



# *The Bryological Times*



## Volume 148

### - In This Issue -



### President's Message

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

**Strengthening IAB: record membership, now onto solidifying our newsletter and journal.**

The International Association of Bryologists (IAB) is celebrating its 50<sup>th</sup> anniversary this year. The aim of the association is “to promote international cooperation and communication among all persons interested in the biology of bryophytes”. To achieve this goal, bryologists are encouraged to join the Association, and I am delighted to report that this year, thanks to the exemplary commitment and recruiting efforts of our Secretary Treasurer, Matt von Konrat, we have achieved the goal set at the beginning of 2019, and have reached a membership of 340 bryologists spanning diverse areas of research, from across the professional spectrum, and from around the world. This is a major accomplishment and we must continue to build our membership base, by encouraging more students and colleagues to join. Annual membership is affordable at \$16 or \$8 for students and bryologists from selected countries. Our goal is to reach 400 by the end of this

President's Messag	1
47 <sup>th</sup> Annual Meeting of the Bryological Society of Japan.....	2
Bryological Activities in Egypt.....	5
Bryophyte Inventory in Wyoming: 16 years of challenging efforts.....	6
Iberian Moss Flora completed.....	10
Moss Flora of Central America: A Review.....	13
The Moss Genus <i>Fissidens</i> in New Zealand: A Review.....	14
Cambridgeshire's Mosses & Liverworts: A Review.....	16
Theses in Bryology 36.....	19
News Item.....	19
Administrative Information.....	20

anniversary year and thereby honor the vision and efforts of the founding members William C. Steere (U.S.A.), Stanley W. Greene (U.K.) and Zennoske Iwatsuki (Japan).

A strong membership is critical to any organization, but a dynamic organization depends on active service of its members and regular publications of news and advances. The recent ballot for the election highlights the willingness of members to step forward to volunteer for offices, and thereby contribute to the operation of the organization. However, *we need you, too!* Communicate with council members and engage in the activities of the association. The Bryological Times, now in its 40<sup>th</sup> year of publication, remains a prime medium to share news on conferences, books, upcoming and completed field excursions, recent dissertations and opinions. Over the past 40 years, colleagues committed to its mission have held the editorial position and sought to offer a periodic newsletter linking bryologists across the globe. However, the editor can only be responsible for the timely publication; the actual content is shaped by your submission. Bryological communities are active everywhere, students are trained in institutions on all continents, and we know that opinions are not in short supply! Submit your contribution to the newsletter and join our current editor's, Patrick Dalton, commitment to distribute an informative newsletter to our members.

A strong professional association also distributes major scholarly advances through its flagship journal. IAB publishes "Bryophyte Diversity and Evolution". The journal, now in its 6<sup>th</sup> year, aims at becoming a prime medium for publishing major advances in the evolutionary biology of bryophytes. Our journal should serve as a window into the dynamic world of bryology to biologists and bryologists from across all fields. Advocating for bryology is not restricted to conference hallways, presentations to local naturalists or schools, involving citizen scientists is just important. Promoting bryology starts with raising the profile of our journal. The journal editor, Dietmar Quandt, and the editorial board

are committed to lead this effort, calling on critical and prompt reviews from your colleagues and publishing and sharing your significant contributions in a timely and competitive manner. However, here too, the process starts with us. By submitting research outcomes significantly advancing our knowledge on the biology of bryophytes, we contribute to raising the profile, and impact factor, of the journal, firmly anchoring it among the prime international journals focusing on the diversity and evolution of bryophytes. I invite you to actively embrace this challenge and thereby strengthen the achievements of IAB and more importantly position of bryology as a highly active field of research in plant biology.

We have achieved a record membership, are about to participate in an exceptional meeting in Madrid, and now need to fulfill the potential of our newsletter and journal in sharing activities among our members and disseminating major advances in bryology within our community and beyond.

I wish you all ongoing stimulating bryological research.



**Save  
the Date**  
**9-12 July 2019**

A joint conference between  
iMOSS, the International  
Association of Bryologists  
and the Sociedad Española de  
Briología

Venue: Real Jardín Botánico,  
Madrid, Spain



This conference will celebrate the 50th  
anniversary of IAB and the 30th anniversary  
of the Sociedad Española de Briología.  
More information to come on registration,  
accommodation and program soon!  
Contact: Jesús Muñoz jmunoz@rjb.csic.es

REAL JARDÍN  
BOTÁNICO

Report on the 47th Annual Meeting of  
the Bryological Society of Japan,  
Toyama

Yuya Inoue, Hiroshima University, Hattori  
Botanical Laboratory, Hiroshima, Miyazaki,  
Japan. [jujainoue@hiroshima-u.ac.jp](mailto:jujainoue@hiroshima-u.ac.jp)  
Diana Ríos Poveda, Hiroshima University,  
Hiroshima, Japan.  
[dianariospoveda@hotmail.es](mailto:dianariospoveda@hotmail.es)

The 47th annual meeting of the Bryological Society of Japan (BSJ) was held in Toyama Prefecture, central Japan, during 27–29 August, 2018. About 60 people participated the meeting, which was organized by Naoko Sakai (Toyama Science Museum). Toyama is located in the Hokuriku region on the main Honshu island and is the leading industrial prefecture on the Japan Sea coast. The prefecture is also famous for Tateyama mountain range, a part of northern Japanese Alps. This region contains only known glaciers in East Asia outside Russia (Fukui & Iida 2012).

On the first day of the meeting, we enjoyed a lecture on microscopic observations of bryophytes by Hiroshi Kiguchi (Shohei High School, Saitama) and Tatsuwo Furuki (Natural History Museum and Institute, Chiba). Then, two researchers from the Toyama Science Museum presented the plenary talks with an excellent introduction to the vegetation and conservation of Tateyama mountain range (by Michihito Ota), and a presentation on the bryophyte flora around Murododaira Plains in Tateyama mountain range (by Naoko Sakai).

The second day was filled by eleven oral and eight poster presentations (Fig. 1A & B). Many of the presentations focused on the taxonomy and ecology of bryophytes; some related to physiological, technical or educational issues, such as heavy metal absorption, cultivation of mosses, and web contents on bryophytes. In parallel with the presentations, we held also a bryophyte photo contest, and participants enjoyed seeing nice pictures and voting for their favorites. In addition to these programs, we had a great opportunity to obtain many reprints of Naofumi Kitagawa (1935–2016), who was a mild, humble and honest hepaticologist, respected by many people (Deguchi 2017). Two researchers from the Kansai region, Masakuni Kimura (Mori-to-Mizu-no-Genryuu-kan, Nara) and Masaki Michimori (Osaka Natural History Center, Osaka) kindly brought from afar heavy packs with his reprints for all the participants of the meeting. In the evening we enjoyed chatting with each other at dinner party, and Satoshi Imura, the president of BSJ, designated two localities in Japan, namely Inohae Gorge (Miyazaki Pref.) and Sengan Gorge (Toyama Pref.), as National Bryophyte Heritage sites.

The last day was spent visiting one of the representative regions of Tateyama mountain range, Murododaira Plains at 2,450 m.a.s.l. (Fig. 1C–F). The bryoflora around the plains is already well studied, with 65 mosses and 33 liverworts reported (Sakai 2008, 2011). We can easily reach there by bus through Tateyama Kurobe Alpine Route, which is a popular tourist trail passing through the dynamic scenery of Tateyama mountain range. Unfortunately, the cloudy and rainy weather prevented us to enjoy a

full view of the mountains. Still, we were excited to find here two fructifying mosses, rarely found with sporophytes: *Oedipodium griffithianum* (Dicks.) Schwägr. in a rock crevice near the Murodo Bus Terminal (Fig. 1E), and *Andreaea nivalis* Hook. on a boulder along the stream (Fig. 1F), both distributed only in high mountain area and endangered species in Japan. The Murododaira Plains is a protected area, so we could not take specimens, but the participants were happy to take pictures of bryophytes in rock walls areas. In the lunchtime we enjoyed a delicious *masuzushi* lunch box, containing a pressed sushi typical of Toyama, in which salt-pickled and flavored trout is thinly sliced and placed on vinegary rice.

We would like to thank Naoko Sakai, and the staff at the Toyama Science Museum and at the Botanic Gardens of Toyama for their efficient organization and kindness during this very successful meeting. We also thank Belén Estébanez Pérez for her valuable suggestions to a first version of the manuscript.

