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The Bryological Times Special Issue of Women in Bryology prepared by Yarency Rodriguez, D. Christine Cargill, Josephine Milne, Chrissy Christian & Mereia Tabua

The original online version of Women in Bryology was initiated, produced and compiled by D. Christine Cargill, Josephine Milne, Mereia Tabua & Rafael Medina

IN THIS ISSUE

A foreword from the 1st Vice President, Dr. Catherine Reeb

It is a great honor and a great pleasure to open this special issue of the Bryological Times, presenting the first advances of the IAB project "Women in bryology", driven by Chris Cargill, Mereia Tabua and Josephine Milne. One would think that it is an out-of-date feminist struggle in the open and friendly community of bryologists. Of course not! The aim of this issue is to present the involvement, the motivations and the way women came to bryology, women of all ages, origins and status. Why is it so important to expose these testimonies? Because in science, gender balance is generally not in favor of women, even if in our international bryological community, we don't really feel that. But no one can ignore that it could be the case at local scales or in specific institutions.

According to the UNESCO Institute of Statistics[1] (UIS fact sheet 55) there is a gender gap in sciences in general, with no continent exhibiting more than 50% of researchers being female (29.3% for the World), even if great differences occur between regions (from 18.5% to 48.2%)[1]. More than global figures, the most disturbing are the discrepancies in the employment status (and salary) of scientists according to their gender. In Europe, official statistics[2,3] show that more women graduate than men but that the current trend immediately reverses, with more men employed as researchers after their diploma. The glass ceiling (GCI, Glass Ceiling Index) measures the progress of women in the workplace and is always to the detriment of women. In the European Union, only 26 % of the highest positions in sciences are occupied by women, and 74% by men (for 55 % / 45 % of graduate women/men respectively).

From a historical perspective, women in sciences are often little known, the same for painters or writers. Before exploring women's involvement in current bryology, let us bring to the light and honor some of our female elders in this discipline. I want to warmly thank Pr. Robbert Gradstein, who guided me with this evocation; unfortunately this evocation cannot be exhaustive, and I apologize for those who do not appear in this short enumeration.

Up to the late 19th century, all bryologists seem to have been men. **Elisabeth G. K. Britton** (1858-1934) was probably the first female bryologist, a specialist of North American mosses. She was prolific, with 346 publications until 1930. She had a strong character and was engaged in numerous activities enhancing knowledge, collecting and curation of mosses. The herbarium of the New York Botanical Garden now bears her name ("The Elisabeth Gertrude Britton Moss Herbarium"). In North America again, five women are known as the "grand-old ladies of North American bryology" (Gradstein, com. pers.) rose to the rank of Professor of University in the mid-20th century. Is it a sign that bryology could be an exception in promoting women in Science? They are **Ruth Breen** (1905-1987), University of Florida, author of the Moss Flora of Florida, **Margaret H. Fulford** (1904-1999), University of Cincinnati, specialist of South America liverworts, **Elva Lawton** (1896-1993), University of Washington at Seattle, author of the Moss flora of

Northwestern America, **Geneva Sayre** (1911-1992), Russel Sage college, New York State and who received the first Field Hedwig Medal of the IAB for her contribution in bryology, and finally **Winonah Welch** (1896-1990), University of Indiana, a specialist of mosses too (e.g., Hookeriaceae, Fontinalaceae). In Europe, some names may echo in our bryological mind, such as **Jean Paton** (b.1927), great authority on British liverworts and honored by Queen Elisabeth with the royal title of "Lady" for her work. In France, at the Muséum national d'Histoire naturelle (MNHN) Dr. **Suzanne Jovet-Ast** (1914-2006), was a specialist of liverworts, she focused among other groups on the genus Riccia and collaborated with Dr. **Helène Bischler** (1947-2000), one of the first who applied modern integrative taxonomy in bryology (without using this term), combining DNA analyses with morpho-anatomical and morphometric analyses, leading to remarkable monographs on Marchantiales and Lejeuneaceae. In Spain, Pr. **Creu Casa** (1913-2007), in Italy Pr. **Carmela Cortini** (1931-2007), in Scandinavia Dr. **Elsa Nyholm** (1911-2022) were respectively pioneers for bryology in their country. In Africa, Dr. **Sally Perold** (1928-2011) was a remarkable worker on thalloid liverworts, especially Fossombronia and Riccia. Dr. **Gabriela Hässel de Menendez** (1927-2009) at the National History Museum of Buenos Aires and Pr. **Celina Matteri** (1943-2004) in Argentina were the most important female bryologists in South America. And finally, in Australasia, Dr. **Ilma Stone** (1913-2001) (Australia), specialist of pigmy mosses, and **Amy Hodgson** (1888-1983) (New Zealand), to whom Persson dedicated the peculiar genus "Neohodgonsonia" of Marchantiaceae. She lived with her family on a farm, in a remote valley. She became a specialist of liverworts without any formal training and using only rudimentary equipment, helped by correspondence with several bryologists. At 87 years old, she received an honorary Doctorate for her pioneering work from Massey University.

The various careers of these ladies must inspire every young bryologist, especially women, everywhere in the world. Passion associated with serious and constant work are the only driving force that could bring everyone to bryology. These ladies produced significant publications, were innovative and some were remarkable teachers who trained numerous current bryologists. As I said before, I have not felt gender segregation in our international community of bryologists. My short experience in the IAB committees showed the opposite - a constant willingness for equality and gender balance. But this is not the case in all scientific disciplines and institutions. Raising the profile of women in bryology by publishing their biographies in this special issue is our participation for a better awareness of women in sciences, supporting the cause and lighting the way for gender balance. For our discipline, bryology, the real efforts to fund and give access to good working material to colleagues, and students, women and men, having rudimentary conditions or living in low-income countries should increase, without falling into the trap of unjustified favors but with the constant concern of gender equality.

[1]UIS fact sheet 55
[2]Women in Science database, DG Research and Innovation, She Figures 2021
[3]France: Ministère de l'enseignement Supérieur, de la Recherche et de l'Innovation, 2022 "Vers l'égalité femmes-hommes ?", esr.gouv.fr [Higher Education, Research and Innovation Ministry, 2022, "Towards gender equality", esr.gouv.fr]

Raising the profile of women in bryology

The Women in Bryology project started as a way to raise the profile of those who identify as women in bryology. A quick scan of the listings of various awards conferred over the years to members of the International Association of Bryologists saw a large proportion given to men. Well-deserved no doubt, but very few are awarded to women in bryology. The reasons for this may be many and varied – unconscious bias, conscious bias, motivation on the part of men, lack of confidence in women, women are more invisible … the list could go on. But one thing we felt we could do as a community that was concrete, easily achievable, and not too onerous was to bring women to the forefront to our membership and beyond, through their stories.

We began by inviting women that we knew personally within a circle of colleagues or asked colleagues to write biographies of their colleagues. This later expanded when we sent out a call to the IAB community through Bryonet, Facebook, Instagram, and Twitter. The project was enthusiastically picked up and many women (and men!) began to suggest to us other women outside our circle, to whom we sent an invitation to contribute a biography. We did not have any strict requirements on content or word count and they were free to send in a list of their publications if they wished. We did however ask, for those that could, to share their bryo-story in their vernacular language as well.

For us it was a revelation to discover the many women around the world who are involved in bryology in many different aspects. Many we had not known about ourselves through our own sphere of colleagues.

All the women who have contributed to date have been generous and very supportive of this project. As a team, we have very much enjoyed reading all of the biographies, learning about the many and varied journeys that all the women have been on in their quest to study these wonderful plants.

Thank you also to the other IAB members who have emailed us their positive responses to the project – their support has also been much appreciated.

From the Women in Bryology Team
Chris, Pina & Mereia

AFRICA

Nonkululo Phephu
South Africa

I was born in Bizana, a small rural town of Eastern Cape province, South Africa. I started working on bryophytes in 2005 as an intern under the mentorship and leadership of Dr Jacques van Rooy (South African National Biodiversity Institute) until I was a full scientist. He allowed me to take off right away by involving me in bryophyte anatomy, taxonomy, field work, herbarium curation and scientific writing. He and the late Dr Sarie Perold have been very instrumental in shaping me into being one of the few active bryologists working on the Flora of southern Africa. Generally, bryophytes are not well-known here like vascular plants. I love bryology because it gives me a rare opportunity to promote the knowledge of this group of plants as well as to represent my country and continent in this field. At present I am a PhD candidate studying the endemic element of the bryophytes of southern Africa with the University of Witwatersrand. In my current occupation as a lecturer, I am fortunate to not only continue with bryology research but to also establish and preserve the relationship between the academic circles and the National Herbarium (PRE) which houses the largest bryophyte collection in Africa, and recruit students to study these plants.

Ndazalelwa kwidolophana yase Bizana kwiphondo laseMpuma Koloni, eMzantsi Afrika. Ndaqala ukusebenza ngezityalo ezibizwa ngee ‘Bryophytes’ ngonyaka ka-2005, ndifundiswa ngu Dr Jacques van Rooy (South African National Biodiversity Institute) nongasekhoyo uDr Sarie Perold ndade ndaba sisazinzulu kwezi zityalo kule ngingqi yamazantsi e-Afrika. Ezi zityalo zincinci, ziluhlaza, zithanda ukukhula endaweni emanzi nenomthunzi. Azidumanga kwaye azazihoywanga njengezinye iintlobo zezityalo ezimbejembeje ngemibala. Ndiyakuthanda ukufunda ngazo kuba zindinike ithuba elinqabileyo lokwandisa ulwazi ngazo ebantwini, ndiphinde ndimele ilizwe lam kweli candelo. Okwangoku ndiyaqhubeka nezifundo zam neDyunivesithi yaseWits apho ndifundela isidanga sobugqirha kwezi zityalo. Ndikwaxelenga njengomhlohli apho ndikwaziyo ukuqhubeka nophando ngazo ii ‘Bryophytes’, ndiqinise nobudlelwane phakathi kwezemfundo neziko lophando ngezityalo iNational Herbarium (PRE).

List of selected publications:

Norris D, Kraichak E, Risk A, Lucas D, Allard D, Rosengren F, Clark T, Fenton N, Tessler M, **Phephu N**, Lennette E. 2017. On the diversity and richness of understory bryophytes at Nectandra Cloud Forest Reserve, Costa Rica. *Biodiversity Data Journal* 5: e11778. https://doi.org/10.3897/BDJ.5.e11778

Van Rooy, J. & **Phephu, N.** 2016. Centres of moss diversity in southern Africa. *Bryophyte Diversity and Evolution*.

Phephu, N. & Van Rooy, J. 2015. Studies in the liverwort family Metzgeriaceae (Metzgeriales) from southern Africa. 3. The widespread species of *Metzgeria*. *Telopea* 18: 177–184.

Jaca, T.P., **Phephu, N.** & Condy, G. 2015. *Abutilon grandifolium*. Flowering Plants of Africa 64: 76–83.

Phephu, N. 2015. Plant of the Week: *Triumfetta annua*. www.plantzafrica.com

Phephu, N. & Mona, I.G. 2015. Plant of the Week: *Dombeya cymosa*. www.plantzafrica.com

Phephu, N. 2014. A taxonomic revision of Thuidiaceae (Bryophyta) in Africa and the East African islands. Dissertation (M.Sc.). Department of Library Services, University of Pretoria.

Phephu, N. & Van Rooy, J. 2014. Studies in the liverwort family Metzgeriaceae (Metzgeriales) from southern Africa. 2. The African species. *Telopea* 17: 311–318.

Phephu, N. 2014. Plant of the week: *Cola greenwayi*. www.plantzafrica.com

Ellis, L.T. et al. (**Phephu, N.**). 2013. New national and regional bryophyte records, 37. *Journal of Bryology* 35(4): 290–305.

Phephu, N. & Van Rooy, J. 2013. Studies in the liverwort family Metzgeriaceae (Metzgeriales) from southern Africa. 1. *Metzgeria nudifrons* Stephani and a key to the species. *Polish Botanical Journal* 58 (2): 449–455.

Phephu, N., Van Rooy, J. & Van Wyk, A.E. 2013. New combinations and a key to the species of *Pelekium* Mitt. (Thuidiaceae) in sub-Saharan Africa and the East African Islands. *Phytotaxa* 84 (2): 60–64.

Ellis, L.T. *et al.* (**Phephu, N.**). 2012. New national and regional bryophyte records, 32**.** *Journal of Bryology* 34(3): 231–246.

Phephu, N. 2012. Plant of the Week**:** *Marchantia berteroana*. www.plantzafrica.com

Phephu, N. 2012. Plant of the Week: *Tamarix usneoides*. www.plantzafrica.com

Phephu, N. & Van Rooy, J. 2011. Plant of the Week: *Polytrichum commune*. www.plantzafrica.com

Ellis, L T et al. (**Phephu, N**.). 2011. New national and regional bryophyte records, 27. *Journal of Bryology* 33 (2): 158–162.

Van Rooy, J., **Phephu, N.** & Perold, S.M. 2011. New liverwort distribution records in South Africa. *Bothalia* 41: 185, 186.

Phephu, N. & Van Rooy, J. 2011. Note on the Occurrence of *Metzgeria saxbyi* in southern Africa. *Journal of Bryology* 33(1): 85.

Ellis, L.T. et al (**Phephu, N.**). 2010. New national and regional bryophyte records, 25. *Journal of Bryology* 32(4): 311–322.

Phephu, N. 2010. Plant of the Week: *Haplocladium angustifolium*. www.plantzafrica.com

Phephu, N. 2009. Abstract: Towards a Taxonomic Revision of the Thuidiaceae in Africa and the East African Islands. *South African Journal of Botany* Volume 75 (2): 416.

Phephu, N. 2009. Plant of the Week: The genus *Sphagnum*. www.plantzafrica.com

Phephu, N. 2008. Plant of the Week: *Bryum argenteum.* www.plantzafrica.com

Winter, P.J.D., A.R. Magee, **N. Phephu**, P.M. Tilney, S.R. Downie, and B-E. van Wyk. 2008. A new generic classification for African peucedanoid species (Apiaceae). *Taxon* 57 (2): 347−364.

Imen Ben Osman
Tunisia

My name is Imen Ben Osman. I was born in Tunis, Tunisia. Plants have fascinated me since childhood because of their diverse colors, shapes and beautiful flowers. Having a Master's degree in Evolutionary Ecology, I began my journey as a bryologist working on a research project suggested by my supervisor, to whom all the merit is due, Mrs. Amina Daoud-Bouattour, professor at the Faculty of Sciences of Tunis. The field intrigued me, and I found it interesting considering the fact that there are no specialists in Tunisia - "no bryologists". I began my first steps with the encouragement and the assistance of my supervisor and my co-supervisor Mr. Serge Muller, professor at the University of Montpellier, who instructed me on the ABC of bryology. I would like to thank them for their dedication, the time and effort they put in for me, and their constructive advice. I studied the diversity and ecology of the hepaticological flora of Kroumiria, a northern region in Tunisia. Now I am conducting my doctoral studies on the Bryophytes of Tunisia, focusing on the taxonomic diversity and conservation issues under the mentorship of the renowned bryologist Mr. Vincent Hugonnot. I feel very fortunate to have such a mentor; his kindness, expertise, consistent supervision, constructive criticism and his skills in bryology have helped me enormously in undertaking research in this area.

Aside from my thesis, we are also working on a book on the bryoflora of my country as a first step, notably to facilitate the biological inventories, but also the subsequent works on bryophytes in Tunisia, allowing future bryologists to take over and, thus, ensuring continuity. Additionally, and considering the serious conservational issues that the bryflora is facing in Tunisia, we are working on the elaboration of a red list with the aim to contribute to the preservation of the bryophyte flora in the hope of carrying out efficient conservation actions in the near future.

Bryophytes are truly awesome organisms that I'm fond of, despite how challenging they are to study and observe under the microscope, the diversity of their form, the details they contain, their behaviour in their natural environment, their distribution, their preferences are very interesting and inspiring.

إسمي إيمان بن عصمان، ولدت في تونس العاصمة، تونس . لقد سحرتني النباتات منذ الصغر لتنوع ألوانها وأشكالها وأزهارها الجميلة. بعد أن حصلت على درجة الماجستير في علم البيئة التطوري ، بدأت رحلتي كباحثة في علم البريولجية (علم البريولجية هو الدراسة العلمية للنباتات الكبدية ، والزهقرنية والحزازية) عملت في مشروع بحثي

اقترحته مشرفتي التي يعود إليها كل الفضل السيدة أمينة داود- بوعتور ، أستاذة في الكلية العلوم بتونس. أثار هذا المجال اهتمامي ، ووجدته مثيرًا أكثر بالنظر إلى حقيقة أنه لا يوجد متخصصون في تونس - "لا خبراء في علم البريولوجي". بدأت خطواتي الأولى بتشجيع ومساعدة مشرفتي والمشرف المشارك لي السيد سيرج مولر ، الأستاذ في جامعة مونبلييه ، الذي يعود له الفضل في تعليمي أبجديات هذا العلم. أود أن اشكرهم على تفانيهم معي وعلى الوقت والجهد الذي خصصاه لي وعلى نصائحهم البناءة. لقد درست تنوع وبيئة النباتات الكبدية في خمير، وهي منطقة شمالية في تونس. الآن أقوم بإجراء دراسات الدكتوراه الخاصة بي حول نباتات الكبدية ، والزهقرنية والحزازية في تونس ، والتنوع التصنيفي وقضايا الحفظ تحت إشراف عالم الأحياء الشهير السيد فنسنت هوغونوت. أشعر بأنني محظوظة جدًا لوجود مثل هذا المرشد ؛ ساعدني لطفه وخبرته وإشرافه المستمر ونقده البناء ومهاراته في علم البريولجية بشكل كبير في القيام بهذا التخصص

بصرف النظر عن رسالتي ، نحن نعمل أيضًا على كتاب عن نبات الكبدية ، والزهقرنية والحزازية في بلدي كخطوة أولى ، لا سيما لتسهيل عمليات الجرد البيولوجي ، ولكن أيضًا الأعمال اللاحقة على هذه النباتات في تونس ، مما يسمح لعلماء هذا التخصص في المستقبل بتولي زمام الأمور ، وبالتالي ، ضمان الاستمرارية. بالإضافة إلى ذلك ، وبالنظر إلى القضايا المحافظة الخطيرة التي تواجهها هذه النباتات في تونس ، فإننا نعمل على وضع قائمة حمراء بهدف المساهمة في الحفاظ على النباتات الطحلبية على أمل تنفيذ إجراءات حماية فعالة في القريب العاجل

النباتات الطحلبية كائنات رائعة حقًا أنا مغرمة بها ، على الرغم من صعوبة دراستها ومراقبتها تحت المجهر ، إلا انني أرى أنها مثيرة للاهتمام وملهمة للغاية بتنوع شكلها ، والتفاصيل التي تحتويها ، وسلوكها في بيئتها الطبيعية ، وتوزيعها ، وتفضيلاتها

List of selected publications:

Ben Osman, I., Hugonnot, V., Muller, S.D. & Daoud-Bouattour, A. 2019. A contribution to the study of hornworts and liverworts in Tunisia a checklist and ecology of Kroumirian species. *Cryptogamie Bryology*. 40 (21): 271-287. https://doi.org/10.5252/cryptogamie-bryologie2019v40a21

Hugonnot, V., **Ben Osman, I**., Daoud-Bouattour, A., Muller, S.D., Fedorova, A.V., Ignatova, E.A. & Ignatov, M.S. 2020. African and Asian range extension of *Heterocladium flaccidum* (Schimp.) A.J.E.Sm. and confirmation of its specific individuality. *Cryptogamie Bryology*.41 (21): 265-272. https://doi.org/10.5252/cryptogamie-bryologie2020v41a21.

Ben Osman, I., Hugonnot, V., Muller, S.D. & Daoud-Bouattour, A. 2021. *Sphagnum subnitens* Russow & Warnst. at the southern limit of its range in Tunisia, North Africa. *Cryptogamie Bryology*. 43(2): 190-192. https://doi.org/10.1080/03736687.2020.1852818

Ben Osman, I., Hugonnot, V., Muller, S.D. & Daoud-Bouattour, A. 2021. New bryophytes for Tunisia. Part 1: Pottiaceae. *Nova Hedwigia* 113. Issue 1-2, 45-59.

Ben Osman I., Hugonnot V., Muller S. D. & Daoud-Bouattour A. 2021. Four bryophytes collected in Tunisia, new for mainland Africa. *Cryptogamie, Bryologie*. 42 (16): 213-219. https://doi.org/10.5252/cryptogamie-bryologie2021v42a16.

Ben Osman, I., Hugonnot, V., Muller, S.D. & Daoud-Bouattour, A. (in press). New bryophytes for Tunisia. Part 2: Other families. *Cryptogamie Bryology*.

CARIBBEAN

Yoira Rivera Queralta
Cuba

My name is Yoira Rivera Queralta. I was born in Santiago de Cuba, Cuba. The mysteries of the living world caught my attention from my childhood. Graduating with a degree in Biology, I approached the world of bryophytes through my relationship with the Eastern Center for Ecosystems and Biodiversity (Bioeco), an institution that leads bryophyte studies on the island. I was trained by the prestigious Cuban bryologists such as Dr. Ángel Motito Marín (mosses) and the hepaticologist Kesia Mustelier Martínez.

I study the taxonomy of Cuban hornworts and liverworts, their ecology, distribution, and conservation. Likewise, I did my master's studies on the subject of Cuban hornworts, graduating with a Master's degree in Botanical Sciences (University of Havana). Furthermore, I am currently doing my doctoral studies in the group, using Modeling in different climate scenarios to estimate changes in patterns of richness and distribution. Also, I am working on the Checklist of Hornworts and Liverworts of Cuba and in the conservation of Cuban bryophytes (Red List of Cuban Plants). The collaboration and cooperation have been of great value to strengthen bryological studies in Cuba. The support of colleagues such as Dr. Robert Gradstein, Dr. Tamas Pócs, Dr. Christine Cargill, and Dr. Juan Carlos Villarreal, among others have been important to Cuban studies. Colleagues who are interested in collaborating with the bryology group of Cuba please contact me through my email yoira@bioeco.cu or yoira.rivera.1977@gmail.com.

Mi nombre es Yoira Rivera Queralta nacida en Santiago de Cuba, Cuba. Los misterios del mundo vivo me llamaron la atención desde mi niñez. Graduada en Licenciatura en Biología me acerqué al mundo de las briófitas a partir de mi vinculación con el Centro Oriental de Ecosistemas y Biodiversidad (Bioeco), institución que rige los estudios briológicos en la isla. Me formé de la mano de prestigiosos briológos cubanos como Dr. Ángel Motito Marín (musgos) y la hepaticóloga Kesia Mustelier Martínez.

He estado vinculada a los estudios de las antocerotas y las hepáticas talosas de Cuba su taxonomía, ecología, distribución y conservación. Realicé mis estudios de Maestría en la temática de las antocerotas cubanas graduándome como Máster en Ciencias Botánicas (Universidad de la Habana). Actualmente estoy realizando mis estudios Doctorales en el grupo, empleando la Modelación en diferentes escenarios climáticos para estimar los cambios de los patrones de riqueza y distribución

del grupo. Además, trabajo en la elaboración del Inventario de las Antocerotas y hepaticas de Cuba y en la conservación de las briófitas (Lista Roja de Plantas de Cuba). La colaboración y cooperación son fundamentales para lograr fortalecer los estudios briológicos en Cuba, por esto el apoyo de los colegas Dr. Robert Gradstein, Dr. Tamas Pócs, la Dra. Chritine Cargill y el Dr. Juan Carlos Villarreal, entre otros han sido de gran valor. Los colegas que estén interesados en colaborar con el grupo de Briología de Cuba por favor contactarme a través del correo: yoira@bioeco.cu , yoira.rivera.1977@gmail.com

Elisabeth Lavocat Bernard
Guadeloupe

My passion for bryology started on quite an unusual path. I was born in a small village in the east of France. As a child, I was already very close to nature; I enjoyed observing the little ferns and mosses on the old walls along the river. After my high school final exam, I worked in the medical field, as a technician in a cytogenetic laboratory. There I began to enjoy using a microscope to observe cells and chromosomes for hours.

I have lived in the French West Indies for about 40 years. I continued my career as a bio technologist in cytogenetics in Martinique and then in Guadeloupe: first in cytogenetics, then in molecular biology, for the screening of sickle cell disease and thalassemia. However, at the weekend, I often went with my husband to explore the rainforest trails and began to look at bryophytes with increasing interest at each outing, feeling attracted by their somewhat mysterious aspect.

I had little literature available concerning the bryoflora of these islands, except for the cryptogamic flora of Reverend Father Duss (1901) and a bryological flora of Guadeloupe elaborated by a student in 1970. Then, as I was able to have access to the flora of the mosses of Mexico and to get a small microscope, I started a herbarium of bryophytes. I was discouraged more than once, not being accustomed to using the bryophyte keys. Yet over the years, thanks to tenacity, and passion, I held on. And in 2009, I was contacted by the environmental department of Guadeloupe and the National Forestry Office of Guadeloupe and Martinique to assess the bryophyte flora of Guadeloupe and Martinique. It was a great opportunity to improve my knowledge of bryophytes. Numerous field trips, as well as data collected in the literature have led in 2011, with the collaboration of Mr. Alfons Schäfer Verwimp to the publication of a checklist of bryophytes of these islands.

Fortunately, I could retire early enough, which enabled me to indulge in my bryological research, as a member of the Guadeloupe Botanical Conservatory, by exploring many sites in Guadeloupe and Martinique during various studies. From then on, I continued to search in the existing literature, to obtain other flora and publications, and spend time using the microscope. I was discouraged more than once, not being used to using the keys.

Several authorities of Guadeloupe and Martinique (the Regional Directorate for the Environment, Planning and Housing, the National Forestry Office, the National Park of Guadeloupe) trusted me and solicited me in the context of various studies in Guadeloupe and Martinique:

- Study on the status of the bryophyte flora of the French West Indies Guadeloupe and Martinique
- Study of the bryophyte flora of the managed biological reserve of Nord Grande-Terre (National Forestry Office)
- Study of bryophytes as indicators of climate change, bryophytes collected along an altitudinal gradient on the Soufrière volcano, (MOVECLIM project) http://moveclim.blogspot.com/
- Study of the bryophyte flora as part of a floristic and faunistic impact study on a water intake development site.
- Inventories of bryophytes during ZNIEFF programs (Natural Areas of Ecological, Faunistic and Floristic Interest)
- Study of the bryophyte flora of the Montagne Pelée Wilderness Biological Reserve (Of National Forestry Office)

All these studies have strengthened my passion for these plants, their esthetic expression, under the microscope as well as in the field, always producing a constant source of astonishment and wonder! They allowed me to visit the New York Botanical Garden several times (2009, 2010 and 2013) to work on the bryophyte collections of the French West Indies of RP Duss. There, I met Bill Buck and Barbara Thiers who kindly helped me with the identification of some of my samples. When I went to the National Museum of Natural History, in Paris**,** I met Professor Jacques Bardat and Professor Robbert Gradstein who encouraged me to carry on with my research. Since then, we have established a friendly relationship and I appreciate his being available whenever I need help with determinations.

