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2021 IAB elections

The International Association of Bryologists held its biennial election for various position on its council. In 2021, the term of five officers came to an end: Yelitza Leon (Vice President), Isabel Draper, Juliana Rosa Olivera, Javier Martinez-Abigar and Juan Carlos Villarreal. We thank them for engaging in the association and in the council's activities by serving and chairing committees.

The ballots for the election followed new guidelines seeking to ensure representation from the different continents and a correct gender and diversity balance. The ballot comprised three candidates for vice-president, two candidates for Region Africa, three for North America and three for Australasia including South Pacific Islands. We thank all nominees for accepting to be considered for the various IAB officer positions.

The election committee was composed of Kien-Thai Yong (chair), Catherine Reeb and Matt von Konrat, and Isabel Draper and Juan Larraín served as election judges.

The committee validated 161 votes, and thereby certified the election of Juan Carlos Villarreal to the position of Vice President, and of Jessica Budke, Christine Cargill, Andrew Franks, Itambo Malombe and Mereia Tabua to the positions of council members.

We congratulate all elected members.

— Bernard Goffinet, on behalf of the election committee and judges



Juan Carlos Villarreal



Jessica Budke



Christine Cargill



Andrew Franks



Itambo Malombe

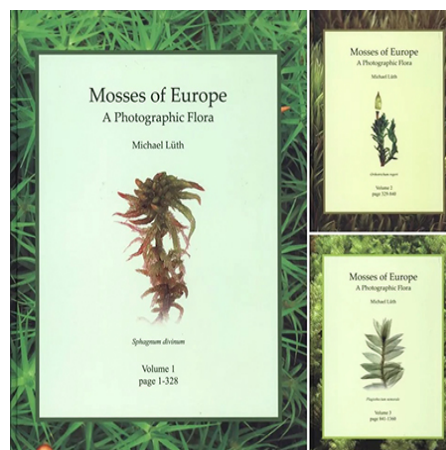


Mereia Tabua

The 2021 IAB awards

The International Association of Bryologists biennially adjudicates several awards and prizes recognizing the accomplishments or promise of its members. In 2021, nominations were requested for the Spruce award, the Hattori Prize, and the Grolle award and applications for the Stanley Green award were sought. Outcomes of the adjudications were announced at IAB general assembly held on July 9, during the virtual BL2021 meeting.

The **Spruce award** recognizes outstanding contributions to bryology by an IAB member within the first 25 years of his/her/their career (dated from their first bryological publication). The adjudication committee was chaired by Javier Martinez-Abaigar, and further composed of Silvia Pressel and Rui Liang Zhu. The **Spruce award 2021** is awarded to **Alain Vanderpoorten** (University of Liège, Belgium) for his nearly 200 publications spanning the fields of taxonomy, molecular biology, floristics, biogeography, ecology, and evolutionary biology, that have gathered about 4,500 citations. Most of his accomplishments emerge from collaborations with bryologists throughout the world and have been published in prestigious international journals, both bryological and broad spectrum, including *Nature Communications*, *New Phytologist*, *Systematic Biology*, *Ecology Letters*, and *Critical Reviews in Plant Sciences*. His early work focused on pleurocarps systematics and primarily Amblystegiaceae, particularly on ecology, population genetics, systematics, and character evolution. He then moved to bryogeography, leading major advances in understanding the processes that underpin long known distribution patterns of bryophytes. His highly innovative research on the settling velocity of spores has been instrumental in linking spore traits to dispersability and hence ranges in bryophytes. In addition, in 2009 Alain has co-authored a comprehensive and extremely useful textbook on bryology “Introduction to Bryophytes”, currently available as an e-book. Other examples of his many important contributions to bryology include a two-volume (1,000 pages) atlas of the bryophytes of Wallonia (Belgium) and co-authorship of “A miniature world in decline: European Red List of Mosses, Liverworts and Hornworts”. He serves as an associate editor of several journals, such as *Journal of Biogeography*, *Taxon*, *The Bryologist*, *Journal of Bryology*, *Botany Letters*, and *Acta Botanica Gallica*. Alain has supervised 12 Ph.D. students and serves on many advisory committees. He has also been honoured with several prestigious national awards in Belgium, among them, National Botanic Garden of Belgium E. Van Romsdaey Award in 1997, Royal Academy of Belgium Plant Biology Award in 2002, and Royal Academy of Belgium Emile Laurent Award in 2008. Alain is highly meritorious of this award, and we wish him many more outstanding publications. Congratulations.



The **Hattori Prize** recognizes an outstanding book, paper or series of papers published on bryophytes within the previous two years (from 1 Jan 2019 to 31 Dec. 2020). The adjudication committee was chaired by Isabel Draper, and further composed of Masaki Shimamura, Hans Stenøien & Li Zhang. The **Hattori Prize 2021** is awarded to **Michael Lüth** (Freiburg, Germany) for his *Mosses of Europe - A Photographic Flora*. This amazing 3 volume book illustrates almost all the European moss species (around 1250 taxa) and is the first such comprehensive treatment for the European moss flora. Each species is illustrated by outstanding macro- and microscopic photographs that show both morphological characters and the species habit in a full-page format. The illustrations are of high quality and the selection of characters shown usually includes the critical characters needed for a correct identification, which makes this book a great complement to the available regional or national moss keys, both for amateurs and for professional bryologists. Michael Lüth has compiled the book almost on his own, from searching and capturing the species in their natural habitat, to preparing microscopic slides illustrating diagnostic morphological features. This monumental work will undoubtedly stand out for many years as the most complete, attractive, and useful photographic guide that will serve the bryological community as well as promote awareness of bryophytes and their diversity to the general public. Congratulations to Michael for this truly outstanding contribution to bryology.