## References

- Deguchi, H. (2017). Dr. Naofumi Kitagawa (1935-2016) – a botanist before being a bryologist. *Hikobia* 17: 225–239.
- Fukui, K. & H. Iida (2012). Identifying active glaciers in Mt. Tateyama and Mt. Tsurugi in the northern Japanese Alps, central Japan. *Journal of the Japanese Society of Snow and Ice* 74: 213–222. (Japanese with English abstract)
- Sakai, N. (2008). Bryophytes around Murododaira Plains, Mt. Tateyama, Toyama. *Journal of Phytogeography and Taxonomy* 56: 99–107. (Japanese with English abstract)
- Sakai, N. (2011). Correction and additional Bryophytes around Murododaira Plains, Mt. Tateyama, Toyama. *Bulletin of the Toyama Science Museum* 34: 135–136. (Japanese)



## Figure legend

Figure 1. A: Oral presentation. Masaki Shimamura reviewing the genus *Marchantia* in Japan. B: Poster presentation. C: Participants walking along the trail at Murododaira Plains, Mt. Tateyama. D: Mikurigaike Pond, a crater lake at Tateyama Volcano. E: *Oedipodium griffithianum*. F: *Andreaea nivalis*.



## Bryological activities in Egypt, again

Wagieh El-Saadawi

Ain-Shams University, Cairo, Egypt

Under the title “bryological activities in Egypt” about four decades ago, El-Saadawi (the *Bryological Times*, September 1981, No. 11, pages 5,6) wrote to say that bryological research at Ain-Shams University was started in 1972 with the ambition of producing a moss flora of Egypt. El-Saadawi, Badawi and their associates made great efforts to establish a bryological herbarium at Ain-Shams University (DAIA) based mainly on collections made from different phytogeographic territories of Egypt and they published many new records for the bryoflora of the country. Six years later Badawi wrote an article also in *The Bryological Times* (June 1987, No. 43, pages 1,2) entitled “Towards an illustrated moss flora of Egypt” In that article she argued that the production of a moss flora of Egypt “is still a long way to go” and that it can only be achieved in several stages (which she explained in detail) and would probably require more than ten years. Now, a period of more than thirty years has passed since that article was published and we have to stand back and consider the objectives and achievements of our bryology research group.

Although a moss flora of Egypt has not been accomplished yet, the research group at Ain-Shams University made substantial though not spectacular progress thus;

1. Scores of works on the bryoflora have been published compared to only 3 publications in 1981 (El-Saadawi, 1981 op.ct.)

2. The number of taxa known from Egypt has increased more than threefold; about 200 taxa are now known.

3. bryology has attracted more researchers, now there are about 20 interested bryologists compared to a few in 1981.

4. Bryological research has started in three other Egyptian Universities beside Ain-Shams University.

5. Contributions to the moss flora of other neighbouring countries viz. Libya, Sudan, Kuwait, United Arab Emirates and Saudi Arabia have been made and published.

6. Participation in the checklist of Mediterranean hepatics and anthocerotes (Ros et al. 2007) and in the checklist of Mediterranean mosses (Ros et al. 2013) have been done.

7. Extension of the research work from mainly floristic to cover, though modestly, other areas of specialty; ecology, phytochemistry and molecular based taxonomy. This last trend started with the help of Mahmoud Magdy (Faculty of Agriculture, Ain-Shams University) and achieved when Olaf Werner (Murcia University) came as a visiting professor to our lab a few years ago. The cooperation with Olaf Werner and Rosa Ros has continued documenting the important bryophytes of the Mediterranean while a young bryologist, Mohammed Farag (Ain-Shams University) is at present in Murcia University training on the use of modern molecular genetics sequencing techniques.

I hope this article to be of interest to the readership. It may therefore be worthwhile to mention the following; Out of the 200 taxa known from Egypt only 13 are hepatics (El-Saadawi, Shabbara, 2007). No fossil bryophytes are hitherto reported from Egypt, only Late Quaternary fossil spores of *Sphagnum* have been reported by Kholeif (2004) in addition to Holocene fossil spores of *Phaeoceros*, *Riccia* and *Sphagnum* by Ziada et al. (2018). *Phaeoceros* and *Sphagnum* are now extinct in Egypt.

We are fortunate that our bryology group made some bryological exploration and publications on the Sinai Peninsula (the richest territory in Egypt for bryophytes) which at present is not easily accessible to researchers because of military action. We hope it becomes safe soon and moss habitats in the valleys and caves have not been damaged. The production of a moss flora of Egypt has been delayed by many factors, but the bryological activities and our publications are keeping our focus to produce a moss flora one day.

#### Publications

El-Saadawi, W. and Shabbara, H. 2007.  
Hepatics of Egypt. An annotated checklist. *Taekholmia* 27: 133-147.

Kholeif, S. 2004.  
Palynology and palaeovegetation reconstruction in late Quaternary sediments of the southern Suez Isthmus, Egypt. *J.Afr.Earth Sci.*40(1-2): 31-47.

Ros, R.M. *et al.* 2007.  
Hepatics and Anthocerotes of the Mediterranean, an annotated checklist. *Cryptogamie, Bryologie* 28(4): 351-437.

Ros, R.M. *et al.* 2013.  
Mosses of the Mediterranean, an annotated checklist. *Cryptogamie, Bryologie* 34(2): 99-283.

Ziada, N., Ibrahim, M.I., Abdel-Hameed, U.K. and El-Saadawi, W.E. 2018.

Bryophyte and pteridophyte spores in Holocene sediments from Fayoum depression, Egypt. Core F 1-08, Egypt. *J. Exp. Biol. (Bot.)* 14(2): 279-286.



## **Bryophyte inventory in Wyoming: 16 years of challenging efforts**

---

Yelena I. Kosovich-Anderson,  
Curator of bryophyte collection, UW Rocky Mountain Herbarium, Laramie, WY, U.S.A.

Wyoming is a state of the western United States, unique in its topography, geological history and natural landscapes. The western two thirds of the state is covered with the mountain ranges of the Rocky Mountains, the major mountain system in western North America, and intermountain basins, while the eastern third is high elevation prairie known as the Great Plains. The major ecosystems include flood-plains, fens, mixed-grass prairie, desert shrublands, sand dunes, badlands, woodlands, forests, subalpine meadows, and alpine tundra.

Being a world-renowned land of national parks and natural monuments, which attracts tourists and researchers from all across the world, Wyoming has undergone multi-disciplinary studies for decades. However, until recently, it still has remained a “blank gap” bryologically. So far, bryophyte distribution and conservation status have not been published for either of the National Park Service or U.S. Forest Service units in the State. The recently published Flora of North America (2007 & 2014) included only part of the available information on the moss flora of the State. “In the past, the only concerted effort to collect bryophytes across Wyoming was by C. L. Porter, whose collections supported his dissertation at the University of Washington, later published in *The Bryologist* (1933 and 1935). There were limited collecting trips by other bryologists from different parts of the country, and at one time, there were as many or

more bryology specimens from Wyoming stored outside the State as in the State” (Heidel 2018).

I came to Wyoming for the first time in 1998 by invitation of my colleague from Colorado, Professor of Philosophy and amateur bryologist, Holmes Rolston III. I was completely charmed with the majestic, beautiful and truly challenging for a scientist country of the American Rocky Mountains. My second and closer acquaintance with Wyoming happened several years later. I launched my first Wyoming bryophyte collections in 2003, when visiting the University of Wyoming (UW) through a Junior Faculty Development Program Fellowship coordinated through the U.S. State Department (Kosovich 2007).

A few words about my background. I am originally from Siberia. In the early 2000s, I served as an Assistant Professor of botany at Irkutsk State University. I had defended my Candidate of Biological Sciences dissertation in 1989, supervised by Dr. L.V. Bardunov, and working on the regional bryophyte flora of Lake Baikal area. It turned out however, that many years later a new continent would become my second home and would give me the second birth in my profession. For that I am grateful to my colleagues and to my fate.

Having moved to Wyoming, I pursued my bryology profession and passion by collecting bryophytes in systematic studies on national forests, monuments and other public lands of the state, in bryophyte floristic inventories. These studies marked collaboration between the U.S. Forest Service and Wyoming Natural Diversity Database to build basic knowledge of bryophyte diversity and species rarity in the state (Heidel 2018). For 16 years of my bryological studies in Wyoming, carried out within the frames of official contracts and grants, as well as – and largely - on volunteer basis, I have succeeded in building up a rich collection of mosses and liverworts, which presently contains over 25,000 voucher specimens; this collection is the largest Wyoming bryophyte herbarium in existence (Kosovich-Anderson 2019, in progress).

