del Fuego seemed to have originated from a single colonizing specimen with subsequent clonal reproduction, whereas populations from South Island, New Zealand reproduced sexually and revealed greater genetic differentiation. He concluded that both ancestrally stable and evolutionarily labile microsatellites are useful in elucidating the intricacies of allopolyploid evolution, but they represent different signals, and they should be analysed separately, though in concert.

Lily Lewis (USA) discussed the results of her doctoral dissertation on the phylogeographic history of the southern South American endemic dung moss, *Tetraplodon fuegianus*, and her efforts to determine the geographic origin of the ancestral *Tetraplodon* that first colonized southern South America. Her analyses are based on thousands of nuclear loci generated through an approach called Restriction Site Associated DNA sequencing. This large data set suggests that the ancestor of *T. fuegianus* originated from north-western North America, rather than north-western Europe, as had been suggested previously by earlier phylogenetic analysis of four loci.

Elisabeth Biersma (UK) presented results of her studies on the evolutionary history of Antarctic bryophytes, using molecular techniques to determine how long bryophytes have been present in Antarctica, and what dispersal routes they may have used. Elisabeth and her colleagues focused on several species of mosses, particularly *Polytrichum juniperinum*, *P. strictum* and *Bryum argenteum*, and concluded that although some Antarctic populations are of seemingly recent (post-LGM) arrival, others reveal the first evidence of long-term survival, with genetic dating methods revealing multi-million year persistence in Antarctica.

In the final presentation of the symposium, Peter Convey (UK) discussed the very real threat of biological invasions to Antarctic biota, including the impacts of non-indigenous biota in Antarctic ecosystems to date, and their implications in a future where these ecosystems are also faced by

some of the most rapid rates of environmental change on the planet. If the Antarctic is to remain the only continent globally that remains largely unaffected by biological invasions, then there are urgent and immediate challenges that face the authorities responsible for conservation and governance in the sub-Antarctic and Antarctic regions.

The symposium brought together scientists from around the world, and the diversity of their presentations reflected the multi-disciplinary interest in a great range of different aspects of Southern Hemisphere bryophyte biology. The global relevance of these southern studies is not only absorbing and fascinating, but also challenging and thought provoking in our rapidly changing world.



2017 IAB Meeting: Shenzhen, China

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Every five years, botanists from around the world share their discoveries and progress on all fields of plant science, at the International Botanical Congress. Our society has joined this major event and held its \pm biennial meeting going as far back as the 12th International Botanical Congress in St. Petersburg, 1975. In 2016, we will again be part of this major event, which will be held in Shenzhen, China, from July 23–29 at the Convention and Exhibition Center (see <http://www.abc2017.cn> for more information). Several proposals for bryological symposia were submitted and at least four were accepted: 1) *Microbiomes of Bryophytes*, 2) *The Moss Tree of Life: Phylogenomic approaches to reconstruct moss evolution, diversification, biogeography and biotic interactions*, 3) *Biodiversity and phylogeography of bryophytes*, and 4) *Early Land Plants: From early adopters to transformative models for citizen science engagement connecting natural history collections to biodiversity research and education*.

A call for additional abstracts was released on July 31. The council submitted two nominations for keynote speakers and is awaiting a decision. This will be a stimulating event for anyone who will join, and a unique opportunity for bryologists to engage in inspiring interactions that will lay the grounds for a strong presence at the next congress in 2021. This meeting will also see the council meet, announce winners for various award competitions and also decide on the venue for the next IAB meeting in 2019. I encourage you to join your colleagues and thereby contribute to a successful meeting and congress. Stay tuned for more news or check out the IAB and IBC websites for more info.



The diversity and distribution of the bryophyte species in coastal forests of Kenya

Itambo Malombe, East African
Herbarium, Nairobi, Kenya

The diversity and distribution of coastal forest bryophytes in Kenya project is funded by the Indian Ocean Commission, Biodiversity Project, as part of the Eastern and Southern Africa and Indian Ocean (ESAIO) collaborative. The specific objectives of the project are to 1) assess bryophyte diversity in the coastal forests of Kenya (a biodiversity hotspot); 2) produce a bryophyte field guide for use by the local community, conservationists, and potential ecotourists; and 3) establish permanent sample plots for monitoring the effects of climate change on bryophytes in the coastal region of Kilifi County (particularly the Arabuko Sokoke Forest and nearby sacred 'kaya' community forests).

The project will implement the standard field methods of collecting bryophytes as developed by University of La Réunion (Ah-Peng et al., 2007). Bryophyte specialists from La Réunion (Claudine Ah-Peng, Nicolas Wilding) and South Africa (Terry Hedderson) are planning to visit, train and assist the local team.

On March 1st–5th 2016, a preliminary workshop was held to launch the project and begin initial field surveys. Several scientists from the coastal region of Kenya attended. Although the coastal forests of Kenya have unique bryophytes, many of which are corticolous, the initial field surveys found that the overall bryophyte cover is somewhat low due to the high ambient temperature. Bryophyte density and biomass are expected to increase with elevation.