The **Grolle award** recognizes outstanding contributions in bryodiversity. The adjudication committee was chaired by Matt Renner, and further composed of James Shevock and Paulo Camara. The **Grolle award 2021** is awarded to **Li Zhang** (Fairy Lake Botanical Garden, Shenzhen, China) for his extensive exploration of bryophyte diversity in underexplored regions of China, especially the provinces of Yunnan, Sichuan, Guizhou and Guangzhou. In 2006, Dr. Zhang joined the Fairy Lake Botanical Garden and established the bryophyte herbarium, and its exchange program. His taxonomic work in China has included hornworts (Zhang et al. 2011, 2018), *Frullania* (Zhang in Wu et al. 2012), *Fissidens* (Zhang 1993, Zhang & Lin 1997, Zhang & Hong 2011), and *Hypopterygium* (Zhang et al, 2016). He has also published bryophyte floras of Macao (2010), Guangdong (including Hainan) (2013), and inventories of Macao (2009) and Hong Kong (1997, 2003).



His publications include the books Higher Plants of China, Vol. 1. Bryophyta (2012) and Higher Plants of China in Color, Vol. 1: Bryophytes (2016), and the first field guide of bryophytes in China, Field Guide of Wild Plants of China: Bryophytes (2016), which are complemented by his superb photography. Dr. Zhang has worked tirelessly to document, communicate, and promote the diversity of bryophytes in China and Hong Kong. We congratulate Li Zhang for his exemplary contributions to Southeast Asian bryology.

The **Stanley Greene award** aims at supporting bryological research. The adjudication committee was chaired by Matt von Konrat and further composed of Maria Jesus Cano, Chris Cargill & Malombe Itambo. See page 10 for Matt's article on the recipients of this award.

—Bernard Goffinet

Notes on some invalid moss taxa

Shuvadeep Majumdar

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Each year many plants new to science are discovered and published with new names, but authors sometimes fail to abide by the rules of the existing nomenclatural code, making the names invalid. Dubagunta Subramanian introduced many moss taxa (Subramanian, 2006, 2007a, b, 2008, 2009a, b, 2010, 2011a, b), including the genus *Physcomitriopsis* D.Subram., but unfortunately none of the species and varieties were validly published, according to Art. 39 and Art. 40 of the Shenzhen Code (Turland *et al.*, 2018); specifically, Art. 39.1 (not accompanied by a Latin diagnosis), Art. 40.1 (type not indicated), Art. 40.6 ('typus', 'holotypus' or their abbreviation not included), or Art. 40.7 (single herbarium, collection, or institution in which the type is conserved not specified), or a combination of these. Some are also illegitimate as later homonyms (Art. 53.1). In addition, *Physcomitriopsis* was not validly published in 2011 (Art. 39.1 and Art. 40.6), but was subsequently validly published (Subramanian 2016a: 542).

A total of 148 names are invalid, as follows. Brackets indicate names with orthographic errors as published. Asterisks indicate taxa that are invalid but also illegitimate as later homonyms.

- Aerobryidium indicum* D.Subram. (2008: 62)
- Aerobryopsis pygmaea* D.Subram. (2010: 271)
- Aerobryum bryoides* D.Subram. (2010: 271)
- Aerobryum plumosum* D.Subram. (2010: 269)
- Aerolindigia barbelloides* D.Subram. (2016b: 624)
- Aerolindigia barbelloides* var. *pterobryopsida* D.Subram. (2016b: 624)
- Barbella diffusa* D.Subram. (2010: 273)
- Barbelopsis trichophora* var. *gracilarioides* D.Subram. (2010: 272)
- Barbula athanurensis* ['athanurensis'] D.Subram. (2006: 133)
- Barbula athanurensis* var. *delicatula* D.Subram. (2007b: 540)
- Barbula foreauana* ['foreauanus'] D.Subram. (2007b: 540)
- Barbula foreauana* ['foreauanus'] var. *acutifolia* ['acutifolius'] D.Subram. (2007b: 540)
- Barbula foreauana* ['foreauanus'] var. *lancifolia* ['lancifolius'] D.Subram. (2007b: 540)
- Barbula foreauana* ['foreauanus'] var. *linifolia* ['linifolius'] D.Subram. (2007b: 540)
- Barbula foreauana* var. *nilgiriensis* D.Subram. (2016a: 540)
- Barbula foreauana* ['foreauanus'] var. *spiniforme* D.Subram. (2007b: 540)
- Barbula kalrayensis* D.Subram. (2006: 133)
- Barbula kalrayensis* var. *globularis* D.Subram. (2007b: 540)
- Barbula kalrayensis* var. *lancifolia* D.Subram. (2007a: 528)
- Barbula kalrayensis* var. *lobata* D.Subram. (2016a: 540)
- Barbula kalrayensis* var. *serrata* D.Subram. (2007a: 528)
- Barbula kalrayensis* var. *serratifolius* D.Subram. (2007b: 540)
- Barbula latifolia* ['latifolium'] D.Subram. (2007a: 529)
- Barbula mayurensis* D.Subram. (2006: 133)