Bryology also allowed me to meet my friend Catherine Reeb (MNHN). We are working a lot together on the Marchantiophytes of the French West Indies and we "tracked down" the *Riccardia* and *Riccia* of Guadeloupe during her stays on the island. Thanks to her I could join the Madbryo working group and participate, in a workshop in Madagascar, in 2018. It was a great opportunity to meet eminent bryologists, to explore some beautiful Malagasy forests and I was proud to bring my contribution in bryology for the training of young Malagasy students.

Living in Guadeloupe is an advantage because the island is relatively small (1700 km^2) and includes a large floristic diversity due to the bioclimatic gradients that extend from sea level to the top “La Soufrière” volcano (1467 m). This aspect is extremely interesting from an ecological point of view! How fortunate, indeed, to be able to observe bryophytes in very dry environments one day and in the cloud forest the day after, only a few miles from my home!

Le parcours qui m'a amenée à la bryologie est assez atypique. Je suis née dans un petit village dans l'est de la France. Déjà très proche de la nature, je me plaisais à observer les petites fougères et mousses sur les vieux murs qui longeaient la rivière. Après le baccalauréat j'ai travaillé dans le domaine médical, en tant que technicienne dans un laboratoire de cytogénétique. C'est là que j'ai commencé à apprécier l'utilisation du microscope à observer pendant des heures les cellules et les chromosomes.

Depuis une quarantaine d'années je vis aux Antilles françaises où j'ai poursuivi ma carrière de bio technologiste en cytogénétique, à la Martinique et ensuite à la Guadeloupe tout d'abord en cytogénétique, puis en biologie moléculaire, pour le dépistage de la drépanocytose et des thalassémies. Cependant, durant le weekend, j'allais souvent en compagnie de mon mari explorer les sentiers de la forêt tropicale et j'ai commencé à regarder les bryophytes avec un intérêt grandissant à chaque sortie, me sentant attirée par leur aspect quelque peu mystérieux et délicat. Je disposais de peu de littérature concernant la bryoflore de ces iles, mise à part la flore cryptogamique du révérend père Duss (1901) et une florule bryologique de la Guadeloupe élaborée par un étudiant (1970). Alors, je me suis procuré la flore des mousses de Mexico (ref) ainsi qu'un petit microscope. Et j'ai commencé un herbier de bryophytes.

J'ai pu heureusement prendre ma retraite assez tôt, ce qui m'a donné du temps pour poursuivre mes recherches bryologiques en tant que membre du Conservatoire Botanique de Guadeloupe en explorant de nombreux sites en Guadeloupe et en Martinique. A partir de là, j'ai continué à éplucher la littérature, me procurer d'autres flores et publications, passé du temps au microscope. Je me suis découragée plus d'une fois, n'ayant pas l'habitude d'utiliser les clés de détermination connaissance de ces plantes fascinantes!

Plusieurs instances de Guadeloupe et Martinique: la *Direction de l'Environnement, de l'Aménagement et du Logement*, l'Office National des Forêts, le Parc National de Guadeloupe, m'ont accordé leur confiance, et m'ont sollicité dans le cadre de différentes études:
A la Guadeloupe:

- Étude sur l'état de la flore des bryophytes des Antilles françaises.
- Étude de la bryoflore de la Réserve Biologique dirigée du Nord Grande-Terre (Office national des Forêts)
- Étude des bryophytes comme indicateurs du changement climatique, bryophytes récoltées le long d'un gradient altitudinal sur le volcan de la Soufrière, (projet MOVECLIM)
- Étude de la bryoflore dans le cadre d'une étude d'impact floristique et faunistique sur un site d'aménagement d'une prise d'eau.

- Inventaires des bryophytes lors de programmes ZNIEFF (Zones Naturelles d'Interêt Ecologique Faunistique et Floristique)

A la Martinique:

- Étude de la bryoflore de la Réserve Biologique Intégrale de la Montagne Pelée (Office national des Forêts)

Toutes ces études ont encore renforcé ma passion pour ces plantes, leur expression esthétique suscitant toujours l'étonnement et la joie en les observant dans leur milieu ou au microscope. Elles m'ont permis de faire quelques stages au New York Botanical Garden (2009, 2010 et 2013) pour travailler sur les collections de bryophytes des Antilles françaises du RP Duss. J'y ai rencontré Bill Buck et Barbara Thiers qui m'ont gentiment aidé pour l'identification de certains de mes échantillons. Au cours de quelques visites au MNHN, j'ai pu rencontrer le Professeur Jacques Bardat et le Professeut Robbert Gradstein qui m'a beaucoup encouragé à persévérer dans mes recherches. Nous avons établi une relation amicale et j'apprécie sa disponibilité lorsque j'ai besoin d'aide pour des déterminations.

La bryologie m'a permis aussi de rencontrer mon amie Catherine Reeb (MNHN). Nous travaillons beaucoup ensemble sur les Marchantiophytes des Antilles françaises et nous avons « traqué » sans relâche les Riccardia et les Riccia de Guadeloupe au cours de ses séjours dans l'ile. Elle m'a donné la belle opportunité d'intégrer le groupe de travail Madbryo et de participer en 2018, à un workshop à Madagascar; Ce fut une grande chance de pouvoir rencontrer d'éminents bryologistes, d'explorer quelques belles forêts malgaches et j'étais alors fière de pouvoir apporter ma contribution en bryologie pour la formation de jeunes étudiants malgaches.

Le fait de vivre en Guadeloupe représente un avantage car l'ile est relativement petite (1700 km^2) et comprend une grande diversité floristique due aux gradients bioclimatiques qui se succèdent depuis le niveau de la mer jusqu'au somment du volcan La Soufrière (1467 m). Cet aspect est extrêmement intéressant du point de vue écologique! Quelle chance d'avoir la possibilité d'observer un jour les bryophytes dans des milieux très secs et le lendemain dans la forêt de nuage, à quelques km de chez moi!!!

List of selected publications:

Lavocat Bernard, E., 2009 — Quelques aspects de la biodiversité chez les bryophytes à la Guadeloupe. Le Courrier de la nature 245: 22-29. SNPN (Société nationale de protection de la nature)

Lavocat Bernard, E., 2010 — État de la flore bryophytique des Antilles françaises. Office National des forêts Guadeloupe, Direction régionale de l'environnement Guadeloupe et Martinique. Rapport AEVA 33 (Association pour l'étude et la protection des végétaux et vertébrés des Petites Antilles). 28 p.

Lavocat Bernard, E. & Schäfer-Verwimp, A., 2011 — Checklist of the bryophytes of the Guadeloupe archipelago and Martinique (French West Indies). Cryptogamie, Bryologie 32 (3): 233–272. http://dx.doi.org/10.7872/cryb.v32.iss3.2011.233

Lavocat Bernard E., 2015 — Study of the bryophytes collected along two altitudinal gradients (350 and 450 m) during the MOVECLIM fieldtrip on La Soufrière (Guadeloupe) in June 2012, 39 pp. (Preliminary bryological results from la Soufrière Transect)

Lavocat Bernard E. & Reeb C., 2016. — Additions to the bryophyte flora of Guadeloupe archipelago (Lesser Antilles). *Bryophyte Diversity and Evolution* 38: 47-52. https://doi.org/10.11646/ bde.38.2.3

Lavocat Bernard, E. 2018. Contribution to the knowledge of the bryophyte flora of Martinique, Lesser Antilles. *Cryptogamie, Bryologie* 39 (3): 343–360. doi/10.7872/cryb/v39.iss3.2018.343

Reeb C., Letsara R., Lala Andriamiarisoa R., JoBrinda J.C., Abalo-Loko G.-A., Boucheron Dubuisson E., Fischer E., Hodgetts N.G., **Lavocat Bernard E**, Naniarimino F., Phillipson P.B., Sass-Gyarmati A. & Vanderpoorten A., 2019 — A pilot workshop on Bryophytes at the National Herbarium (TAN) reveals the presence of seven additional species for Madagascar, Candollea 74(2) : 145 – 150 http://dx.doi.org/10.15553/c2019v742a4

Gradstein S. R. & **Lavocat Bernard E**., 2020. — An evaluation of the endemic bryophyte flora of Guadeloupe. *Cryptogamie, Bryologie* 41 (15): 205-214 https://doi.org/10.5252/cryptogamie-bryologie2020v41a15

Veron S., Rodrigues-Vaz C., Lebreton E., Ah-Peng C., Boullet V., Chevillotte Hervé, Gradstein S. R., Jeremie J., **Lavocat Bernard E**., Lebouvier M., Meyer J. Y., Munzinger Jérôme, Poncy O., Thouvenot L., Viscardi G., Leotard G., Gargominy O., Leblond S., Pignal M., Rouhan G., Tercerie S., Invernon V., Muller S., 2021 — An assessment of the endemic spermatophytes, pteridophytes and bryophytes of the French Overseas Territories: towards a better conservation outlook. *Biodiversity and Conservation*, 30: 2097–2124 https://doi.org/10.1007/s10531-021-02186-8

Reeb C., **Lavocat Bernard, E**. & Gradstein S.R., 2022 — An integrative taxonomic revision of Aneuraceae H.Klinggr. (Marchantiophyta) from Guadeloupe and Martinique, French West Indies. *Cryptogamie, Bryologie* 43 (8): 135-152. https://doi.org/10.5252/cryptogamie-bryologie2022v43a8. http://cryptogamie.com/bryologie/43/8

Poster presentation:

Lavocat Bernard E. & Magnin H., 2013 — Moveclim Guadeloupe: Preliminary bryological data from La Soufrière transect, Moveclim Mid Course meeting, 2 to 6 September 2013

Amelia Merced
Puerto Rico

I am from the Caribbean Island of Puerto Rico, where I grew up and currently live. I have been working with bryophytes for about 20 years. I find bryophytes beautiful and fascinating, and I feel very fortunate for the mentors, friends, and colleagues that I have found in this dynamic and supportive community of bryophyte-loving people. I began my journey as a bryologist under the mentorship of Inés Sastre De Jesús at the University of Puerto Rico (UPR), Mayaguez. She has been a pillar in the study of bryophytes and training students from PR and Latin America. I got into bryophytes because I'm intrigued by the evolution of plants. At that time, bryophytes were considered as lineages of 'early land plants' that could hold keys to the origin of important characters. But it was when I observed mosses under the microscope, that I was captivated by these little plants. Quickly I realized that bryophytes are very interesting by themselves, and I wanted to learn more about the diversity of morphological and anatomical characters.

After completing my masters, I worked at the Herbarium of the UPR Río Piedras where I had the opportunity to collect and identify bryophytes from diverse localities in the island. A series of fortunate events, lead me to spend a year in the laboratory of Jonathan Shaw at Duke University NC, before applying to PhD programs. My work involved micro-photographing herbarium specimens of the mosses of North Carolina, and this became an incredible opportunity for me to meet bryologists from around the world. 10 years later, colleagues from the Shaw lab invited me back as a visiting lab member to their virtual meetings during the Covid-19 pandemic.

For my PhD, I moved to Southern Illinois University (SIU) Carbondale IL, to work under the mentorship of Karen Renzaglia. I learned many important things from Karen and her continuous encouragement and support were essential to my success, particularly as I was raising two kids while getting a PhD. At SIU, I interacted and took classes with bryophyte experts in fields of systematics, ecology and more. My PhD project was on moss stomata, following the work by Jean Paton and Jean Pearce, I wanted to understand the role and occurrence of stomata in bryophytes. I focused on anatomy and ultrastructure and this research provided data to generate a new interpretation of the function and evolution of stomata.

There is something special about studying bryophytes; maybe it is the hours spent trying to identify them or the surprising ways in which they cope with their surroundings. I find these plants inspiring and I apply their teaching to my life: "when the environment is not auspicious, wait", "you don't have to be a tree to be relevant". I'm back home in PR, working with the Forest Service to increase

awareness of bryophytes and their importance in conservation and forest health. I have made field guides for some of the bryophytes of Puerto Rico, conduct workshops about bryophytes and participate in field expeditions to document bryophytes. Maybe someday bryophytes will be considered in forest management plans and in the protection of land. I am also back at the Herbarium of the UPR Río Piedras working with the bryophyte collection and teaching part time… and spreading the love for bryophytes.

Soy de la isla del caribe Puerto Rico, donde me críe y actualmente vivo. He trabajado con briofitas por los pasados 20 años. Encuentro que las briofitas son hermosas y fascinantes, y me siento muy afortunada por los mentores, amigos y colegas que he encontrado en esta dinámica y positiva comunidad de amantes de las briofitas. Comencé mi camino como brióloga bajo la mentoría de la Dra. Inés Satre de Jesús en la Universidad de Puerto Rico (UPR) Mayagüez. Ella ha sido un pilar en el estudio de las briofitas y entrenando estudiantes de PR y Latinoamérica. Originalmente me interese en las briofitas porque quería estudiar la evolución de las plantas. Para ese tiempo, las briofitas eran consideradas un linaje de 'plantas basales' que poseían características compartidas con las primeras plantas terrestres. No fue hasta que observé las briofitas que quedé cautivada por estas pequeñas plantas. En ese momento me di cuenta que las briofitas son interesantes en si mismas y quise aprender más sobre su diversidad morfológica y anatómica.

Luego de completar la maestría, trabajé para el Herbario de la UPR Río Piedras donde tuve la oportunidad de colectar e identifica briofitas de diversas localidades en la isla. Una serie de eventos afortunados, me llevo a pasar un año en el laboratorio de Jonathan Shaw en la Universidad de Duke NC, antes de comenzar el PhD. Trabajé micro-fotografiando especímenes de herbario de musgos, esta fue una oportunidad increíble para conocer briólogos de diferentes partes del mundo. 10 años más tarde, mis colegas del Shaw Lab me invitaron a ser parte de sus reuniones de laboratorio virtuales durante la pandemia de Covid-19.

Para el PhD me moví a Southern Illinois University (SIU) Carbondale IL para estudiar bajo la tutela de Karen Renzaglia. Aprendí mucho de Karen, su apoyo y guía constante fueron esencial para mi éxito, particularmente porque estaba criando mis dos hijos mientras obtenía el PhD. En SIU, interactúe y tomé clases con expertos de briofitas en campos de sistemática, ecología y otros. mi proyecto de PhD fue con los estomas en musgos, siguiendo el trabajo de Jean Paton y Jean Pearce, yo quería entender el rol y la ocurrencia de los estomas en briofitas. Me enfoque en anatomía y ultrastructura, esta investigación proveyó datos para generar una nueva interpretación de la función y evolución de los estomas.

Hay algo especial sobre estudiar las briofitas, quizás son las horas que se pasan identificando o las formas sorpresivas en que se ajustan a sus alrededores. Encuentro estas plantas inspiradoras y aplico sus enseñanzas a mi vida: "cuando el ambiente no es propicio, espera", "no tienes que ser un árbol para ser relevante". Estoy de regreso en PR, trabajando para el Servicio Forestal en aumentar el conocimiento de las briofitas y su importancia en la conservación y en la salud forestal. He preparado guías para algunas de las briofitas de Puerto Rico, dado talleres sobre identificación, y participado en expediciones de campo para documentar las briofitas. Quizás algún día las briofitas sean consideradas en planes de manejos o en la protección de áreas naturales. También estoy de regreso en el Herbario de la UPR Río Piedras trabajando con la colección de briofitas y dando clases a tiempo parcial… y compartiendo el amor por las briofitas.

List of selected publications:

Mercado-Díaz J and **Merced A**. 2021. Effects of hurricanes on the bryological and lichenological flora of Puerto Rican forests. *Acta Científica* 32: 55-72.

McAdam SAM, Duckett JG, Sussmilch FC, Pressel S, Renzaglia KS, Hedrich R, Brodribb J and **Merced A**. 2021. Stomata: the holey grail of plant evolution. *American Journal of Botany* 108(3): 1-6.

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Merced A. and Renzaglia KS. 2019. Contrasting pectin polymers in guard cell walls of *Arabidopsis* and the hornwort *Phaeoceros* reflect physiological differences. *Annals of Botany* 123: 579-585.

Merced A. and Renzaglia KS. 2017. Structure, function and evolution of stomata from a bryological perspective. *Bryophyte Diversity and Evolution* 39 (1): 7-20.

Renzaglia KS, Villareal JC, Piatkowski BT, Lucas JR and **Merced A**. 2017. Hornwort stomata: Architecture and fate shared with 400-million-year-old fossil plants without leaves. *Plant Physiology* 174: 1-10.

Merced A. and Renzaglia KS. 2016. Patterning of stomata in the moss *Funaria*: a simple way to space guard cells. *Annals of Botany* 117 (6): 985-994.

Merced A. and Renzaglia K. 2014. Developmental changes in guard cell wall structure and pectin composition in the moss *Funaria:* implications for function and evolution of stomata. *Annals of Botany* 114 (5): 1001-1010.

Merced A. and Renzaglia KS. 2013. Moss stomata in highly elaborated *Oedipodium* (Oedipodiaceae) and highly reduced *Ephemerum* (Pottiaceae) sporophytes are remarkably similar. *American Journal of Botany* 100 (12): 2318-2327.

Merced-Alejandro, A and Sastre-DJ I. 2009. A sequence for the development of paraphyses in *Neckeropsis* (Neckeraceae). *The Bryologist* 112 (2): 342- 353.

CENTRAL AMERICA

María Victoria Ríos Gálvez
Guatemala

Born in Guatemala City and graduated from the University of San Carlos de Guatemala with a bachelor's in biology. I began my studies on bryophytes in 2005 in a research project in which I participated with Dr. Virginia Freire. On that occasion I supported the study of Hepatic flora for the Guatemalan cloud forest, conducted in a nature reserve called Biotopo del Quetzal in the northeast of the country. From that moment I knew that bryophytes would be my passion! I had the opportunity to apply for an internship at the Smithsonian Tropical Research Institute in Panama City where I was able to train on the taxonomic identification of specimens from nature reserves in the department of Petén, thanks to the support of Dr. Noris Salazar who motivated me to continue with the study of the Bryoflora of Guatemala.

After my internship in 2009 I was able to publish an illustrated guide which was given to the staff of the natural reserves administered by the University of San Carlos de Guatemala; which included the most common bryophytes of the University Biotopes of Petén, more specifically in the region of El Zotz, Dos Lagunas, Laguna Del Tigre and Cerro Cahuí. During this year I also participated in a research project called Growth and Distribution of Minor Plant Organisms in Prehispanic Architecture and its relationship with the degradation of the Cultural Heritage in Guatemala, worked on the Technical Proposal for its control for the location of Nakum Archaeological Site, Petén. At this location the damage caused by the growth of algae, bryophytes and lichens in pre-Hispanic architecture was evaluated.

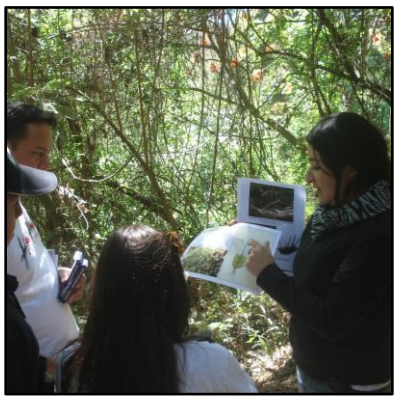
I also worked on my undergraduate thesis with an amazing topic which is the Diversity of Mosses, for the location of Cerro Cahuí and San Miguel La Palotada El Zotz Biotopes, Petén. In 2016 I was invited by Dr. Matt Von Konrat to participate as a research associate on the Bryophyta Flora of Guatemala, as part of the Consortium of North American Bryophyte Herbaria portal of the Field Museum of Natural History.

I enjoyed sharing my knowledge with children and adults about these beautiful organisms and of them being so ancient. It still surprises us with their special qualities of survival, motivating them to study bryophytes and for more people to get involved in the research of bryophytes in Guatemala.

Nací en la ciudad de Guatemala, soy egresada de la Universidad de San Carlos de Guatemala, de la Escuela de Biología. Inicie mis estudios sobre briofitas en el año de 2005 en un proyecto de

investigación en el cual participe con la Dra. Virginia Freire, en esa ocasión apoye al estudio; Hepatic flora of a Guatemalan cloud forest, realizado en una reserva natural llamada Biotopo del Quetzal al nororiente del país.

Desde ese momento supe que las briofitas serian mi pasión y se me presento la oportunidad de aplicar a una pasantía en el Instituto Smithsonian de Investigaciones Tropicales en la Cuidad de Panamá donde pude capacitarme con identificación taxonómica de especímenes de reservas naturales del departamento de Petén, gracias al apoyo de la Dra. Noris Salazar quien me motivo a continuar con el estudio de la brioflora de Guatemala.



Gracias a la pasantía realizada en 2009 pude publicar una guía ilustrada la cual fue entregada al personal de las reservas naturales administradas por la Universidad de San Carlos de Guatemala; Briófitos más comunes de los Biotopos Universitarios de Petén. El Zotz, Dos Lagunas, Laguna Del Tigre y Cerro Cahuí. Durante este año también participe en un proyecto de investigación llamado Crecimiento y Distribución de Organismos Vegetales Menores en la Arquitectura Prehispánica y su relación con el deterioro del Patrimonio Cultural edificado, Propuesta Técnica para su control, Sitio Arqueológico Nakum, Petén. Acá se evaluó el daño que puede ocasionar el crecimiento de algas, briofitas y líquenes en la arquitectura prehispánica.

De igual forma realice mi tesis de pregrado Diversidad de Musgos de los Biotopos Cerro Cahuí y San Miguel La Palotada El Zotz, Petén. Durante el 2016 fui invitada por el Ph.D. Matt von Konrat a participar como investigadora asociada al portal Bryophyta Flora of Guatemala, Consortium of North American Bryophyte Herbaria del Field Museum of Natural History.

Disfrutó compartiendo mis conocimientos a niños y adultos sobre estos bellos organismos que siendo tan antiguos nos sorprende con sus cualidades especiales de sobrevivencia, motivándolos al estudio de las briofitas y que cada vez seamos más las personas que nos involucremos en la investigación de brioflora en Guatemala.

Noris Salazar Allen
Panama

I was born in a small town (San Francisco) on the outskirts of Panama City. As such there were trees around the house, a large backyard where my grandmother had rabbits, chickens, and turkeys. It was like living in the countryside within the city. My parents liked to travel to the countryside. There, my sister and I, city girls, learned of farming, milking cows, and picking vegetables. We were fortunate to have old people who loved and knew how to share nature with little kids. When deciding what area to choose for studies at the university, Botany was my first choice.

After two years at the University of Panama (UP) I obtained Benito Juárez and LASPAU scholarships to finish my B.A. in Biology at Trinity College in Washington DC. There I got interested in animal behavior. How far I was from knowing bryophytes! After graduation, I worked for 2 years in the Department of Botany (UP). After those years I entered graduate studies at SUNY, Geneseo. I was planning to concentrate or specialize in algae or fungi that were needed at UP. But the professors that taught them were on sabbatical and I had only two years of the LAPAU scholarship to finish my Masters. The professor who specialized in bryophytes was available to serve as my research advisor. That is how I started in Bryology! When I returned to Panama, I was appointed assistant professor in the Department of Botany and started the Bryology and Lichenology Section of the PMA Herbarium and continued collecting bryophytes and lichens. At PMA herbarium, there was a small collection of bryophytes left by Marshall Crosby of the Missouri Botanical Garden (MBG). I went to MBG to study bryophytes with Marshall Crosby who was a classmate of the director of the PMA Herbarium. I brought with me my collections of bryophytes and lichens of Panama. I also visited Margaret Fulford (Cincinnati) who kindly offered to identify my liverwort collections and provided me with a great number of her reprints. After Cincinnati, I went to the Smithsonian Institute to be trained by Dr. Mason Hale on the identification and curation of the lichens, I had brought from Panama.

In 1981, I started my Ph.D. in bryology at the University of Alberta under Dale Vitt. Diana Horton was also very supportive of my work in Alberta. For my Ph.D. I worked on the revision of the pantropical moss *Leucophanes*. With Dale's financial support I collected *Leucophanes* in Vanuatu and worked on the monograph of that genus. Upon returning to Panama, I was appointed Professor at the UP. Years later, I was granted a one-year Postdoctoral Fellowship at the Smithsonian Tropical Research Institute (STRI-Panama) and, afterwards a Fulbright Research Fellowship (Stotler's lab. and Janice Glime's) on bryophytes. After my postdoc at STRI I was offered a part-time research position which I still hold. I also sought training on the identification of tropical

liverworts with the help of Rob Gradstein who did work with us in Panama. Later, during a visit to NMNH in Paris, Hélène Bischler asked me to do the revision of *Cyathodium* for the Americas. I had never seen the plants in Panama nor worked on a monograph of a foliose or thalloid liverwort. But it has been one of the most rewarding experiences. The discovery of the new species *C. bischlerianum*, named after Hélène, was a reminder of how much is still to know about tropical bryophytes. That there are more questions than answers to their biology, developmental morphology, and genetics and how interesting and challenging is working with them. Currently, I am working on the revision of the Neotropical moss *Octoblepharum* and doing research on the Neotropical thalloid liverwort *Dumortiera* and the bryoflora of Panama. Besides Panama, I have done field work in Canada (Alberta), NY-USA Genesee Valley, Perú (Pakitza), Colombia (Páramos), Central America (Guatemala, El Salvador, Costa Rica), Mexico, Puerto Rico, Indonesia and Vanuatu.

Nací en un pequeño barrio (San Francisco) en las afueras de la ciudad de Panamá. Había árboles alrededor de la casa y un patio grande donde mi abuela tenía conejos, gallinas y pavos. Era como estar en el campo viviendo en la ciudad. A mis padres les gustaba viajar por el interior del país. Allí, mi hermana y yo, niñas de ciudad, aprendimos agricultura, a ordeñar vacas y a recoger vegetales. Fuimos muy afortunadas de estar rodeadas por personas mayores que amaban la naturaleza y sabían compartir ese amor con los niños pequeños. Cuando tuve que decidir el área de estudio en la universidad, la Botánica fue mi primera elección.