Literature cited:

Ah-Peng, C., M. Chuah-Petiot, B. Descamps-Julien, J. Bardat, P. Stamenoff & D. Strasberg. 2007. Bryophyte diversity and distribution along an altitudinal gradient on a lava flow in La Réunion. *Diversity Distrib.* 13: 654–662.



***Cynometra - Brachystegia* vegetation zones in Arabuko Sokoke Forest (as seen looking towards the Indian Ocean).**



Inception meeting, 1st March 2016, with participants of the bryoflora of coastal forests in Kenya project.



Thomas Mwadime taking photographs of corticolous bryophytes.



***Cheilolejeunea intertexta* growing on *Elaeodendron*. This species is among the first recorded in Kenya.**



Participants of the ATOL-Pleurocarps Meeting.

ATOL-Pleurocarps Meeting, 2016

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On June 9th, 2016, 30 bryologists from nine countries attended the second symposium focused on the “evolution and systematics of pleurocarpous mosses” at the Nees Institute for Plant Biodiversity at the University of Bonn in Germany. Despite the title, the event was open to contributions to other aspects of moss evolutionary biology. Seventeen talks ranging from reconstructing the backbone tree of mosses to phylogeographic patterns in pleurocarpous mosses composed the program, which was complemented by seven posters, presenting insights in the reproductive biology of mosses with dwarf males, resolution of specific taxonomic ambiguities or variation in organellar genomes. The event concluded with a one day field trip to the nearby Nitztal (Eifel).

The program with all abstracts is available for download at https://www.pleurocarps.nees.uni-bonn.de/programme/pleurocarps2016_programme-1.

The event was perhaps best characterized by the stimulating discussions that followed the talks and poster presentations, catalyzing, according to participants, potential future collaborations. The event was a success and participants expressed an interest in seeing such opportunity for exchanging ideas and progress be renewed on a regular, ideally biennial basis. We are considering organizing the third symposium in 2018, a symposium that should appeal to all moss systematists. We plan on holding the event again at the Nees Institute, which is ideally located in a city (i.e., Bonn) that is readily accessible by plane, train and car that offers accommodation and dining opportunities within walking distance, and also a rich cultural environment that includes the Botanical Garden across the street.

Furthermore, the modest registration fee, which was only 20 Euros this year, contributes to this event being affordable, including to graduate students and postdocs, who likely benefit the most for the opportunity to present and exchange ideas.

We are looking forward to the next event, and we encourage anyone working on the evolutionary biology of mosses to plan on attending.



The official corporate logo of the International Association of Bryologists (IAB)

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In the fall of 2014, the council started a competition for an official corporate logo of the International Association of Bryologists (IAB). The idea was to update our logo to one that keeps pace with the contemporary age but also reflects the mission and history of the association. The competition was communicated to IAB members via Facebook and Bryonet. Until December 1st the council received 14 designs by various colleagues and artists around the globe. At the IAB council meeting during the 2015 world conference of Bryology in Chile, the council decided on a short list that was distributed to the IAB members and in addition posted on Facebook. Members were asked to individually select their preferred design by anonymously voting. The voting (55% of the votes) selected the logo submitted by Juan Carlos Correa an artist from Chile, which is also reflected by the likes on Facebook. We are happy to present the winning logo which will serve as the official logo of the association.

On behalf of the members, the IAB council is grateful for the submissions and expresses sincere gratitude to the artists that participated in the competition. We congratulate Juan Carlos Correa for the winning logo which was awarded 300 USD and Jo Wilbram for the second winning nomination receiving a five-year IAB membership.



New IAB logo designs by Juan Carlos Correa



Training on tropical bryophytes and pteridophytes of SE Asia- a three-part program

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Bryophytes and pteridophytes are part of the diversity of almost all terrestrial habitats, and are known to be good bio-indicators. Nevertheless, they are rarely included in floristic inventories, management plans, and other ecological assessments. The lack of taxonomic expertise in these groups has hampered the understanding, conservation and appreciation of these specious organisms, especially in the tropics.



Selected bryophytes found within the Limestone Glass House of Queen Sirikit Botanic Garden: clockwise from top-left *Lunularia cruciata* (liverwort), *Hyophila involuta* (moss), *Racopilum orthocarpum* (moss), *Phaeoceros carolinianus* (hornwort). Photo credit: Thien-Tam Luong.

Recognizing the necessity to develop and enhance the taxonomic capabilities of potential personnel from the ASEAN (Association of Southeast Asian Nations) countries in understanding and documenting the enormous tropical biodiversity in SE Asia, the ASEAN Centre for Biodiversity (ACB) embarked on a program entitled “Extended Taxonomic Capacity Building for Sustainable Use of Biodiversity: Bryophytes, Pteridophytes and Economically-Important Insects (Predators and Parasitoids)”. The project has been implemented under the East and Southeast Asia Biodiversity Information Initiative (ESABII) with the financial support of the Ministry of the Environment, Japan (MOE-J) through the Japan - ASEAN Integration Fund (JAIF). A major component of the program involves three inter-related training activities intended for selected representatives from ASEAN member countries to be trained on the taxonomy of bryophytes and pteridophytes. Benito C. Tan (University of California, Berkeley, USA) and Boon-Chuan Ho (Singapore Botanic Gardens, National Parks Board, Singapore) were the key trainers invited to provide relevant teachings in bryology for the three activities.