- Barbula ricciofolia* ['ricciofolius'] D.Subram. (2006: 131)
Barbula thillaiammai D.Subram. (2007a: 529)
Bartramia kodaikanalensis D.Subram. (2009b: 439)
Bryum angelica D.Subram. (2007b: 540)
Bryum billardifolium D.Subram. (2010: 269)
Bryum divaricata D.Subram. (2007a: 531)
Bryum giganteum D.Subram. (2009b: 438)
Bryum grandifolium D.Subram. (2007a: 533)
Bryum kalrayensis ['kalrayansis'] D.Subram. (2007b: 541)
Bryum kalrayensis ['kalrayansis'] var. *acutifolius* D.Subram. (2007b: 541)
Bryum kalrayensis ['kalrayansis'] var. *chelliammai* D.Subram. (2007b: 541)
Bryum kalrayensis ['kalrayansis'] var. *delicatula* D.Subram. (2007b: 541)
Bryum kalrayensis ['kalrayansis'] var. *ramosa* D.Subram. (2007b: 541)
Bryum kalrayensis ['kalrayansis'] var. *serratifolia* D.Subram. (2007b: 541)
Bryum kanagambigai D.Subram. (2007a: 532)
Bryum mariammai D.Subram. (2007a: 533)
Bryum pachamalaiensis D.Subram. (2009b: 437)
Bryum ramosum var. *acutifolium* ['acutifolia'] D.Subram. (2007b: 540)
Bryum ramosum var. *lanceolatum* ['lanceolata'] D.Subram. (2007b: 540)
Bryum rhodobryoides D.Subram. (2009b: 438)
Bryum serratifolium D.Subram. (2007a: 531)
Bryum spinifolium D.Subram. (2007a: 532)
Bryum yercaudensis D.Subram. (2007a: 532)
Campylopus linearis D.Subram. (2007a: 528)
Campylopus linearis var. *albicans* D.Subram. (2016a: 539)
Campylopus linearis var. *nilgiriensis* D.Subram. (2016a: 538)
Catagonium ['Catagonium'] *indicum* D.Subram. (2016b: 630)
Cryptoleptodon limantocladioides var. *lanceolatus* ['lanceolata'] D.Subram. (2016b: 627)
Cryptoleptodon nervatus D.Subram. (2016b: 625)
Cryptoleptodon nervatus ['Cryptolepdon nervata'] var. *himantocladioides* D.Subram. (2016b: 625)
Cryptoleptodon nervatus ['nervata'] var. *spathulatus* ['spathulata'] D.Subram. (2016b: 625)
Cryptoleptodon ovatus D.Subram. (2016b: 626)
Cryptoleptodon ovatus ['ovata'] var. *nilgiriensis* D.Subram. (2016b: 626)
Dicranoloma lancifolium ['lancifolia'] D.Subram. (2007a: 528)
Dicranum indicum D.Subram. (2007a: 528)
Dicranum indicum var. *lancifolium* ['lancifolia'] D.Subram. (2016a: 538)
Dicranum indicum var. *spinifolius* D.Subram. (2007a: 528)
Dicranum kalrayensis D.Subram. (2007b: 540)
Dicranum lancifolium ['lancifolia'] D.Subram. (2007b: 540)
Dicranum ovalifolium ['ovalifolia'] D.Subram. (2007b: 540)
Ditrichum flexicaule var. *linifolia* D.Subram. (2016a: 537)
Dolichomitra ['Dolichomitrea'] *constrictifolia* D.Subram. (2009b: 440)
Fissidens alternifolius D.Subram. (2007a: 528)
Fissidens angelii D.Subram. (2009a: 352)
Fissidens barbuloides D.Subram. (2011a: 915)

- Fissidens ceylonensis* var. *anamalaiensis* D.Subram. (2009a: 352)
Fissidens delicatulus D.Subram. (2007a: 528)
Fissidens diversifolius var. *nagarcoilensis* D.Subram. (2011b: 995)
Fissidens geppii var. *marthandanii* D.Subram. (2011b: 995)
Fissidens grandifolius D.Subram. (2007b: 539)*
Fissidens indicus ['*indicum*'] D.Subram. (2007a: 527)
Fissidens kanagambigai D.Subram. (2009a: 352)
Fissidens kanagambigai ['*kangambigai*'] var. *minimus* ['*minima*'] D.Subram. (2009a: 352)
Fissidens kalrayensis D.Subram. (2007b: 539)
Fissidens lancifolius D.Subram. (2011a: 915)
Fissidens lancifolius var. *trichurensis* D.Subram. (2011a: 915)
Fissidens minima D.Subram. (2007b: 539)
Fissidens oblongifolius D.Subram. (2007b: 539)
Fissidens obtusifolius var. *indicus* ['*indicum*'] D.Subram. (2009a: 352)
Fissidens obtusifolius var. *plumosus* D.Subram. (2009a: 352)
Fissidens obtusifolius var. *valpariensis* D.Subram. (2009a: 352)
Fissidens ovoides D.Subram. (2007a: 527)
Fissidens recurvatus ['*recurvata*'] D.Subram. (2011b: 997)
Fissidens shervarayensis D.Subram. (2007a: 527)
Fissidens undulaefolia D.Subram. (2016a: 541)
Grimmia neilgiriensis D.Subram. (2008: 39)
Handeliobryum himalayanum var. *bipinnata* (2016b: 632)
Hedwigidium neelgiriensis D.Subram. (2008: 57)
Herpetineuron pinnataum ['*pinnata*'] D.Subram. (2009b: 439)
Himantocladium grenulosum var. *aerobryoides* D.Subram. (2016b: 629)
Himantocladium indicum D.Subram. (2009a: 357)
Homalia filiformis D.Subram. (2016b: 630)
Homaliadelphus feruginea var. *pulneyensis* D.Subram. (2016b: 631)
Homaliopsis kollimalaiensis D.Subram. (2008: 68)
Homalothecium laevigatum var. *indicum* D.Subram. (2009b: 437)
Kanagambigai barbelloides D.Subram. (2016b: 628)
Lepyrodontopsis indicum D.Subram. (2010: 273)
Leucophanes grandifolium ['*grandifolius*'] D.Subram. (2009a: 354)
Leucophanes grandifolium ['*grandifolius*'] var. *lanceolatus* ['*lanceolata*'] D.Subram. (2009a: 354)
Macromitrium anamalaiense ['*anamalaiensis*'] D.Subram. (2009a: 357)
Meteoriopsis ['*Meteriopsis*'] *grandiformis* D.Subram. (2009a: 357)
Meteorium neelgiriense D.Subram. (2008: 65)
Meteoriopsis ['*Meteriopsis*'] *squarrosa* var. *anamalaiensis* D.Subram. (2009a: 357)
Meteoriopsis ['*Meteriopsis*'] *squarrosa* var. *valpariensis* D.Subram. (2009a: 356)
Mnium prostratum D.Subram. (2009a: 355)
Neckera bipinnata D.Subram. (2016b: 630)
Neckeropsis crinita var. *thamnobryoides* D.Subram. (2016b: 630)
Neckeropsis crinita var. *tomentosa* D.Subram. (2016b: 630)
Neckeropsis lepiniana var. *pterobryopsida* D.Subram. (2016b: 630)
Neodicladiella ['*Neodicladiella*'] *pendula* var. *delicatula* D.Subram. (2010: 272)