Después de dos años en la Universidad de Panamá (UP), obtuve las becas Benito Juárez y LASPAU para finalizar mis estudios en Trinity College en Washington D.C. (USA). Allí me interesé por el comportamiento animal. ¡Cuán lejos estaba de conocer a las briofitas! Después de graduarme, trabajé dos años en el Departamento de Botánica (UP). Luego de esos años inicié estudios de postgrado en SUNY (Geneseo). En ese momento estaba planeando hacer una especialidad en algas u hongos que se necesitaban en la UP. Sin embargo, los profesores que enseñaban esas materias estaban en sabático y solo tenía dos años de la beca LASPAU para terminar mi maestría. El profesor que se especializaba en briofitas estaba disponible para ser mi asesor en la investigación de la maestría. ¡Así fue como me inicié en Briología! Cuando regresé a Panamá, fui nombrada Profesora Asistente en el Departamento de Botánica e inicié la Sección de Briología y Liquenología del herbario PMA y, continué colectando briofitas y líquenes. En el herbario PMA, había una pequeña colección de briofitas dejadas por Marshall Crosby del Jardín Botánico de Missouri (MBG). Fui al MBG a estudiar briofitas con Crosby, quien fuera compañero de clase de la directora del herbario PMA. Llevé mis colecciones de briofitas y líquenes de Panamá. También, visité a Margaret Fulford (Cincinnati) quien amablemente ofreció identificar mis colecciones de hepáticas y me donó un gran número de separatas

de sus publicaciones. Después de Cincinnati, visité a Mason Hale en el Instituto Smithsonian (USA) para un entrenamiento en la identificación y curación de los líquenes que había traído de Panamá.

En 1981, inicié mi Ph.D. en briología en la Universidad de Alberta con Dale Vitt. Diana Horton también apoyó mucho mi trabajo en Alberta. Para mi doctorado trabajé en la revisión del musgo pantropical *Leucophanes*. Con el apoyo financiero de Dale colecté *Leucophanes* en Vanuatu y trabajé en la monografía de este género. A mi regreso a Panamá, fui nombrada profesora en la UP. Varios años después, obtuve una beca postdoctoral del Instituto Smithsonian de Investigaciones Tropicales (STRI-Panamá) y después una beca postdoctoral Fulbright de investigación (en los laboratorios de los Stotlers y Janice Glime). Después de mi postdoctorado en STRI me ofrecieron una posición de investigación a tiempo parcial, la cual ejerzo todavía. También, busqué entrenarme en la identificación de hepáticas tropicales con la ayuda de Rob Gradstein quien realizó trabajos con nosotros en Panamá. Más tarde, durante una visita al NMNH en París, Hélène Bischler me propuso que hiciera la revisión de *Cyathodium* para la América. Nunca había visto esas plantas en Panamá, tampoco había trabajado en una monografía de una hepática talosa o foliosa. Pero ésta ha sido una de las experiencias más gratificantes de mi carrera. El descubrimiento de una nueva especies *C. bischlerianum*, nombrada en honor a Hélène, fue un recordatorio de lo mucho que todavía hay por conocer sobre las briofitas tropicales. Hay más preguntas que respuestas sobre su biología, morfología del desarrollo y genética y cuán interesante y desafiante es trabajar con ellas. Actualmente, estoy trabajando en la revisión de las especies neotropicales del musgo *Octoblepharum*, realizando investigaciones en las especies neotropicales de la hepática talosa *Dumortiera* y en la brioflora de Panamá. Además de Panamá, he realizado trabajo de campo en Canadá (Alberta), NY-USA el valle de Geneseo, Perú (Pakitza), Colombia (páramos), América Central (Guatemala, El Salvador, Costa Rica), México, Puerto Rico, Indonesia y Vanuatu.

List of selected publications:

https://stri.si.edu/scientist/noris-salazar/bibliography

EUROPE

Martina Pöltl
Austria

I was born in Graz, Austria, where I also graduated with a diploma in plant sciences at the Karl-Franzens-University. For three years I've been curating the bryophyte collection of the Universalmuseum Joanneum in Graz (GJO). In addition to my primary job, I'm also working on my doctoral thesis focusing on the morphology and genetics of European *Riccia* species.

I have been working with bryophytes for about six years now. At the beginning bryophytes aroused my interest only in the winter months, because there were hardly any interesting vascular plants to study or observe at my doorstep. But the more intensively I studied bryophytes, the more fascinated I became by this group of little organisms, and I turned my focus completely on them. Today, I not only conduct research in the field of bryology, but I also try to promote bryophytes in different ways in research and in society. I do this through different events like workshops, excursions and lectures where I try to arouse interest in bryophytes and I'm sure one day they will get the interest they have deserved for a long time.

Ich bin in Graz, Österreich, geboren, wo ich auch meinen Master in der Studienrichtung „Pflanzenwissenschaften" an der Karl-Franzens-Universität absolviert habe. Seit drei Jahren bin ich nun wissenschaftliche Mitarbeiterin und Kuratorin der Moos-Sammlung am Studienzentrum Naturkunde des Universalmuseums Joanneum (GJO). Nebenbei arbeite ich an meiner Doktorarbeit, in welcher Europäische *Riccia*-Arten auf morphologischem und genetischem Level beforscht werden.

Mit Moosen generell beschäftige ich mich seit etwa sechs Jahren. Zu Beginn habe ich mich nur in den kalten Wintermonaten mit Moosen beschäftigt, da es schlichtweg keine Gefäßpflanzen vor meiner Haustüre gab, die auch im Winter interessant zu beobachten oder zu analysieren waren. Die Arbeit mit Moosen schien ein guter Ersatz zu sein. Je länger ich mich aber mit den Moosen beschäftigte, desto mehr fand ich Gefallen an diesen kleinen Pflanzen und schon bald sind sie zum absoluten Mittelpunkt meines Interesses und meiner Forschung geworden. Heute ist es mir besonders wichtig, nicht nur im wissenschaftlichen Bereich mit Moosen zu arbeiten, sondern auch ganz allgemein zur Bryologie zu vermitteln. Dazu halte ich verschiedene

Veranstaltungen, drinnen sowie draußen, rund um das Thema „Moos“ ab und hoffe sehr, dass sie eines Tages die Aufmerksamkeit bekommen, die sie schon längst verdient hätten.

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Kathrin Rousk
Denmark

I hold a MSc degree in Animal Ecology from Marburg University, Germany from 2009. You may wonder why I am now writing for this project organised by the IBA. Well, my passion for the inconspicuous yet beautiful and important plants developed shortly after this…in Wales! I moved here, to Bangor, to start my PhD entitled "Nitrogen dynamics in boreal forests". Still no bryophytes? Well, I chose to focus on a process in the nitrogen cycle that takes place in mosses: nitrogen fixation performed by cyanobacteria that colonise mosses.

During my PhD, I went to boreal forests in Northern Sweden to collect mosses – specifically the very common moss *Pleurozium schreberi* which forms thick and expansive moss carpets in these northern, cold forests, wow! This was overwhelming for me, coming from central Germany where deciduous forests have little moss cover. Working with *P. schreberi*, I identified the effects of increased nitrogen availability and drying events as well as heavy metal pollution on moss-associated nitrogen fixation. Following my PhD (from 2013), I started as a postdoctoral fellow at the University of Copenhagen, working further on moss-associated nitrogen fixation in arctic ecosystems and trying to identify how climate change will impact this process in the Arctic. Nitrogen fixation performed by cyanobacteria on mosses can contribute half to total ecosystem nitrogen input, hence, any impacts on this process will affect the entire ecosystem.

Since 2019, I am a tenure-track assistant professor in terrestrial ecology at the University of Copenhagen. Here, I am leading the Ecosystem Ecology group, focussing on moss-cyanobacteria associations and nitrogen fixation. The group is a mix of BSc, MSc, PhD students and postdocs with different backgrounds but all fascinated by mosses and associated bacteria. With starting grants from the Danish Research Council and the European Research Council, we aim to identify the effects of climate change on nitrogen fixation in mosses across ecosystems (arctic, boreal, temperate, tropical) as well as to determine the nature of the relationship between mosses and associated cyanobacteria. For this, we employ laboratory-based assessments as well as field work across the globe. We work with many different moss species now, and it seems like all mosses are colonized by these versatile cyanobacteria, but to varying extents – certain moss traits determine who is there and how many! We also aim to promote research within bryology, trying to highlight the importance, beauty and wonder of bryophytes.

Ich bin in einem kleinen Ort nördlich von Marburg geboren und aufgewachsen – von Wäldern und Bergen umgeben. An der Universität in Marburg habe ich dann auch studiert und meine Diplomarbeit (Master of Science) in Tierökologie in 2009 geschrieben.

Aber wie bin ich von Tierökologie auf Moose gekommen? Meine Faszination mit den unscheinbaren, leicht zu überschauenden, aber wunderschönen Pflanzen hat sich kurz nach meinem Diplomabschluss entwickelt…und das ist in Wales passiert! Ich bin nach Bangor in Wales gezogen um hier meine Doktorarbeit zu schreiben. Das Thema war "Stickstoff Umwandlungen in borealen Wäldern". Immer noch keine Bryophyten? Ich konnte mir aussuchen woran ich arbeite, und habe mich für einen Prozess im Stickstoffkreislauf entschieden der in Moosen passiert: Stickstofffixierung bei Cyanobakterien die Moose besiedeln.

In meiner Doktorarbeit bin ich zu borealen Wäldern in Nord Schweden gereist um Moose zu sammeln- insbesondere das sehr häufige Moos *Pleurozium schreberi* dass hier in diesen kühlen, nördlichen Wäldern dichte, dicke und weitläufige Matten formt, wow! Das war sehr überraschend für mich, da wo ich her komme, aus der Mitte von Deutschland, Laubwälder vorherrschen in denen nicht viele Moose auf dem Boden wachsen.

Durch meine Forschung an *P. schreberi* habe ich herausgefunden wie sich z.B. Verschmutzung durch Schwermetalle, zu viel Stickstoff und zu wenig Feuchtigkeit auf die Stickstofffixierung bei Cyanobakterien auf Moosen auswirken. Nach meiner Doktorarbeit (von 2013) habe ich an der Universität in Kopenhagen als Postdoc angefangen, wo ich weiterhin mit Stickstofffixierung in Moosen, aber nun in der Arktis, arbeiten konnte. Hier habe ich mich auf die Auswirkungen des Klimawandels konzentriert. Stickstoffifxierung bei Cyanobakterien die Moose besiedeln kann mehr als die Hälfte zum Stickstoffgehalt in Ökosystemen beitragen und wenn sich dieser Prozess verändert, durch z.B. Klimawandel, wird das ganze Ökosystem betroffen sein.

Seit 2019 habe ich eine Stelle als „Tenure-Track Assistant Professor" in Terrestrischer Ökologie an der Universität in Kopenhagen. Hier leite ich die „Ökologie von Ökosystem" Arbeitsgruppe wo wir uns auf das Zusammenspiel von Moosen und Cyanobakterien und Stickstofffixierung konzentrieren. Meine Gruppe besteht aus einem Mix aus Bachelor und Master Studenten, Doktoranden und Postdocs mit verschiedenen Hintergründen und Interessen, wir sind aber alle fasziniert bei Moosen und ihren Bakterien.

Mit Forschungsgeldern für junge Gruppenleiter von Dänischen und Europäischen Forschungsgesellschaften können wir nun viel mehr forschen, z.B. wie der Klimawandel die Stickstofffixierung in Moosen in verschiedenen Ökosystems (Arktis, Boreale-, gemäßigte-,

tropische Wälder) beeinflusst, ob Moose und Cyanobakterien einen Vorteil von ihrem Zusammenleben haben usw. Um das alles herauszufinden führen wir Experiment im Labor und in der Natur durch. Wir arbeiten mit vielen verschiedenen Moosarten, und es scheint so als wären alle Moose mit Cyanobakterien besiedelt aber in unterschiedlichem Ausmaß –Eigenschaften der Moose bestimmen wer und wie viele Bakterien da sind. Mit unserer Forschung wollen wir auch die Beudetung, Schönheit und Faszination die Moose und andere Bryophyten haben fördern und hervorheben.

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https://www1.bio.ku.dk/english/research/te/ecosystem-ecology/

See the story of Kathrin Rousk's research in writing and visuals

Catherine Reeb
France

I was born in Paris, France. After training in biology and geology, I studied botany on European plants, ecology and evolution in France. I teach at the Sorbonne Université (Paris, France) in master's degrees for high-school teacher training and I belong to the Institut de Systématique at the Museum d'Histoire Naturelle in Paris, for research activities. I was soon attracted by hidden diversity, entering into a sort of microscopic galaxy, with many unknown but accessible planets, being offered to our curiosity. I hesitated whether to dive into lichens or into bryophytes, the latter finally won.

In the year 2000, I discovered tropical biodiversity in French Guyana, West Indies and finally in Madagascar. I began to work in research both on fern ecology and on thalloid liverworts. I accumulated experiences in Madagascar, spending several weeks there each year and I became more and more involved in Malagasy bryophyte surveys, learning every day. It cannot be a solitary task and a working group was created (Madbryo) which aims to improve and to boost the knowledge both for herbarium study and for new collections in the field. Among all of the colleagues involved, let me mention Lova Marline, the first female bryologist from Madagascar, Roger Lala Andriamiarisoa and John Brinda, from the Missouri Botanical Garden.

For my PhD, I was supposed to work on the ecological approach of bryophyte microstations. As soon as I began to study them for simple thalloid liverworts (*Riccardia*, Aneuraceae) in Madagascar, I realized that it was impossible to seriously identify most of the specimens, in the field or in the herbarium; taxonomy and systematic just dawned on me. I discovered molecular approaches and the integration of various methods to delineate species, with a stream of questions around species, speciation and biological history: "What is a species?", "How can we decide to propose this species?", "Could we find hidden characters?". Trying to answer these questions, I became interested in geomorphometrical characterization of thallus.

Bryophyte study is not easy, needing improbably thin sections from one cell thick leaves; how many times did I complain about these slippery little things under the binocular! But succeeding in the identification of a liverwort or just understanding that you are observing something that probably has no name for the moment, even in native language, is an extraordinary joy. I cannot end this presentation without a special thanks to my favorite bryophytes, undoubtedly the liverwort genus *Riccia*; I cannot explain this attraction, they are just beautiful.

Je suis née à Paris, France. Après une formation en biologie et géologie j'ai étudié la botanique autour de la végétation européenne, l'écologie et l'évolution. J'enseigne à Sorbonne Université (Paris, France) au sein du master préparant les futurs enseignants des lycées et pour mes activités de recherche, j'appartiens à l'institut de Systématique du Muséum National d'Histoire Naturelle.
J'ai été attirée très tôt par la biodiversité cachée, entrant dans une sorte de galaxie microscopique, constituée de nombreuses planètes inconnues mais accessibles, s'offrant juste à notre curiosité. J'ai hésité à plonger dans les lichens ou dans les bryophytes. Ce sont ces dernières qui l'ont emporté !

Dans les années 2000, j'ai découvert la biodiversité tropicale en Guyane française, aux Antilles puis à Madagascar. J'ai commencé à travailler en recherche à la fois sur l'écologie des fougères et sur les hépatiques à thalle. J'ai accumulé les expériences à Madagascar y passant plusieurs semaines chaque année, et je me suis investie de plus en plus dans l'étude des bryophytes malgaches, apprenant chaque jour un peu plus. Cela ne peut pas être une activité solitaire et un groupe de travail a été créé (Madbryo) dont le but est de dynamiser la connaissance de ces plantes malgaches à partir des herbiers et de nouvelles collectes sur le terrain. Parmi tous les collègues impliqués, citons Lova Marline, la première bryologue femme de Madagascar, Roger Lala Andriamiarisoa et John Brinda, du Missouri Botanical Garden.

Pour ma thèse, j'étais supposée travailler sur une approche écologique microstationnelle des bryophytes. Dès que j'ai commencé cette étude, portant sur des hépatiques à thalle (*Riccardia*, Aneuraceae), j'ai réalisé qu'il était impossible d'identifier sérieusement la plupart des spécimens en herbier ou sur le terrain. La taxonomie et la systématique se sont alors imposées à moi. J'ai découvert les approches moléculaires et l'intégration de nombreuses méthodes pour délimiter les espèces. Est venu le flot de questions autour de la notion d'espèce, de la spéciation et de l'histoire biologique : « qu'est ce qu'une espèce ?», « comment pouvons nous décider de proposer cette espèce ? », « pouvons nous trouver de nouveaux caractères ? ». Cherchant à répondre à ces questions, je me suis aussi intéressée à la caractérisation geomorphométrique des thalles.

L'étude des bryophytes n'est pas chose facile. Elle nécessite d'improbables coupes fines sur des feuilles d'une cellule d'épaisseur. Combien de fois ai-je râlé après ces petites choses qui glissaient sous la binoculaire ! Mais réussir à identifier une hépatique ou comprendre soudainement que ce que vous observez n'a probablement pas de nom pour le moment, même en langue native, procure une joie extraordinaire. Je ne peux pas terminer cette présentation sans évoquer, ni remercier mes bryophytes favorites, incontestablement les hépatiques à thalle du genre Riccia. Je ne peux pas expliquer cette attraction, elle sont juste belles.

Second photo courtesy of Rui-Liang Zhu

List of selected publications

https://isyeb.mnhn.fr/en/directory/catherine-reeb-5468

Andrea Sass-Gyarmati
Hungary

My name is Andrea Sass-Gyarmati, I was born in Cluj-Napoca city in Romania. I did my Bachelor and Master studies at the Eszterházy Károly University in Eger, Hungary. I currently work as the curator of the Cryptogamic Herbarium in Eger (EGR) and as a research fellow in the Botanical Department.

My childhood wish was always to see animals (especially monkeys) in the jungle and to study them, but I was unable to fulfill that dream while living in Romania. My life completely changed when finally I entered the University in Eger in 1991 and I met Tamás Pócs who had just repatriated with his family to Hungary after nine years spent in Tanzania. He gave a lecture on the Kenyan high mountain's plants and animals - especially bryophyte communities so I immediately knew that I would like to learn a lot from him and I was fortunate to become a student of Tamás. So this was why I gave up my zoological interest and started with bryophytes. And it was very easy when I realised how nice a world they represent when I first saw them through the microscope.

I was very fortunate to have the support and permanent guidance of Prof. Tamás Pócs since my early student years. I have been interested in tropical bryophytes since the third year of my university studies, when I participated in the postgraduate Tropical Bryological Course held at the Helsinki University Herbarium (Finland) in 1993. There I met skilled and experienced bryologists who influenced my first steps, such as Prof. Robbert Gradstein, Prof. Timo Koponen and the late Prof. Jan-Peter Frahm.

After finishing my studies I went back to Romania (with my Hungarian diploma) which was not accepted in Romania so I worked for three years at the Tribunal of Cluj-Napoca city. In 1999 Tamás founded his cryptogamic research group of the Hungarian Academy of Sciences and invited me as a research member and I came back to Eger for the second time and since then I have worked here.

My research interests include the systematics and floristic studies of bryophytes with an emphasis on the tropics. I participated as a visiting researcher at the Field Museum, Chicago working on Rudolf M. Schuster's collection from the Fiji Islands and also took part in an international expedition organized by Dr. Matt von Konrat in the same area. A very cooperative relationship was built between our two institutes, including mutual visits several times. We also had visitors from Turku Herbarium, Finland and from the Ho Chi Minh City University, Vietnam, when their researchers worked on the very rich bryophyte material from Vietnam collected by several scientists (Balázs, Pócs, Topál, Tran Ninh).

Recently I have been working on the revision of *Bazzania* species of Africa including the Mascarene Islands and Madagascar. It was also a great opportunity for me to participate in the Madbryo project in the Paris Natural History Museum, exploring Madagascar bryoflora during an expedition organized by Dr. Catherine Reeb in 2018. In addition to research, I am delighted to meet young and enthusiastic students and share my knowledge of bryophytes and their important role in the ecosystem.

A nevem Sass-Gyarmati Andrea, 1972-ben születtem Kolozsváron. Az érettségit követően biológia alap és mesterszakot Egerben végeztem el az Eszterházy Károly Katolikus Egyetemen.
Jelenleg tudományos munkatársként valamint az Egyetem kriptogám herbáriumának (EGR) kurátoraként dolgozom, emellett oktatási feladataim is vannak.

Gyerekkoromban mindig is az volt a vágyam, hogy állatokat (főleg majmokat) lássak a dzsungelben és tanulmányozhassam őket, de ezt az álmot nem tudtam teljesíteni Romániában élve. Az életem teljes fordulatot vett, amikor 1991-ben sikeres felvételt nyertem az egri egyetemre. Itt ismerhettem meg Pócs Tamás professzort, aki kilencévnyi Tanzániában töltött év után családjával éppen hazatelepült Magyarországra. Egyik napon, amikor előadást tartott a kenyai magashegységi növényekről és állatokról - különösen a moha közösségekről, így azonnal tudtam, hogy ezen az úton szeretnék elindulni. A mohák csodálatos világát könnyű volt első látásra megszeretni, amint először figyeltem meg őket a mikroszkópon keresztül. Már a korai főiskolai éveim alatt Pócs Tamás professzor folyamatos támogatásával biztosította, hogy komolyabban is a trópusokon előforduló mohák tanulmányozásával kezdjek foglalkozni.

Harmadéves főiskolásként meghatározó élmény volt számomra, hogy részt vehettem 1993-ban a Helsinkiben (Finnország) rendezett Intenzív Trópusi briológiai kurzuson. A tanfolyamon elismert és tapasztalt mohászok befolyásolták a kezdeti lépéseimet ebben a tudományágban, mint Robbert Gradstein, Timo Koponen professzorok és a néhai Jan-Peter Frahm professzor.

Tanulmányaim befejezése után visszamentem Romániába (magyar oklevéllel), amelyet azonban Romániában nem fogadtak el, így három évet a kolozsvári Törvényszéken dolgoztam. Pócs Tamás 1999-ben megalapította a Magyar Tudományos Akadémia kriptogám kutatócsoportját és meghívást kaptam részéről hogy kutatócsoporti tagként dolgozzak, így azóta Egerben dolgozom.

Kutatási területem a kiemelten a trópusokon előforduló mohák rendszertana és florisztikai vizsgálata. Vendégkutatóként többször is részt vettem a chicagói Field Museumban, ahol Rudolf M. Schuster Fidzsi-szigetekről származó gyűjteményén, illetve egy nemzetközi expedíció tagjaként Dr. Matt von Konrat kiváló szervezésében a Fidzsi szigetek moháinak gyűjtésében és tanulmányozásában. Nagyon gyümölcsöző együttműködés épült ki a két intézmény között az elmúlt években. A finnországi Turku Herbáriumból és a vietnami Ho Si Minh-városi Egyetemről is érkeztek látogatóink, amikor kutatóik több elsősorban magyar tudósok (Balázs, Pócs, Topál, Tran Ninh) által gyűjtött, igen gazdag vietnami mohaanyagon dolgoztak.

Jelenleg a *Bazzania* májmoha nemzetség afrikai elterjedésű fajainak a revízióján dolgozom és nagyszerű lehetőség volt számomra, hogy részt vehettem a Madbryo projektben és a Madagaszkári mohaflóra felfedezésében, a Dr. Catherine Reeb által szervezett madagaszkári expedíció során 2018-ban, valamint a Párizsi Természettudományi Múzeum nagyon gazdag trópusi mohaanyagának a feldolgozásában. A kutatás mellett örömömre szolgál, ha fiatal és lelkes hallgatókkal találkozhatok útjaim során és velük is megoszthatom tudásomat a mohákról és az ökoszisztémában betöltött fontos szerepükről.

List of selected publications:

https://www.researchgate.net/profile/Andrea-Sass-Gyarmati

Helena Hespanhol
Portugal

I grew up in the city of Vila Nova de Gaia, located south of the city of Porto, in the North of Portugal. Although living in a city, I grew up with a lot of contact and sense of respect for nature, raised mainly by my grandparents and my parents who often took me and my brother on long walks and picnics in nature.

I started my bryological adventure at the University of Porto, in Portugal, when I finished my degree in Biology in 2002. I have always been curious about plants and small details, and, surprisingly, at an open day at the university to promote research and attract students, I met some young plant researchers. After this event, I decided to participate in an internship about the plant communities colonizing tree trunks in the woodlands of Northern Portugal. When I graduated, I joined a team of botanists to set up a more complete inventory of bryophytes in the Peneda-Gerês National Park. For a year, I visited amazing nature spots in these northern mountains and observed different habitats and plenty of bryological diversity. During this time, I discovered these fascinating and tiny plants in more detail, with the help of a small magnifying glass and realized that it can be a very meditative task. I had the chance to work with my professor and bryologist who introduced me to the world of bryophytes, Dra. Ana Séneca, a bryologist friend, Cristiana Vieira, companion of many bryological and personal adventures and also a lichenologist friend, Joana Marques, an enthusiastic and adventurous scientist. Together, we have visited many bryophyte and lichen species-rich sites, in Portugal and abroad. I also had the opportunity to work with the first bryologist in Portugal, Dra. Cecília Sérgio, from the University of Lisbon. I still remember those train travels, with a bag full of bryological samples that needed a more proper identification. I learned a lot with Dra. Cecília Sérgio and feel very grateful for her dedication. I always returned with a little more confidence, for new identifications.

After graduating, I moved to a PhD, to study bryophyte communities from rock outcrops in Northern and Central Portugal. I never imagined the adventure I would start and that bryophytes would take me to travel to so many places. I am still fascinated by the mountains and bryophytes that grow on rocky outcrops, with their peculiar strategies to avoid water loss. I had the opportunity to visit some important bryophyte collections in different herbaria in Europe and got to know an amazing network of bryologists by attending several conferences in Europe.

After my PhD, I started a Post-Doc, with the objective of assessing the vulnerability of bryophyte species in the context of climate change. I worked closely with national, Iberian and international researchers, submitted scientific project proposals, participated in the organization of scientific

events, published scientific articles and books and also had the opportunity to mentor students. From early on, I have also been actively involved in scientific dissemination activities.

Since 2017 I am a contracted researcher at the Research Centre in Biodiversity and Genetic Resources (BIOPOLIS-CIBIO) and I am currently working on a project about combining microclimate sensor networks and models to uncover the vulnerability of bryophytes to climate change (https://linktr.ee/bryomicroclim). With this project, I hope to provide some answers to big questions in ecology, using bryophytes as model organisms.