### **The quick facts about the author’s herbarium**

The collection is statewide in scope, with additional representation of the bryophyte floras of other parts of the Southern and Central Rocky Mountains. The total number of voucher bryophyte specimens from Wyoming is over 25,000 (including roughly 2,500 specimens of liverworts) and about 30,000 duplicates. Each specimen label contains or will contain detailed GPS location data (so far, the label information on most of these specimens is briefly recorded on the outside of the draft packets). The core of the herbarium is the material from the Rocky Mountain portion of the State (foothills, montane, subalpine and alpine zones, with elevation ranging from approximately 2000 to 3700 m above s. l.); southeastern Wyoming (Laramie, Sierra Madre, and Medicine Bow Mts., including the highest peaks of Snowy Range), west-central Wyoming (Wind River Range and beyond the Wind River Indian Reservation) and northern and north-western Wyoming (Beartooth and Bighorn Mts. and Absaroka Range). The bryophyte flora of the High Plains and intermountain basin is less well represented. Collections to date span all 23 counties of the State. Albany County has been best collected due to its proximity to the University of Wyoming with its Rocky Mountain Herbarium, and also due to a number of unique landforms (e.g., peaks of the Snowy Range, ancient rock formations of Vedauwoo, etc.) that traditionally attracted researchers. The herbarium is very diverse taxonomically. The most frequently collected families are Amblystegiaceae, Aulacomniaceae, Brachytheciaceae, Bryaceae, Grimmiaceae, Hypnaceae, Mielichhoferiaceae, Mniaceae, Orthotrichaceae, Polytrichaceae, and Pottiaceae. A number of specimens were annotated by experts on taxonomic groups; liverwort specimens in particular from the families Lophoziaceae, Cephaloziaceae, and Cephaloziellaceae (annot. by V. Bakalin); mosses, namely from the families Bartramiaceae (annot. by B. Shaw and T. Koponen), Brachytheciaceae (annot. by M. Ignatov), Bryaceae (annot. by J. Spence), Mniaceae (annot. by T. Koponen), Amblystegiaceae and Calliergonaceae (annot. by L. Hedenäs and W.

A. Weber), Dicranaceae (annot. by J.-P. Frahm and R. R. Ireland), Pottiaceae (annot. by M. T. Gallego, W. A. Weber, P. Eckel, B. Mishler and K. Kellman), Mielichhoferiaceae (annot. by J. Shaw), Sphagnaceae (annot. by R. Andrus and J. Shaw). About 10 % of the herbarium represent problematic material for additional microscopic and molecular investigations (Kosovich-Anderson 2017c, 2019).

To date, the author's herbarium has revealed no less than 30 moss species and 8 genera that are additions to Wyoming flora (including ones highly disjunctive in the Rocky Mountains, having their centers of distribution in Greenland and in Mexico), one species is new to the North American continent, one variety is newly described; both distribution and habitat information on many Wyoming species has been fully overhauled (Andrus & Kosovich-Anderson 2011; Kosovich-Anderson 2011a,b,c, 2013, 2014b, 2015a,b, 2016, 2017a,b, 2018, 2019, in progress; Kosovich-Anderson & Spence 2008; Kosovich-Anderson & Ignatov 2010; Kosovich-Anderson & Weber 2011). The first annotated checklists of the Medicine Bow National Forest, Shoshone National Forest and Devils Tower National Monument have been completed and soon to be published. I am pleased to report that for the last few years the Rocky Mountain Herbarium (RM) bryophyte accessions have grown by leaps and bounds with my specimens. The specimens from my herbarium are presently being included in a nationwide database of the bryophytes of the major herbaria (Kosovich-Anderson 2014a,c; Heidel 2018; RM Herbarium Specimen Database 2019). The identification work on specimens is on going. All the information is being summarized by the author in the "Conspectus of the Bryophyte Flora of Wyoming" (Kosovich-Anderson 2019, in progress). The newly created collection is a valuable resource documenting the State bryophyte flora for further taxonomic, ecological and phytogeographical studies.



Alpine zone of Snowy Range, crossed by steep trails of "difficult" level rating. Its quartzite cliffs are habitats of a number of intriguing minor forms of Grimmiaceae

### **Publications, technical reports and database, based on author's herbarium of Wyoming bryophytes**

Andrus, R. E. & Y. I. Kosovich-Anderson. 2011. Two *Sphagnum* Sect. *Cuspidata*, new to the Western conterminous United States. *Evansia* 28(2): 54-57.

Heidel, B. 2018. Big breakthroughs in bryophytes. *Rocky Mountain Herbarium Friends Newsletter* 3(4). April 24, 2018.

Kosovich, Y. I. 2007. Wyoming experiences of a Siberian botanist. *JFDP – Reflections of Eurasian Scholars* / Ed. Z. Usmani, T. Shadieva & I. Khanzada. Bloomington, IN, USA – Milton Keynes, UK: Authorhouse. P. 99-105.

Kosovich-Anderson, Y. I. 2011a. Two Dicranaceae species from the Beartooth Plateau, new to Wyoming. *Evansia* 28(2): 50-53.

Kosovich-Anderson, Y. I. 2011b. Annotated checklist of bryophytes of Beartooth Mountains of Wyoming, Shoshone National Forest – a technical report prepared for Wyoming Natural Diversity Database, Laramie, Wyoming, and Shoshone National Forest, USDA Forest Service. University of Wyoming, Laramie, Wyoming, U.S.A. 249 pp. (+ illustrations)

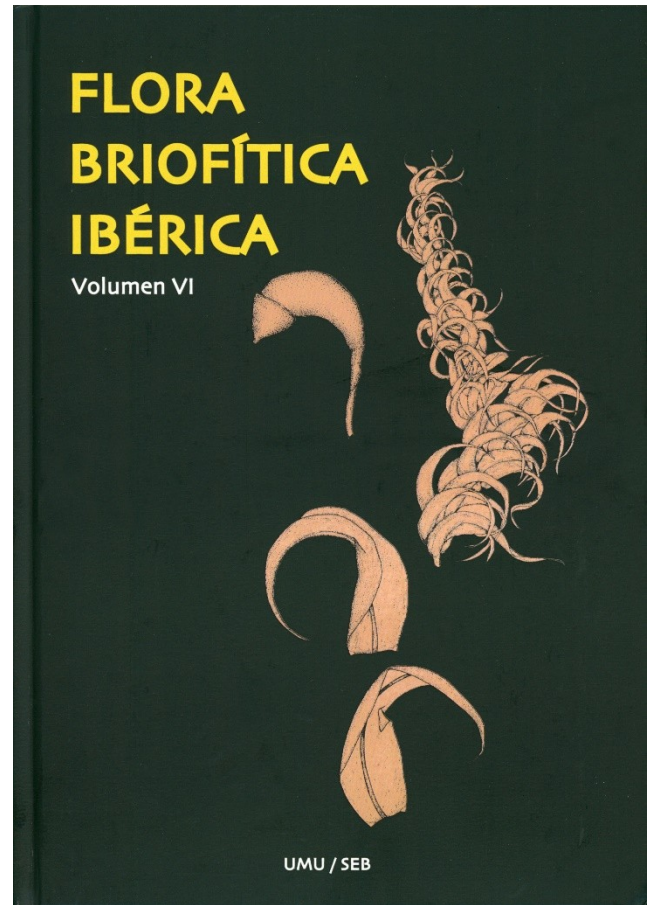
Kosovich-Anderson, Y. I. 2011c. *Pogonatum urnigerum* and *Dicranella palustris*, new to Wyoming. *Evansia* 28(4): 107-108.