- Octoblepharum serratifolium* D.Subram. (2009a: 354)
Octoblepharum spinifolium D.Subram. (2009a: 354)
Philonotis fanciformis D.Subram. (2007b: 542)
Philonotis hirsuta D.Subram. (2007b: 542)
Philonotis robusta D.Subram. (2007b: 543)
Philonotis robusta var. *flexicaulis* D.Subram. (2007b: 543)
Physcomitrella athanurensis ['*Physcomitriella*'] D.Subram. (2006: 127)
Physcomitrella athanurensis var. *linifolia* D. Subram. (2016a: 542)
Physcomitrella indica ['*Physcomitriella indicum*'] D.Subram. (2006: 131)
Physcomitrella ['*Physcomitriella*'] *kalrayensis* D.Subram. (2007b: 543)
Physcomitrella ['*Physcomitriella*'] *kalrayensis* var. *minima* D.Subram. (2007b: 543)
Physcomitrella ['*Physcomitriella*'] *kolanchiappensis* D.Subram. (2006: 131)
Physcomitrella recurvata D.Subram. (2011a: 915)
Physcomitrella serratifolia D.Subram. (2011b: 997)
Physcomitrella serratifolia var. *densifolia* D.Subram. (2011b: 997)
Physcomitrella serrulata D.Subram. (2011a: 915)
Physcomitrella ['*Physcomitriella*'] *sivapuriensis* D.Subram. (2006: 127)
Physcomitrella spathulata D.Subram. (2011a: 915)
Physcomitrium ['*Physcomitrium*'] *barbuloides* D.Subram. (2011a: 915)
Physcomitrium linifolium ['*Physcomitrium linifolia*'] D.Subram. (2011a: 916)
Pinnatella foreauana var. *minutifolia* D.Subram. (2016b: 632)
Porotrichum ovalifolium ['*ovalifolium*'] D.Subram. (2009a: 357)
Pottia serrulata D.Subram. (2007a: 529)
Pottia valpariensis D.Subram. (2010: 269)
Pseudoleskea perfalcata var. *ovalifolia* D.Subram. (2016a: 543)
Pseudotrachypus kothagirianus D.Subram. (2016b: 624)
Pseudotrachypus kothagirianus var. *pinnatus* ['*pinnata*'] D.Subram. (2016b: 624)
Pterobryopsis schmidii var. *pinnata* D.Subram. (2009a: 356)
Thamnobryum fasciculatum var. *keralensis* D.Subram. (2016b: 632)
Trichostomum flexifolium D.Subram. (2007a: 530)*
Trichostomum inclinatum var. *lancifolium* D.Subram. (2007a: 530)
Weymouthia ['*Weymouthia*'] *barbelloides* D.Subram. (2016b: 623)
Weymouthia barbelloides ['*Weymouthia barbellides*'] var. *densifolia* D.Subram. (2016b: 624)
Weissia ['*Weisia*'] *bryoides* D.Subram. (2009b: 437)

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News from the National Museum of Nature and Science Herbarium (TNS)

Yuya Inoue

National Museum of Nature and Science, Tsukuba, Japan

The National Museum of Nature and Science Herbarium (TNS) is located in Tsukuba City, Ibaraki Prefecture, Japan. In April 2021, the herbarium underwent a change in staffing. I (Yuya Inoue) was appointed a curator of bryophytes in succession to Dr. Masanobu Higuchi. The museum's herbarium TNS was founded in 1877, and it houses the collections of algae, bryophytes, fungi/lichens, pteridophytes, and seed plants, more than 2 000 000 specimens in total. The bryological collections consist of approximately 240 000 specimens, including 1400 type specimens.

I appreciate your continuous support, and please note that all correspondence regarding your bryological research should be sent to me as follows.

Yuya Inoue, PhD

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Announcements: Stanley Greene recipients 2021

Matt von Konrat
Field Museum, Chicago

The International Association of Bryologists (IAB) is excited to announce that two recipients received the 2021 Stanley Greene Award. This is an award for early career scientists and students to pursue a research project in bryology. The committee was chaired by the Secretary-Treasurer, Dr. Matt von Konrat, and three members that were appointed by the IAB council, Dr. María Jesús Cano, Dr. Chris Cargill and Dr. Malombe Itambo. Awards were evaluated based on scientific merit, innovation, feasibility and broader impact. Nine applications were received that were all highly meritorious. The committee awarded two awards to Dennis Alejandro Escolástico Ortiz, PhD Biology student, Université Laval, and Kris Anderson, MS student, University of Connecticut. A brief synopsis of both projects is provided below.

Kris Anderson, University of Connecticut

Experimentally testing the fundamental assumption that shifts in ploidy facilitate shifts in sexuality in a dioicous moss

As with all embryophytes, the life cycle of mosses comprises a multicellular gametophyte generation alternating with a multicellular sporophyte generation. But unlike other land plants, the gametophyte generation of bryophytes is dominant and composes the vegetative phase. The gametophyte produces sex organs and subsequently gametes. The sexual condition of gametophytes is thought to be typically determined by sex chromosomes. In the haploid generation, the genome should thus ancestrally contain only one heterosome. In bryophytes, sex is expressed during the haploid life phase, so their sex chromosomes are referred to as U (female) and V (male) chromosomes. Moss gametophytes can be unisexual (dioicous) or bisexual (monoicous). If sex is determined by sex chromosomes, shifts in sexuality are thought to be linked to shifts in ploidy, with genome duplication following sexual reproduction generating plants with both heterosomes, i.e., U and V, and thus the ability to express both sexes. Many independent shifts between dioicy and monoicy have occurred, such that both conditions appear throughout the moss tree of life with 50% of moss species being monoicous, and hence 50% dioicous. The mechanisms facilitating and maintaining these shifts are not critically explored. It is widely assumed that when a dioicous moss undergoes whole genome duplication (WGD), the progeny is monoicous. In mosses, female and male dioicous gametophytes carry either a U or V sex chromosome, respectively. My research seeks to test the hypothesis: WGD of a dioicous mosses via apospory will result in a shift to monoicy in the first generation of aposporous plants.