The first activity was to introduce the 17 participants to the basic biology and life-cycles of these plants. Participants also visited the Cibodas Botanical Garden, in which an outdoor moss garden has been maintained since 2006. The second activity was an eight-day event

commencing on 25 November 2014 (including three days of data-processing training) in Bali, Indonesia. The main venue of this activity was at the campus of Universitas Dhayana Pura, where the opening event was featured in the Bali Post, a local newspaper. This activity provided the 18 participants with knowledge on advanced topics in bryology and pteridology, such as details about special morphological features, use of identification keys, up-to date classifications, ecology, and applications. Participants were also brought to the Bali Botanical Garden for some hands-on experience with live plants.



Participants studying bryophytes at Queen Sirikit Botanic Garden after a demonstration. Photo credit: Boon-Chuan Ho.

Following the success of the first two activities, the third and final activity was held on January 20th—30th 2015, at the beautiful Queen Sirikit Botanic Garden, Chiang Mai, Thailand. After the first two days of familiarizing and reviewing the fundamental essentials, the 31 participants were given group projects either on bryophytes or pteridophytes. This intensive training activity included field excursions to nearby nature areas in which participants learned about sample collecting and processing of these plants. The samples collected were brought back to the laboratory for further processing and identification under the microscopes with appropriate literature references.

The resulting species descriptions and distributions that were prepared and submitted by the participants were later compiled and edited into two guide books. *The Guide to the Bryophytes in the Limestone Glass House of Queen Sirikit Botanic Gardens* and *Field Guide to the Pteridophytes of Chiang Mai, Thailand* have recently been published by the ACB.



The bryophyte team from the workshop held at Queen Sirikit Botanic Garden. Photo credit: Thien-Tam Luong.

These guide books are intended to be utilized as tools in implementing future education and conservation programs on biodiversity of these non-flowering seedless plants in ASEAN member states.

Inadequate understanding of taxonomy has been recognized as one of the essential hurdles in conservation efforts, such as implementation of sustainable management and conservation plans. It is hoped that the three-part training program has benefited the ASEAN participants, and their respective home institutions, with the newly acquired ability to recognize and distinguish these different taxonomic groups. It is believed that much of the biodiversity in bryophytes and pteridophytes in SE Asia is yet to be discovered and documented. As a community, we need to know what is out there in order to save and protect it.



Theses in Bryology 33

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As reported in a previous issue of *The Bryological Times* (99: 17. 1999), the International Association of Bryologists has decided to begin a repository of bryological theses. These theses are being housed in the Library of The New York Botanical Garden. They are available via interlibrary loan. The NYBG Library online catalog (CATALPA) may be viewed

at: <http://www.nybg.org/library/>. As these 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 below. 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).

Lewis, Lily Roberta. 2015. Resolving amphitropical phylogeographic histories in the common dung moss *Tetraplodon* (Bryopsida: Splachnaceae). Ph.D. dissertation, University of Connecticut, Storrs, CT. iv + 125 pp. In English. E-mail: lily.lewis@uconn.edu.

This doctoral dissertation focuses on the phylogeography of *Tetraplodon*, with special emphasis on the origin of the southernmost South American endemic, *T. fuegianus*. Among the rarest of geographic disjunctions in plants is the amphitropical, or bipolar disjunction. Bryophytes exhibit this pattern more frequently than other plant groups, typically at or below the level of species. Chapter 1 delimited three major lineages within *Tetraplodon* with distinct yet overlapping ranges, including an amphitropical lineage containing *T. fuegianus*. Based on molecular divergence date estimation and phylogenetic topology, the American amphitropical disjunction is traced to a single direct long-distance dispersal event across the tropics. Chapter 2 provides the first evidence supporting the role of migratory shore birds in dispersing bryophytes (as well as other kinds of diaspores) across the tropics. Chapter 3 describes the complete chloroplast and mitochondrial genomes and nuclear ribosomal repeat across seven patches of *T. fuegianus*. Screening of variation within distinct patches revealed inter-individual polymorphism within single patches, and intra-individual variation in the nuclear ribosomal repeat. Chapter 4 employs a RAD-seq approach to sequence thousands of loci across the range of the amphitropical lineage, allowing for resolution of a monophyletic *T. fuegianus*, which shares an ancestor with

populations from northwestern North America. Within the lineage, geographic structure is identified, suggesting a complex phylogeographic history for this group, likely shaped by Pleistocene glaciations in northwestern North America.

Nonnenmacher, Hermann Frederick. 1992. A bryofloristic survey of Neosho County, Kansas, with ecological notes. M.S. thesis, Pittsburg State University, Pittsburg, KS. vii + 81 pp. In English.

This master's thesis is the first county-level survey of bryophytes in Kansas. Neosho County was chosen because it represented one of the most poorly collected counties in the eastern half of the state. Collections were made from August 1991 through March 1992 from 51 localities representative of the topographic areas and vegetation types in the county. 699 specimens were collected. Substrate and habitat notes were compiled for each specimen. In total, 17 species of hepatics and 60 species of mosses are reported. *Nowellia curvifolia* and *Rhizomnium punctatum* are new to the state.