Cresci na cidade de Vila Nova de Gaia, situada a sul da cidade do Porto, no Norte de Portugal. Embora vivendo numa cidade, cresci com muito contacto e sentido de respeito pela natureza, criado principalmente pelos meus avós e pelos meus pais que muitas vezes me levavam a mim e ao meu irmão em longas caminhadas e piqueniques na natureza.

Comecei a minha aventura briológica na Universidade do Porto, em Portugal, ao terminar a minha licenciatura em Biologia, em 2002. Sempre tive curiosidade por plantas e pequenos detalhes e, surpreendentemente, num dia aberto na universidade para promover a investigação e atrair estudantes, conheci alguns investigadores que estudavam plantas. Após este evento, decidi participar num estágio sobre as comunidades vegetais que colonizam troncos de árvores nas florestas do Norte de Portugal. Quando terminei a licenciatura, juntei-me a uma equipa de botânicos para fazer o inventário das briófitas no Parque Nacional da Peneda-Gerês. Durante um ano, visitei locais incríveis nestas montanhas do Norte e observei diferentes habitats e bastante diversidade briológica. Durante este tempo, descobri mais detalhadamente estas fascinantes e minúsculas plantas, com a ajuda de uma pequena lupa e apercebi-me que pode ser uma tarefa muito meditativa. Tive a oportunidade de trabalhar com a minha professora e brióloga que me apresentou ao mundo das briófitas, Dra. Ana Séneca, uma amiga brióloga, Cristiana Vieira, companheira de muitas aventuras briológicas e pessoais e também uma amiga liquenóloga, Joana Marques, cientista entusiasta e aventureira. Juntas, visitámos muitos locais ricos em espécies de briófitas e líquenes, em Portugal e no estrangeiro. Tive também a oportunidade de trabalhar com a primeira brióloga em Portugal, Dra. Cecília Sérgio, da Universidade de Lisboa. Ainda me lembro das viagens de comboio, com uma mala cheia de amostras de briófitas que precisavam de ser identificadas. Aprendi muito com a Dra. Cecília Sérgio e sinto-me muito grata pela sua dedicação. Voltava sempre dessas viagens com um pouco mais de confiança, para novas identificações.

Depois da licenciatura, iniciei um doutoramento, para estudar comunidades de briófitas de afloramentos rochosos no Norte e Centro de Portugal. Nunca imaginei a aventura que iria começar e que as briófitas me levariam a viajar para tantos lugares. Fiquei fascinada pelas montanhas e

pelas briófitas que crescem em afloramentos rochosos, com as suas peculiares estratégias para evitar a perda de água. Tive a oportunidade de visitar algumas importantes coleções de briófitas em diferentes herbários na Europa e conheci uma rede incrível de briólogos ao participar em diversas conferências na Europa.

Depois do doutoramento, segui para um pós-doutoramento, com o objetivo de avaliar a vulnerabilidade das espécies de briófitas no contexto das mudanças climáticas. Trabalhei em estreita colaboração com investigadores nacionais, ibéricos e internacionais, apresentei propostas de projetos científicos, participei na organização de eventos científicos, publiquei artigos científicos e livros e tive também a oportunidade de orientar alunos. Desde cedo, tenho também estado ativamente envolvida em atividades de divulgação científica.

Desde 2017 sou investigadora contratada no Centro de Investigação em Biodiversidade e Recursos Genéticos (BIOPOLIS-CIBIO) e estou atualmente a trabalhar num projeto sobre o uso combinado de redes de sensores microclimáticos e modelos para revelar a vulnerabilidade de pequenas plantas às alterações climáticas (https://linktr.ee/bryomicroclim). Com este projeto, espero dar algumas respostas a grandes questões em ecologia, usando as briófitas como organismos modelo.

List of selected publications (Para mais informação, pode consultar o meu percurso profissional e lista de publicações em):
https://www.researchgate.net/profile/Helena-Hespanhol

Christiana Vieira
Portugal

Nature has always been a safe and magical place, full of possible discoveries for me. The smallest organisms allowed the most unexpected discoveries and the plants were the permanent element of my life growing up on a farm. I grew up without really knowing what I wanted to be "when I grew up". At secondary school, I studied bryophytes and was enchanted by the detail of their shapes. At the University of Porto, in the Biology course, my favourite subjects were botany related and I loved to draw their cells and discover the life forms that had to survive without leaving the same place. In the third year, I chose the subject of mechanical dispersion of bryophyte spores as the subject of the practical classes' report and I met my future seminary, internship, and PhD supervisor - Professor Ana Séneca. In the fourth year of the biology course, when the opportunity arose to study the phytosociology of hygrophilous and hydrophilous bryophytes of the National Park of Peneda-Gerês with my fellow botanist João Honrado, I realized that I had arrived at the "microhabitat" where I would be happy in science.

I started leafing through the floras of European and Iberian bryologists and memorizing forms and absorbing a new scale of life - when I returned from the field I brought back so many gifts wrapped in newspaper to discover that bryology became addictive in no time. In the early years, whenever I had specimens that were "impossible" to identify I would turn to the invaluable assistance of the experienced Dr Cecilia Sérgio, a calm and persevering inspiration who always supported and encouraged me to be a better bryologist and taught me the intricacies of the more difficult Genera and to understand the morphological plasticity of many aquatic species.

I was also very fortunate to have a friend-colleague-bryologist, Helena Hespanhol, and another friend-colleague-lichenologist, Joana Marques - and together, in the field or the lab, the exploration of briolichenic communities became our stimulus for journeys and discoveries. Meanwhile, our PhDs, post-docs, projects, students' orientations, public visits, presentations, and organization of cryptogamic congresses followed one another - 20 years passed in a flash, always with many bryophytes, visits to national and international herbaria and friendships with other bryologist colleagues from all over the world.

In Bryology, my efforts were to know the list and distribution of species of watercourses, to use bryophytes for bioindication, to know and apply techniques of habitat restoration for the conservation of populations of bryophyte species, to contribute with data for the Red Lists of Bryophytes, and to contribute with data for ecological modelling.

Now I am the curator of the Herbarium of the Museum of Natural History and Science of the University of Porto (PO) and I have the privilege of caring for, studying, publishing data, and writing podcasts about some of the first Portuguese collections of bryology. In the future, I hope to intensify my studies of Portuguese bryology and allow more and more access to bryological collections, but also continue to show and teach about the most fascinating organisms I know - bryophytes.

A natureza sempre foi um local seguro e mágico, pleno de descobertas possíveis para mim. Os mais pequenos seres permitiam as descobertas mais inesperadas e as plantas eram o elemento permanente da minha vida ao crescer numa quinta. Cresci sem saber muito bem o que queria ser "quando fosse grande". No liceu estudei as briófitas e fiquei encantada com o grau de detalhe das suas formas. Na universidade do Porto, no curso de Biologia, as minhas disciplinas preferidas eram as relacionadas com a botânica e encantava-me desenhar as suas células e descobrir as formas de vida que tinham de sobreviver sem sair do lugar. No terceiro ano escolhi o tema da dispersão mecânica dos esporos das briófitas como tema de relatório das aulas práticas e conheci a minha futura orientadora de seminário, estágio e doutoramento – a Professora Ana Séneca. No quarto ano do curso de biologia, quando surgiu a oportunidade de fazer o estudo da fitossociologia de briófitas higrófilas e hidrófilas do Parque Nacional da Peneda-Gerês com o colega botânico João Honrado percebi que tinha chegado ao "micro-habitat" onde iria ser feliz na ciência.

Comecei a folhear as floras de briólogos europeus e ibéricos e a memorizar formas e a absorver uma nova escala de vida – quando voltava do campo trazia tantos presentes envolvidos em jornal para descobrir que a briologia se tornou viciante em pouco tempo. Nos anos iniciais, sempre que tinha espécimes "impossíveis" de identificar recorria ao auxílio precioso da experiente Drª Cecília Sérgio, uma inspiração calma e perseverante que sempre me apoiou e encorajou a ser melhor brióloga e me ensinou os meandros de Géneros mais difíceis e a compreender a plasticidade morfológica de muitas espécies aquáticas.

Também tive a grande felicidade de ter uma amiga-colega-brióloga, Helena Hespanhol, e outra amiga- colega-liquenóloga, Joana Marques – e juntas, no campo ou no laboratório, a exploração das comunidades brioliquénicas passou a ser o nosso estímulo para viagens e descobertas. Entretanto os nossos doutoramentos, pos-docs, projectos, orientações de alunos, visitas com público, e apresentações e organização de congressos criptogâmicos sucederam-se - 20 anos passaram-se num ápice, sempre com muitas briófitas, visitas a herbários nacionais e internacionais e amizades com outros colegas briólogos de todo o mundo.

Na Briologia, os meus esforços foram no sentido de conhecer a lista e distribuição das espécies dos cursos de água, de usar briófitas na bioindicação, de conhecer e aplicar técnicas de restauro de habitats para a conservação de populações de espécies higroturfosas, de contribuir com dados para as espécies das Listas Vermelhas das Briófitas, de conseguir contribuir com dados para modelação ecológica.

Agora sou curadora do Herbário do Museu de História Natural e da Ciência da Universidade do Porto (PO) e tenho o privilégio de cuidar, estudar, publicar dados e escrever podcasts sobre algumas das primeiras coleções portuguesas de briologia portuguesa. No futuro espero intensificar os meus estudos de briologia portuguesa e permitir cada vez mais o acesso às coleções briológicas, mas também continuar a mostrar e ensinar sobre os seres mais fascinantes que conheço – as briófitas.

List of selected publications (Lista selecionada de Publicações):

Vieira, C., & Hespanhol, H. (2021). Writing the story of Porto herbarium and its botanists: 170 years of contributions to Iberian bryology. Boletin de la Sociedad Espanhola de Briologia. 52(53), 11.

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Vieira C, Séneca A, Sérgio C & Ferreira MT (2012). Bryophyte taxonomic and functional groups as indicators of fine scale ecological gradients in mountain streams. Ecological Indicators 18: 98-107.

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Sérgio C, Garcia CA, Sim-Sim M, **Vieira C**, Hespanhol H, Stow S (2013) Atlas e Livro Vermelho dos Briófitos ameaçados de Portugal (Atlas and Red Data Book of Endangered Bryophytes of Portugal). MUHNAC. Lisboa. 464 pp. (book: ISBN: 978-989-8618-57-3).

Vieira C, Hespanhol H, Gonçalves J, Marques J & Bota A. (2012). Biological valuation in mountain landscapes as a tool for the conservation of bryophytes in Baixo-Tâmega, Portugal. Studia Botanica Hungarica 43: 69-84.

Vieira C, Séneca A, & Sérgio C (2004). The Bryoflora of Valongo - the refuge of common and rare species. Boletín de la Sociedad Española de Bríologia 25: 1-16.

If you want to know more about my professional path you can check my page (Se quiser saber mais sobre o meu percurso profissional pode consultar a minha página):

https://www.researchgate.net/profile/Cristiana-Vieira-2

Joanne Denyer
Republic of Ireland

I was born in East Sussex, United Kingdom, where I grew up until I moved away to undertake an undergraduate degree in Environmental Science at Leicester University. My degree was very focussed on vascular plants, and I don't remember bryophytes being mentioned outside of learning their life-cycle. I first became interested in bryophytes after graduating, when I was studying on a field skills course with Margaret Pilkington at the University of Sussex. She introduced me to their structure, identification and use as indicator species. The fact that they could provide information about habitats was what initially sparked my interest and I started to learn some common species. I was lucky to be living in East Sussex at the time - despite this being in the south of England, the woodlands in this county provide habitat for species more typical of the west of Britain.

During my PhD (on grazing impacts on chalk grassland) I joined the British Bryological Society Southern group and attended their winter meetings. I was very fortunate to spend time in the field with Rod Stern, Howard Matcham, David Streeter, Jeff Duckett, Jeff Bates, Fred Rumsey and (once) Francis Rose. I was incredibly lucky to have such inspiring bryologists to support me and they were so helpful as I slowly developed my field skills.

After my PhD I went to work in Scotland at the Macaulay Institute in Aberdeen (now James Hutton Institute). Here I worked with Robin Pakeman and Alison Hester on the impacts of land-use, climate change and grazing on upland plant communities. The fieldwork took me into upland areas all over Scotland and I was fascinated by the bryophyte communities. Summer field meetings with the British Bryological Society to places such as Mull and north-west Sutherland not only introduced me to new bryophytes, but also rugged upland bryologists such as Gordon Rothero and David Long. I'll never forget my first outing with Gordon Rothero to look at hepatic mat liverworts. I passed him a sample of *Hookeria lucens* and asked 'what liverwort species it was'. He was very kind in his reply!!

From Scotland I moved down to Cambridgeshire to start a career in ecological consultancy. It was a very different landscape from the Scottish Highlands, but I grew to appreciate the flat fenland under the helpful and encouraging guidance of Mark Hill and Chris Preston. The highlight of the BBS Cambridgeshire bryophyte group winter meetings was often a churchyard – a hotpot of diversity in the agricultural landscape of the fens.

In 2008 I moved to the Republic of Ireland. I am based in Dublin and work as a freelance ecological consultant specialising in bryophytes and aquatic and wetland habitats (with a focus on petrifying springs, fens, wet woodland and bogs). When I moved to Ireland, there weren't any recording groups (and very few active bryologists), so I started the Irish Bryophyte Group and now run this with Rory Hodd. Initially we were focussed on recording bryophytes for the BBS Atlas project (which was completed in 2014). We had one-two day local recording meetings, but I also organised longer meetings for the BBS in various under-recorded Irish counties. We often had visiting bryologists from the UK join our meetings and share their expertise which was incredibly useful. Thanks, in particular to Gordon Rothero, Sam Bosanquet, David Chamberlain, Chris Preston, Mark Hill, Nick Hodgetts, Tom Blockeel, Liz Kungu, David Long and Sharon Pilkington who have provided so much training and support over the years. I'm currently the BBS Regional Bryophyte recorder for Co. Wicklow and Co. Kildare. In 2014 I received the National Biodiversity Data Centre 'Distinguished Recorder Award' in 2014 in recognition of outstanding contribution to bryological recording in Ireland. Our current recording project is a bryophyte flora of County Wicklow.

As I write this, my consultancy work involves botanical and bryological survey, monitoring and assessment for a range of projects such as Ecological Impact Assessments (for industry, housing developments, road schemes and sustainable energy projects) and habitat management and restoration. I also provide specialist advice and training to organisations such as the National Parks and Wildlife Service (NPWS), Environmental Protection Agency and local councils. In recent years my work has had a focus on petrifying spring habitats and I'm currently working on updated national monitoring guidance for this habitat with NPWS. I am also undertaking research into air pollution impacts on bog and petrifying spring habitats, with a focus on their impacts on bryophytes. I regularly teach bryophyte identification courses to undergraduates (University College Dublin and Trinity College Dublin) and to organisations and professionals. Courses include using bryophytes as habitat indicators, microscope identification skills, field identification skills and habitat specific courses. I'm incredibly lucky to have my hobby as my job and whilst I frequently complain that I'm too busy, it really is a luxury to be busy doing what I love! Thanks to all those who have helped me on my bryological journey – I have found it an incredibly supportive community and have made great friends along the way.

List of selected publications:

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Hill, M.O.H., **Denyer, J.L.,** Bosanquet, S.D.S.B. and Blockeel, T.L.B. (2013). Meeting Report: BBS Summer Meeting 2012. *Field Bryology* 109, 38-47.

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Denyer, J.L., Hartley, S.E. and John, E.A. (2010). Both bottom-up and top-down processes contribute to plant diversity maintenance in an edaphically heterogeneous ecosystem. *Journal of Ecology* 98, 498–508.

Denyer, J.L., Hartley, S.E. and John, E.A. (2007). Small mammalian herbivore determines vegetation response to patchy nutrient inputs. *Oikos* 116, 1186-1192.

NORTH AMERICA

Mélanie Jean
Canada

I am an assistant professor in the department of biology at Université de Moncton in New Brunswick (Canada) since 2021. The research conducted in my lab focuses on the ecology of bryophytes and understory plants in the boreal forest, from its southern edge with the temperate forest to its northern edge. We study plant community dynamics, plant-plant, plant-soil and plant-microbiota interactions, nitrogen fixation and functional traits. I am also a contributor to the Canadian bryomonitoring initiative (https://bryomonitoring.ca/).

I grew up in Laval, a suburb of Montreal (Quebec, Canada). I have always been interested in nature and loved going out camping and hiking, a passion that came from my plant biologist and meteorologist parents. However, I initially had no interest at all in bryophyte. To me they seemed like difficult uninteresting small green things – how wrong was I! I completed my BSc in biology at Université de Montréal. My first biology job was in peatland ecology in southern Quebec. I was a bit discouraged by the challenges of *Sphagnum* identification and preferred focusing on vascular plants. I spent a semester at Université de la Réunion in the Indian Ocean, being amazed by the diversity of tropical areas. While I was sampling ferns with a visiting scientist, we met a team of bryologists who managed to pique my curiosity. When I came back from La Réunion, I flew directly to the subarctic to work as a field assistant in a remote field camp along the Boniface River in northern Quebec and fell in love with the North. This experience motivated me to pursue a MSc at Université Laval in Quebec City, during which I worked on vegetation-permafrost interactions. It is while working on my MSc that I (finally!) started to realize the importance of bryophytes, both in terms of biodiversity and ecosystem functions.

It is during my PhD at the University of Saskatchewan that I fell in love with bryophytes. I was investigating how climate change and changes in the fire regimes in Alaskan forests may affect bryophyte succession and ecosystem function in terms of carbon and nitrogen cycling. I was also introduced to the concept of bryosphere, i.e. the entire hidden macro- and microscopic world that lives within the bryophyte canopy. Terry McIntosh taught me the basics of bryophyte identification. The closer I looked; the more wonderful bryophytes became! I then kept working on bryophytes through my postdoctoral fellowships, studying how forest-moss-microbiome interactions shape moss-associated nitrogen fixation, an important N source in boreal forests, and using bryomonitoring to assess the spatial footprint of boreal mines with Nicole Fenton at Université du

Québec en Abitibi-Témiscamingue. I still find bryophyte identification to be challenging, but it is a challenge that I now gladly undertake, and which makes me learn constantly! With the help of the late Jean Faubert and the Société Québécoise de bryologie, we even rediscovered a species of hornwort that had not been observed in Quebec for >50 years! I am now dedicating a large portion of my research to this group of plants and share my passion for bryophytes and their beauty to as many people as possible!

Je suis professeure adjointe au département de biologie de l'Université de Moncton au Nouveau Brunswick (Canada) depuis 2021. Les recherches menées dans mon laboratoire portent sur l'écologie des bryophytes et des plantes de sous-bois dans la forêt boréale, de sa limite sud avec la forêt tempérée à sa limite nord. Nous étudions la dynamique des communautés végétales, les interactions plantes-plantes, plantes-sol et plantes-microbiote, la fixation de l'azote et les traits fonctionnels. Je contribue également à l'initiative canadienne de bryosurveillance (https://bryomonitoring.ca/).

J'ai grandi à Laval, en banlieue de Montréal (Québec, Canada). J'ai toujours été intéressée par la nature et j'adorais faire du camping et des randonnées, une passion qui me vient de mes parents (biologiste végétale et météorologue). Cependant, au départ, je n'étais pas du tout intéressée par les bryophytes… Elles me semblaient être de petites choses vertes difficiles et inintéressantes - comme j'avais tort ! J'ai fait mon baccalauréat en biologie à l'Université de Montréal. Mon premier emploi en biologie était en écologie des tourbières dans le sud du Québec. J'ai été un peu découragée par les difficultés d'identification des sphaignes et j'ai préféré me concentrer sur les plantes vasculaires. J'ai passé un semestre à l'Université de la Réunion, dans l'océan Indien, et j'ai été émerveillée par la diversité des zones tropicales. Alors que j'échantillonnais des fougères avec un scientifique en visite, nous avons rencontré une équipe de bryologues qui ont su piquer ma curiosité. À mon retour de La Réunion, j'ai pris un vol direct vers le subarctique pour travailler comme assistante de terrain dans un camp éloigné dans le nord du Québec, et je me suis découvert une passion pour le Nord. Cette expérience m'a motivée à poursuivre une MSc à l'Université Laval à Québec, au cours de laquelle j'ai travaillé sur les interactions végétation-pergélisol. C'est en travaillant sur ma MSc que j'ai (enfin !) commencé à réaliser l'importance des bryophytes, tant en termes de biodiversité que de fonctions écosystémiques.

C'est au cours de mon doctorat à l'Université de la Saskatchewan que ma passion pour les bryophytes est née. J'étudiais comment le changement climatique et les modifications des régimes de feux dans les forêts de l'Alaska affectent la succession des bryophytes et leurs fonctions dans la forêt boréale dans les cycles du carbone et de l'azote. J'ai découvert le concept de bryosphère, c'est-à-dire l'ensemble du monde caché, macro et microscopique, qui vit dans la canopée des bryophytes. Terry McIntosh m'a appris les bases de l'identification des bryophytes. Plus je regardais de près, plus les bryophytes devenaient merveilleuses ! J'ai ensuite continué à travailler sur les bryophytes dans le cadre de mes stages postdoctoraux, en étudiant comment les interactions

forêt-mousse-microbiome façonnent la fixation de l'azote par les mousses, une importante source de N dans les forêts boréales, et en utilisant la bryosurveillance pour évaluer l'empreinte spatiale des mines boréales avec Nicole Fenton à l'Université du Québec en Abitibi-Témiscamingue. L'identification des bryophytes reste un défi pour moi, mais c'est un défi que je relève désormais avec plaisir, et qui me permet d'apprendre sans cesse! Avec l'aide du regretté Jean Faubert et de la Société Québécoise de bryologie, nous avons redécouvert une espèce d'anthocérote qui n'avait pas été observée au Québec depuis >50 ans!

Je consacre maintenant une grande partie de mes recherches à ce groupe de plantes et je souhaite partager ma passion pour les bryophytes et leur beauté avec le plus grand nombre de personnes possible!

List of selected publications:

Jean M, Fenton NJ, Bergeron Y, Nilsson MC. 2021. Sphagnum and feather moss associated N2 fixation along a 724-year chronosequence in eastern boreal Canada. *Plant Ecology*. 222(9): 1007-1022. https://doi.org/10.1007/s11258-021-01157-x

Stuart JEM, Holland-Moritz H, **Jean M**, Miller SN, Ponciano JM, McDaniel SF, Mack MC. 2021. The relationship of C and N stable isotopes to high latitude moss-associated N_2-fixation. *Oecologia*. 197: 283-295. https://doi.org/10.1007/s00442-021-05005-7

Jean M, Holland-Moritz H, Melvin A, Johnstone J, Mack M. 2020. Experimental assessment of tree canopy and leaf litter controls on the microbiome and nitrogen fixation rates of two boreal mosses. *New Phytologist*. 227: 1335–1349. https://doi.org/10.1111/nph.16611

Stuart J, Holland-Moritz H, Lewis L, **Jean M**, Miller S, McDaniel S, Fierer N, Ponciano J, Mack M. 2020. Host identity as a driver of moss-associated N_2-fixation rates in Alaska. *Ecosystems*. 24: 530–547. https://doi.org/10.1007/s10021-020-00534-3

Jean M, Melvin A, Mack M, Johnstone J. 2020. Broadleaf litter controls feather moss growth in black spruce and birch forests of interior Alaska. *Ecosystems*. 23(1): 18-33. https://doi.org/10.1007/s10021-019-00384-8

Jean M, Lafleur B, Fenton N, Paré D, Bergeron Y. 2019. Influence of fire and harvest severity on understory plant communities. *Forest Ecology and Management*. 436: 88-104. https://doi.org/10.1016/j.foreco.2019.01.004

Jean M, Mack M, Johnstone J. 2018. Spatial and temporal variation in moss-associated dinitrogen fixation in coniferous and deciduous dominated Alaskan boreal forests. *Plant Ecology*. 219(7): 837-851. https://doi.org/10.1007/s11258-018-0838-y

Jean M, Faubert J. 2018. Redécouverte de l'*Anthoceros agrestis* Paton au Québec, Canada. *Carnets de Bryologie*. 22: 1-4. http://www.societequebecoisedebryologie.org/lescarnets.html

Jean M, Alexander H, Mack M, Johnstone J. 2017. Patterns of bryophyte succession in a 160 year chronosequence in deciduous and coniferous forests of boreal Alaska. *Canadian Journal of Forest Research (CJFR)*. 47(8): 1021-1032. https://doi.org/10.1139/cjfr-2017-0013

Patricia Herrera-Paniagua
Mexico

My name is Patricia Herrera-Paniagua. I was born at Queretaro city, Mexico. I fell in love with the biology subject and wanted to be a biologist. I did my university and postgraduate studies both at the Universidad Autonoma de Queretaro (UAQ) and at the Instituto de Biologia UNAM (IBUNAM).

I currently work as a professor-researcher in the Biology career of Facultad de Ciencias Naturales (UAQ). However, getting to this position was not easy. Studying and dedicating oneself to scientific aspects in countries that do not invest in science is complicated, and even more so if you dedicate yourself to studying a non-charismatic group. Surely, I am lucky. At first, I wanted to study butterflies, but knowing the mosses and knowing that there was a lot to do in Mexico made me want to study them.

In my bryology training, I was fortunate to have the support and guidance of Dr. Claudio Delgadillo Moya from IBUNAM. He has been a supportive influence in my academic training and is an example of dedication to generating knowledge about the bryophytes of Mexico. Being part of a university means that one has to divide your time between various tasks, including an administration, so I cannot dedicate myself only to research. But as a professor, I have tried to influence my students about the importance of knowing and conserving bryophytes. I have also created a small collection of bryophytes at the QMEX Herbarium at the university. In research, I dedicated myself to doing projects on the diversity and ecology of the mosses of the state of Querétaro and adjacent areas. I have been involved in comprehensive floristic diversity projects, hoping to highlight the importance of taking mosses into account, not just vascular plants. My latest collaborative project is called “Valoración del estado actual de la biota acuática en el semidesierto queretano a través de grupos selectos (FONDEC-UAQ-2019-2021)” participating with the analysis of bryophytes in freshwater ecosystems.

You can consult my academic profile via ResearchGate. Although there are more robust academic trajectories, measured by the number of publications and undergraduate/postgraduate students, I am happy with my work and with what it allows me to do and learn. I hope to continue contributing to the knowledge of Mexican bryophytes and the promoting of their importance. Thanks for your interest.