- Kosovich-Anderson, Y. I. 2013. Bryophyte flora of the Medicine Bow National Forest [Markow's Grant of Wyoming Native Plant Society]. *Castilleja* 32(4): 3-4.
- Kosovich-Anderson, Y. I. 2014a. Modern herbarium resource for bryological studies in Wyoming. *The Jepson Globe* 24(1): 9.
- Kosovich-Anderson, Y. I. 2014b. Annotated checklist of bryophytes of the southeastern portion of the Wind River Range, Wyoming – a technical report prepared for Wyoming Natural Diversity Database, Laramie, Wyoming, and Shoshone National Forest, USDA Forest Service. University of Wyoming, Laramie, Wyoming, U.S.A. 129 pp. (+ illustrations)
- Kosovich-Anderson, Y. I. 2014c. Bryophyte inventory bonanza. *Castilleja* 33(1): 6-7.
- Kosovich-Anderson, Y. I. 2015a. Annotated checklist of bryophytes of the Southern Absaroka Range, Wyoming – results of bryophyte inventory. Prepared for Shoshone National Forest in cooperation with Wyoming Natural Diversity Database, University of Wyoming. April 2015. Cheyenne, Wyoming. 61 pp. (+ 75 illustrations)
- Kosovich-Anderson, Y. I. 2015b. Mosses of the Rocky Mountains in Wyoming, U.S.A.: new altitudinal records for North America. *Arctoa* 24: 141-147.
- Kosovich-Anderson, Y. I. 2016. Bryophytes of Smith Gulch area fens and vicinity, Black Hills National Forest, South Dakota – a technical report prepared for Wyoming Natural Diversity Database, University of Wyoming, and Black Hills National Forest, USDA Forest Service. University of Wyoming, Laramie, Wyoming. 44 pp. (+ appendices).
- Kosovich-Anderson, Y. I. 2017a. Annotated list of bryophytes of the northern Absaroka Range, Shoshone National Forest, Wyoming, U.S.A. Prepared for Shoshone National Forest (USDA Forest Service) and Wyoming Natural Diversity Database. University of Wyoming, Laramie, Wyoming. 30 April 2017. 44 pp. (+ appendices).
- Kosovich-Anderson, Y. I. 2017b. Annotated list of bryophytes of Devils Tower National Monument, Wyoming, U.S.A. Prepared for National Park Service and Wyoming Natural Diversity Database. University of Wyoming, Laramie, Wyoming. 30 March 2017. 25 pp. (+ appendices).
- Kosovich-Anderson, Y. I. 2017c. Contemporary bryological research in Wyoming, U.S.A. Proceedings of the 2<sup>nd</sup> All-Russian Conference, dedicated to the memory of Doctor of Biological Sciences, Professor, Honored Scientist of the Russian Federation L. V. Bardunov (1932-2008). Irkutsk-Kyren, September 11-15, 2017. – Irkutsk: V. B. Sochava Institute of Geography, Siberian Branch of Russian Academy of Sciences Publishers. P. 67-69.
- Kosovich-Anderson, Y. I. 2018. Bryophytes of the Bighorn National Forest, Wyoming, U.S.A.: an annotated species list. Prepared for the Bighorn National Forest, USDA Forest Service, and the Wyoming Natural Diversity Database, University of Wyoming. University of Wyoming, Laramie, Wyoming. 121 pp. (+ appendices).
- Kosovich-Anderson, Y. I. 2019. The conspectus of the bryophyte flora of Wyoming / Bryophytes of Wyoming . Cheyenne, Wyoming. February 2019. In progress.
- Kosovich-Anderson, Y. I. & M. S. Ignatov. 2010. Three interesting Brachytheciaceae mosses from the Beartooth Plateau (Rocky Mountains, Wyoming, U. S. A.). *Arctoa* 19: 183-190.
- Kosovich-Anderson, Y. I. & J. R. Spence. 2008. A remarkable new range extension of the subtropical *Brachymerium vinosulum* Cardot (Bryaceae). *Evansia* 25(4): 90-93.
- Kosovich-Anderson, Y. I. & W. A. Weber. 2011. Mosses of the Wyoming's Beartooth Plateau: new noteworthy records for the Rocky Mountain region. *Phytoneuron* 2011-58: 1-10.



Devils Tower is a spectacular geologic feature of northeastern Wyoming. It is a prominent columnar monolith of igneous rock that rises near the banks of the Belle Fourche River to an elevation of 1558 m above sea level. Devils Tower and its surrounding area were established as the first national monument by President Theodore Roosevelt in 1906. Field survey of the bryophyte flora of the Devils Tower National Monument, conducted by Y. Kosovich-Anderson in 2015-2016, revealed 78 species and infraspecific taxa of mosses and liverworts, several of which may warrant conservation consideration in the state



---

### Iberian Moss Flora completed

---

Ryszard Ochyra | W. Szafer Institute of Botany of  
the Polish Academy of Sciences | Kraków |  
Poland | [r.ochyra@botany.pl](mailto:r.ochyra@botany.pl)

J. Guerra, M. J. Cano & M. Brugués (Eds). 2018. Flora briofítica ibérica. Volumen VI. Hypnales: Fabroniaceae, Leskeaceae, Pterigynandraceae, Thuidiaceae, Calliergonaceae, Amblystegiaceae, Brachytheciaceae, Lembophyllaceae, Entodontaceae, Sematophyllaceae, Plagiotheciaceae, Hypnaceae, Hylocomiaceae, Pylaisiadelphaceae, Rhytidiaceae. 463 pp., 134 pls. with line drawings and SEM and light microscope photographs, ISBN 978-84-609-9096-3 (whole series), ISBN 978-84-697-9126-4 (volume VI) (hardcover with dust jacket, size 28,3 × 20,2 cm), price 70 €. Published by Universidad de Murcia and Sociedad Española de Briología. To order contact Flora Briofítica Ibérica, Área de Botánica, Fac. de Biología,

Campus de Espinardo, Universidad de Murcia, 30100 Murcia, España. Fax: (+34) 868883917 or (+34) 868883963.

Two thousand eighteen will go down in the history of European bryology due to the completion of the project of the six-volume Flora of Iberian mosses. Until the early 1980s, the bryological studies on the Iberian Peninsula were in serious stagnation, and the basic sources of knowledge about the mosses of this area were severely obsolete works: *Sinopse des briófitas de Portugal*, published in 1928-1931 by A. Machado and the second part of *Flora ibérica - briófitas*, completed a year later by A. Casares-Gil, which was devoted to mosses. The last four decades have brought about the unprecedented development of bryological research in the Iberian countries, especially in Spain, marked by numerous floristic and taxonomic discoveries. They were the outcome of the activity of a large group of bryologists of young generations from various academic centres, in particular in Barcelona, Madrid and Murcia. At the end of the last century they entered a sufficiently mature stage that an attempt was made to summarise them. In this way, a project of a descriptive Flora of Iberian mosses was born, covering the entire Iberian Peninsula and the Balearic archipelago. It was coordinated by Professor Dr Juan Guerra Montes from the University of Murcia and Professor Dr Rosa María Cros i Mata from the Autonomous University of Barcelona, who in the last three volumes was replaced by Professor Dr Montserrat Brugués, also from the same university.

The publication of the proper descriptive Flora was preceded by the treatments of particular genera and families, or even orders, which were published in the form of separate fascicles. In this way, in the years 2000-2005 appeared 13 fascicles containing mainly genera of the family Pottiaceae, whose representatives are the dominant element in the arid areas of the Iberian Peninsula. The thirty-two genera developed in this way, including 92 species and five varieties, supplemented by genera, species and varieties that were not published in separate fascicles, were published in 2006 as the first, but

nominally third volume of this Flora containing the families Pottiaceae and Encalyptaceae. After the publication of this volume, the rate of publishing of the fascicles dropped and in 2006-2016 only six additional booklets were published. They contained the treatments of the families Seligeriaceae (2006), Bartramiaceae (2007) and Ephemeraceae (2007), and after a five-year break three more were printed: in 2012 a fascicle containing the treatment of *Brachythecium* Schimp. was published, in 2013 the largest of all fascicles appeared including the orders Archidiales, Dicranales and Fissidentales and, finally, in 2016, the third largest fascicle with revisions of four families from the order Hypnales (Fabroniaceae, Leskeaceae, Pterigynandraceae and Thuidiaceae) was published. Thus, in total, 19 fascicles were released. On the other hand, subsequent volumes of the Flora appeared irregularly, at different time intervals. And so, in 2007 the first volume was published, in 2010 the fourth one, in 2014 the fifth, and a year later the second. Finally, in 2018, the last sixth volume, crowning this entire mammoth Flora, was published.

The sixth volume covers 15 families of pleurocarpous mosses, which in the traditional Fleischer-Brotherus system were included in the order Hypnobryales (=Hypnales), of which the first four were issued in 2016 in the aforementioned separate fascicle. All other families were not previously published, except for the genus *Brachythecium*, which was released in 2012 in a separate booklet. In total, this volume contains descriptions and keys for the determination of 181 species and 6 varieties classified into 69 genera. The Brachytheciaceae is the richest family, with 59 species and one variety classified into 15 genera. For more than half less taxa, only 20 species and 12 genera consists of the family Amblystegiaceae in a narrower sense, because the family Calliergonaceae, comprising 10 species from 6 genera, was split off from it. The third place in terms of species richness belongs to the family Hypnaceae, numbering 22 species and 5 varieties classified in 9 genera, whereas the fourth is occupied by the broadly conceived family Plagiotheciaceae (20 species and 7 genera). The

remaining families number from 11 to one species, classified from one to five genera.

All taxa are developed according to the same scheme that was adopted in previous volumes. For each taxon, the author(s) and the editor(s) are given. Taxonomic descriptions are detailed and comprehensive, and the basic subject literature is quoted for families and genera. For the names of all taxa, with the exception of familial names, bibliographical data are cited, and for generic names only the type is given, and neither basionyms nor any existing synonyms are mentioned. In contrast, for the names of species and varieties basionyms and the most important homotypic and heterotypic synonyms are given, and the type citations taken from the protologues are provided. In many cases, the authors of the lectotypisations are mentioned, and for the names of several species of *Hypnum* Hedw. lectotypes were designated for the first time. One can only have doubts whether in certain cases, for instance *Hypnum resupinatum* Taylor and *Stereodon revolutus* Mitt. indication of the holotype is justified when there are at least two duplicates of the type specimens available in different herbaria. It is unlikely that the authors of the descriptions of these species in 1849 or 1859, respectively, would indicate one of the specimens as a type, because the concept of nomenclatural types did not exist then, and therefore these names require rather lectotypification.