**Dennis Alejandro Escolástico
Ortiz, Université Laval**

**Population genomics and clonal
structure of *Racomitrium lanuginosum*
(Hedw.) Brid. in the Canadian tundra**

The subarctic region is characterized by shrubs, heaths, lichens and bryophytes. Bryophytes, mainly mosses, are conspicuous plants in cold settings and play crucial ecosystem roles. Even though bryophytes are key elements of the arctic plant diversity, the information concerning the population genetics is scarce compared, for example, to boreal regions. One of the main reasons for this knowledge gap is the logistically



complex and expensive access to the Subarctic and Arctic. Among the subarctic mosses, *Racomitrium lanuginosum* (Hedw.) Brid. is an emblematic member in arctic, subarctic and alpine environments. This species is distributed in the Northern Hemisphere and reproduced mainly by clonal growth forming extensive carpets. There are few studies about the population genetics of *R. lanuginosum* using sanger-generated sequences that show high genetic variation at a regional scale. Alternatively, next-generation sequencing methods, such as genotyping-by-sequencing (GBS), may help to resolve fine-scale genetic structure. GBS greatly outperforms molecular markers producing thousands of loci and single nucleotide polymorphisms (SNP) for population genetic analyses. My research addresses three objectives: *i*) to determine the species' clonal spatial structure at fine and local scales in a forest-tundra and a shrub-tundra; *ii*) to estimate the moss genetic diversity in both habitats; *iii*) to identify the moss clonal growth strategy.

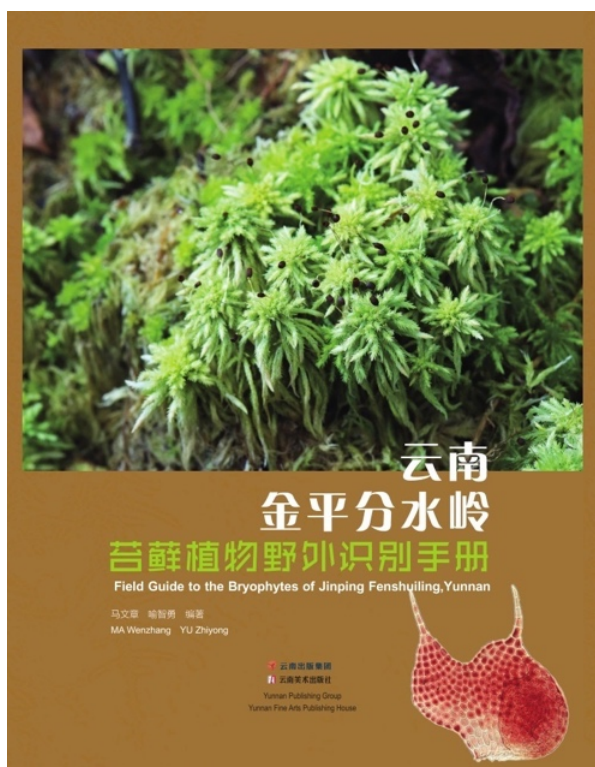
Whats on the web?

There are many great internet resources for bryologists and anyone else interested in mosses, liverworts and hornworts. In this issue we provide links to some that you might find interesting. Summaries are taken from the web pages where available; BT does not warrant that these are accurate! Times for videos are stated at the end of each summary.

Moss evolution — a lecture by Ralf Reski

[link](#)

For millions of years, mosses have been developing a lot of ingredients to protect them from harsh environment conditions. The Moss Evolution is a fascinating story to tell. Who could know this better than Ralf Reski, distinguished pioneer in moss research at the University of Freiburg? One of first to cultivate mosses in the lab, to sequence and reprogram mosses' genomes. [8m 35s]



Book review

Field Guide to the Bryophytes of Jinping Fenshuiling, Yunnan

MA Wenzhang & YU Zhiyong

Yunnan Publishing Group, Yunnan Fine Arts Publishing House, Kunming

ISBN 978-7-5489-4213-9. 299 pp. Published October, 2020. Availability for purchase outside China through China Scientific Book Services, Beijing
www.hceis.com
List price \$62 USD.¹

Reviewer

James R. Shevock, California Academy of Sciences, San Francisco

email: [James R. Shevock](mailto:James.R.Shevock)

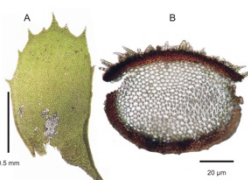
This field guide is beautifully produced. This paperback book measures 21 × 28.3 × 2.5 cm and weighs about 1.8 kg. With these dimensions and weight it is not a work one is likely to actually carry in the field. It is, however, a remarkable overview of the diversity of bryophytes within Jinping Fenshuiling National Nature Reserve, in southernmost Yunnan Province near the Vietnam border. The paper used is rather thick stock, very high quality and glossy textured, and therefore, the photographs are beautifully reproduced. The entire guide is written in both Chinese and English so the intent of the authors was to make this work accessible to bryologists beyond those residing in China. In addition, the overall layout was designed to introduce plant enthusiasts to the diversity and beauty of bryophytes. Photographs take up the majority of each printed page.

Yunnan is likely the most species rich province for bryophytes in China. This field guide provides color images for many Asian endemics and many species have not been previously photographed, and therefore, it has great utility well beyond Jinping. One can learn to recognize many different genera and species simply by studying the photographs. The guide displays three hornworts in three genera in two families; 80 species of liverworts among 50 genera and 28 families, and 143 mosses from 101 genera in 42 families. Several species represent taxa that are rare or endangered in China, some only known from Yunnan, and several monotypic genera are presented.