Mi nombre es Patricia Herrera Paniagua, y nací en la ciudad de Querétaro, Querétaro, México. A mí me encantó la materia de biología en la preparatoria y por eso quise ser bióloga. Mis estudios

universitarios y de posgrado los hice tanto en la Universidad Autónoma de Querétaro (UAQ) como en el Instituto de Biología de la UNAM (IBUNAM).

Actualmente me desempeño como profesora-investigadora en la Lic. en Biología, de la Facultad de Ciencias Naturales de la UAQ. Sin embargo, llegar a esta posición no fue fácil. Estudiar y dedicarte a aspectos científicos en países que no invierten en ciencia es complicado, y más si te dedicas a estudiar un grupo no "carismático". Así que sí, soy afortunada.
En principio quería estudiar mariposas, pero al conocer a los musgos y saber que había mucho por hacer en México, me hizo querer estudiarlos. En mi formación briológica tuve la fortuna de tener el apoyo y la orientación del Dr. Claudio Delgadillo Moya del IBUNAM. Él ha sido un pilar en mi formación académica y es un ejemplo de dedicación y entrega a generar conocimiento sobre las briofitas de México.

El formar parte de una universidad involucra que tengas que dividir tu tiempo entre varias tareas, incluyendo administrativas, por lo que no puedo dedicarme solo a la investigación. Pero como profesora he procurado impactar a mis alumnos sobre la importancia de conocer y conservar a las briofitas. También he creado una pequeña colección de briofitas en el Herbario QMEX de la universidad. En investigación me he dedicado a hacer proyectos sobre la diversidad y ecología de los musgos de Querétaro y áreas adyacentes. He estado involucrada en proyectos integrales de diversidad florística, esperando resaltar la importancia de tomar en cuenta a los musgos, no solo a las plantas vasculares. Mi último proyecto en colaboración se llama "Valoración del estado actual de la biota acuática en el semidesierto queretano a través de grupos selectos (FONDEC-UAQ-2019-2021)" participando con el análisis de las briofitas en ecosistemas de agua dulce.

Tú puedes consultar mi perfil académico en researchgate.net. Aunque hay trayectorias académicas más robustas, medidas por el número de publicaciones y tesistas, estoy contenta con mi trabajo y con lo que me permite hacer y conocer. Espero poder seguir contribuyendo con el conocimiento sobre las briofitas mexicanas y la divulgación de su importancia. Gracias por tu interés.

Ariadna Ibarra-Morales
Mexico

My name is Ariadna Ibarra-Morales. I was born in Tapachula, Chiapas, México, a small town very close to the border with Guatemala. As both of my parents are scientists, and growing up surrounded by mangroves, mountain forests and coffee plantations, my love for nature started at a very young age.

I studied biology at the National Autonomous University of Mexico. Early in my career, the classes of Professor Ramiro Cruz Duran introduced me to bryophytes, and on field trips I fell in love with liverworts. When deciding the topic of my thesis, my advisors suggested that I study hornworts instead of liverworts, because they didn't know anyone studying Mexican hornworts. I must confess I was not very fond of the idea in the beginning, but when I started to dive into it, there was no turning back.

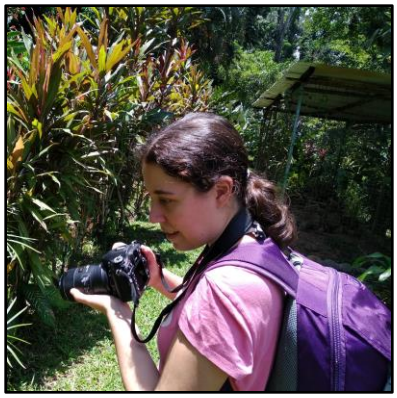
It has been a very bumpy road for me with the hornworts, none of my advisors had any experience identifying them. It was thanks to the help and ready advice provided by Dr. Juan Carlos Villarreal that my research took a good path, identifying, describing and illustrating the plants we collected in central Mexico. I continue studying hornworts for my Master's degree project, at the same university.

Despite currently working as a technician in Centro de Investigación Científica de Yucatán with systematics of Amaranthaceae, my love for hornworts remains. I spend my spare time collecting and studying Mexican hornworts. There is a lot of work still left in this regard, in almost every field trip something different turns up, and there are still many unsampled regions within the country and a lot of unidentified material to study. I hope I can dedicate more time to their study in the future and that more Mexican scientists get involved in studying hornworts, so we can have more accurate estimate on their diversity and conservation.

Mi nombre es Ariadna Ibarra Morales. Nací en Tapachula, Chiapas, México, una ciudad pequeña muy cerca de la frontera con Guatemala. Siendo mis padres científicos y habiendo crecido rodeada de manglares, bosques tropicales de montaña y plantaciones de café, mi amor por la naturaleza comenzó a una edad temprana.

Estudié biología en la Universidad Autónoma de México. Al comienzo de mi carrera, las clases del profesor Ramiro Cruz Durán me introdujeron a las briofitas, y en las prácticas de campo me enamoré de las hepáticas. Al elegir el tema de mi tesis, mis asesoras sugirieron que estudiara antoceros en lugar de hepáticas porque no conocían a nadie que estudiara los antoceros mexicanos.

Debo confesar que la idea no me gustó mucho al principio, pero cuando comencé a sumergirme en ellos no hubo vuelta atrás.



Mi camino con los antoceros ha tenido muchos obstáculos, ninguna de mis asesoras tenía experiencia identificándolos. Fue gracias a la ayuda y la buena disposición del Dr. Juan Carlos Villarreal que mi investigación tomó un buen camino, identificando, describiendo e ilustrando las plantas que colectaba en el centro de México. Continué estudiando antoceros durante mi proyecto de maestría, en la misma universidad.

A pesar de que actualmente trabajo como técnico investigando la sistemática de la familia Amaranthaceae en el Centro de Investigación Científica de Yucatán, mi amor por los antoceros perdura. En mis tiempos libres colecto y estudio antoceros mexicanos. Aún hay mucho trabajo por hacer en el país, en casi cada salida al campo algo diferente aparece, muchas regiones del país no han sido muestreadas y hay una gran cantidad de material sin identificar por estudiar. Espero poderles dedicar más tiempo en el futuro, y que más científicos mexicanos se involucren en el estudio de los antoceros para que podamos tener mejores estimados de diversidad y contribuir a su conservación.

Laura Briscoe
United States of America

I grew up in Salt Lake City, Utah, and spent a lot of my childhood outdoors, always noticing small things. I actually wanted to be an entomologist, and started volunteering in the entomology collections at the Natural History Museum of Utah starting at age 14. I continued to be interested in entomology, and it wasn't until my second year in college when I started taking botany classes that I was hooked. I was able to take a bryophyte biology and ecology course that year and as soon as I saw a leafy liverwort rehydrate under a microscope I thought there was nothing else I wanted to look at for the rest of my life.

I have a B.A. in Human Ecology from College of the Atlantic in Bar Harbor, Maine, with an emphasis in botany and museum studies. I then moved to Chicago to work in the botany collections at The Field Museum, where I stayed for a decade. During that time I received a M.S. in Plant Biology and Conservation from Northwestern University and the Chicago Botanic Garden, with a focus on plant taxonomy and systematics. I was also able to do field work in southern Chile and Fiji during that time, helping work on a floristic treatment for the liverworts of the Cape Horn region, and a systematic understanding of the family Acrobolbaceae.

In late 2016 I moved to New York City to be the collections manager of the Cryptogamic Herbarium at the New York Botanical Garden. I oversee ca. 700,000 of bryophytes, including almost 20,000 type specimens. It's a joy to help other researchers find what they need in our massive collections, and every day I discover something I didn't know about before, so I'm in a constant state of learning. After two decades in collections work, I have become very interested in understanding and contextualizing the power dynamics of how collections are made and housed, and the importance of decolonization of our understanding of natural history collections and of our understanding of the natural world. I am also extremely passionate about exsiccatae collections and am interested in the digitization of specimens and schedae. At present I am overseeing the digitization of bryophytes and lichens from non-North America held at NY.

List of selected publications:

Briscoe, L. et al. (2009) Bryophytes of adjacent serpentine and granite outcrops on the Deer Isles, Maine, USA. Rhodora 111 (945): 1-20.

Briscoe, L., Engel, J.J., Söderström, L, Hagborg, A., von Konrat, M. (2015) Notes on Early Land

Plants Today. 66. Nomenclatural notes on Acrobolbaceae. Phytotaxa 202 (1): 58-62.
Briscoe, L., et al. (2017) Molecular, morphological and biogeographic perspectives on the classification of Acrobolboideae (Acrobolbaceae, Marchatiophyta). Phytotaxa 319 (1): 56-70.
Briscoe, L., et al. (2022) Shining Light on Labels in the Dark: Guidelines for Offensive Collections Materials. Collections (in prep)

Jessica Budke
United States of America

I was born in Youngstown, Ohio and grew up in rural Indiana. When I was a teenager, my family packed into our car and drove across the middle of the United States on a memorable vacation to St. Louis, Missouri. We went up in the Gateway Arch, took in a baseball game, and visited the Missouri Botanical Gardens. As we explored the garden grounds, I was amazed by the plant diversity flourishing around me. I had never seen plants with so many different leaf shapes, vibrant colors, and aromatic flowers. There were enormous floating water lilies, cactuses with swollen water-filled stems, and a myriad of other plants that I had not experienced in person before. Many of the displays highlighted the work of scientists who studied the ecology and evolution of these fascinating organisms. As we walked past the research buildings, I couldn't help but press my nose to the window to see if I could catch a peek of those researchers at work.

After that summer, I wanted to become a botanist. My mom, who was trained as a nurse, was both skeptical and supportive of my botanical dreams. Being a volunteer at the Cincinnati Zoo, she suggested I give botany a test run and encouraged me to apply for an internship at the Zoo. As a high school student, I spent the next summer at the Center for Conservation and Research of Endangered Wildlife where I worked with Bernadette Plair and Dr. Valerie Pence studying the cryopreservation of meristematic tissues to create novel "seeds" for tropical plants that could be stored long-term in the frozen garden. These women were fabulous mentors who generously shared their expertise and passion for plant biology. It was this experience that made me feel like a scientist and, needless to say, I was hooked on botany!

I continued to follow my botanical passions over the next few years, ultimately deciding to pursue an undergraduate degree in Botany at Miami University in Ohio. While at Miami, I joined Dr. Jim Hickey's laboratory group studying fern morphology and taxonomy. As part of my undergraduate research project, I went on my first botanical collecting trips, where we explored the rivers of Tennessee hunting for elusive quillworts. While I was an undergraduate, the world-renowned bryologist Dr. Howard Crum passed away. His loss to the field stimulated discussion in our fern lab members about the fact that there are not enough researchers studying bryophytes. Shortly thereafter, I started noticing mosses everywhere: in the sidewalk cracks, on tree branches, and in the drip zones of air conditioners. As I looked closer, I became fascinated by their diverse morphologies and wanted to explore them more deeply.

I went on to get my Master's Degree and PhD at the University of Connecticut, where I studied bryophyte development and evolution under the guidance of Dr. Bernard Goffinet and Dr. Cynthia Jones. After digging back into the literature, I dove into a project exploring the moss calyptra, which is a cap of maternal gametophyte tissue that covers the sporophyte apex during early development. My research demonstrated that the calyptra of *Funaria hygrometrica* (cord moss) is covered by a thick, waxy cuticle that forms early during development and provides protection to the immature sporophyte apex.

I am now an Associate Professor of Ecology and Evolutionary Biology and the Herbarium Director at the University of Tennessee - Knoxville. One of my favorite aspects of my job is training the next generation of scientists. I enjoy teaching them new skills and watching them grow their expertise. When I think about my scientific journey, it has been driven by pursuing my passions, recognizing opportunities, and being supported by fabulous mentors who have helped me be successful.

List of selected publications (*undergraduate student collaborator):

Budke JM[1], Patel NR[1], GoFlag Consortium, Wienhold MD, Bruggeman-Nannenga MA (1 = co first authors). 2022. Exploring systematic relationships and morphological evolution in the moss genus *Fissidens* using molecular data generated from herbarium specimens. Journal of *Systematics and Evolution* https://doi.org/10.1111/jse.12926

Lewis RA, **Budke JM**. 2022. Bryophyte specimen organization and storage systems: A comparative assessment of staff practices and user preferences. *The Bryologist* 125: 222-247.

Whitaker KR*, **Budke JM**. 2021. Moss sporophyte transpiration rates are higher when calyptrae are removed. *Evansia* 38: 100-108.

Bainard JD, Newmaster SG, **Budke JM**. 2020. Genome size and endopolyploidy evolution across the moss phylogeny. *Annals of Botany* 125: 543-555. (Editor's Choice – Bryophyte Highlight)

Budke JM. 2019. The moss calyptra: A maternal structure influencing offspring development. *The Bryologist* 122: 471-491. (Featured on the cover: Volume 122, Issue 3.)

Budke JM, Bernard EC, Gray DJ, Huttunen S, Piechulla B, Trigiano RN. 2018. Introduction to the Special Issue on Bryophytes. *Critical Reviews in Plant Sciences* 37:102-112.

Budke JM, Goffinet B. 2016. Comparative cuticle development reveals taller sporophytes are covered by thicker calyptra cuticles in mosses. *Frontiers in Plant Science* 7: 832.

Busta L, **Budke JM**, Jetter R. 2016a. The moss *Funaria hygrometrica* has cuticular wax similar to vascular plants, with distinct composition on leafy gametophyte, calyptra and sporophyte capsule surfaces. *Annals of Botany* 118: 511-522.

Budke JM, Goffinet B, Jones CS. 2013. Dehydration protection provided by a maternal cuticle improves offspring fitness in the moss *Funaria hygrometrica*. *Annals of Botany* 111: 781-789.

Wynne MA*, **Budke JM.** 2012. Examining the ability of calyptrae to produce protonema in *Funaria hygrometrica*. *Evansia* 29: 61-64.

Budke JM, Goffinet B, Jones CS. 2012. The cuticle on the gametophyte calyptra matures before the sporophyte cuticle in the moss *Funaria hygrometrica* (Funariaceae). *American Journal of Botany* 99: 14-22. (Winner of the 2013 Grady L. Webster Publication Award.)

Liu Y, **Budke JM**, Goffinet B. 2012. Phylogenetic inference rejects sporophyte based classification of the Funariaceae (Bryophyta): rapid radiation suggests rampant homoplasy in sporophyte evolution. *Molecular Phylogenetics and Evolution* 62: 130-145.

Budke JM, Goffinet B, Jones CS. 2011. A hundred-year-old question: is the moss calyptra

covered by a cuticle? A case study of *Funaria hygrometrica*. *Annals of Botany* 107: 1259-1277.

Kirsten Coe
United States of America

Born and raised in West Baltimore (Maryland, USA), I was originally exposed to botany in the context of an urban trail system near my house as well as an Ecology class taught at my Quaker elementary school. My interest in bryology, however, was piqued when I was fortunate to be a student of Robin Wall Kimmerer (SUNY ESF), from whom I took the course 'The Ecology of Mosses' and with whom I worked on my first research project as an undergraduate: examining microhabitat partitioning of *Anomodon* species on limestone outcrops. I was immediately drawn to the micro-world of bryophytes and struck by how much there was still to be learned about their ecology. Simultaneously, among the most memorable travels of my formative years were to the Southwestern U.S., where I was captivated by desert landscapes and dryland indigenous cultures. Towards the end of my time as an undergraduate and over a two-year period before I began graduate school, I worked and traveled in the drylands of South Africa, Namibia, and Botswana, and found myself constantly in awe of their biological diversity, ecology, and beauty. The smell of African desert soil after a rain is like nothing else in this world.

My passions for bryology and dryland ecology converged in my Ph.D. program at Cornell University (New York), where, working in Jed Sparks' ecophysiology and biogeochemistry lab, I examined dryland biocrust moss physiological responses to global change. In collaboration with Jayne Belnap, Sasha Reed, and the US Geological Survey "crust lab" in Moab, Utah, I discovered that certain precipitation projections (specifically, smaller rainfall events occurring during the summer months) cause *Syntrichia* mosses to enter carbon deficit and ultimately suffer mortality, on rapid (<6 month) timescales. Scaling up these responses to represent climate scenarios for the Western U.S. revealed that most projections of increased drought and/or reduced precipitation for the coming century will negatively influence biocrust moss functioning and survival. As *Syntrichia* is a keystone biocrust organism, we also found that loss of moss from the crust community is likely to fundamentally alter dryland carbon and nitrogen cycling.

My postdoctoral appointments took me first to the Alaskan tundra, and then to temperate forests and peatlands of the Northeastern U.S. In each of these environments, I continued to pursue a broad interest in bryophyte ecophysiology and feedbacks to ecosystem function. I am currently an Assistant Professor at Middlebury College in Vermont, where my work in bryology follows two main themes: (1) Ecophysiology of desiccation tolerance in the dryland moss clade *Syntrichia* (3dmoss.berkeley.edu)*;* and (2) Bryophyte-cyanobacteria symbioses in temperate systems as drivers of nitrogen cycling. Finally, I am engaging in ongoing work to build a framework of

bryophyte functional traits with my dear friends and colleagues Mandy Slate, Daniel Stanton, and Ben Carter. Woven through all of my research efforts is an ever-evolving commitment to decolonial research methodology and respect for indigenous ways of knowing.

Being a bryologist is to be constantly learning, and to be consistently in awe. The most rewarding aspects of my work lie with the people with whom I get to learn, and the incredible landscapes we get to explore together.

List of selected publications:

Antoninka, A., Chuckran, P.F., Mau, R.L., Slate, M.L., Mishler, B.D., Oliver, M.J., **Coe, K.K.**, Stark, L.R., Fisher, K.M. and Bowker, M., (2022) Responses of biocrust and associated soil bacteria to novel climates are not tightly coupled. *Frontiers in Microbiology 13:821860* (link)

Stanton, D. and **Coe, K.K.** (2021) 500 million years of charted territory: Functional ecological traits in bryophytes. *Bryophyte Diversity and Evolution 43(1): 234-252* (link)

Carvajal Janke, N. and **Coe, K.K.** (2021) Evidence for a fungal loop in shrublands. *Journal of Ecology 109(4): 1842-1857* (link)

Silva, A.T., Gao, B., Fisher, K.M., Mishler, B.D., Ekwealor, J.T.B., Stark, L.R., Li, X., Zhang, D., Bowker, M.A., Brinda, J.C., **Coe, K.K.**, Oliver, M. (2020) To dry perchance to live: insights from the genome of the desiccation-tolerant biocrust moss *Syntrichia caninervis*. *The Plant Journal*. (link)

Slate, M., Brinda, J., **Coe, K.K.**, Greenwood, J. and Stark, L. R. (2020) Prehydration mitigates damage accrued from prolonged periods of desiccation in cultured shoot apices of *Syntrichia ruralis*. *Journal of Bryology.* 18: 1-12 (link)

Coe, K.K., Greenwood, J., Slate, M., Clark, T, Brinda, J., Fisher, K., Mishler, B., Bowker, M., Oliver, M., Ebrahimi, S., and Stark, L.R. (2020) Strategies of desiccation tolerance vary across life phases in the moss *Syntrichia caninervis*. *American Journal of Botany*. 108(2): 1-14 (link)

Coe, K.K., Howard, N., Slate, M., Butler, R., Greenwood, J., Bowker, M., Mishler, B., and Stark, L. (2019) Morphological and physiological traits in relation to carbon balance in a diverse clade of dryland mosses. *Plant, Cell, and Environment.* 42(11): 3140-3151 (link)

Deane-Coe, K.K. & Sparks, J. P. (2016) Cyanobacteria associations in temperate forest bryophytes revealed by $\delta^{15}N$ analysis. *Journal of the Torrey Botanical Society* 143(1): 50-57 (link)

Deane-Coe, K.K., Mauritz, M., Celis, G., Natali, S., Salmon, V., Crummer, K.G. & Schuur, E.A.G. (2015) Experimental warming alters productivity and isotopic signatures of tundra mosses. *Ecosystems* 18(6): 1070-1082 (link)

Coe, K.K. & Sparks, J. (2014) Physiology-based prognostic modeling of the influence of changes in precipitation on a keystone dryland plant species**.** *Oecologia* 176(4) 933-942 (link)

*Reed, S., ***Coe, K.K.,** Sparks, J., Zelikova, T.J., and Belnap, J. (2012) Changes to dryland rainfall result in rapid moss mortality and altered soil fertility**.** *Nature Climate Change 2:752-755* *dual 1st authorship (link)

Coe, K.K., Belnap, J. & Sparks, J. (2012). Precipitation-driven carbon balance controls survivorship of desert biocrust mosses. *Ecology* 93(7): 1626-1636 (link)

Jenna Ekwealor
United States of America

I have always been a friend to the small and unappreciated.
My mother likes to tell stories of how when I was a kid, we'd go into a toy store for some special occasion, where she would tell my brother and I we could each pick one toy. My brother would take his time, weighing the pros and cons of each choice until he found the perfect one. I, on the other hand, would march straight to the nature-themed section and confidently select a large, rubber insect. I have some memories like this. It's not that I was particularly interested in insects, per se, I think I just felt like someone had to befriend the ones that so frequently were ignored.

I was born in San Jose, California, but I grew up in the middle of the United States. No great mountains or exciting deserts there, but one thing we can boast about is the abundance of fireflies in the summer, or, as locals called them: lightning bugs. Kids used to squish them onto their shirt to have a glowing smear for a few minutes. In retrospect, that's fascinating biochemistry! But at the time, I protested and stood up for the bugs. So, although I had never paid much attention to mosses before graduate school (and perhaps it's precisely because I had neglected mosses my whole life that I became interested in them), it's not out of character for me to become infatuated with and an ambassador for these small, strange, frequently unappreciated and unassuming plants.

I became interested in bryophytes under the mentorship of Dr. Kirsten Fisher. Kirsten introduced me to mosses that live in the Mojave Desert and from that moment on, I was captivated. These mosses are the toughest of tough: they live through long, hot, and very dry summers and cold, even snowy, winters. They dry out completely and shut down when water is unavailable, baking in the sun, waiting for as long as it takes. When it rains again, these plants quickly open their leaves (a process that resembles a time lapse video of a blooming flower) and get to work immediately. They can live for hundreds of years, cloning into identical copies of themselves. In fact, all mosses can dry out (as they don't have roots or sophisticated water storage capabilities), desert mosses can just endure drier conditions and recover a bit faster. Strange as it may sound, I find these small, resilient organisms inspiring.

I now consider myself somewhat of a moss evangelist. The thing I love to share most about studying bryophytes is the way it transforms the way you see the world. In most places (even deserts!) mosses are everywhere yet most people don't notice them. Once you do, however, you

see so much more than you did before! Seeing bryophytes allows you to appreciate a whole new world right in front of your eyes, in and amongst the world you thought you knew so well.

Jenna is currently a Biodiversity Genomics Postdoctoral Fellow in the Smithsonian Institution's Data Science Lab where she is studying evolutionary history of *Syntrichia*. She earned her PhD from University of California, Berkeley, Department of Integrative Biology in 2020, studying ultraviolet radiation and desiccation tolerance in Mojave Desert *Syntrichia* mosses; a Master of Science in Environmental Science, Biology Option, from California State University, Los Angeles, in 2015, where she studied life history and population genetics in Mojave *Syntrichia caninervis*; a Bachelor of Science in Biology from Purdue University, Indianapolis, in 2012; and a Bachelor of Arts in Religious Studies from Indiana University, Indianapolis, in 2012.

List of selected publications:

Ekwealor, JTB, SD Benjamin, JZ Jomsky, MA Bowker, LR Stark, DN McLetchie, BD Mishler, and KM Fisher. Genotypic confirmation of a biased phenotypic sex ratio in a dryland moss using a novel RFLP technique. Accepted in *Applications in Plant Sciences.*

Ekwealor, JTB and BD Mishler. The transcriptomic effects of acute ultraviolet radiation exposure on two *Syntrichia* mosses. *Frontiers in Plant Science* (2021), DOI: 10.3389/fpls.2021.752913.

Ekwealor, JTB, TA Clark, O Dautermann, A Russell, S Ebrahimi, LR Stark, KK Niyogi, and BD Mishler. Natural ultraviolet radiation exposure alters photosynthetic biology and improves recovery from desiccation in a desert moss. *Journal of Experimental Botany* (2021), DOI: 10.1093/jxb/erab051.

Silva, Anderson T., B Gao, KM Fisher, BD Mishler, **JTB Ekwealor**, LR Stark, X Li, D Zhang, MA Bowker, JC Brinda, KK Coe, and MJ Oliver. To dry perchance to live: insights from the genome of the desiccation-tolerant biocrust moss *Syntrichia caninervis*. *The Plant Journal* (2020), DOI: 10.1111/tpj.15116.

Ekwealor, JTB and KM Fisher. Life under quartz: Hypolithic mosses in the Mojave Desert. *PLOS ONE* 15(7): e0235928 (2020), DOI: 10.1371/journal.pone.0235928.
Press & Interviews: UCB Press Release, Smithsonian Magazine, The Guardian, The New York Times: Trilobites, Science Friday, WTF, Biology?, Scientific American, Scienmag Science Magazine, Phys.org, EurekAlert!, полит Pro Science, Wissenschaft.de.

Ekwealor, JTB, AC Payton, AE Paasch, KM Fisher, and SF McDaniel. Multiple factors influence population sex ratios in the Mojave Desert moss *Syntrichia caninervis*. *American Journal of Botany* 104(5):1-10 (2017), DOI: 10.3732/ajb.1700045.

Meijome, Tomás E.*****, **JTB Ekwealor***, RA Hooker Y Cheng, WA Ciovacco, SA Balamohan, TL Srinivasan, BR Chitteti, PP Eleniste, MC Horowitz, EF Srour, A Bruzzaniti, RK Fuchs, and MA Kacena. C-Mpl is expressed on osteoblasts and osteoclasts and is important in regulating skeletal homeostasis. *Journal of Cellular Biochemistry* 117:959-969 (2016), DOI: 10.1002/jcb.25380.

Eleniste, Pierre P., V Patel, S Posritong, O Zero, H Largura, Y Cheng, ER Himes, M Hamilton, **JTB Ekwealor**, MA Kacena, and A Bruzzaniti. Pyk2 and megakaryocytes regulate osteoblast differentiation and migration via distinct and overlapping mechanisms. *Journal of Cellular Biochemistry* 9999:1-11 (2015), DOI: 10.1002/jcb.25430.