In addition to the extensive description, for each species and variety, habitat data and information on occurrence in individual provinces of Spain and Portugal are given, selected specimens examined are cited, and in many cases descriptions are accompanied by taxonomic discussions. In addition, each species and variety is illustrated with very good quality line drawings on full-page plates, showing moss habit, leaf shapes, laminal cells, capsules, peristome teeth and other structures with taxonomic significance. In the case of species of the genus *Sematophyllum* Mitt. in addition to line drawings, there is a plate with SEM micrographs of the peristome. A similar table contains images of alar cells in various species of the genus *Brachythecium* made from the light microscope.

The Flora contains dichotomous keys to determination of genera within families as well as species within genera. In the final part there is a key to determination of all genera of mosses described in the whole Flora. It is an artificial key, covering the keys to 34 groups of genera distinguished on the basis of characteristic morphological features, not necessarily indicative of their close relationship.

Taxonomic concepts adopted by the authors are rather well established and firmly rooted in the current bryological literature, although occasionally they are partial to the acceptance of some genera distinguished recently on the basis of molecular data, especially in the Brachytheciaceae. The nomenclature of taxa is exceptionally correct, although the authors did not avoid some minor defects. The authorship of the family name Amblystegiaceae is ascribed to G. Roth, who, as it was commonly believed, used it for the first time in his work of 1899, whereas in fact the family was described in 1885 by N. C. Kindberg. The authorship of generic names *Eurhynchium*, *Heterocladium*, *Hyocomium*, *Scleropodium* and *Thuidium* should be attributed only to W. Ph. Schimper himself, not to Ph. Bruch and W. Ph. Schimper as the authors of the Flora do, just as it is with all other names proposed in the fifth and sixth volumes of *Bryologia europaea*. *Heterocladium heteropterum* is a species described by W. Ph. Schimper, not as it was commonly thought by S. E. Bridel, because *Pterigynandrum heteropterum* Brid., previously regarded as a basionym of this name, is synonymous with *P. filiforme* Hedw. The author of the generic name *Tomentypnum* is Loeske, not "(Hedw.) Loeske". Many similar inaccuracies can be found in other volumes of the Flora, but in general they do not significantly affect the high standard of the whole work.

Because this is the final volume of this mammoth Flora, it is now worth summarising some of the most important data regarding this opus. According to data from all volumes, the moss flora of the Iberian Peninsula and the Balears consists of 811 species, 5 subspecies and 30 varieties, classified in 220 genera and 60 families. In the elaboration of the whole work 38

authors took part, including 33 from Spain, two in each from Portugal and Germany and one from Argentina. Most of them also acted as editors of the treatments of particular genera and families. As a co-editor or editor of the Calliergonaceae and the genera *Hygrohypnum* Lindb., *Tomentypnum* and *Conardia* H. Rob. served Dr Lars Hedenäs, the Swedish expert in these taxa. The work of authors and editors was coordinated in all volumes by J. Guerra, assisted by M. Brugués, M. J. Cano and M. R. Cros in, respectively, five, four and three volumes.

All authors, editors and coordinators deserve sincere congratulations and should be given words of the utmost recognition for bringing this unique and great work to the end. This outstanding scientific achievement is a precious and wonderful contribution to the treasury of bryological knowledge, for which the entire bryological community should be grateful to them. It is a milestone in the study of European mosses filling a severe gap in the knowledge of moss flora in the Atlantic-Mediterranean area, which until recently was one of the least studied in Europe. Works of this sort do not require a special recommendation, because they are always the most sought-after tool by researchers of such currently fashionable biodiversity. The Flora looks great in terms of editing and one can be sure that it will serve for decades as an invaluable tool for the determination of mosses not only for bryologists, but also all other researchers of the vegetation cover of the Iberian region, in which mosses are an important constituent. This work will undoubtedly be an important stimulus of further floristic and taxonomic studies not only in southern Europe, but also in the adjacent regions of North Africa, which still require both detailed field exploration and taxonomic studies. This is confirmed by further discoveries of species new to science as well as new discoveries of species of great phytogeographic importance.



## Moss Flora of Central America

Part 4. *Fabroniaceae–Polytrichaceae*

Bruce Allen

### **A Review: Moss Flora of Central America. Part. 4. Fabroniaceae–Polytrichaceae.**

---

Dr. Johannes Enroth  
Faculty of Biological and Environmental  
Sciences  
University of Helsinki  
Finland

**Allen, B.: Moss Flora of Central America. Part. 4. Fabroniaceae–Polytrichaceae. Monographs in Systematic Botany from the Missouri Botanical Garden 132: I–X, 1–830. Missouri Botanical Garden Press 2018.**  
[orders@mbgpress.org](mailto:orders@mbgpress.org). Price: \$ 165.

“The unfinished is nothing”. This motto is printed on one of the first pages of this 830-page volume. The first part of this impressive flora was published in 1994, so it has been a project of more than a quarter of a century for Bruce Allen.

These days very few people can or want to commit themselves to projects of this magnitude, so Allen is to be warmly thanked for his perseverance that rendered this major bryological contribution possible in the first place. True, the first three parts contained contributions from a few other bryologists, but still, to my understanding, it has essentially been an Allen-undertaking.

The first part was in many ways more concise than the other three: there were no illustrations of the taxa, type information was compact, and the discussions were shorter. Altogether 966 species/varieties have been treated in the four parts, the present volume treating 208 in 15 pleurocarpous families (Fabroniaceae through Hylocomiaceae) plus Diphysciaceae and Polytrichaceae. Of those species 19 are described as new here, as well as the unispecific genus *Karstia* (Hypnaceae) and the family to accommodate the aquatic genus *Hydropogonella*, also unispecific. Additionally 11 new combinations and two *nomina nova* are proposed.

There is some interesting and more or less unorthodox taxonomy in this volume. Thuidiaceae is not recognized but genera such as *Haplocladium*, *Thuidium*, *Pelekium* and *Rauarella* are placed in the Leskeaceae, which is an older family name than Thuidiaceae. This is justified by the fact that, according to Allen, there are transitional genera, especially *Haplocladium*. In Amblystegiaceae Allen does not recognize *Straminergon* and, in my mind quite justifiably, states it is “hard to exaggerate the difficulties in formulating a coherent concept of the Amblystegiaceae”. *Heterocladium* is placed in the Pterigynandraceae based on leaf areolation. It seems the genus is polyphyletic, as based on some previous molecular analyses as well as on our own, as yet unpublished results, some but not all of its species belong in the Neckeraceae; this is discussed by Allen. Plagiotheciaceae is understood in a wide sense, containing also genera such as *Herzogiella* and *Pseudotaxiphyllum*. *Entodontopsis*, *Pilosium*, *Rozea* and *Stereophyllum* are treated under Stereophyllaceae. *Stereophyllum* is said to be a unispecific genus; there is however *S. linisii* described from the Philippines (Enroth & Tan,

2007) and recently reported from Thailand (He et al., 2018; but placed in the genus *Pseudoparaphysanthus* of the Neckeraceae based on inappropriate taxonomic judgment).

The Sematophyllaceae have 17 genera in the Flora area, and its treatment takes up over 150 pages. The Pylaisiadelphaceae, recently established for some 15 genera previously placed in Sematophyllaceae or Hypnaceae, which, as Allen states, form a heterogeneous grouping of little practical use; six genera occur in the Flora area. The large and notoriously difficult family Hypnaceae of “sometimes nondescript” taxa is understood to include also the recently proposed Taxiphyllaceae and has 17 genera treated here. *Rigodium* is surprisingly (at least to me) placed in the Hylocomiaceae, although molecular evidence (Quandt et al., 2009) shows it belongs in the Lembophyllaceae – where it was originally placed by Brotherus almost a hundred years ago. This is unquestionably a very valuable and useful flora. Among its best assets are the long, versatile discussions by an experienced “practical” rather than theoretical bryologist with great insight. They make very enjoyable and rewarding reading. Another great feature is the detailed and therefore very useful species descriptions, supported by informative line drawings. The generic descriptions and keys refer to the genera as a whole rather than just in the Flora area, which further extends the usability of this volume.

Somewhat off-topic, I was very pleased when sometime back I received the 3<sup>rd</sup> part of this series, as it treated the Neckeraceae. I have for a long time struggled identifying Neotropical specimens of *Porotrichum* s. lato of that family, but with the help of Allen’s flora my life is much easier in that respect. I believe many colleagues will share my feelings about this flora. It makes life easier.