As with the design of any field guide, one has to decide on the organizational structure of how species are to be organized and displayed and the level of technical writing of the accompanying narratives. In this field guide, the authors purposely placed every species in alphabetical order by scientific name and not separating the liverworts and hornworts from the mosses. However, there is an index arranged by hornworts, liverworts

¹ Copies can also be arranged for purchase from the author. Inquiries regarding cost, payment options and charges for international postal shipment should be sent to the following email link: email.

and mosses utilizing family placements starting on page 288 for those who are seeking specific taxa within various families. There are 505 numbered color figures of species taken in situ and many taxa also have additional microphotographs of leaves, cross sections, gemmae and other diagnostic features useful for species identification.

波叶拟金枝藓 <i>Pseudotrimegistia undulata</i> (Broth. et Yas.) Akiyama et Tsubota  图 364 摄于老米乡西隆山三岔河，2410 米，生于朽走树根 Fig.364 On decaying root, 2410m, San-Cha River, Mt. Xi-Long, Zhe-Mi Township  图 365 植株特写 Fig.365 Close-up of plants  图 366 显微镜下的叶 Fig.366 Leaf under the microscope 植物体大，硬挺，具光泽，松散交织生长，长可达6厘米以上。主茎匍匐，不规则羽状分枝。叶基部宽阔，中上部强烈收缩为舌状先端，边缘具齿突；角细胞分化，大型，多呈橘红色（图366）。 在中国，波叶拟金枝藓是毛茛藓科中最显眼的物种。尤其林下散射光环境，多为腐木生，偶附生于乔木树干基部。 分布于广西、海南、台湾和云南。老挝、柬埔寨、泰国和越南也有报道。 Plants large, rigid, glossy, loosely interwoven, up to 6cm long. Primary stems creeping, irregularly pinnately branched. Leaf bases broad, middle and upper parts distinctly narrowed to ligulate apices, margins dentate; alar cells differentiated, large, often tangerine-colored (Fig.366). <i>Pseudotrimegistia undulata</i> is the most eye-catching species of Pylaisiadelphaceae in China. It prefers habitats with indirect sunshine under forests, and mainly dwells on decaying woods, occasionally on tree trunks. Distributed in Guangxi, Hainan, Taiwan and Yunnan. Also reported from Laos, Cambodia, Thailand and Vietnam.	阿萨羽苔 <i>Plagiochila assamica</i> Steph.  图 302 摄于老米乡西隆山三岔河，2410 米，腐木生 Fig.302 On decaying wood, 2410m, San-Cha River, Mt. Xi-Long, Zhe-Mi Township  图 303 显微镜下的植物体 A 枝叶；B 茎横切及鳞毛 Fig.303 Plants under the microscope A Branch leaf B Cross-section view of stem with paraphyllia 植物体大，绿色至淡褐色，稀疏交织成片。主茎硬挺，分枝呈树状，展开于同一平面。植株个体长4-5厘米，枝条宽2-3毫米（含叶）。叶背缘外卷，基部下延，边缘具齿8-12个（图303 A）。茎背面密布刺状鳞毛（图303 B）。 体态优美，野外识别较易。 目前在中国已知仅分布于云南。不丹、尼泊尔、泰国、印度和越南也有报道。 Plants large, green to light brown, loosely interwoven. Primary stems dendroid, spreading in one plane. Individuals of plants 4-5cm long, branches 2-3mm wide with leaves. Leaf margins outwards curved at dorsal sides, decurrent at base, each leaf margin with 8-12 teeth (Fig.303 A). Paraphyllia numerous on dorsal sides of stems (Fig.303 B). <i>Plagiochila assamica</i> is an elegant species, easily recognizable in the field. Currently only known from Yunnan in China. Also reported from Bhutan, Nepal, Thailand, India and Vietnam.
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Sample page spread from *Field Guide to the Bryophytes of Jinping Fenshuiling, Yunnan* by MA Wenzhang & YU Zhiyong.

For some species the image occupies a full page but the majority of them cover ½ of a page. Some cropping could have been implemented on a few images that would have made them even more striking, but we get a really good feel for how they appear in the field in their original compositional state. In total, there are 154 genera displayed in this guide. Another wonderful feature of this guide is every image or photomicrograph is referenced by a collection number made by the first author and these vouchers all reside at the Kunming Institute of Botany, Chinese Academy of Sciences herbarium (KUN). Each species is provided with insights into its habitat preference, substrate specificity and generalized description. At the end of each species entry is the distribution range within China followed by other countries and continents where applicable.

The guide begins with a short Preface followed by a list of species presented and the page where each species appears. The authors have also added the Chinese name for each taxon throughout as a link to the Chinese names of bryophytes that appear in the multi-volume *Flora Bryophytorum Sinicorum* (10 of the projected 12 volume work is now published).

With the advancement in digital camera technology, obtaining high quality photographs of bryophytes in the field is becoming more and more attainable (especially those cameras with stacking features), and therefore, bryological field guides can now be produced with remarkable images. It is such a work that is presented here.

As with any such endeavor some species can be difficult to identify and also photograph, especially those that do not grow in one plane. The author has re-evaluated a couple of species identifications but it was not possible to update the text prior to the printing of this guide. These include three liverworts that appear on pages 12, 52, and 181. *Bazzania fleischeri* should be *B. tridens*, *Cololejeunea sphaerodonta* is rather *C. ocellata* and *Plectocolea truncata* may be *Jungermannia comata*. Notwithstanding this minor imperfection, this is a wonderful work that I can recommend without reservation. Anyone seeking a photographic overview of selected Asian bryophytes will find this guide of value. As a point of full disclosure, I offered suggestions to enhance grammatically the sentence structure of the English narratives while this guide was in its initial development stage. This work, however, is entirely the product of the authors.