Virginia Freire
United States of America

From the Guatemalan cloud forest to the Hawaiian rain forest, my professional journey as a bryologist has been an interesting one. My research interest was not always bryophytes, I started as an ethnobotanist in the coasts and highlands of my beautiful homeland, Guatemala. I was granted a Fulbright scholarship, that allowed me to complete a MSc. in Molecular Biology, genetically modifying coffee, at Southern Illinois University, Carbondale, Illinois. I soon had a change of heart when realizing the negative economic impact of genetically modified crops on the small farmers of third world countries like Guatemala. That lead me to explore Molecular Systematics of vascular plants, but quickly realized studying plants, rather than only DNA, was the most enjoyable part of my day. I was fortunate to be at SIU, where one of the last remaining Plant Biology Departments in the Nation had a rare congregation of Bryologists. Drs. Barbara Crandall-Stotler and Raymond Stotler took me as a PhD. student and introduced me to the fascinating world of liverworts. I owe much to their excellence, high standards and patient guidance.

I was hired as a Professor in Bryology and Plant Morphology at University of Wisconsin, Stevens Point in 1999. I became Associate then Full Professor and then Emerita at retirement in 2019. My major contribution to bryophytes during those years were the curation of the Bryophyte Collection at the UWSP Robert Freckmann Herbarium; the mentoring of numerous students on bryology related undergraduate research projects; teaching the only Bryology and Lichenology course in the Midwest at that time and teaching a workshop on Bryophytes at the Milwaukee Field Station, a unique opportunity for participants from Illinois, Minnesota, and Wisconsin.

My unexpected stay in Guatemala in 2003 and 2004, lead to the first study of liverworts in Guatemala. The study took place in the Cloud Forest and three Guatemalan undergraduate students joined me in field and laboratory work as research assistants. Two of them completed their undergraduate thesis on bryophytes. One is now back in Guatemala after obtaining a MSc and PhD in Bryology from Puerto Rico. The third student is now a Biologist in Guatemala, with interest in mosses. The study produced a publication. However, due to immigration issues, I did not have access to the specimens after returning from Guatemala to the US in 2005. Many remain unnamed or in need of further study.

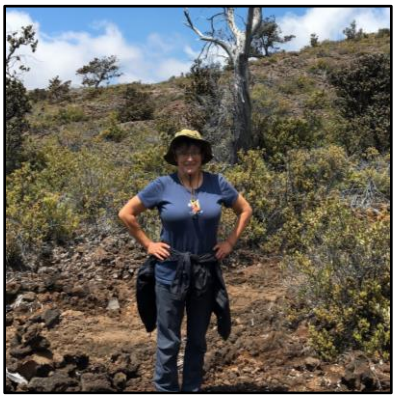
Looking back at my career as a professor in the United States, I realize how much I enjoyed teaching and getting students interested in plants, especially bryophytes and ethnobotany. However, I also realize how intense the teaching and workload was at UWSP. On top of an already very

heavy load, I took a voluntary unpaid overload to be able to introduce a new practical course in Ethnobotany to our curriculum. This course was always a student's favorite. A good part of my time was also consumed mentoring undergraduate research and directing the Ethnobotany minor that was also my creation and a success. This satisfying but overwhelming academic schedule led to my early retirement. With my husband Emmet, we did bryological work in Wisconsin and after my retirement decided to move to Hawai'i, where we are contributing to the study of liverworts of this beautiful State.

El estudio de hepáticas ha sido una experiencia fascinante que me ha transportado del bosque nuboso de Guatemala hasta el bosque lluvioso de Hawai'i. Empecé mi vida profesional como etnobotánica, investigando plantas medicinales y árboles de usos múltiples en las costas y montañas de mi bella Guatemala. Al gaduarme, como Licenciada en Biología de la Universidad de San Carlos de Guatemala (USAC), obtuve una beca Fulbright que me permitió completar una maestría en Biología Molecular de Plantas, en Southern Illinois University, Carbondale, Illinois (SIU). Mi tópico de tesis fue la transformación genética del café (*Coffea arabica*). Este trabajo fue interesante pero mi enfoque científico cambió al asistir a una plática filosófica, en la que se explicó el impacto económico negativo de los cultivos modificados genéticamente en los productores menores de países del tercer mundo, como Guatemala. Por razones éticas personales, no pude continuar en esta línea de trabajo. Decidí explorar la Sistemática Molecular, estudiando plantas parasíticas. Después de dos semestres de doctorado, reconocí que el trabajo con ADN no era tan satisfactorio como el tiempo invertido en el montaje de especímenes para el herbario. Comprendí que quería estudiar y entender la morfología y taxonomía de plantas como organismos, con un énfasis menor en estudios moleculares. Fui muy afortunada de estar en SIU, donde uno de los pocos Departamentos de Botánica restantes en los Estados Unidos, aún existe. Este Departamento tenía una congregación poco común de Briólogos. Los Doctores Barbara Crandall-Stotler y Raymond Stotler me ofrecieron una candidatura a su programa doctoral, estudiando hepáticas; específicamente, el género *Fossombronia* en América Latina. A ellos debo mucho por introducirme al mundo fascinante de las briofitas, por su excelencia académica, por sus estrictos estándares, y por su paciencia y apoyo.

En 1999, fui contratada como profesora de Botánica, en la Universidad de Wisconsin en Stevens Point, WI (UWSP). Mi título oficial fue el de Profesora de Briología y de Morfología Vegetal, pero también di clases de etnobotánica, horticultura, introducción a botánica y seminarios en varios tópicos. Pasé por todas las promociones de una Carrera académica en los Estados Unidos, de profesora asistente, a profesora asociada, a profesora (tenured), y hasta profesora emérita a mi jubilación, en el 2019. Mis mayores contribuciones a la briología durante mi carrera académica fueron: mi trabajo como curadora de la colección de briofitas del herbario "Robert W. Freckmann"

de UWSP; el asesoramiento de varios proyectos de investigación en briofitas; el impartir el único curso en briofitas y líquenes en el área central de los Estados Unidos; el impartir un taller de briofitas en Milwaukee Field Station, oportunidad única para participantes de Illinois, Minnesota y Wisconsin.



Mi permanencia inesperada en Guatemala en 2003-2004, resultó en el primer estudio de hepáticas en Guatemala. Este estudio se llevó a cabo en el Bosque Nuboso del Biotopo Universitario para la Conservación del Quetzal y fue financiado por la Dirección General de Investigación de la USAC. Esta investigación produjo un artículo científico en el Journal of Tropical Bryology, sin embargo, debido a dificultades con inmigración, no tuve acceso a los especímenes colectados después de mi retorno a los Estados Unidos en el 2005. Como consecuencia, varios especímenes no han sido identificados o necesitan corroboración. Tuve como asistentes de investigación a tres estudiantes de Biología de la Universidad de San Carlos. Dos de ellos, Mervin Pérez y Felipe Ramírez, continuaron el estudio de briofitas de Guatemala en su trabajo de tesis. Uno de ellos, Mervin, obtuvo maestría y doctorado en briofitas en Puerto Rico y ha retornado a Guatemala. La tercera estudiante, María Victoria Ríos, ha trabajado en musgos de Guatemala.

Analizando mi Carrera como profesora en los Estados Unidos, me doy cuenta de lo mucho que disfruté dar clases, e interesar a mis estudiantes en el estudio de plantas, especialmente briofitas y etnobotánica. Sin embargo, estoy consciente de la muy intensa carga de trabajo que tuve. En adición a un horario pesado de clases y laboratorios; tomé horas extra, sin remuneración, para poder introducir un curso práctico en Etnobotánica. Este curso fue siempre un favorito de nuestros estudiantes continúa siendo impartido hasta este día. Una buena parte de mi tiempo fue consumida en la asesoría de proyectos de investigación y en la creación de un área de énfasis en Etnobotánica y un jardín etnobotánico en nuestro campus. Mi trabajo, aunque satisfactorio fue muy intenso, resultando en mi jubilación prematura. Con mi esposo, Emmet, trabajamos en briofitas de Wisconsin y publicamos dos artículos científicos después de mi jubilación. En el 2019 nos mudamos a Hawaii, donde estamos contribuyendo al estudio de hepáticas de este bello lugar.

List of selected publications:

Freire, A.V., F.D. Bowers & E.J. Judziewicz. 2020. Bryophytes of Butternut Pines, Oconto County, Wisconsin. The Great Lakes Botanist 59: 178-190.

Freire, A.V., T. Route and E.J. Judziewicz. 2019. Bryophytes of St. Martin Island, Delta County,

Michigan. The Great Lakes Botanist 58: 201-209.
Freire, A. V., F. Ramirez & M. Perez. 2013. Liverworts from the Cloud Forest of Guatemala. Journal of Tropical Bryology. 35:1-13.
Freire, A. V., M. E. Perez and F. Ramirez. 2011. Biodiversidad de hepaticas y antoceradas de Guatemala. In: Biodiversidad en Guatemala Vol. II. E. Cano (Ed.). Universidad del Valle de Guatemala Press.
Milner, M., I. Sharma, **V. Freire** & D. C. Cargill. 2011. Spore ornamentation patterns and species delimitations within Australian *Fossombronia* Raddi (Fossombroniaceae) populations. The Bryologist 114(1):128-141.
Freire, A. V. & R. E. Stotler. 2007. Typifications of Latin American species in the genus *Fossombronia* (Marchantiophyta). The Bryologist 110(4).
Freire, V. Biodiversidad de Hepaticas en Guatemala. 2006. In: Biodiversidad en Guatemala. E. Cano, ed. Universidad del Valle de Guatemala Press.
Freire V., F. & N. Salazar-Allen. 2006. Diversidad de las Briofitas en Guatemala: Introduccion a las briofitas. In: Biodiversidad en Guatemala. E. Cano, ed. Universidad del Valle de Guatemala Press.
Freire, V., F. Ramirez & M. Perez. 2005. Distribucion de las hepaticas presentes en el sendero interpretativo "los musgos" del Biotopo Universitario para la Conservacion del Quetzal, Mario Dary Rivera, Purulha, Baja Verapaz, Guatemala. Revista Cientifica de la Direccion General de Investigacion, Universidad de San Carlos de Guatemala.
Crandall-Stotler, B. R. Stotler and **V. Freire**. 1999. On the status of *Austrofossombronia peruviana* (Gottsche & Hampe) R.M. Schust. Ex Stotler, Stotl.-Crand & A.V. Freire (Fossombroniineae, Marchantiophyta). Haussknechtia Beiheft 9 (Riclef-Grolle-Festschrift):67-78.

Janice Glime
United States of America

I began my bryological journey in Maryland in the eastern United States. As an undergraduate I was disappointed that none of the professors of botany could answer my questions about bryophytes or help me identify them. When I began my Master's degree, I intended to tackle the flora at the Girl Scout camp where I served as nature counselor in the summer, but I soon became much more interested in the bryophytes than in the flowering plants and ferns. I had always liked little things, revelling in miniature trains and doll houses and miniature Christmas villages.

But other factors soon became important as well. I don't like the pressure of competition and biochemistry was just coming into its own as a very competitive field, needing to be the first to describe some pathway. That wasn't for me. As a Master's candidate at West Virginia University, I made friends with another grad student who was working on aquatic insects. I eagerly accepted her invitation to join her on her field trips because I had always loved streams. I discovered a whole new world of insects that lived among the mosses in the stream and soon found out that at that time little was published about them. After contacting a number of potential Ph. D. advisors, I found William Drew at Michigan State University who was willing to advise an interdisciplinary project. And by then I knew I loved teaching college students. My committee members represented bryology, aquatic entomology, plant ecology, limnology, invertebrate biology, and phycology.

When I finished my degree, I began teaching college in New Hampshire, where rocky streams were ideal habitats for aquatic mosses, especially species of *Fontinalis*. I experimented with these plants, looking for their limits of tolerance. One of my friends asked why, if I liked *Fontinalis* so much, was I always trying to kill it? But my general skills in bryophyte taxonomy were poor. I knew the eastern acid stream species, but not much else. I tried, but I had only Conard's How to Know the Mosses and Liverworts book, and Jennings book on mosses of Pennsylvania that relied heavily on sporophytes that I usually did not have. I had no herbarium available to me, and I had never had a course on bryophyte taxonomy. I never taught a course on bryophytes, and I was discouraged by my lack of ability to verify it when I did identify something.

After five years I moved to the Upper Peninsula of Michigan and everything changed. Howard Crum had just published the first edition of The Mosses of the Great Lakes Forest. The department had a bryophyte herbarium, largely courtesy of Bill Steere, and Bob Linn was in the department as a Park Service Scientist and an interest in bryophytes.

The very best boost to my career as a bryophyte ecologist came when Nancy Slack invited me to the first Andrews Foray. I learned so many bryophytes on that trip and made good contacts that I finally felt I had the tools to become a real bryologist. I could explore other habitats and not restrict myself to the limited species of acid streams.

Two of my favorite memories, ones that kept me going, were finding that it was okay to be wrong, especially in the field. First, Bill Steere was arguing with another bryologist over the identity of a moss. Then, Richard Zander was elaborating on how to recognize *Barbula* species. I picked up one that he had pointed to, looked at it with my hand lens, and asked how can I tell it from *Ceratodon*? He looked at it, threw it on the ground, and said it **is** *Ceratodon*. I figured if the experts could make mistakes, it was okay for me to make some as well. So, this time, with a few more forays under my belt, I finally considered myself a bryologist, teaching it and advising graduate students. I am not a systematist. I am a bryophyte ecologist. And that often means I can't ignore the scruffy little bits that don't seem to fit the keys.

I love going to a variety of interesting habitats, joining other bryologists who share their experiences and interesting stories, and contributing to our knowledge of the many roles these organisms bring to the ecosystem. I think the most valuable aspect of my bryological journey is that the bryologists have always been so helpful. I never felt competition, only helpful comments. There is no other career path I would even consider!

Annie Martin
United States of America

I am a mosser. Known to most folks as Mossin' Annie, I have been fascinated with mosses since childhood. Today, my life's passion is advocating and promoting bryophytes (mosses) as viable horticultural choices in today's landscapes. I wear many hats - moss rescuer, small business owner of a Mossery (moss nursery) and online Moss Shop, licensed landscape contractor, site design consultant, public educator, social influencer, published author and quasi-bryologist. Most importantly, I have embraced my destiny as a moss artist creating enticing moss landscapes and features that resolve environmental challenges and provide year-round green appeal. My ultimate goal is design and install moss gardens myself and to facilitate the process for other DIY moss enthusiasts. While I teach that it is important to choose appropriate species for the target location and to follow best practices for planting and maintenance, I emphasize the significant component of infusing good spirit energy into the process and connecting with the natural environment. As part of my educational outreach, I have written a book to share my expertise in moss gardening, *The Magical World of Moss Gardening* (Timber Press, 2015 – translated into Japanese, 2017). Every single day, mosses consume my being. Life is good as a mosser.

Early Background and Education

Blessed to be born in the mountains of western North Carolina, US, I discovered mosses at an early age while hiking and camping with my family. The plant diversity in my region is outstanding and ranks among the best in the world. The Appalachian Mountain range (including the Blue Ridge Mountains and Great Smoky Mountains) are among the oldest. The French Broad River is an ancient river with the distinction that it runs North. The headwaters are near where I live now in Pisgah Forest, NC and the river traverses up to Asheville, NC (my hometown) through Tennessee until it reaches the mighty Mississippi River. I'll add another impressive aspect to my locale, Transylvania County, NC (and adjacent Jackson County) has the highest annual rainfall east of the Rocky Mountains. I live in a temperate rain forest with all four seasons. In the winter, we can experience snowfall of 6" to 18" deep, but luckily, it always melts within a few days or a couple of weeks.

At age 10, during the 1960s terrarium craze, I created my first moss terrarium for my pet anole, Oscar. I continued to make and share my terrarium creations with family and friends. I frolicked in the Kenilworth neighborhood splash pool that was only a few sites away from one of the most impressive moss gardens in the US. It was intentionally planted with a variety of bryophytes in the 1960s by Doan Ogden, a landscape designer. Little did I realize that my moss destiny was just

down the street. In my early 20s, I started to enhance "forest driftwood" with mosses. Like many people, I just knew that I liked "moss" and clumped all species into that vague general category. I attended the University of North Carolina at Charlotte (B.A., 1976) as an undergraduate where my studies were focused on sociological research methodologies. I obtained my master's degree in media production from Appalachian State University in Boone, NC (M.A., 1982). During this phase of my life, my interests were studying Appalachian culture and developing media skills.

IAB Thanks

Without a formal education in bryology, I am appreciative of the knowledge gained from IAB members, especially Dr. Janice Glime. Many of the photographs of moss gardens around the world featured in my book were generously shared with me by Bryonetters. Additionally, I am thankful for the friendship of Dr. Joseph Rohrer, co-author of the *Princeton Field Guide -- Common Mosses of Northeast and Appalachians*. Books authored by IAB professors are among the most-used references in my personal bryology library. When wearing my "bryology hat," I discourage the use of common names referring to species using scientific nomenclature along with basic descriptive terminology in my efforts to bridge the knowledge gap between the general public and the scientific community. It's a challenge to interpret terminology and research findings into verbiage that a typical gardener can understand.

Moss Rescues – Motivating Factor

Rescuing mosses is a primary focus of my time. These mountains are not only a popular tourist destination but a highly-desired retirement location. I have watched "economic development" occur my entire life. Huge swaths of forest lands have been converted into high-income resort communities. Landscapers try to kill mosses growing in grass lawns or cover them up with mulch and pine needle dressings. Roofers destroy mosses when replacing shingles. Maintenance crews are obsessed with pressure-washing mosses from parking lots and sidewalks. Department of Transportation (DOT) crews regularly mow roadsides eliminating mature, impressive colonies. So, I approach property owners with brazen requests to rescue mosses before the destruction happens. Most of the time, my target rescues are the result of my moss radar – I spy with my little moss eye! As the word of my effort spreads, homeowners now contact me with moss rescue opportunities, too. I carry a $1 million liability insurance policy as reassurance to property owners. Also, I practice Southern politeness by leaving the rescue site clean, properly thanking people and sometimes even baking "thank you" cookies.

As mentioned above, there are plenty of places where mosses are subject to destruction. In fact, I experience major angst when I miss out rescuing mosses due to a time-driven deadline. I want all mosses in danger to be relocated to a new home where they will be appreciated. Please know that in my lectures, I admonish any "stealing" or "poaching" from our national, state, and local forests and parks. Ethical principles and quality standards are maintained throughout all aspects of my

business operations, services, and products. I adhere to all USDA and US Forest Service regulations regarding the acquisition and distribution of moss plants.

MY MOSS JOURNEY as a Professional Landscaper and Dedicated Advocate

Driven by the compulsion to rescue mosses, and the desire to create moss landscapes, my "official" moss journey began in 2008. I established Mountain Moss Enterprises offering a full range of professional services and quality moss products. I decided to quit my job and boldly follow my dream. Start-up was a slow process given the economic depression but I was determined not to give up. Over a decade later, I can report that my small business has survived, and I have attained recognition as a moss gardening expert.

My passion is to create magic with mosses in my innovative landscaping projects! I so enjoy using the intended planting space as my canvas and an array of moss trays and mats as my paint. The process of envisioning an enchanting design invigorates my spirit as I incorporate a variety of textures, shapes, and shades of green (with golden overtones) with consideration of anticipated colorful sporophytic displays. Immediate gratification is way better than waiting for mosses to grow in. One of my favorite projects was transforming my own asphalt driveway into a serene moss retreat in the dead of winter some twelve years ago. It is still magnificent.

Educational Outreach

My public educational outreach has included hundreds of in-person lectures and workshops reaching thousands of moss lovers. I have been privileged to present programs for botanical gardens (i.e., US Botanic Garden, Washington, DC and the Atlanta Botanical Garden in Atlanta, GA), native plant societies, numerous garden clubs, environmental organizations, and master gardener groups. Recently, I've added Zoom lectures to my offerings. To further promote mosses, I have a Facebook group, Go Green with Moss, with 6000 members in our world-wide moss village. Additionally, I have a YouTube channel with instructional videos. Other social media efforts include Instagram, Twitter, Pinterest, and LinkedIn.

Implications for Further Research

It is a definite disadvantage that I lack any scientific training or academic studies in bryology. There is an apparent void that exists between the academic study of bryology and horticulture. I have an extensive list of research topics that I wish would be addressed by bryological researchers in collaboration with horticultural colleagues. I receive multiple emails every week from aspiring moss gardeners; at this point, I can only provide common sense answers based upon years of experience not documented research with validated results. In the hope that one of the readers will want to pursue new avenues in bryological research, I'm taking this opportunity to mention this

issue. Bryophyte specific practical cultivation methods would help build the body of knowledge desired by moss gardeners, (i.e., Beneficial nutrients for specific species and the identification of pathogens or diseases that can negatively impact positive growth). I am curious about other phenomena that I've encountered such as why *Climacium americanum* occasionally has intense orange leaf tips or what triggers *Hedwigia ciliata* to shift towards a cantaloupe color then back again to green. As a mosser, I'm more like a "fly on the wall" gleaning pertinent content from research discussions on Bryonet.

My experiential research has been based on direct observations of selected moss species exposed to a variety of environmental conditions and horticultural circumstances over a period of years not the rigorous standards and control of variables expected using scientific methodologies. Since I find written record-keeping to be tedious, in this aspect, I don't even rate as a quasi-bryologist. For instance, while I've determined there are better ways to grow mosses than to waste your time with a "moss milkshake," I did make an effort to test the concept with certain variables in terms of species, substrate, and "glue" medium creating a system of notecards for documentation of results. On the first try, the mixture washed away in the rain. On the 2nd effort, I controlled the weather variable by placing the items under a carport. Unfortunately, my dog liked the taste of the milkshake. Amazingly, the manufactured stone yielded the best results with all species. In 2010, I was a recipient of a Western North Carolina Agricultural Options grant (NC Tobacco Trust Fund). My "quasi" conclusion was that Entodon seductrix exhibited the best growth and fastest attachment to all substrates. I had theorized that Thuidium delicatulum would rank as best.

Media Accomplishments, Publications and Professional Affiliations

I have authored numerous articles for magazines. However, the majority of my publications have been written by other writers who have interviewed me, and that I have contributed photographs to illustrate content. My publications and media accomplishments lists are too long to cite so I'll mention only a few. I'm excited to share that the *Mother Earth News* magazine (Oct/Nov 2022 issue) has a wonderful story written by Atlanta freelance writer, Tom Oder. I've been featured in newspaper articles from *The New York Times* to the *Asheville Citizen-Times* (my hometown newspaper). In terms of other media, I've been interviewed for radio shows, podcasts, and webinars. Being on both *The Native Plant Podcast* and *Growing a Greener World Podcast* have been hallmark achievements of my mossin' career. My professional affiliations include these memberships: International Association of Bryologists, American Bryological and Lichenological Society, Garden Communicators organization and the NC Native Plant Society.

Final Thoughts

While most of my contemporaries are retired, as a mosser, I work long hours…and sometimes it's really hard work. If I could change any aspect of my life, I would begin my serious moss journey much earlier. I still have so much to learn…to create…and to share. I will keep on mossin'…I hope you will, too.

Morghan McCool
United States of America

I was born in Monterey, California but was born into a military family. This lifestyle doomed me to live a sporadic life bouncing between states for 18 years. Regardless of the city or state in which I found myself, the one thing that remained constant was nature. Wherever I went, there was always something new that the area of my previous home did not have. My ability to perceive the intricacies of nature around me was, without a doubt, fostered by my father. He often would take me on hikes and nature walks, an interest shared only between my father and me. However, despite this, I was certain that I would become a medical doctor, just like my father.

When I graduated high school, I enrolled at the University of Louisville due to the school's prolific medical program. However, it only took 2 semesters for me to change my mind and pivot into the ecology program. I completed my Bachelor of Science in Biology with a track in ecology. During my undergrad, I conducted research on tradeoffs between sexual and asexual reproduction in dioicous mosses. My undergraduate education did a tremendous job at nurturing my blooming passion for botany and conservation; passions that persist more and more each day.

I chose to continue my graduate education at the University of Louisville because of my incredible advisor and the unique opportunity that Kentucky's geology offers. My graduate research has blended karst geology and bryology. My primary project is investigating the effects of anthropogenic disturbance on bryophyte community assembly at karst cave entrances. Cave entrances have a unique ability to moderate the microclimate of the corresponding ecotone. I theorize that these entrances may serve as "habitat islands"; locations where species retreat once their original habitat has become intolerable. In addition, karst caves are incredibly delicate, and I am increasingly fascinated with their ability to withstand stress and disturbances. I wonder what role the cave entrance habitat island plays in that tolerance. In addition to the ecosystem ecology of bryophytes, I am also interested in the foliar fungal endophytes of bryophytes and what role those fungi play in their ecology.

Outside of academics, I am a part-time tutor and teacher for students with learning disabilities and differences. My hobbies include hiking, crocheting, reading, and making collages. I am an avid user of iNaturalist and am often taking photos of what might be trivial organisms but are incredibly interesting to observe! I often find a story of Constantine Rafinesque echoing in my mind; one in which Rafinesque was observed with his eyes fixed on the ground, constantly in search of new plants and animals. I, too, find myself staring at the ground in awe at the majesty of Earth. In the future, I would be interested in investigating the reliability of iNaturalist in citizen science bryology and the position of bryology in modern education.

Mandy Slate
United States of America

I grew up in the lush green hills of Tennessee but wasn't interested in plants until I moved to the temperate rainforests of Western Oregon where plants quickly consumed me. Ironically, I still didn't notice the lush mosses within these forests until after moving to Portland, OR to start college. I was extremely fortunate that my biology instructor, April Fong, from the local community college saw a direction and drive in me that I couldn't even imagine at that point in my life. April suggested that I contact Sarah Eppley and Todd Rosenstiel at Portland State University once I transferred to ask about gaining some research experience just in case, I ever wanted to go to grad school.

Research in the Eppley-Rosenstiel lab focuses on the physiology and ecology of mosses, topics which continue to consume my research interests. Just in case I wasn't hooked, April also introduced me to SoBeFree, an annual west coast bryophyte foray. SoBeFree is very welcoming, and everyone made me feel like a part of the community well before I knew a thing about mosses. My research in the Eppley-Rosenstiel lab considered sex-specific physiological and morphological variation in *Ceratodon purpureus* and as predicted this experience fueled a non-stop stream of research questions on moss ecophysiology that could only be satiated by pursuing a PhD.