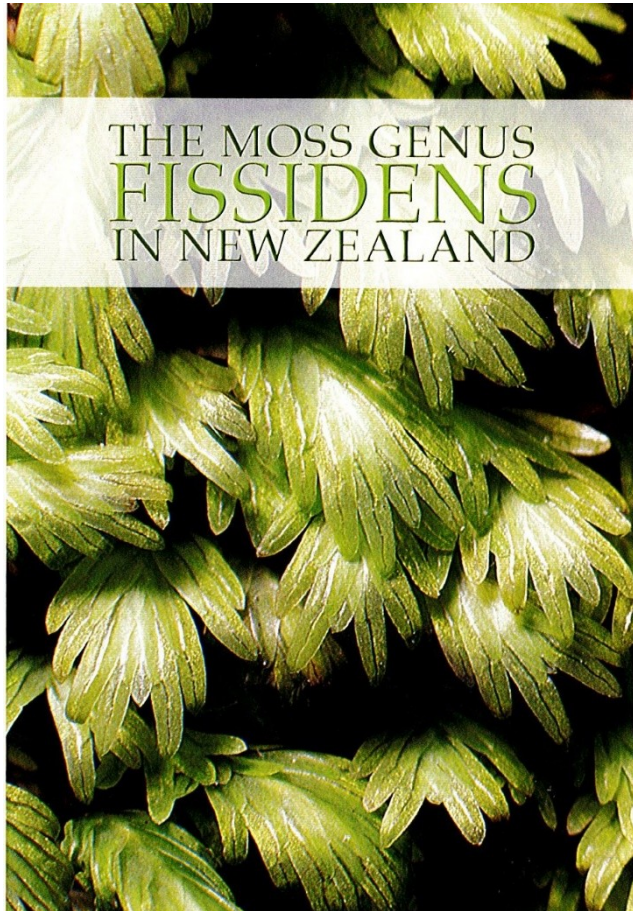
Literature

Enroth J. & Tan B.C. 2007. *Stereophyllum linisii* (Stereophyllaceae), a new species from the Philippines. *Annales Botanici Fennici* 44: 146–148.

He S., Sukkharak P. & Chantanaorrapint S. 2018. *Pseudoparaphysanthus linisii* (Neckeraceae), a new combination and a new

record for mainland South-east Asia. *Journal of Bryology* 40: 143–148.

Quandt D., Huttunen S., Tangney R. & Stech M. 2009. Back to the future? Molecules take us back to the 1925 classification of the Lembophyllaceae (Bryopsida). *Systematic Botany* 34: 443–454.



### [A Review: \*Fissidens\* in New Zealand](#)

Rod Seppelt [rseppelt@onthenet.com.au](mailto:rseppelt@onthenet.com.au)

**Beever, J., Malcolm, B., & Malcolm, N. 2018**  
**The Moss genus *Fissidens* in New Zealand.**  
Micro-Optics Press. ISBN 978-0-9582224-4-4.  
Pp 130

**Text by Jessica Beever, illustrations, design and layout by Bill and Nancy Malcolm.**

**Available from: Micro-Optics Press, PO Box 320, Nelson 7040, New Zealand.**

**Email: [nancym@micro-opticspress.com](mailto:nancym@micro-opticspress.com)**

**Price: including GST and Postage. In New Zealand: NZ\$36. In Australia: NZ\$46. Rest of World: NZ\$54**

**Payment: PayPal or direct bank transfer. NO credit cards.**

The genus *Fissidens* (Fissidentaceae) comprises worldwide around 450 species with its greatest diversity in tropical and neo-tropical regions. The genus is distinguished from all other mosses by its unique leaf structure, but satisfactorily delimiting the species is often difficult.

Many species descriptions, while being well served for words, often lack illustrations, or at least detailed illustrations of key characters. This makes for considerable difficulty in identification, particularly if fruiting material is not present.

The *Fissidens* flora of New Zealand is relatively limited, including some 34 species and varieties (Beever 2014)

(<http://dx.doi.org/10.7931/J24Q7RWN>).

By contrast, neighbouring Australia has around 70 species and varieties (Seppelt & Stone 2016)

(<http://anbg.gov.au/abrs/Mosses>

[Online/Fissidentaceae.pdf](#)). With the relatively limited number of species, the authors are fortunate in being able to state that “..identifying the 30 odd species might seem a daunting task, but all but a few of them differ in ways that (require) nothing more high-tech than a hand lens”.

The book is designed to be of considerable use to the novice as well as the more experienced. There is a simple but useful guide to *Fissidens* leaf morphology, a key to species and no less than 330 images of plants, whole and part leaves. Distribution maps indicate land districts in which the species occur. The intentionally simple but informatively written and well-illustrated introductory section explains the unique leaf structures and variations as well as other key “spotting” characters useful for identification. Bordered and unbordered leaves are matched with whole leaf images of both, together with an accompanying set of illustrations showing the various parts of the leaf and differences between closed and open vaginant laminae. Six simplified leaf drawings summarise key identifying

characters in plain language comprehensible to any reader, regardless of experience.

The key to species and infraspecies is based on an earlier New Zealand *Fissidens* guide book (Beever et al. 2002). There are several terms used in the key that may be difficult to envisage. For example, *hyaline axillary nodules* (not illustrated) and the *sainsburia*-type peristome (illustrated in the text) that could perhaps have been illustrated in the introduction. The key is, however, cross-referenced with an informative glossary (itself well-illustrated). The glossary is also cross-referenced to the profusely illustrated and greatly amplified “Glossary of Bryological Terms” (Malcolm & Malcolm 2006, 2<sup>nd</sup> ed.), another benchmark production from Micro-Optics Press.

The format for each taxon provides notes on form and habitat; leaf apex shape; vaginant laminae; leaf base; costa; leaf margins; leaf cells; capsule (including stance, colour and length); seta length, colour, stance and symmetry; calyptra and operculum. Each taxon is well illustrated and on an outline drawing of the leaf are indicated the regions of the leaf depicted by each illustration.

Jessica Beever, in association with the late Ilma Stone, has done much towards advancing our knowledge of *Fissidens* in Australasia. Although there remain many puzzling taxa in Australia, particularly from its tropical and subtropical regions, this lavishly illustrated and easily readable flora will enable anyone to identify *Fissidens* collections in New Zealand and it will be of considerable value as a reference for Australia and many of the islands of Oceania.

So what, if any, criticisms? A few minor comments more than criticisms.

1. The glossary refers the reader to the illustrations of *Fissidens taylorii* var *sainsburyanus* for an image of the *sainsburianus*-type peristome. A companion image shows the “deeply divided tooth of *Fissidens leptocladus*, a type that is typical of most *Fissidens* species”. This represents the *bryoides*-type peristome, so perhaps this could have been defined in the glossary and cross-referenced to the figure.

2. *Axillary hyaline nodules*. While defined in the glossary, these structures, when present, are easiest to observe with the leaves stripped from the stem or in transverse sections of the stem and leaf base. Perhaps an illustration could have been included.

3. *Costa, nerve, midrib. Vein*. These terms are used interchangeably. In the introduction, one finds “costa (midrib)”. In the glossary, costa and nerve are cross-referenced. “Midrib” of a leaf (syn: nerve) is included in the glossary but “vein” is not. The term *costa* is used consistently in the species descriptions.

These minor criticisms that do not really detract from what is a very useful and beautifully produced guide to all the New Zealand *Fissidens* taxa. The book represents another highly professional and beautiful collaboration with Micro-Optics Press who have done much to present to the world the innate beauty of minutiae of our flora.