FROM THE VAULT

In this article, translated from the original published in 1814, French botanist Nicaise Desvaux (1784–1856) described a typical botanist's kit of the period. If the box dimensions given by Desvaux are correct, this was indeed a miniature kit! It is interesting to compare the contents with 'botany kits' marketed today.

Description and use of a botanist's kit

by N. A. Desvaux

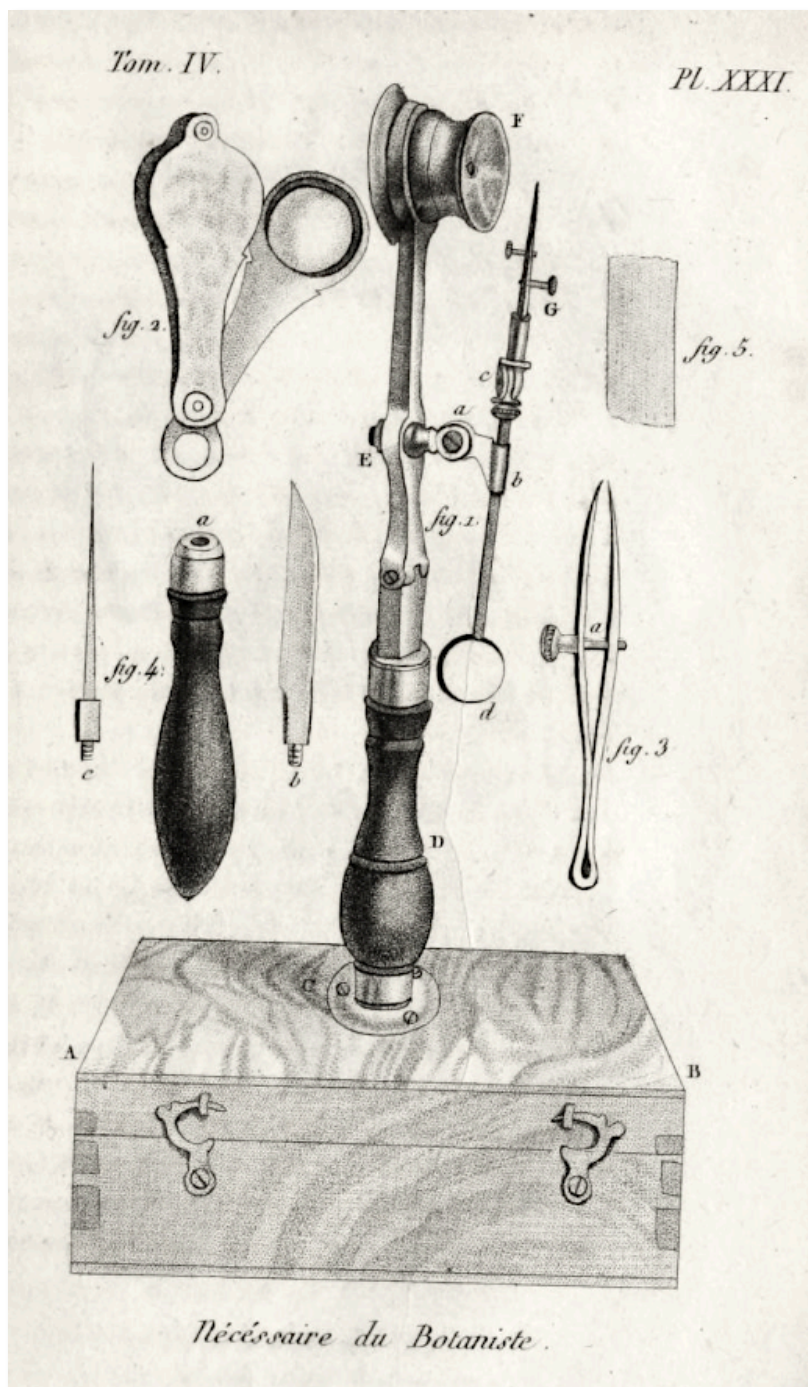
Journal de Botanique, Appliquée à l'Agriculture, volume 4, issue 2, pages 49–51 + pl. XXXI.

As soon as we want to methodically analyse the botanical characters of plants, we must have some instruments that are suitable for this purpose, which, although interesting, have been neglected; and each botanist has had to make up a kit of instruments, which is fairly simple but rather expensive.

In building a botanist's kit, we assemble all the small instruments that experience tells us are necessary or useful: pliers to hold a flower, a pin to remove the petals, a knife to cut an ovary or a fruit, an ordinary magnifying glass to enlarge these various organs. But we must admit that we only use such a kit for want of a better one, and that often the pin is too short, the knife too big, the magnifying glass too awkward, and the clamp annoying because of the continuous pressure that must be applied.

After looking at several of these kits, and by trial and error on various constructions, I settled on the one I present here. One should not expect to find here items that are useful for microscopic observations, because for research of that kind, which is only done in the office by those who direct their research towards the study of the infinitely small things in nature, another instrument [the microscope] is needed, which by itself forms a kit but is not needed for the usual tasks of the botanist.

Our kit, constructed very cheaply but with great care and neatness (by M. Chevalier, optical engineer, Quai de l'Horloge, who can make up this kit on demand), consists of a box (*pl. XXXI, fig. 1, A, B*) which, for portability, is $3\frac{3}{4}$ inches long, $2\frac{1}{2}$ inches wide and 1 inch thick [$95 \times 64 \times 25$ mm], containing the various pieces.



At the upper part *C* is a nut, which obviously serves to fix the observation lens (*F*) and its support (*D, E*); the lower rounded part of this support (*D*), made of coloured wood, can be used as a handle when you want to use the instrument without mounting it on its base (*A, B*). The vertex *F* is intended to accommodate a strong lens with a focal length of 8.5 mm, which seemed to me the most suitable in the majority of cases.