Specifically, I was interested in understanding how mosses impact and are impacted by co-occurring vascular plants and found an excellent mentor for these questions in Ray Callaway at the University of Montana where I worked in semi-arid Intermountain grasslands. During grad school, I was fortunate to join the Desiccation and Diversity in Dryland Mosses research group where I developed numerous collaborations with researchers I continue to work with and a deep understanding of the physiology of mosses throughout the desiccation and rehydration process. I was also fortunate to collaborate with Rebecca Durham at MPG Ranch, a conservation property in Western Montana (https://www.mpgranch.com/), where together we installed a large biocrust restoration experiment. These experiences helped me weave together and frame multiple research interests within a more applied context and led to a postdoc with Dean Pearson at the Rocky Mountain Research Station where my research focused on better integrating an understanding of biocrusts into the field of restoration ecology.

My current postdoc with Nichole Barger at the University of Colorado, Boulder builds on my previous body of work to evaluate how precipitation and biocrust mosses impact vascular plant recruitment and strategies for restoration. Throughout these experiences, one of the most exciting things for me has been introducing students and community members to mosses to inspire a closer look at things we all too often overlook in nature.

List of selected publications:

Slate, M.L., McLeod, M.L. and R. M. Callaway. 2021. Presence of an invasive forb and native moss modifies the effect of water pulses on soil nitrogen availability. *Functional Ecology*. 35:2108-2118. https://doi.org/10.1111/1365-2435.13831

Slate, M.L., Brinda, J.C., Coe, K.K., Greenwood, J.L. and L.R. Stark. 2020. Prehydration mitigates damage accrued from prolonged periods of desiccation in cultured shoot apices of *Syntrichia ruralis*. *Journal of Bryology*. 1-12. https://doi.org/10.1080/03736687.2020.1833157

Slate, M.L., Durham, R.A., and D.E. Pearson. 2019. Strategies for restoring the structure and function of lichen-moss biocrust communities. *Restoration Ecology*. 28: S160-167. https://doi.org/10.1111/rec.12996

Coe, K.K., Howard, N.B., **Slate, M.L**., Bowker, M.A., Mishler, B.D., Butler, R., Greenwood, J., and L.R. Stark. 2019. Morphological and physiological traits in relation to carbon balance in the diverse dryland moss clade *Syntrichia*. *Plant, Cell & Environment*. 42: 3140-3151. https://doi.org/10.1111/pce.13613

Slate, M.L., Sullivan, B.W. and R.M. Callaway. 2019. Desiccation and rehydration of mosses greatly increases resource fluxes that alter soil carbon and nitrogen cycling. *Journal of Ecology.* 107: 1767-1778. https://doi.org/10.1111/1365-2745.13162

Slate, M.L., Callaway, R. M. and D. E. Pearson. 2019. Life in interstitial space: biocrusts inhibit exotic but not native plant establishment in semi-arid grasslands. *Journal of Ecology*. 107: 1317-1327. https://doi.org/10.1111/1365-2745.13117

Slate, M. L., Stark, L. R., Greenwood, J. L., Clark, T. A. and J. C. Brinda. 2018. Prehydration rescues shoots of *Syntrichia norvegica* (Pottiaceae) damaged by extreme desiccation events. *The Bryologist*. 121: 13-204. https://doi.org/10.1639/0007-2745-121.2.193

Slate, M. L., Rosenstiel, T.N. and S.M. Eppley. 2017. Sex-specific physiology and morphological differences in the moss *Ceratodon purpureus* (Dicranales). *Annals of Botany*. 120: 845-854. https://doi.org/10.1093/aob/mcx071

Susan Moyle Studlar
United States of America

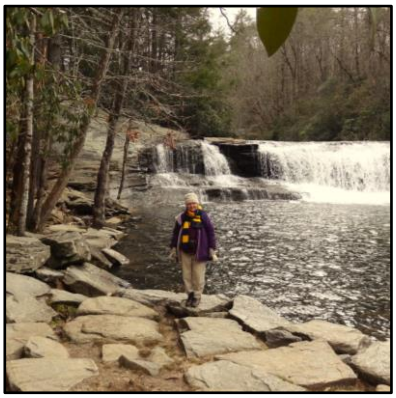
I grew up on the shores of Lake Minnetonka in Minnesota and spent many happy hours exploring the woods near our home. Both my parents were biologists, and their enthusiasm for nature and science was contagious. At Carleton College, I was inspired by charismatic botanist William H. Muir 's emphasis on non-flowering plants. At the ACM (Associated Colleges of the Midwest) Wilderness Field Station, I took bryologist Robert V. Drexler's Field Botany course, and was enchanted by the beautiful robust mosses of the North Woods and the leafy liverwort *Frullania* and its resident rotifers.

I pursued a Ph.D. in Botany under Aaron J. Sharp at the University of Tennessee (Knoxville) and became fascinated with bryogeography during our field trips to Mexico. After temporary teaching positions at Wellesley College and Virginia Commonwealth University, I joined the faculty of Centre College of Kentucky (1978-1982), where I greatly enjoyed teaching botany and ecology, and involving students in research. We surveyed bryophytes of the Red River Gorge, and the students enrolled in my bryology course at the University of Virginia's Mountain Lake Biological Station. We also investigated trampling impacts on mosses and involved the entire Station in the project. I loved Mountain Lake and came back summer after summer. My first projects were on mosses in bird nests and host specificity of epiphytes in an old growth remnant.

While at Centre I married Donley Studlar and eventually resigned tenured status to raise two boys. With the heavy course load and requirement for full-time teaching, this seemed my best option. I had more time to write papers and lead public nature walks (often featuring bryophytes) as Technical Director of the Central Kentucky Wildlife Refuge.

For the rest of my career, I taught botany, ecology, and biology courses as either Visiting or Adjunct faculty, following Don to Oklahoma State University (four years) and West Virginia University (WVU, 23 years), with extended visits (and botanical/bryological explorations!) to England, Scotland, and Australia. At WVU, I introduced students to bryophytes and lichens through my botany courses and Herbarium Internship program. Together we revived the long-neglected bryophyte and lichen herbaria at WVU and participated in the NSF-TCN digitization program. My Interns also served as Assistant Leaders in my public Moss-Lichen Walks at the West Virginia Botanical Garden. For eleven years, I looked forward to leading the Moss Extravaganza Walks for the WV Department of Natural Resources' Spring Wildflower Pilgrimage. My bryophyte ecology projects were a lot of fun including bryophytes growing on slime molds,

bryophytes in acidified streams, dung moss in WV, bryophyte survival in the stratosphere, roof mosses, moss harvest in WV, and tenacity of cliff bryophytes as related to climbing impacts.



My first Crum Moss Workshop was in 2014, when Bill Buck invited me to be the local (WV) organizer. What a pleasure it was to investigate beautiful nearby montane bryophyte communities and learn more about their history and ecology! The 2016 Crum Workshop featured the Red River Gorge of Kentucky where we compared Workshop findings to my findings about 40 years earlier. My husband and I retired from WVU in 2017 to Asheville, North Carolina where bryological opportunities abound. At the University of North Carolina – Asheville I taught (2020) *Bryophytes and Lichens of the Southern Appalachians* remotely due to COVID. I sent each student 43 bryophyte or lichen samples for independent study and required each student to conduct independent field trips and share their findings on the class website via Powerpoint shows. In the future I plan to focus on more public walks, consulting (bryophyte ID), and floristic projects, while also serving as Trail Boss in the 10 acre woods of my residential community.

It has been a privilege to immerse myself in nature (highlighting bryophytes and lichens) and to share my discoveries with students, colleagues, the public, and my family.

List of selected publications:

Studlar, Susan Moyle and James P. Vanderhorst. 2022. The 2014 Crum Workshop: Bryophytes of the Allegheny Highlands of West Virginia. *Evansia* 39 (3): 97-114.

Studlar, Susan Moyle and Linda Fuselier. 2018. The 2016 Crum Workshop: Bryophytes of the Red River Gorge Geological Area, Kentucky. *Evansia* 35 (1): 6-23.

Studlar, Susan Moyle, Linda Fuselier, and Peter Clark. 2015. Tenacity of bryophytes and lichens on sandstone cliffs in West Virginia and relevance to recreational climbing impacts. *Evansia* 32 (3): 121-135.

Studlar, Susan Moyle and JeriLynn E. Peck. 2009. Extensive green roofs and mosses: reflections from a pilot study in Terra Alta, West Virginia. *Evansia* 26 (2): 52-58.

Studlar, Susan Moyle and JeriLynn Peck. 2007. Commercial moss harvest in the Appalachian Mountains of West Virginia: Targetted Species and Incidental Take. *Bryologist 110 (4): 752-765.*

Studlar, Susan Moyle and Elizabeth H. Byers. 2007. *Splachnum ampullaceum* Hedw. (Dung Moss): Second Report from the Allegheny Mountains of West Virginia. *Evansia* 24 (1): 10-14.

Studlar, Susan Moyle, Christopher Eddy, and James Spencer. 2007. Survival of four mosses from West Virginia after two hours in the stratosphere. *Evansia* 24 (1): 17-21.

Studlar, Susan Moyle, Steven L. Stephenson, and Paul J. Harmon. 2002. Annotated Checklist of the Hornworts, Liverworts, and Mosses of West Virginia. *Wildlife Resources Technical Documents 01-3.* West Virginia Department of Natural Resources. Elkins, West Virginia.

Stephenson, Steven L., **Susan Moyle Studlar**, Carolyn J. McQuattie, and Pamela J. Edwards. 1995. Effects of acidification on bryophyte communities in West Virginia mountain streams. *Journal of Environmental Quality* 24(1): 116-123.

Studlar, Susan Moyle and Jerry A. Snider. 1989. Bryophytes of the Red River Gorge of Kentucky: floristics and phytogeography. *Castanea* 54: 133-152.

Stephenson, Steven L. and **Susan Moyle Studlar**.1985. Myxomycetes fruiting upon bryophytes: coincidence or preference? *Journal of Bryology* 13: 537-548.

Studlar, Susan Moyle. 1983. Recovery of trampled bryophyte communities near Mountain Lake,

Virginia. *Bulletin of the Torrey Botanical Club* 110: 1-11.
Studlar, Susan Moyle. 1982. Host specificity of epiphytic bryophytes near Mountain Lake, Virginia. *Bryologist* 85: 37-50.
Studlar, Susan Moyle. 1980. Trampling effects on bryophytes: trail surveys and experiments. *Bryologist* 83: 301-313.
Breil, David A. and **Susan Moyle**. 1976. Bryophytes used in construction of bird nests. *Bryologist* 79: 95-98.

Barbara Thiers
United States of America

I grew up in San Francisco, California, where my father was a mycologist and founder of the San Francisco State University Herbarium. Although his main interest was the macrofungi of California, he maintained a lifelong interest in bryophytes, sparked by a course he took in bryology taught by Dr. Margaret Fulford. He frequently said he wished he had more time, and better skills, to identify liverworts. Never one to miss an opportunity to beat my dad at something, I started to collect and study them as a college undergraduate. Although I too found them very hard to identify, I was captivated by their mystery and beauty under the microscope and I wanted to learn more.

I attended the University of Massachusetts for graduate school, where I studied with Dr. Rudolf Schuster. This choice of graduate mentor was ill-advised. Rudy had an enormous ego, was impatient and dismissive, and ultimately had very little interest in training me. However, I am grateful that he introduced me to the Lejeuneaceae, that vast and glorious family of mostly tropical hepatics that was the focus of my research interest for many years.

After completing my Ph.D. I accepted a postdoctoral fellowship at the New York Botanical Garden, where my project was to curate the William Mitten bryophyte herbarium. This gem of a collection (probably 50,000 specimens) contained specimens collected by just about every famous botanical collector and engendered in me a deep interest in the history of botanical exploration. I was able to stay on at the Garden when my postdoc ended, and gradually worked my way up through the administration of the herbarium. In the early years at NYBG I had the opportunity for quite a bit of tropical fieldwork, including collecting Lejeuneaceae in Australia, Papua New Guinea and South America. Later my duties as Director of the Herbarium, as well as motherhood, pushed hepatics to a lower priority in my life, but I never lost interest in them. I kept my hand in through a few projects, such as the treatment of the Lejeuneaceae and Pleuroziaceae for Flora of North America. My main priority in those years was the development of a collections digitization program at NYBG, and furthering such efforts on a national and international level. I also took the time to summarize the information I had compiled for herbarium tours and presentations over the years into a book about herbaria geared for the general public.

My career at The New York Botanical Garden surpassed my wildest expectations in opportunities as well as challenges, and l am so grateful for my years there. However, the pandemic pause gave me the opportunity to think more deeply about the future, and I realized that I wanted to substitute administration for more direct work with plants. My husband, a mycologist, also retired from

NYBG, and I now live in the Denver, Colorado metropolitan area, where we are Research Adjuncts at the Denver Botanic Gardens. My project there is to create a reference collection of Colorado bryophytes for botanists, land managers and the interested public. I am finding great pleasure in reacquainting myself with western North American bryophytes after a 40-year hiatus. The joy I feel in setting off into the mountains for a day of collecting and discovery in a new but familiar and beautiful landscape has more than affirmed my decision to change my life. I'll still struggle with identifications, I'm sure, but now have the time I need to devote to this work.

List of selected publications:

1984. Branch characters significant to subfamilial classification of Lejeuneaceae (Hepaticae). Syst. Bot. 9: 33-41.

1992. A Re-evaluation of *Cheilolejeunea* subgenus and *Xenolejeunea*. Tropical Bryology 5: 11 21.

1992. (with S. Emory). The history of bryology in California. Bryologist 95: 68-78.

1983 Index to the genera and species of Hepaticae described by William Mitten. Brittonia 35: 271-300.

1993. A monograph of *Pleurozia* (Hepaticae, Pleuroziaceae). The Bryologist 96: 517-554.

1997. *Cheilolejeunea* in Australia: Description of new taxa and key. J. Hattori Bot. Lab. 82: 321 328.

2016. With M. Tulig and K. Watson. Digitization of The New York Botanical Garden Herbarium. Brittonia 68: 324-333.

2020. With J. Collins, S. Pomponi, A. Bentley, R. Borchelt, K. Boundy-Mills, J. Cook, L. Dierking, S. Edwards, M. H. Hazbón, T. Karim, G. Matsumoto, P. Soltis.
Biological Collections: Ensuring Critical Research and Education for the 21st Century. National Academy of Sciences Press. 210 pages.

2020. *Herbarium: The quest to preserve and classify the world's plants*. Timber Press. Portland, OR, 304 p. Publication date: 24 November 2020.

In press. *Lejeuneaceae.* Flora of North America. Vol. 22 Bryophytes part 2. Submitted 2010, revised 2013.

In press. *Pleuroziaceae.* Flora of North America. Vol. 22 Bryophytes part 2. Submitted 2012.

OCEANIA

Julia Askeland
Australia

I was born in South Africa and acquired an early appreciation and respect for nature from my family. During the school holidays, I would often stay with my grandma who was a volunteer with South African National Parks. We would go for walks along the mountain, with her chatting away to her friends and observing the fynbos while I collected interesting objects and pestered critters I found along the way. When I was nine years old, I moved with my family to Australia. Much to my dismay, there were no kangaroos or koalas in suburban Melbourne. Also, Bindi Irwin, who I was promised would be my friend, was nowhere to be found.

Upon leaving school, I travelled to Peru to volunteer at a research centre in the Amazon Rainforest. At the time I paid little attention to the rich botanical diversity present. Back in Melbourne, I decided to study a Bachelor of Environmental Science (Wildlife Conservation and Biology) at Deakin University. I had an interest in primatology and volunteered overseas on various studies, returning to Peru twice more to monitor spider monkey reintroduction programs. Enthralled by the Amazon, I was always sad to return home. I missed walking through the jungle all day and falling asleep to the rainforest soundtrack.

My interests began to shift as I started to take a particular liking to the botanical classes on offer. Botany offered a less chaotic experience than tracking monkeys through the jungle and I enjoyed learning a skill set that was universally applicable. Upon graduating, Covid-19 hit and I found myself with a lot of time on my hands and not an awful lot to do with it during lockdowns. I contacted one of my university lecturers, Tricia Wevill, and we began to discuss ideas for an honours project. She raised an opportunity regarding a bryological project jointly advertised for co-supervision with botanist; Matthew Dell, which I found intriguing.

My honours project is investigating the effects of Cool Temperate Rainforest (CTRF) gradients on bryophyte functional traits. Bryophytes contribute significantly to the biodiversity of CTRF. In Victoria, CTRF occurs as small, fragmented patches - often in cool and protected gullies, where threatened by climate change and fire. Little is known about how climate-driven changes to vegetation will affect bryophyte functional composition and diversity at various scales. My project is investigating this by sampling epiphytic bryophytes on the dominant canopy tree Myrtle Beech (*Nothofagus cunninghamii*), along a gradient from the gully centreline in CTRF towards the

ecotone of adjoining eucalypt-dominated forest. The analysis aims to inform likely scenarios for bryophyte communities upon drying and contraction in area of rainforest patches. Such information may be used to prescribe CTRF buffer requirements for land managers and to advise on bryophyte conservation needs.

While I was undertaking fieldwork, I realised that something felt awfully familiar. A damp smell, the colour of the leaf litter, and various creatures trying to feast on my blood – I was back in the rainforest! While putting together my project, it had not really dawned on me that I would be in rainforest again. I'm not sure what will come after I complete my honours, but hopefully there is more rainforest and more bryophytes too.

Chris Cargill
Australia

I was born in the Gippsland country town of Bairnsdale in the state of Victoria, close to my mother's hometown. Growing up, my siblings and I spent every school holiday on my grandparent's farm, playing in the garden, helping with the animals, picnicking in the local countryside. I do remember that one of Christmas gift requests at the age of eight was for a microscope, which I received. A prediction of things to come?

While neither of my parents were particularly interested in nature, my favourite theme on Walt Disney's weekly show, Disneyland, was Adventureland which was all about nature. I loved it. Then as I went from primary school to high school, my favourite subject was biology. I went onto a tertiary education, at Monash University with the plan to become a psychologist or a teacher. After one year of Psychology, I chose Botany in my second year, though I almost stuck with Psychology because in 3rd year Botany you were required to go camping in the bush – something I had never done and did not particularly want to start in 3rd Year university. No showers, no toilets? Come on! However, the thought of another 2 years of Psychology was enough to cement my decision to take Botany as a subject, which I thoroughly enjoyed.

I completed an Honours year, with a project on the biology of two *Hypnodendron* moss species which grew in the Dandenong Ranges, where I compared their ecology in the forest as well as their morphologies back in the lab. My supervisor was Dr George A.M. Scott, who at the end of my undergraduate degree, offered me a technical position in his lab to back fill his technician who was going on sick leave for an extended period. George asked me to work on the liverwort genus *Fossombronia* – herbarium specimens only – of which I was not particularly enamoured. After working on a large, beautiful, dendroid moss species, a small simple thalloid liverwort that looked like an elongated lettuce was not all that inspiring. But spores were important in its taxonomy, so I began a lifelong love of the Scanning Electron Microscope as a magical instrument revealing the beautiful patterns produced by the many *Fossombronia* species. Over my career I have taken thousands of images of spores of both liverworts and hornworts. They never fail to excite me in their perfection. Also seeing these plants alive and in the field was completely different to working on dried herbarium specimens, and so I began my career as a hepaticologist. And I also grew to love camping and doing fieldwork – particularly with George Scott and natural history photographer Bruce Fuhrer. They were great in the field and I have never laughed so much as when I was out with them both.

In 1992 I was lucky to be given a three-year grant to work on the hornworts of Australia (the study of which continues to this day) and in 1997, I travelled to the USA to complete my PhD with Drs Ray Stotler and Barbara Crandall-Stotler working on a revision of the Fossombroniinae for Africa, Southwest Asia and the sub-continent of India. It was here that I received a fabulous grounding in taxonomy and systematics, worked with wonderful fellow students and met many bryologist idols.

On the completion of my doctorate in 2001, I came back to Australia to take up the position of curator of the cryptogam collections at the Australian National Herbarium (CANB). Since then, I have continued to work on *Fossombronia*, *Asterella* and the hornworts, but more recently I obtained a grant to revise the genus *Riccia* for Australia, another liverwort with beautiful spores. I have been very fortunate to work with many fabulous people throughout my career, too many to list here. And I cannot imagine studying anything other than liverworts and hornworts – such wonderful and mysterious plants.

List of selected publications:

Cargill, D. C. (2021) *Fossombronia pseudointestinalis* (Fossombroniaceae, Marchantiophyta), a new species from southern Australia. *Arctoa*. 30: 175-186

Cargill, D. C., Palsson, R. (2021) Hornworts of Australia: three new *Anthoceros* L. (Anthocerotaceae) species from New South Wales. *Telopea*. 24: 325-343.

Cargill, D. C., Beckmann, K., Seppelt, R. (2021) Taxonomic revision of *Riccia* L. (Ricciaceae, Marchantiophyta) in the monsoon tropics of the Northern Territory, Australia, *Australian Systematic Botany*. 34: 336-430.

Cargill, D.C., Beckmann, K. 2020. Typification and identity of *Riccia macrospora* Stephani (Ricciaceae) *Swainsona*. 33: 113-124.

Cargill, D.C., Callaghan, D.A., Forrest, L.L. and Reeb, C. (2020) *Fossombronia isaloe*nsis Cargill & D.A.Callaghan, a new liverwort from sandstone massifs in southern Madagascar. *Journal of Bryology.* 42: 213-222.

Cargill, D.C., Manju C. N., Deepa K. M., Chandini V. K. and Rajesh K. P. (2019) A new Indian species of *Riccia* L. with connections to northern Australia, *Journal of Bryology*. 41(3): 236-242. https://doi.org/10.1080/03736687.2019.1611249

Cargill, D.C., Milne, J., Forrest, L. L. and Gueidan, C. (2017) Disjunct populations of *Monocarpus sphaerocarpus* (Monocarpaceae, Marchantiopsida) within Australia show no sequence variation. *Muelleria*. 35**:** 35-42. (*June 2017*)

Cargill, D.C., Neal, W.C., Sharma, I., and Gueidan, C. (2016) A preliminary molecular phylogeny of the genus *Riccia* L. (Ricciaceae) in Australia. *Australian Systematic Botany* 29: 197-217.

Cargill, D.C. (2016) Rare and peculiar hornworts: *Notothylas orbicularis* and *N. javanica* (Notothyladaceae), new genus and species records for Australia. *Phytotaxa.* 275(1): 1-13.

Cargill, D. C, N. G. F. Vella, I. Sharma and J. T. Miller (2013) Cryptic speciation and species diversity among Australian and New Zealand hornwort taxa of *Megaceros* Campb. (Dendrocerotaceae). *Australian Systematic Botany*. 26(5): 356-377

Cargill, D. C. and J. Milne (2013) A new terrestrial genus and species within the aquatic liverwort family Riellaceae (Sphaerocarpales) from Australia. *Polish Botanical Journal* 58(1): 71-80.

Cargill, D. C. and B. A. Fuhrer. (2008) Taxonomic studies of the Australian Anthocerotophyta II: The genus *Phaeoceros*. *Fieldiana*. Botany N.S., No. 47: 239-253.

Cargill, D. C., K. S. Renzaglia, J. C. Villarreal and R. J. Duff. (2005) Generic concepts within

hornworts: historical review, contemporary insights and future directions. *Australian Systematic Botany*. 18: 1-10.

Cargill, D.C. & G.A.M. Scott. (1997) Taxonomic Studies of the Australian Anthocerotales I. Journal of the Hattori Botanical Laboratory. 82: 47-60.

Alison Downing
Australia

Alison Downing grew up amongst nurserymen and orchardists on her mother's side of the family and bushwalkers and environmentalists on her father's side. She trained in horticulture and was the first woman to be employed by the Forestry Commission of New South Wales as a nurseryman.

She joined the staff of the School of Biological Sciences at Macquarie University in 1970 specifically to take responsibility for plant production and plant collecting for both research and teaching. Alison retired in 2003 but continues her research activities as an Honorary Associate and Curator of Cryptogamic Collections at Macquarie University. At the time of her retirement the Macquarie University Herbarium, was renamed The Downing Herbarium (MQU) in her honour. This was in recognition of services to the University and in particular, her role in the establishment of the herbarium in 1972.

Alison became interested in bryophytes when collecting for university laboratory classes a task she continues today. Encouraged by Patricia Selkirk and Rod Seppelt, her earliest bryological publications related to collections of bryophytes from Macquarie Island. During a visit to Jenolan Caves with bryologists Helen Ramsay and Wilf Schofield, her curiosity was aroused by the unusual and eclectic combination of mosses that occurred on limestone outcrops at Jenolan Caves. These included species from rainforests, from arid and semi-arid biological soil crusts and introduced and cosmopolitan species. This led to completion on a part time basis (between 1989 and 1993) of her MSc *Distribution of bryophytes on calcareous substrates in south-eastern Australia*, supervised by Patricia Selkirk.

Alison has studied Mandarin and when attending the 2007 World Bryology Conference in Kuala Lumpur, Malaysia, a fortuitous introduction to Professor Zhang Yuan Ming from the Chinese Academy of Sciences led to an invitation to give a presentation to his students in Urumqi when she visited China with a Chinese-led international team of palaeontologists in 2007. Subsequently she has contributed to studies on the biological soil crusts of the Gurbantünggüt Desert in north-western China (e.g. Zhang, J. *et al.* 2009). More recently, she has advised and mentored students working on bryophyte ecology in Guizhou Province of south-western China. In Australia, she has encouraged Chinese researchers and their students, proof-read manuscripts and hosted them and their families. Alison is held in high regard by the biocrust and bryological research community of China.

Alison and her husband Kevin have been regular participants of New Zealand's annual John Child Bryophyte and Lichen Workshops and Australasian Bryophyte Workshops. These field trips over many years have contributed extensively to the bryophyte collections of The Downing Herbarium. Alison and Kevin have also been most welcoming to international and local bryologists visiting Sydney, accompanying them on field work. They have maintained contact with their many visitors by correspondence and by visiting them on overseas trips.

From 2013 to 2016 Alison served as a Councillor of the International Association of Bryologists and worked hard in this role to support the bryological community in Australia and worldwide. She has been active in raising awareness amongst non-botanists of plants of many kinds but particularly bryophytes. In retirement, Alison continues to manage the bryophyte collection at Macquarie University and has been actively involved in research on the taxonomy of Australian members of the moss family Bruchiaceae with Helen Ramsay and Rod Seppelt. She continues to be actively involved with both the international and Australian bryological communities. Noteworthy also has been Alison's steadfast support of bryology, bryologists and bryophyte research in Australia for 35 years. She has been a wonderful colleague and friend over many years.