Pasiche Lisboa, Carlos J. 2013. Protonematal dispersal by water, wind, and animal. M.S. thesis, University of Puerto Rico, Mayagüez Campus. x + 57 pp. In English with Spanish abstract.

Bryophyte dispersal studies have focused on the spore, but this master's thesis looks at dispersal of the protonemata of mosses. The species *Callicostella belangeriana* and *Taxiphyllum taxirameum* were studied in Puerto Rico. Hydrochory (water), anemochory (wind), and endozoochory (animal) experiments were carried out to test protonematal dispersal capabilities. With water and wind, a high proportion of the protonemata fell near the experimental source. There was little or no correlation between protonematal size and dispersal distance for hydrochory and anemochory. Viability was not affected by hydrochory or endozoochory but was diminished with anemochory. The research suggests that protonematal dispersal can be a major driver of

short distance dispersal that allows the maintenance, establishment and survival of bryophyte populations.

Peralta, Denison Fernandes. 2009. Polytrichaceae (Polytrichales, Bryophyta) do Brasil. Ph.D. thesis, Universidade de São Paulo. vi + 170 pp. In Portuguese with English abstract. Address of author: Herbário, Instituto de Botânica, Caixa Postal 68041, 04045-972 São Paulo, São Paulo, Brazil. E-mail: denilsonfperalta@gmail.com.

In this doctoral thesis, the Polytrichaceae of Brazil are treated. Fourteen species in seven genera are included: *Atrichum androgynum*, *Itatiella ulei*, *Notoligotrichum minimum*, *Oligotrichum canaliculatum*, *O. denudatum*, *O. riedelianum*, *Pogonatum campylocarpum*, *P. pensilvanicum*, *P. perichaetiale* ssp. *oligodus*, *Polytrichadelphus pseudopolytrichum*, *Polytrichum angustifolium*, *P. commune* and *P. juniperinum*. Additionally a new species of *Oligotrichum* is proposed. Twelve lectotypes of Brazilian Polytrichaceae are designated. Keys, descriptions, illustrations and discussion are provided for all taxa.

Pérez Pérez, Mervin Emanuel. 2010. Do novel *Spathodea campanulata* forests function as habitat for bryophytes? Analysis of diversity and establishment process. M.S. thesis, University of Puerto Rico, Mayagüez Campus. xii + 63 pp. In English with Spanish abstract.

In this master's thesis, the natural succession of secondary forests in Puerto Rico dominated by alien species such as *Spathodea campanulata* (Bignoniaceae) are examined as a habitat for bryophytes. These novel forests facilitate invasion/establishment of native vascular plant species. In forest fragments of different ages, past land use, and geological substrates, bryophyte inventories were carried out following the floristic habitat sampling technique. Additionally, a multi-factor experiment using *Neckeropsis disticha* propagules was conducted to evaluate habitat

quality and microclimate in bryophyte establishment. There was significant differences in bryophyte richness among patches; those in karst had the highest bryophyte richness value. This patterns was explained by microhabitat diversity and shorter flood periods. In *S. campanulata* patches temperature and light intensity were higher at the forest edge than in the interior, while relative humidity showed an opposite pattern. No relationship between microclimatic data and bryophyte richness and composition was observed. Forest structure and age explained bryophyte richness better than altitude and vascular plant species richness. In field experiments, vegetative propagules were more successful in the establishment process than sexual ones. It was concluded that *S. campanulata* forests support bryophyte re-establishment and the succession of epiphytic bryophytes and also promotes native vascular plant species.

Reeb, Catherine. 2014. Taxonomie intégrative du genre *Riccardia* (Aneuraceae, Marchantiophyta) en Afrique. Ph.D. thesis, Muséum National d'Histoire Naturelle, Paris, France. 2 + xviii + 374 pp. In French with English abstract. Address of author: Institut de Systématique, Évolution, Biodiversité, Muséum National d'Histoire Naturelle, 57 rue Cuvier, Case postale 39, 75005 Paris, France. E-mail: reeb@mnhn.fr; catherine.reeb@gmail.com.

This doctoral thesis looks at the genus *Riccardia* in Africa, for which 23 species are reported. It aims to review the species hypothesis for Africa, using an integrative taxonomy background. Three approaches were used: morphological, morphometrical and molecular. Primary Species Hypothesis have been proposed from morphological examination, and refined after comparison with results obtained from distances analysis, and NJ trees. An analysis of the architecture of the thallus is proposed and a software has been developed in order to acquire exhaustive measurements from each thallus. Measurements have been statistically analyzed in order to test congruence between the

morphometric groups and the morphological assignments. Primary Molecular Species hypothesis have been conducted using the software ABGD and by reconstructing haplotype networks. Monophyly, and sharing of exclusive molecular features have been investigated. The way to make the decision about Secondary Species Hypothesis are discussed, and results from the different analysis are compared. Eleven species are recognized, including six new species.