#### References:

Beever, J.E. 2014. Fissidentaceae, In: Heenan, P.B., Breitweiser, I., Wilton, A.D. Flora of New Zealand – Mosses. Fascicle 8. Manaaki Whenua Press, Lincoln

<http://dx.doi.org/10.7931/J24Q7RWN>

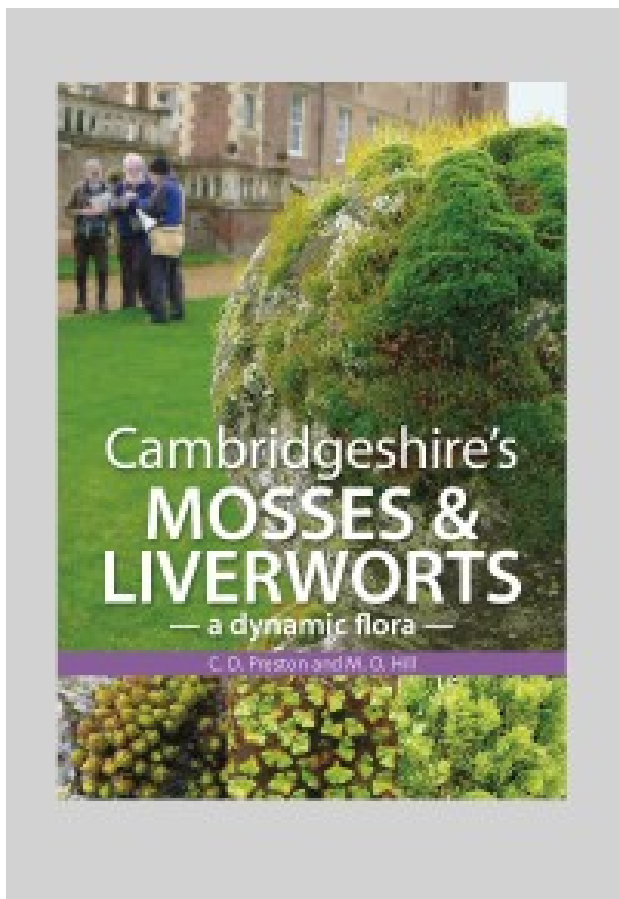
Beever, J., Malcolm, B., & Malcolm, N. 2002. The moss genus *Fissidens* in New Zealand, an illustrated key. Micro-Optics Press, Nelson.

Malcolm, B. & Malcolm, N. 2006. Mosses and other bryophytes, an illustrated glossary. 2<sup>nd</sup> Edition (0-9582224-7-9) Micro-Optics Press, Nelson.

Seppelt, R.D., & Stone, I.G. 2016. Australian Mosses Online. 70. Fissidentaceae. Australian Biological Resources Study, Canberra. Version 16 June 2016.

[http://www.anbg.gov.au/Mosses\\_online/70\\_V2\\_Fissidentaceae.html](http://www.anbg.gov.au/Mosses_online/70_V2_Fissidentaceae.html)





Oliver L. Pescott, [olipes@ceh.ac.uk](mailto:olipes@ceh.ac.uk)  
CEH Wallingford, UK

**Preston, C.D. & Hill, M.O. (2019)**  
***Cambridgeshire's Mosses & Liverworts – a dynamic flora.*** Pisces Publications: Newbury, Berkshire ([www.naturebureau.co.uk](http://www.naturebureau.co.uk)). 326 pp. ISBN 978-1-874357-89-6.

The question, I suppose, is why international readers of the *Bryological Times* should concern themselves with a Flora of a small lowland English county, with relatively low bryophyte diversity? The answer will be abundantly clear to any reader who takes the time to flick through, or indeed thoroughly digest, the 300-odd pages of

this attractive and erudite publication; for those future readers who have not yet ordered their copy, let me outline some of its attractions.

Unlike many local or regional Floras, the book is split more-or-less evenly between the species accounts and the introductory chapters, although to call them such is to suggest that they are merely an appetiser before the main course of the accounts. In fact, these chapters are an intrinsic part of the rich tapestry of the book, with the detail, history, analysis and insight of the topics treated woven back-and-forth with the species accounts themselves. It is not the case that these chapters deal with unexpected topics – they consist of a background to the county's physiography, land use and environmental features as they relate to bryophytes, a history of bryophyte recording from 1660 to 1999, details of the recent survey effort (2000-2018), summary statistics concerning the species and the recording effort, overviews of the approaches used to analyse change in the subsequent habitat chapters, nine chapters on particular habitat-based species groupings, another covering casual species occurrences, extinctions and introductions, and a biogeographic summary putting the Cambs flora in its wider context. But the attention to detail, and effort displayed in leaving no analysis of interest undone, no summary table uncalculated, no useful map unplotted, and no historical link unfollowed, leaves one astounded at the mastery of the subject on display.

To provide a random example: in the county overview chapter an account of the building stones and roofing materials typical of Cambridgeshire is provided, noting those that have been particularly productive of bryological diversity. For example, “[t]he 18<sup>th</sup> Century gravestones made of oolite ... are especially rewarding”, although recent gravestones made of highly polished granitic substances are “intensely bryophobic”. Later on, in the short chapters describing the analytical approaches, we learn about the process of creating a set of species characteristic of the built environment of Cambs, including churchyards, and the changing proportions of records of these species relative to all records over 10 decades. The chapter presenting the analyses relating to this species

group provides a coincidence (heat) map of these species, a map of all medieval and other churches in the county, various summary tables with succinct habitat preferences for the species treated, and a three page in-depth analysis of churchyard sites in isolation from the other types of built environment investigated. For example, we find that a number of species, including *Didymodon rigidulus*, *Orthotrichum anomalum*, *Rhyncostegiella tenella* and *Homalothecium sericeum*, were all more frequently found in ancient churchyards than in modern ones. Later on, in the species accounts, none of this preparatory work and analysis is overlooked. For example, in the account for *Orthotrichum anomalum*: “[a]lmost half of our tetrad [2 × 2 km grid square] records (46%) are from churchyards or cemeteries, and we have found it in 55% of the churchyards we have visited. Here it grows on stonework ledges, window sills and buttresses of the church walls, on the flat tops of table tombs, on other monuments and gravestones, on the coping stones of boundary walls and sometimes on concrete steps and paths. Oolitic limestone is a favoured substrate.” Which also goes to show how many clear and detailed field notes must have been taken and typed up during their field campaign.

In a similar way, the historic treatment of bryological recording in this Flora is second to none. The chapter focusing on this topic comes in at 36 pages, with numerous excellently reproduced colour images of historic works, specimens, field notes, and recorders. Neither is this chapter denied useful maps, or summary charts and tables, with the “recording footprint” maps of various botanical luminaries (Ray, Vernon, the Martyns, Relhan, Henslow and contemporaries), and 20<sup>th</sup> Century recording periods, being particular highlights in a chapter full of interest. However, this chapter does not sit apart from the rest of the Flora, as such chapters sometimes do in such works; throughout the recent survey, Preston & Hill have both also clearly been hard at work in the library and herbarium, nailing down pre-Linnean polynomials used by their predecessors to describe Cambridgeshire species, and uncovering previously unknown Cambridgeshire records

through careful studies of correspondence, handwriting on herbarium labels, and Flora marginalia. These discoveries flow through to the chapters on habitat change, and are used throughout the species accounts, particularly in the paragraphs dealing with each taxon’s first known record. For example, *Polytrichum commune* var. *commune*, the only one of Ray’s bryophytes that Oswald & Preston (2011) were willing to equate with a modern species, was first reported in Ray (1660) as ‘On Hinton Moor in the watery places’. Many more species have localised first records reported by Vernon, the Martyns and Relhan for the late 17<sup>th</sup> and 18<sup>th</sup> Centuries.

I should now say a little more about the format of the species accounts, given that these do occupy half the book, and might be considered, at least by those who tend to skip the “introductory” chapters of Floras, as the main point of this publication. The accounts are variable in length and content, depending on the commonness or rarity of the taxon. All the accounts are divided into three sections, the first treating of habitat and ecology, the second detailing the first record for the county, and often later ones as well where the species is rare or the records of historic interest, and information on change in the 20<sup>th</sup> Century where the species was subject to such analysis; the third provides information on the reproductive status of the taxon in the county, with the observed frequency of capsule production where relevant. For the rarest species this information is fairly condensed, for the commoner taxa these sections expand to half a page or slightly more (the book is approximately B5 size). The commoner taxa are also furnished with two dot (i.e. “Atlas”-style) maps, one at 5 × 5 km and one at 2 × 2 km, both distinguishing records made in different time periods, with accompanying frequency information per period. As noted above, all the accounts, but particularly those of the commoner taxa, draw on information from the earlier chapters extensively; in addition, detailed information on the frequency of host plants is given for epiphytes, and this information is also summarised by host in an appendix. The species accounts do not feature photos, but images of

habitats, and of bryologists at work, are abundant throughout the first half of the book.

Readers of book reviews expect some critical points, if only to be reassured that a marginally hagiographic review like this one is actually the product of an attentive reading. One minor quibble of mine is the printing of the book in a sans-serif font, which I personally find significantly harder to read than serif styles (although Wikipedia tells me that the jury is out on this with respect to the wider population). Some readers might also comment on the absence of taxonomic authorities and lists of synonyms in the species accounts, although these are so widely available elsewhere for the British flora that is not so very surprising that the authors opted to omit them, presumably to save space. It would be strange, however, to take this an indicative of any type of taxonomic sloppiness, when the evidence against this is detailed throughout the text (e.g. appendix 1 is a list of species excluded from the Flora on the basis of specimen redeterminations and other checks). Otherwise, having waxed lyrical about this book's detail and near-perfection, it would be perverse of me to needlessly invent other gripes: I have none.