Clamp *G* is placed in socket *b*, which has a joint *c* that allows it to tilt in various directions and enables one to focus the lens; the clamp ends in a point inserted in the ivory specimen-holder *d*, whose purpose is to support small coloured objects, slightly moistened, so that they adhere to them, and to observe them by means of the white background; then this specimen-holder is moved towards the lens by turning the movable clamp in its socket *b*. By removing the ivory disc we can remove the clamp, which comes out of socket *b*, or we can remove the whole device by removing it from socket *b*, which is joined to the support.

If this were the only arrangement, one would have to hold the instrument at eye level in order to examine it, but it can be placed on a table. The seated observer, by means of the articulation *a* which is in the square part of the rod

and serves to incline the lens enough so that one can draw what is desired, so the position of the user is not hindered; they could, pen or pencil in hand and looking through the lens, describe or draw the objects they see.

Figure 2 shows a magnifying glass, with one or two lenses, which can be suspended by means of the loop at the bottom. As I found that the magnifiers with a focal length of 17 and 25 mm were of little use, I made these 13 and 15 mm. They are very useful for seeing different aspects of specimens. The eye very easily compensates when using magnifying glasses instead of focusing more distantly.

Figure 3 is a part which, by means of screw *a*, can hold the smallest objects without having to exert pressure that is too strong and tires the hand, or so weak that it lets the specimen escape; which is all the more unfortunate if it was very difficult to obtain and separate from the parts to which it was attached.

Figure 4 consists of a small handle *a*, in which are screwed alternately, and as needed, a cutting blade *b* and a stylet *c*. The blade forms, when mounted, a small knife that is very useful for cutting various parts of plants which are to be studied for their internal texture, and the stylet is suitable for separating very small parts from each other.

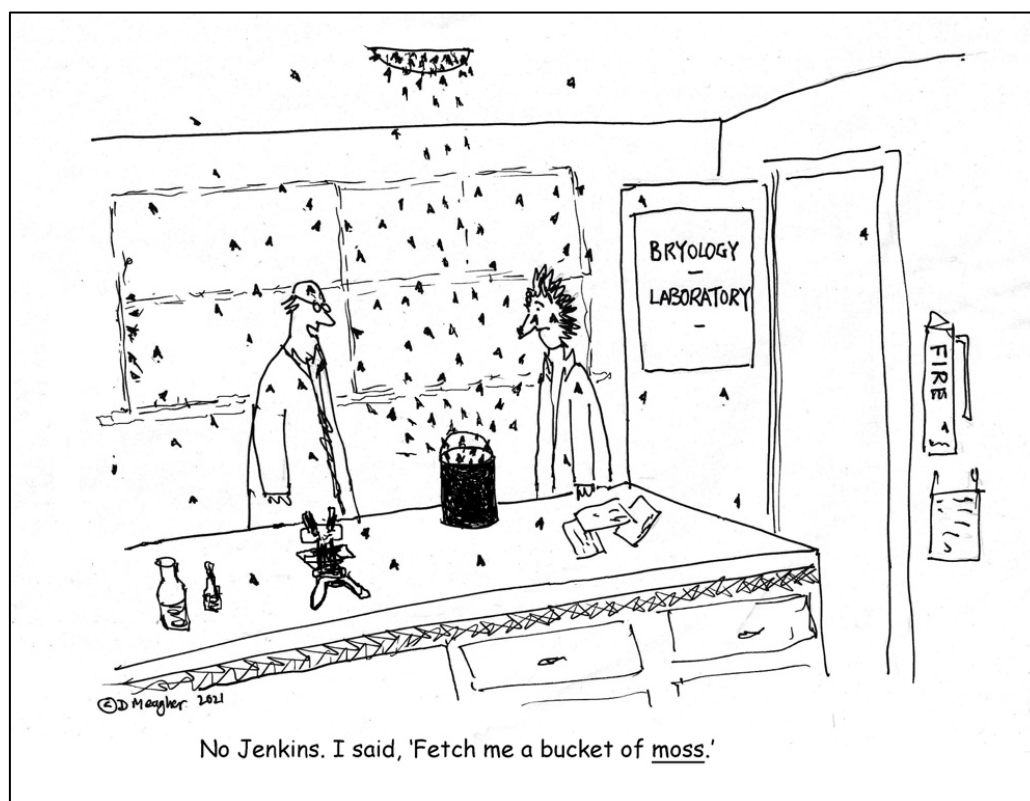
Figure 5 is a small glass slide which, when placed in the clamp, serves as a support for specimens that are placed in a water droplet.

— translated by D. Meagher

Where's Tamas?

Tamas Pócs reports that, from 16 August to 12 September this year, he visited Kenya with two students. The aim of the visit was to hold a short course on the tropical liverworts at Kenya National Museum, East African Herbarium, and to study the epiphyllous communities and bryophytes in general on Mt Kenya, Taita Hills and in the coastal forests. The visit was organised by Dr Itambo Malombe.

Afterwards Tamas intended to visit Mt Kilimanjaro in Tanzania, to take part briefly in a project of Senckenberg Museum entitled: 'Kilimanjaro ecosystems under global change', run by Dr. Andreas Hemp with his wife and his team already for 30 years. The aim of this was to study phytosociologically the bryophyte layers of typical Kilimanjaro ecosystems.





The International Association of Bryologists was established in 1969 to promote international cooperation and communication among all persons interested in the biology of bryophytes. This is achieved through sponsorship and arrangement of meetings and symposia that relate to the various aspects of bryology, and by IAB-sponsored publications including *The Bryological Times* and *Bryophyte Diversity and Evolution*. The Association also supports the publication of reviews, lists, software, and compendia.

Website: www.bryology.org

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The Bryological Times is published twice yearly.

Contributions can be emailed to the editor, [David Meagher](mailto:David.Meagher@unimelb.edu.au).

Articles should be less than 1500 words in files no larger than 15 MB.

Images should be no more than 2 MB each and may be emailed separately.

The deadline for the next issue is 31 March 2022.

Cover: Carpets of Fire Moss (*Funaria hygrometrica*) 18 months after an ecological burn in box–ironbark forest, Heathcote–Graytown National Park, Victoria, Australia. (David Meagher, 2011)