Soares, Abel Eustáquio Rocha. 2015. A família Thuidiaceae Schimp. no Brasil, um estudo taxonômico, filogenético e morfológico. Ph.D. thesis, Universidade de Brasília, Brasília, Brazil. 201 pp. In Portuguese with English abstract. E-mail: abeljah@gmail.com.

This doctoral thesis seeks to provide a taxonomic revision of the Thuidiaceae in Brazil and present a molecular phylogeny for the family worldwide in order to determine generic limits. The thesis is divided into four chapters. The first is the molecular phylogeny using *rps4*, *nad5* and *26S*. In the strict sense, only *Thuidium*, *Pelekiium* (including *Cyrto-hypnum*) and *Thuidiopsis* are included in the family, leaving a polyphyletic and paraphyletic Leskeaceae. The second chapter looks at phylogenetic relationships within the family, using the same genetic markers. In the third chapter a new Brazilian species of *Thuidium* is described. The final chapter is a taxonomic revision of the family in Brazil. A total of 16 species in two genera are accepted. All taxa are keyed, described, illustrated and mapped for Brazil.

Villanueva Areizaga, Doralis M. 2008. Genetic diversity of *Neckeropsis undulata* (Hedw.) Reich. populations in old and young forest stands. M.S. thesis, University of Puerto Rico, Mayagüez Campus. x + 44 pp. In English with Spanish abstract.

In this master's thesis, the effects of deforestation and forest fragmentation on bryophyte communities are examined. Forest fragmentation

in Puerto Rico has been shown to negatively affect bryophyte communities in the remaining forest remnants. Because bryophyte dispersal abilities are limited and forest fragmentation is expected to reduce genetic diversity of isolated populations, the genetic diversity of populations of *Neckeropsis undulata* was assessed in old forest stands (impacted by fragmentation) and more recently recovered forest stands (young). The study was carried out in Guajataca State Forest, using 1936 aerial photographs. All samples were analyzed using the AFLP method for polymorphism identification. When populations from old and young forest stands were compared for genetic diversity, there was no significant difference.

Trunk inhabiting bryophytes of Fiji

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This research focused on the ecology of bryophytes on the lower trunks of two host tree species. The study set out to test if factors such as elevation range of study sites, height along the host tree stem, the number and surface area of tree stems (i.e., habitat area), influenced bryophyte taxa richness in Fiji. The presence or absence of bryophyte species on the lower stems of the *Calophyllum* spp. trees and tree ferns were assessed at three elevations (~160m, 590m, and 1260m) on the island of Viti Levu, Fiji.

A total of 143 bryophyte taxa were found, consisting of 90 leafy liverworts, 2 thalloid liverworts, and 51 mosses. No hornworts were found. The study revealed eight new liverwort records for Fiji, including one new genus record. There was a humped distribution of bryophyte taxa richness with peak taxa richness observed at mid-elevation or in the upland forest. Additionally, along the altitudinal gradient 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.



(A, B) Researchers recording the presence or absence of bryophyte species on *Calophyllum* spp.



Field site on the island of Viti Levu, 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.

Based on:

Tabua, M. 2016. *Trunk-inhabiting bryophyte diversity on two common native trees along an altitudinal gradient on Viti Levu, Fiji*. 119 pp. M.S. thesis, University of the South Pacific, Suva, Fiji.



Grant recipient Miles Berkey.

**2016 Conservation and Endangered Species Grant Recipient:
Miles Berkey**

This Conservation and Endangered Species Grant aims at sponsoring research projects focusing on rare species, habitat protection or bryophyte hotspots in high need of conservation actions. Proposals were reviewed by a subcommittee of the conservation committee, which included Tomas Hallingbäck, Claudine Ah-Peng, Noris Salazar, Lars Söderström and Benito Tan.

Five submissions were reviewed. The International Association of Bryologists is excited to announce that the proposal entitled "Survey for potential presence of critically imperiled bryophyte species: *Brachydontium trichoides*, *Brachydontium olympicum*, and *Bryoxiphium norvegicum* subsp. *norvegicum* in the North Cascades" submitted by Miles Berkey (North Cascades National Complex) was recommended for funding. The following is a brief account by Miles outlining his project.

My study of nature, through a particular focus on bryophytes, has imparted an immense appreciation for the complex subtleties in a landscape. Cold, wet days, the inhospitably damp Cascade winters, and the staggering bushwhacks to kneel before an unknown liverwort on a water-logged stump; then the still, calm focus in the lab has formed my confounding captivation for mosses. I live in Marblemount, Washington, and work for the North Cascades National Park Complex. The combination here of excessive rainfall, cloud cover, and forests that stretch from the coastline to the mountains work to create a generous diversity of bryophytes, with numerous genera endemic to this region.