Chris Preston and Mark Hill have both spent the great majority of their lives in Cambridgeshire, and both started their bryological careers as undergraduates at the University. It is hard to imagine two better guides to the bryophytes of a region, and to the people who have recorded them over the past 350 years. Indeed, the breadth and depth of the information presented here, and the creativity displayed in presenting it, sets the local Flora bar so high that it will be a long time before anyone else manages to catch a glimpse of it again, let alone clear it.

### References

Oswald, P.H., Preston, C.D. (Eds.), 2011. *John Ray's Cambridge Catalogue (1660)*. Ray Society, London.



## THESES IN BRYOLOGY 36

---

William R. Buck  
Institute of Systematic Botany  
New York Botanical Garden  
Bronx, NY 10458-5126, U.S.A.  
[bbuck@nybg.org](mailto:bbuck@nybg.org)

As reported in a previous issue of *The Bryological Times* (99: 17. 1999), the International Association of Bryologists has decided to begin a repository of bryological theses. These theses are being housed in the Library of The New York Botanical Garden. They are available via interlibrary loan. The NYBG Library online catalog (CATALPA) may be viewed at: <http://www.nybg.org/library/>. As theses arrive, bibliographic data and a brief synopsis will be published in this column (see examples below). Bryological theses for any degree, covering any aspect of bryology, in any language, will be included. Please send theses to Bill Buck at the address above. Please refer to the preliminary notice (cited above) for information on financial assistance from IAB for reproduction of theses. The current IAB Treasurer is Matt von Konrat ([iab@fieldmuseum.org](mailto:iab@fieldmuseum.org) or [mvonkonrat@fieldmuseum.org](mailto:mvonkonrat@fieldmuseum.org))

Duarte Silva, Ana Gabriela. 2016. Revisão taxonômica e filogenia molecular de *Callicostella* (Müll.Hal.) Mitt. para região neotropical. Ph.D. thesis, Universidade de Brasília, Brazil. [vii] 84 pp. In Portuguese with English abstract. E-mail of author:

This doctoral dissertation examines *Callicostella* (Pilotrichaceae) for the Neotropics. Of the 97 accepted names worldwide, 47 occur in the Neotropics. The genus is quite diverse but with

no unique features, making it difficult to circumscribe. The goal of this study was to circumscribe *Callicostella* using a molecular phylogenetic approach. A monophyletic core was identified and recognized as a genus. Five species were recognized in the Neotropics, *C. apophysata*, *C. crenata*, *C. depressa*, *C. merkelii* and *C. pallida*. All are treated taxonomically with descriptions, photographs, distribution maps and conservation status. Excluded taxa moved to other generic include *C. monofaria* moved to *Amblytropis*, *C. grossiretis* to *Cyclodictyon*, *C. scabriseta* and *C. submonofaria* to *Pilotrichum*, *C. radicans*, *C. rufescens*, *C. subfissidentoides* and *C. subsecunda* to *Thamniopsis*, and *C. columbica*, *C. mexicana*, *C. pellucida*, *C. rivularis*, *C. saxatilis* and *C. tenerrima* to *Trachyphium*.

Wolski, Grzegorz J. 2013. Siedliskowe Uwarunkowania Występowania Mszaków w Rezerwatach

Przyrody Chroniących Jodłę Pospolitą w Polsce Środkowej. Ph.D. dissertation, Uniwersytet Łódzki, Łódź, Poland. 2 volumes, 145 + 96 pp In Polish. E-mail of author:

[grzegorz.wolski@biol.uni.lodz.pl](mailto:grzegorz.wolski@biol.uni.lodz.pl).

This doctoral dissertation, whose title translates as Habitat Conditions for the Occurrence of Bryophytes in Nature Reserves Protecting

Common Fir in Central Poland, examined 143 bryophytes (116 mosses and 27 hepatics) from nature reserves. The ecology and bryosociology of each are discussed.



## NEWS ITEM

**OzBRYO**  
A meeting for bryophyte researchers in Australasia  
2<sup>nd</sup> and 3<sup>rd</sup> December, 2019  
University of Melbourne Parkville, VIC, Australia

Sponsored by  
**Botany Foundation**

**REGISTRATION AND CALL FOR ABSTRACTS NOW OPEN**

OzBryo will bring together researchers from Australia, New Zealand and further afield that work on bryophytes. The meeting will be a platform for early career researchers to share their research with others and will have a number of workshop sessions to provide participants with a foundation for the deeper study of bryophytes and will feature special symposiums from national and international speakers.

For more information and to register visit:  
<https://www.ozbryo.org>

**KEY DATES**  
FRIDAY 27 SEPTEMBER 2019  
Call for Abstracts Close  
FRIDAY 1 OCTOBER 2019  
Registration Closes

**CONFERENCE THEMES**

- Resources and technologies
- Comparative genomics
- Biochemistry
- Development
- Systematics and ecology
- Genes and gene regulation

## Administrative Information

### IAB Officers & Council

<p><b>President</b> Bernard Goffinet Dept. of Ecology and Evolutionary Biology, 75 North Eagleville Road,  University of Connecticut, Storrs, CT, 06269-3043 United States of America</p>	<p><b>Editor of Bryophyte Diversity and Evolution</b>  Dietmar Quandt Nees-Institut für Biodiversität der Pflanzen, Meckenheimer Allee 170 D-53115, Bonn Germany</p>	<p><b>Council Member</b> Juan Larraín Instituto de Biología  Pontificia Universidad Católica  de Valparaíso Campus Curauma Chile</p>	<p><b>Council Member</b> Juliana Rosa Oliveira  University of Brasilia Dep. Botany, Caixa Postal 04457  Brasilia, DF. Brazil</p>
<p><b>1<sup>st</sup> Vice-President</b> Lars Söderström  Dept. of Biology, Norwegian</p>	<p><b>Editor of The Bryological Times</b> Patrick J Dalton  School of Natural Sciences</p>	<p><b>Council Member</b> Javier Martínez-Abaigar  Universidad de La Rioja</p>	<p><b>Council Member</b> Michael Stech Naturalis Biodiversity Center</p>

University of Science and Technology, N-7491 Trondheim, Norway	University of Tasmania Private Bag 55 Hobart, Tasmania 7001	Madre de Dios 51, 26006 Logroño, La Rioja, Spain	PO Box 9517, NL-2300 RA Leiden Netherlands
<b>2<sup>nd</sup> Vice-President</b> Yelitza León	<b>Council Member</b> Claudine Ah-Peng	<b>Council Member</b> Denise Pinheiro da Costa	<b>Council Member</b> Kien Thai Yong
Centro Jardín Botánico	University of La Réunion	Instituto de Pesquisas Jardim Botânico do Rio de Janeiro	Institute of Biological Sciences
Universidad de Los Andes Apartado 52 La Hechicera	UMR PVBMT, BP 7151 15 Avenue René Cassin	Rua Pacheco Leáo 915 22460-030, Rio de Janeiro, RJ	University of Malaya 50603 Kuala, Lumpur
Mérida 5101 Venezuela	97715 Saint-Denis France	Brazil	Malaysia
<b>Past President</b> Jeff Duckett	<b>Council Member</b> Isabel Draper	<b>Council Member</b> Catherine Reeb	<b>Council Member</b> Juan Carlos Villarreal
The Natural History Museum	Departamento de Biología (Botánica) Universidad Autonoma de Madrid	Institut de Systématique	Departement de Biologie
London	Madrid	Évolution Biodiversité UMR 7205, Muséum National	Universite Laval
United Kingdom	Spain	d'Histoire Naturelle, Paris, France	Québec Canada
<b>Secretary-Treasurer</b> Matt von Konrat	<b>Website Coordinator</b> Vacant		
Dept. of Science and Education, Field Museum, 1400 South Lake Shore Drive, Chicago, IL 60605- 2496, United States of America			

---

### Newsletter Column Editors

**Conservation Column Editor:** Tomas  
*Tomas.Hallingback@ArtData.slu.se*

**Literature:** Johannes Enroth,

**Theses:** William R. Buck,

**Tropical Biology:** Tamás Pócs,

### Association Objectives

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

### Next Meeting

The next IAB meeting will be held jointly with the Sociedad Espanola de Briologia, in Madrid, Spain.

### Call for Submissions

*The Bryological Times* was founded in 1980 by S. (1928--1989) as a newsletter published for the *The Bryological Times* welcomes announcements summaries of bryological conferences, fieldtrips; book reviews and notices of original articles, artwork and photography. send submissions to the editor:

All submissions will be acknowledged by email.

Contributors will be asked to review their publication.

### Copyright Statement

Articles appearing in *The Bryological Times* are printed with the author's permission. Persons or organizations wishing to cite content should cite *The Bryological Times* as the source.

Renew your membership online at  
[www.bryology.org](http://www.bryology.org)