I developed a fascination for bryophytes during the last quarter of my undergrad at The Evergreen State College, five years ago. Since then I have been devoted to understanding the bryophytes in The Pacific Northwest. I have specifically found the bryoflora of fens and bogs to be very intriguing, and have been working to expand the poorly inventoried list of *Sphagnum* species within Washington State. Recently, I moved up to the North Cascades National Park to work for the season. Both my immediate proximity to alpine ecosystems, and the overall lack of bryophyte surveys done in and around the park have inspired me to spend the summer collecting. Among the many species I am eager to find here, there are a few that are of regional and global significance: *Brachydontium trichodes*, *Brachydontium olympicum*, and *Bryoxiphium norvegicum* ssp. *norvegicum*. With the advancing subalpine zone, in the North Cascades, habitable zones for these mosses are becoming

fewer and fewer. To assist me with this study, the International Association of Bryologists has awarded me the Endangered Species and Conservation Grant. This grant will help tremendously to enable a concerted effort to better understand the distribution of these mosses in the Pacific Northwest.



Student Profile: Kalman Strauss

I love moss. I always have. I've always adored peering into cracks in the sidewalk to spot a little moss, petting the soft lumps of moss in my grandparents' yard, and beholding the enormous emerald carpets in a northern forest. I even loved moss when I was a toddler—what better place for a new walker to fall down than on a soft patch of moss? While I've long revelled in the delights of moss, it is only recently that I became interested in the science of bryophytes.

A few years ago, I was reading through a botany textbook and there was a chapter on bryophytes. I was immediately captivated by the fascinating science of these plants: the fact that an early form of liverworts is thought to be the first plant to colonize land around 430 million years ago; the capillary action systems that allow bryophytes to attract and retain water, thus allowing them to live on all seven continents; the reproductive alternation of generations and the slender sporophytes. I was hooked! I realized that these plants, which until then I had appreciated only as a soft cushion, were actually quite complex and an important part of our ecosystem. I wanted to delve in deeper and learn more. I read several more books solely devoted to bryophytes, but I realized that I was still having a difficult time teaching myself some of the basics, for example the difference between pleurocarps and acrocarps. I needed help.

Filled with trepidation but great hopefulness, I contacted Matt von Konrat, a renowned bryologist who works at the Field Museum of Natural History in Chicago. At the time, my greatest aspiration was that he might email me back and I might get a few of my questions answered. Little did I realize that Matt would generously take me



Kalman Strauss.

under his wing and introduce me to a wonderful group of knowledgeable, giving, and brilliant bryologists. Over the past few years under Matt's guidance, I have had the honor to meet and learn from: Laura Briscoe, Bill Buck, Tom Campbell, Jerry Jenkins, Juan Larrain, Tamás Pócs, Nancy Slack, Sue Williams, and of course Matt himself.

With these inspiring scientists I have explored the great variety found among bryophytes; shared in their joy as a dried specimen springs back to life or a tardigrade is found; and discussed topics as varied as cladograms, peristomes, and even the best nail polish to use on prepared slides. I have been so honoured to be able to work with these amazing scientists, who have taught me not only about bryology, but, more importantly, about sheer big-heartedness.

Of course, after being so generously mentored, I wanted to give back, so to speak. So, I have been developing and teaching programs about bryophytes at my local nature center, sharing my love and knowledge with people of all ages. It has been such a privilege for me to teach classes about bryophytes, and then watch my students kneel down in the forest with their new magnifying lenses and see these plants in a whole new way. I hope that by spreading my love and appreciation of the world of bryophytes, I might help to protect

these plants and their place in the ecosystem. I look forward to many more years learning about and teaching others about bryophytes. They are so much more than just a soft carpet in the woods.



Research Profile: Stuart McDaniel



Stuart McDaniel.

I came to the study of mosses as an intern with Norton Miller at the New York State Museum doing biological survey work in the Adirondack Mountains during the summers of 1997 and 1998. We were principally interested in the dispersal biology of mosses and liverworts, in particular those found on calcium carbonate rocks. For one project we sampled and identified all bryophytes growing on anthropogenic calcium carbonate along the highway to the top of Whiteface Mountain. Given the well-documented history of the highway, and the rarity of such bryophytes in the region, we were able to crudely estimate dispersal distances and rates of colonization, ecological parameters that remain unknown for most plant species.

I started graduate school with Jon Shaw at Duke University in 1998 intent on taking molecular approaches to ecological problems in bryophytes. Over the course of my graduate career my interest gradually shifted from ecology to molecular population genetics and the evolution of complex traits. My thesis work focused on sexual dimorphism and the genetic basis of reproductive isolation between populations of the moss *Ceratodon purpureus*. I first attended a moss meeting in St. Louis when Moss2003 met subsequent to a bryophyte phylogenetics conference, in part coordinated by Brent Mishler and the NSF Deep Gene grant. Talks by, and conversations with, David Cove, Ralph Quatrano, Ralf Reski, Fred Sack and Mitsuyasu Hasebe in particular, really helped me see the potential for collaboration between population genetic and molecular genetic approaches to understanding phenotypic evolution.

The MOSS2004 conference in Freiburg was the first time I presented my work to a group of molecular-developmental biologists.

Small meetings like this are terrific for interacting with people in the field. There are plenty of opportunities to get feedback on your work from senior scientists, and they are generally pleased to share current and exciting new work under way in their labs. I was pleased to meet some of the photobiologists working with moss, like Jon Hughes, as well as authors of some of the classic papers in moss experimental biology, like Martin Bopp. A large percentage of participants are dealing with some of the same problems in growing and manipulating the mosses in culture, so it's a great place to pick up new solutions to culturing problems. I learned my inductive conditions for producing sporophytes were not as efficient as they might be! Moreover, it's very interesting to see when diverse manipulations produce similar phenotypes; I was pleased to see myosin knockout mutants that looked very much like the small-colonied hybrid progeny produced by my cross.

Mosses, any moss really, are terrific model systems for many questions in evolutionary biology. The availability of clonally replicable haploid gametophytes is a dream come true for a quantitative geneticist. Now is a particularly exciting time to be working on mosses, *Physcomitrella patens* in particular. The tools for studying gene function in this moss, and perhaps others like *C. purpureus*, are well developed. A way to identify genes underlying ecologically important trait variation in nature was lacking, at least from an evolutionary genetics perspective. It may soon be possible to find the allelic variation underlying ecologically important trait variation, and provide a rigorous experimental verification of this hypothesis in the lab. This type of work is imaginable in only a small handful of species.



Book Review: *Bryophytes of Wallonia*

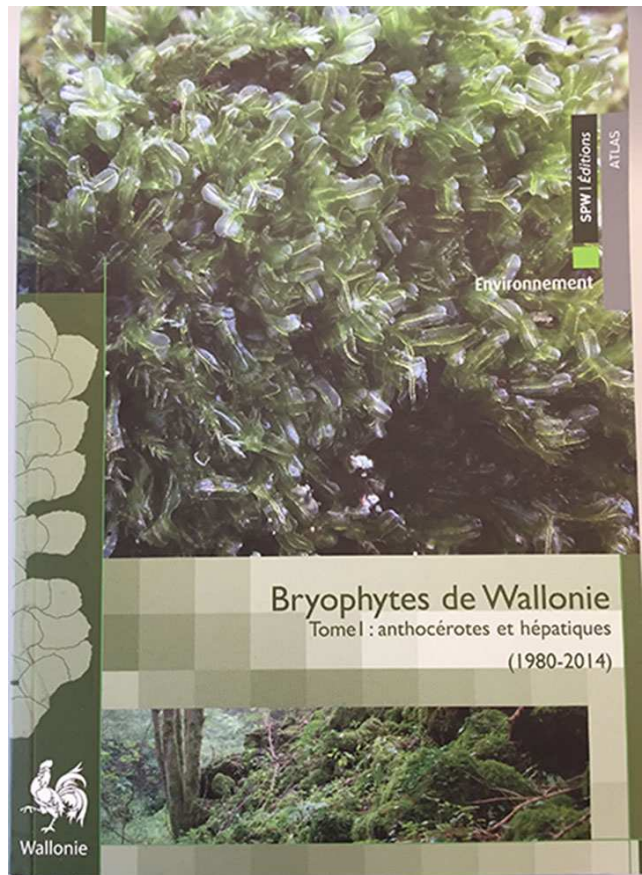
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Sotiaux A. & Vanderpoorten A., 2015: *Bryophytes de Wallonie* (1980–2014). Publication du Département de l' Etude du Milieu Naturel et Agricole. Tome I: Anthocérotes et Hépatiques; Tome II: Mousses. Price 15 € and 25 €, respectively.

To order contact Joëlle Burton, Direction Générale de l'Agriculture, des Ressources Naturelles et de l'Environnement C.R.E.A, Avenue Prince de Liège, 15, B-5100 Namur (Jambes), Belgium.
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For bank wire use: BIC code: GKCCBEBB;
IBAN code: BE96068105572605.

I have in front of me the two volumes of *Bryophytes de Wallonie* (1980–2014), together 1064 pages with an inviting cover and careful designed layout. What is remarkable is that the name of the authors does not appear on the cover page. This is an unjustified modesty, because this is without doubt the “opus magnum” of one of our Belgian colleagues: André Sotiaux.

The foreword mentions that this atlas is based upon 280,000 specimens, divided over the 720 species that are currently occurring in Wallonia, and that the inventory took over 35 years. I couldn't refrain myself from some calculation and from comparing this with my own experience: 280,000 specimens over 30 years give an average of 8,000 specimens per year or approximately 150 specimens per week. One must be in a ‘top area’ of the Ardennes to make 150 collections in one day; thus with one excursion per week one can never reach this result. My estimation is that easily 3 or 4 excursions per week are needed to get this average. Sustaining such an inventory effort for more than 35 years is truly a “titanic job”!



Bryophytes of Wallonia

Volume 1 gives a general introduction and describes the inventory method and database. We read that the average species richness in Wallonia is 122 species per unit square (4×4 km), ranging from 86 to 146 species. The main part of Volume 1 covers the hornworts and liverworts. Volume 2 covers the mosses and is completed by a glossary and candidate ‘red list’ for Wallonia.

The nomenclature of the Atlas does not always follow the Belgian checklist (Sotiaux et al. 2007). This may seem strange, as both authors are also co-authors of the checklist. However, several modifications took place during the inventory and a pragmatic compromise seems to have been found. Nevertheless, the lumping of *Fissidens viridulus* into *F. incurvus* is not very consequent; I still consider both to be different species.

A distribution map is provided for each species. However, for liverworts, a second distribution map gives the status of the species before 1985. Each species is further annotated with extra information. I must congratulate the layout designer who succeeded in providing all the

information without overloading the type page. Information is provided on the European red-list status, the current status in Wallonia, the frequency in Wallonia and per eco-district, biogeographical and ecological data and other information (e.g. determination hints). I was told that the text was written under time pressure and this can be noted in the writing style; nevertheless, the annotations are worth reading and provide useful information. Additionally, the Atlas is illustrated with beautiful landscape pictures, habitat photographs or micro-photographs. One minor remark: the authors did not take the current bryological inventory of Flanders into account. Comparisons are made with the Netherlands and the Grand-Duchy of Luxembourg. Indeed, nearly all bryophytes occur more in Wallonia, however some species occur more in Flanders (e.g., *Pallavicinia lyellii* and *Drepanocladus polygamus*). More disturbing is that both in Wallonia as in Flanders, *Mylia anomala* and *Ptilidium ciliare* are on the brink of extinction.

This Atlas will for several years remain a reference work and should be on the working table of bryologists with interest in bryophyte distribution.

Based on:

De Beer, D. 2015. Boekbespreking: Bryophytes de Wallonie (1980–2014). *Muscillanea* 35: 60–62.

Literature cited:

Sotiaux. 2007. Bryophyte checklist and European Red List of the Brussels-capital region, Flanders and Wallonia (Belgium). *Belg. J. Bot.* 140: 174–196.



Obituary: In Memory of Herman Stieperaere

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Herman Stieperaere, retired bryologist of the National Botanical Garden of Belgium, passed away at the age of 69 years on 11 June 2015. Herman started his professional career as research assistant at the University of Ghent where he continued his research in grassy heathlands (Nardo-Gallion vegetation). It was the subject of this doctoral thesis. In 1981 he took up the position of bryologist at the National Botanical Garden. Since then, Herman was an active member of the Flemish Bryological and Lichenological Society (VWBL), was president of the society between 1983 and 1988 and from 2002 and 2015 editor of the society's journal *Muscillanea*.

During more than 35 years, Herman was the “hub of the club” and it is difficult to sketch in a few words his importance for the VWBL and for bryology in Belgium.

It is characteristic of him that he sometimes jokingly said: “*my higher plants, I no longer know and my bryophytes, I don't know them yet?*”. This was an understatement. Herman was our scientific support and, on top of his research obligations at the Botanical Garden, he considered it important to share his bryological knowledge with florists and conservationists alike. Herman took his time for this: you got the needed advice. As an extra, one could get information about the “*the culinary art of a medieval recipe?*” or “*the cultivation of a rare rose- or chicken variety?*”. Gastronomy, old roses and chicken varieties were topics of his various interests. When you were with Herman, you always left wiser.



Herman Stieperaere

Under Herman's leadership, the VWBL became a more professional organisation. As editor of *Muscillanea*, the scientific level of our journal increased and remained high. When reading Herman's contributions one is guided through the inventoried area: as no other, Herman could sketch the micro-world of mosses and liverworts in a large-scale landscape context. Herman could be very direct and had "unsalted opinions" about site management of a nature reserve or research done by others. In most cases his remarks were very pertinent and were based upon extensive field experience and broad knowledge of the scientific literature. This directness was often misunderstood; it was his way of communicating and he had no problem if one replied equally direct. Despite his "big mouth", he remained a modest person.

Sitting next to him in the car on the way to a next excursion with the classical-music radio in the background, one received a free course in landscape ecology with the area south of Bruges as a reference. He loved this area where he spent most of his youth and where he took his first steps in phytosociology. So rightfully did he complain about the decline of the landscape and plant diversity as a result of intensive farming. He enjoyed and looked forward to the monthly excursions of the VWBL. With much gusto and with walking stick and plastic shopping bag with convolutes, he was quickly surrounded by amateur bryologists - he never lost his teaching skills!

Whatever the success of the bryological excursion, when on the way back we passed an old farmers' garden, he forgot the mosses especially when he then had an opportunity to chat with the owner. We noticed the difficulties he had during the last excursions and how difficult it was during the last general meeting of the VWBL as he fully realised that his end was near.



Editor's Corner

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Earlier this year, Bernard Goffinet and Matt von Konrat approached me with the opportunity to edit *The Bryological Times*. To better grasp what might be expected of me as editor, I familiarized myself with the newsletter by reading through numerous volumes archived in the Missouri Botanical Garden's library.

The Bryological Times has established itself as an effective platform for publicizing news about conferences, workshops and forays as well as notes about bryologists and their publications. I hope to continue to promote this content as well as expand the newsletter by drawing on the broad expertise of the IAB membership.

The Bryological Times requests notes on the ecology, taxonomy, and distribution of bryophytes. Essays on techniques for assisting in the collection, study, labeling, and curation of bryophyte specimens will also be accepted. Lastly, featured profiles of bryologists and their diverse research interests are welcomed. I look forward to your contributions as well as comments and suggestions to further develop our newsletter.

Thanks to Kristina Lugo for much assistance in editing and compiling this volume.

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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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