Written by Patricia Selkirk, Chris Cargill & Pina Milne

List of selected publications:

Downing, A.J. (1992), Distribution of bryophytes on limestones in eastern Australia, *Bryologist* 95: 5-14.

Downing, A. and Marner, S. (1998). The first moss to be collected in Australia? *Leucobryum candidum* - collected by William Dampier in 1699. *Journal of Bryology* 20: 237-240.

Downing, A.J. and Oldfield, R. (2000), Rainforest bryophytes in karst landforms of south eastern South Australia, *Hikobia* 13: 225 – 233

Downing, A.J. and Selkirk, P.M. 1993 Bryophytes on the calcareous soils of Mungo National Park, an arid area of southern Central Australia. *Great Basin Naturalist* 53(1): 13-23.

Downing, A. and Zhang, Y.-M. 2010 Mosses from marginal desert lands of Xinjiang Uyghur Autonomous Region, north-western China. *Hikobia* 15(4): 477 - 484

Downing, A.J., Oldfield, R.J. and Fairbairn-Wilson, E. (2002), Mosses, liverworts and hornworts of Mount Canobolas, New South Wales, *Cunninghamia* 7: 527 – 537.

Downing, A.J., Oldfield, R.J. and Selkirk, P.M. 1995. Bryophytes in the vicinity of Wombeyan Caves, New South Wales. *Cunninghamia* 4: 129-141.

Downing, A., Peacock, R.J., and Ramsay, H. 2014. Some new and noteworthy bryophytes from Antarctic Beech (*Nothofagus moorei*) forests of north-eastern New South Wales. *Telopea* 17: 239–251.

Downing, A.J., Ramsay, H.P. & Schofield, W.B. (1991), Bryophytes in the vicinity of Jenolan Caves, New South Wales, *Cunninghamia* 2: 371 – 384.

Downing, A.J., Selkirk, P.M. and Oldfield, R.J. 1997.The mosses of the Yarrangobilly Caves district, New South Wales: a review of the mosses collected by the Reverend W.W. Watts in 1906. *Journal of the Hattori Botanical Laboratory* 82: 105-121.

Downing, A., Selkirk, P.M. and Oldfield, R.J. 1998. Changes in the assemblage of mosses on limestones in south-eastern Australia--some implications for the management of karst systems. *ACKMA Journal* 30:42-45. (Australasian Cave and Karst Management Association Inc. Journal).

Downing, **A. J.,** Seppelt, R. D. and Selkirk, P. M. (1986) Analysis of bryophyte distribution patterns on Sub-Antarctic Macquarie Island *CNFRA 58*, Issue 1 177-182

Downing, A.J., Seppelt, R.D. and Selkirk, P.M. 1988. Analysis of bryophyte distribution patterns on subantarctic Macquarie Island. *Colloque sur Les Ecosystèmes Terrestres Subantarctiques, 1986, Paimpont, C.N.F.R.A.* 58:177-182.

Downing, AJ, Brown EA, Oldfield RJ, Selkirk PM, and Coveny R 2007 Bryophytes and their distribution in the Blue Mountains region of New South Wales. *Cunninghamia* 10(2): 226-254.

Guo, Y., Zhao, Y., and **Downing, A.J.** 2020. Effect of storage time on the physiological characteristics and vegetative regeneration of desiccation-tolerant mosses on the Loess Plateau, China. *Restoration Ecology* 28 (S2): S203-S211.

Ramsay H P, Seppelt R D, and **Downing A. J.** 2018. *Trematodon* (Bryopsida: Bruchiaceae) in Australia: unravelling the conundrum. *Telopea*, 21: 101-119.

Ramsay H P, Seppelt R D, and **Downing A. J** 2020. The genus *Trematodon* (Bruchiaceae) in Australia. *Telopea* 23: 1-19. dx.doi.org/10.7751/telopea12856

Ramsay, H. P., Seppelt, R. D., and **Downing, A. J.** (2018). Additional notes, corrections and sporophyte descriptions for *Mesochaete* Bryopsida: Aulacomniaceae) in Australia. *Telopea*, 21: 1-8. https://doi.org/10.7751/telopea12181

Selkirk PM, **Downing AJ**, and Seppelt, RD. 1987 Distribution of bryophytes on Sub-Antarctic Macquarie Island *Symposia Biologica Hungarica* 35: 677-683.

Selkirk, P.M., Whinam, J.P., **Downing, A.J.** and Skotnicki, M.L. 2008. Mosses of subantarctic Heard Island: updated list and discussion of their distribution. *Polar Record* 44(229): 155-164.

Seppelt R.D., **Downing A.J**., Deane-Coe K.K., Zhang Y., and Zhang J. 2016. Bryophytes within biological soil crusts. In: Weber B., Büdel B., Belnap J. (eds) Biological Soil Crusts: An Organizing Principle in Drylands. Ecological Studies (Analysis and Synthesis), vol 226. Springer, Cham. https://doi.org/10.1007/978-3-319-30214-0_6

Whinam, J., Selkirk, P.M., **Downing, A.J.** and Hull, B. 2004. Return of the megaherbs: plant colonisation of derelict ANARE Station buildings on subantarctic Heard Island. *Polar Record* 40:235-243.

Zhang, B., Zhang, Y., **Downing**, **A.** and Niu, Y. 2011. Distribution and composition of cyanobacteria and microalgae associated with biological soil crusts in the Gurbantünggüt Desert, China. *Arid Land Research and Management* 25(3): 275-293.

Zhang J., Zhang Y., **Downing, A.**, Cheng J., Zhou X., and Zhang B. 2009. The influence of biological crusts on dew deposition in Gurbantunggut Desert, Northwest China. *Journal of Hydrology* 379 (3-4): 220-228.

Zhang, J., Zhang, Y.M., **Downing, A.**, Wu, N. and Zhang, B.C. 2011. Photosynthetic and cytological recovery on remoistening *Syntrichia caninervis* Mitt., a desiccation-tolerant moss from Northwestern China. *Photosynthetica* 49: 13-20.

Zhou, X., Zhang, Y. and **Downing**, A. 2012. Non-linear response of microbial activity across a gradient of nitrogen addition to a soil from the Gurbantünggüt Desert, northwestern China. *Soil Biology and Biochemistry* 47: 67-77.

Zhou, X., Zhang, Y., Ji, X., **Downing, A.** and Serpe, M. 2011. Combined effects of nitrogen deposition and water stress on growth and physiological responses of two annual desert plants in northwestern China. *Environmental and Experimental Botany* 74: 1-8.

Book chapters:

Downing A, and Oldfield R. 2001 Mosses and Liverworts In: *A Guide to Berowra Valley Regional Park.* Friends of Berowra Valley Regional Park pp 57-58, 206-207. ISBN 0-95756907-0-1

Downing A, and Oldfield R. 2008 Mosses, Liverworts and Hornworts (Bryophytes) at Jenolan Caves. pp. 1- 5, In: Eddison, I. *Flora and Fauna of the Jenolan Karst Conservation Reserve*¸ C. Melbourne and E. Christian, ISBN: 978-0-9805833-1-1

Alison Haynes
Australia

Alison Haynes grew up in the Kent countryside in England, had a horsey childhood and studied law at universities in London (Kings College) and Paris (the Sorbonne). After her degree she went to Australia on a working holiday, took her first job in journalism on return to England, and continued as a journalist, editor and author after emigrating to Australia a few years later.

In 2004 she and her husband moved from inner-city Sydney into a 1927 cottage and the wide-open spaces of the Illawarra (near Wollongong). This allowed Alison to enjoy being in natural spaces, bushwalking and beach-combing. Moving out of the city also reawakened her interest in biology (a favourite subject when at school also winning the school biology prize on leaving): she was now ready for a career change and decided life was too short not to give it a go.

Alison enrolled in a science degree at the University of Wollongong and graduated with a first-class honours degree in conservation biology. Her path then took a mossy turn as she contemplated a PhD. Taxonomic study was not the main consideration; instead, her starting point was the potential for mossy biocrusts on green roofs. However, Alison felt that there was not enough known about how moss survives more generally in the urban environment. City life for plants involves changes in light, hydrology, pollution and substrate. How do these effect the biodiversity of moss? So, Alison settled on a project focusing on the ecology and physiology of urban moss.

For Alison, concepts like scale, water relations and surviving stresses became important. The fact that moss is so small with leaves just one cell thick means that it can rely on the process of diffusion to obtain water and minerals. This in turn affects where it thrives - particularly in the urban environment where it can exploit small niches like pavement cracks, dimples in road surfaces or skeletal soils. Rhizoids suffice for anchoring whereas larger plants require the vascular tissues of roots. All of these aspects are being contemplated and tested in her project.

One of the reasons Alison turned to biology as a second career was to undertake fieldwork and experience places, she otherwise would not have the opportunity to visit. Moss, albeit small, has not disappointed on this front. Travelling for conferences has allowed her to witness the micro 'mountains' of biocrusts in Utah (USA), visit urban moss and night markets in Shenzhen (China), and in 2019 to see numerous dry-adapted moss species in the wild during the IAB/iMOSS conference field trip to the Parque Regional de la Cuenca Alta del Manzanares (Spain). In February 2020, moss took Alison camping in Antarctica to collect specimens from sites on the King George

Island glacier retreat. The samples were returned to Australia to await analysis for C13, which will show what conditions were like as the plants grew, and possibly C14 testing for dating purposes. But intervention from COVID has put this on hold.

'Why study moss?' Alison now has a ready answer: for its rich research potential, because it's thought-provoking philosophically, and because it leads her to places near and far.

List of selected publications:

Haynes, A, 2021, When less is more: failure to adapt to local conditions sometimes boosts resilience, *Conservation Physiology*, 9, 1, coab055

Ayre, D, **Haynes, A,** Gregory, D, 2021, Low genetic differentiation despite fragmentation in an endangered fire-sensitive shrub, *International Journal of Plant Science*, 182, 3, 229-237

Paton-Walsh, C ... **Haynes, A** et al, 2019, A Clean Air Plan for Sydney: An Overview of the Special Issue on Air Quality in New South Wales. *Atmosphere 10* (12), 774, 10.3390/atmos10120774

Popek, R, Haynes, A, Przybysz, A and Robinson, S, 2019, How Much Does Weather Matter? Effects of Rain and Wind on PM Accumulation by Four Species of Australian Native Trees, *Atmosphere*, 10.3390/atmos1010063

Haynes, A, 2019, Dark matters: night light stops toads in their tracks, *Conservation Physiology* Volume 7, Issue 1, 2020, coz085

Haynes, A, Popek, R, Boles, M, Paton-Walsh, C and Robinson, S, 2019, Roadside Moss Turfs in South East Australia Capture More Particulate Matter Along an Urban Gradient than a Common Native Tree Species, *Atmosphere*, 10(4):224

Haynes, A, 2019, Silver moss is a rugged survivor in the city landscape, *The Conversation*: https://theconversation.com/silver-moss-is-a-rugged-survivor-in-the-city-landscape-113459

Haynes, A, 2018, Approaches to Plant Evolutionary Ecology Gregory P. Cheplick (Book review), *Austral Ecology* doi.org/10.1111/aec.12614

Haynes, A 2018, Domestic Dilemma: When Cultivated Plants Lose their wild side, *Conservation Physiology*, 6 10.1093/conphys/coy039

Haynes, Alison, 2017, Collected Papers of Michael E. Soulé. Early Years in Modern Conservation Biology (Book Review), *Austral Ecology* DOI: 10.1111/aec.12500

Coote, **A, Haynes**, A, Philp, J and Ville, S, 2017, When Commerce, Science and Leisure Collaborated: The Nineteenth-Century Global Trade Boom in Natural History Collections, *Journal of Global History* 12, 3, 319-339.

Haynes, Alison, 2015, Cane toads - a tale of sugar, politics and flawed science (Book Review), *Austral Ecology* 40, (8), 14-15

Conference presentations:

Small plants in the (big) green city: What role for moss? Invited speaker, Green Street, Clean Air Street, webinar, SCAN (Street-scale Greening for Cooling and Clean Air in Cities), March 2021

From CBD to glacier edge: moss colonisation and climate change, speed talk and poster ESA online conference 2020

Small plants, big ideas: a review of potential applications for moss-dominated biocrusts, Speed talk, ESA conference, Launceston, November 2019

Talk and poster, *Concrete conversations: experiments with moss and microtopography on an urban gradient*, SEB, Seville, July 2019.

Poster, *Of turf, trees and air quality: does moss trap more particulate matter than leaves?* IAB/iMoss, Madrid, July 2019

Invited presenter: *Moss in the metropolis,* Untaming the Urban, workshop and seminar at Fenner School of the Environment, Canberra, December 2018.

Symposium co-convener and chair, *Innovation for Conservation: Using new approaches and emerging technology to improve wildlife and habitat protection and management,* Ecological Society of Australia conference, Brisbane, November 2018.

Poster, *Of turfs and trees: does moss trap more particulate matter than trees on urban roadsides?* Ecological Society of Australia conference, Brisbane, November 2018.

Talk, *Stress in the city: learning about plant stress in the urban living lab,* Boden Research Conference: Ecosystem Collapse and Surprises, Canberra, May 2018.

Poster, *Moss in the metropolis: experiments in micro-habitat, micro-topography and multiple stress,* Fenner Conference on the Environment: Urban Sustainability and Conservation, Canberra, April 2018.

Speed talk, *Microhabitats in the concrete jungle: finding patterns of persistence of moss*
EcoTas – Ecological Society of Australia conference Hunter Valley, November 2017.

Poster, *Metro moss: experiments on an urban gradient.* International Botanical Congress, Shenzhen, China, 2017.

Poster, *Parking lots, pavements and pollution - a review of biocrusts' life in the city.* Biocrust3 Conference, University of North Arizona, Moab, USA, September 2016.

Emma Little (nee Pharo)
Australia

Emma was born in Melbourne, Australia to a family very keen on being outdoors and camping. She wanted to be a park ranger until she realised that it meant cleaning toilets and scolding people. Instead, she did a BSc at the University of Melbourne. Emma's interest in bryophytes came about after she joined Professor Andy Beattie's biodiversity research lab at Macquarie University. While most of the lab members were focused on invertebrates, Emma's interest has always been botanical after being inspired by some wonderful botanists at the University of Melbourne, including the legendary George Scott.

On starting her PhD at Macquarie, Emma met Dr. Patricia Selkirk and Ms. Alison Downing, and through their encouragement, she was able to sneak botanical interests into an invertebrate group given that all these taxa are understudied and cryptic compared with birds, mammals, and vascular plants. Alison and Kevin Downing played a pivotal role in Emma's PhD studies and travels. Alison provided much needed technical support and encouragement. It was a random conversation between Alison and Professor Dale Vitt at a conference that led to Emma gaining a post-doc with Dale at the University of Alberta, Canada.

At the University of Alberta, Emma and Dale worked with a team of foresters, economists, and social researchers on resilient forest ecosystems. Two years into the post-doc and three days after marrying a Canadian, Emma was offered a faculty position at the University of Tasmania. In a substantial leap of faith, Rich consented to moving to the other side of the world where they started a new life in Tasmania. Emma has been on staff at UTAS since 1999 and Rich found ongoing work with CSIRO.

While she began her career as an ecologist, a series of opportunities have seen her morph into an environmental planner. She is now a teaching intensive academic delivering units into the Master of Environmental Geospatial Science and the Master of Planning. Her main teaching responsibilities are land use planning (KGA512 Statutory Land Use Planning) and environmental law and policy (KGA381 Environmental Impact Assessment).

Emma has wide ranging interests in interdisciplinary learning and communication between a range of environmental disciplines. Between 2011 and 2016, she worked as an adviser for a not-for-profit and learned a lot about how government, media, and industry works. She has an ongoing volunteer role in the 'real world', which means Emma can give her students authentic learning tasks and conduct research that is strongly linked to need and end users.

Most of Emma's publications are in forest management and the maintenance of biodiversity with a sideline in the scholarship of teaching. Her work on bryophyte diversity in Australian landscapes has always had an applied edge. She has had a series of PhD student work on topics as diverse as mammal biodiversity in India and integrated catchment management. Her PhD students include Dr Pep Turner (The ecology and conservation of bryophytes in Tasmanian wet eucalypt forest), Dr Mikayla Jones (Bryophytes of the Tasmanian Buttongrass Moorlands) and Dr Jen Sanger (The Distribution of Epiphytes over Environmental and Habitat Gradients in Tropical and Subtropic Australia).

One of her highly cited papers is a review paper in a major conservation journal:

Pharo, EJ and Zartman, CE*, 'Bryophytes in a changing landscape: The hierarchical effects of habitat fragmentation on ecological and evolutionary processes', *Biological Conservation*, 135 (3) pp. 315-325. doi:10.1016/j.biocon.2006.10.016 ISSN 0006-3207 (2007).

As well as publications about higher education teaching, a selection of her bryophyte and forestry papers is below:

Romanski J, **Pharo EJ**, Kirkpatrick JB, 'Epiphytic bryophytes and habitat variation in montane rainforest, Peru', Bryologist, 114, (4) pp. 720-731. ISSN 0007-2745 (2011)

Turner PAM, Kirkpatrick JB, **Pharo EJ**, 'Dependence of bryophyte species on young, mature and old growth wet eucalypt forest', Biological Conservation, 144, (12) pp. 2951-2957. ISSN 0006-3207 (2011)

Pharo EJ, Meagher DA, Lindenmayer DB, 'Bryophyte persistence following major fire in eucalypt forest of southern Australia', Forest Ecology and Management, 296 pp. 24-32. ISSN 0378-1127 (2013)

McMullan-Fisher S, Kirkpatrick JB, May TW, **Pharo EJ**, 'Surrogates for Macrofungi and Mosses in Reservation Planning', Conservation Biology, 24, (3) pp. 730-736. ISSN 0888-8892 (2010)

Ferguson AV, **Pharo EJ**, Kirkpatrick JB, Marsden-Smedley JB, 'The early effects of fire and grazing on bryophytes and lichens in tussock grassland and hummock sedgeland in north-eastern Tasmania', Australian Journal of Botany, 57, (7) pp. 556-561. ISSN 0067-1924 (2009)

Pharo EJ, 'Salvage Logging and Its Ecological Consequences', Austral Ecology, 34, (6) pp. 717-718. ISSN 1442-9985 (2009)

Pharo EJ, Hodge DA, Turner PAM, Dalton PJ, 'Successional patterns of terrestial bryophytes along a wildfire chronosequence in the wet eucalypt forests of southern Tasmania', Tasforests, 18 pp. 67-75. ISSN 1033-8306 (2009)

Pharo EJ, Lindenmayer D, 'Biological legacies soften pine plantation effects for bryophytes', Biodiversity and Conservation, 18, (7) pp. 1751-1764. ISSN 0960-3115 (2009)

Turner PAM, Kirkpatrick JB, **Pharo EJ**, 'Bryophyte relationships with environmental and structural variables in Tasmanian old-growth mixed eucalypt forest', Australian Journal of Botany, 54, (3) pp. 239-247. ISSN 0067-1924 (2006)

Josephine (Pina) Milne
Australia

I was born in Melbourne, Australia and after completing my high school education embarked on a Bachelor of Education in Environmental Studies. During the course of the four-year degree, I developed a passion for botany and physical geography. My first encounter with bryophytes was during the third year of my degree where I was required to complete a research project. I decided to focus on desiccation tolerance in plants. For the project I needed plants that were small enough to fit into a chamber attached to an oxygen electrode. Bingo – bryophytes!

After graduating, bryophytes were put on hold as I pursued a teaching career in a secondary school, then as a tutor in a university and bringing up two daughters. It was whilst tutoring that I decided to complete a postgraduate degree. I returned to bryophytes and focused on the reproductive biology of the moss genus *Dicranoloma* in cool temperate rainforests. Over a three-year period I collected and examined plants to track the development of males and females. A steady hand was essential when dissecting dwarf males that are a distinctive character of the genus. I also became fascinated by the invertebrates that inhabited these plants, mites in particular. By the end of the project, I was hooked on bryophytes, mosses in particular. I was awarded a PhD for my thesis: 'Studies of the biology of four species of *Dicranoloma*.'

I was fortunate to gain employment at the Royal Botanic Gardens Victoria (RBGV) and worked in the National Herbarium of Victoria (MEL) for 24 years, retiring in November 2021. Whilst at the Gardens I completed flora treatments of a number of moss families, including the family Neckeraceae for the Australian Biological Resources Study program (https://www.anbg.gov.au/abrs/Mosses_online/). This project was completed with Dr Niels Klazenga who was a great support and mentor. Although I am particularly interested in rainforest mosses, the composition and dynamics of bryophytes in soil crusts has also been of interest.

Public engagement and community awareness of bryophytes has always been one of my areas of focus, particularly because of my education background. Whilst at the RBGV it became apparent that there were limited resources for teachers so with colleagues the *Forgotten Flora* (bryophytes, lichen & fungi) Education kits which comprised information and activity booklets and 10 posters were produced. This project was a stepping stone into another project with colleagues at the RBGV which involved the development, curation and touring of the exhibition, *Hidden in Plain View the forgotten Flora*. The exhibition focused on bryophytes, fungi and lichens.

In 2006 I was appointed to the position of Collections Manager at MEL and as time allowed, I continued my interest in bryophytes by collecting, identifying and vouchering. I also had the opportunity to collaborate with Dr Christine Cargill (CANB) and Dr Laura Forrest on research focusing on the complex thallose liverwort *Monocarpu*s and more recently, on *Riella* with Chris Cargill.

Everywhere I travel I am inevitably drawn into looking down on the ground, in crevices or tree trunks for bryophytes. If I have my family, including my young grandsons or friends with me, they too are required to join in my enthusiasm for bryophytes. A hand lens or magnifying glass which reveals the beauty of the plants soon has them interested.

List of selected publications:

D. C. Cargill, **J. Milne**, L. L. Forrest and C. Gueidan (2017) Disjunct populations of *Monocarpus* sphaerocarpus (Monocarpaceae, Marchantiopsida) within Australia show no sequence variation. *Muelleria* 35: 35-42.

Forrest, L.L., Long, D.G., Cargill, D.C., Hart, M.L., **Milne, J**., Schill, D.B., Seppelt, R.D. and. Villarreal, J.C. (2016). On *Monocarpus* (Monocarpaceae, Marchantiopsida), an isolated salt-pan complex thalloid liverwort. *Australian Systematic Botany* 28, 137–144.

Cargill, D.C. & **Milne, J.** (2013) A new terrestrial genus and species within the aquatic liverwort family Riellaceae, (Sphaerocarpales) from Australia. *Polish Botanical Journal* 58(1): 71–80.

Milne, J. and Jolley, H. (2010). The importance of herbarium records in documenting the occurrence and changing distribution of the adventive moss species *Pseudoscleropodium purum* in Victoria. *Victorian Naturalist* 127, 146–150.

Milne, J., Short, M. and Beckmann, K. (2006). A preliminary study of bryophytes and invertebrates of soil crusts in the Little Desert National Park and surrounds. *Victorian Naturalist* 123, 195–203.

Kellar, K., Short, M. and **Milne, J.** (2006). Epiphytes on *Nothofagus cunninghamii* and *Eucalyptus regnans* in a Victorian cool temperate rainforest. *Victorian Naturalist* 123, 222–229.

Milne, J. (2006). The genus *Diphyscium* in Australia. *Journal of Bryology* 28, 194–197.

Milne, J. (2002), Review of: Key to the genera of Australian mosses, by W.R. Buck, D.H. Vitt & W.M. Malcolm. Flora of Australia Supplementary Series Number 14. Australian Biological Resources Study, *New Zealand J. Bot* 40(4): 701-702.

Milne, J. (2001). Reproductive biology of three Australian species of *Dicranoloma* (Bryopsida, Dicranaceae): sexual reproduction and phenology. *The Bryologist* 104, 440–452.

Milne, J. (2000). Gemmae in *Dicranoloma serratum* (Broth.) Par. *Journal of Bryology* 22, 70–72.

Milne, J. and Louwhoff, S. (1999). Vertical distribution of bryophytes and lichens on a Myrtle Beech, *Nothofagus cunninghamii* (Hook.) Oerst. *Hikobia* 13, 23–30.

Helen Ramsay
Australia

Helen has been described as a bryologist who has witnessed the development and expansion in the latter 20th century of bryology in Australia and has herself contributed significantly and continues to do so.

Helen completed her doctorate in bryophyte genetics in 1966 at Sydney University. No sooner had she submitted her thesis than she and her young family embarked on a trip to the UK where Helen was to take up the Leverhulme Fellowship at Bangor in Wales under Professor Paul Richards. Unbeknown to Helen, Richards was heading overseas; Helen was to see Richards in person again 15 months later. But this did not damper Helen's determination. She established herself in the laboratory and took every opportunity to learn the required skills and techniques to specialise in meiotic cell division in bryophytes. Helen has numerous publications focusing on cytological studies in mosses. Helen's cytological studies while mostly concentrated on Australian mosses, also included mosses from the United Kingdom, Canada and New Zealand.

In 1968 Helen and her family returned to Sydney where Helen took on a tutorship at the University of New South Wales, where she was to remain until she retired from a senior lectureship position. Helen's passion for bryology is evident from the diversity of projects she has completed and published on: Census of New South Wales Mosses, Register of type specimens of mosses in Australian herbaria and has collaborated with several internationally recognised bryologists e.g. Dale Vitt on *Macromitrium*, Wilf Schofield and Ben Tan on Australian Sematophyllaceae and more recently with John Spence on Bryaceae. Helen also worked closely with Ilma Stone on tropical mosses and she has continued this work with Andi Cairns and David Meagher.
An outcome of the 1979 bryophyte workshop taught by George Scott was the commencement of the Australasian Bryological Newsletter. For quite a number of years Helen together with Patricia Selkirk and assistance from Alison Downing, all at Macquarie University produced the newsletter. It still continues to this day.

Helen has also been a strong advocate of the Australian Bryological Resources Study (ABRS) and at each Australian Bryophyte workshop (usually held every two years since the 1980s) has provided an update on developments in the scheme and provided encouragement for new comers to the field of bryology. Helen herself has contributed to ABRS taxonomic studies and to the Flora of Australia Volume 51, Mosses 1 [https://www.awe.gov.au/science-research/abrs/publications/flora-of-australia/vol51] later Mosses Online and currently Bryophytes of Australia [BoA: https://www.anbg.gov.au/abrs/Mosses_online/].

In 2019, aged 91, on the Queen's Birthday Honours List, Helen was recognised and awarded the honour of an AM (a Member of the Order of Australia) for "Significant Service to Plant Science".

The information here is borrowed heavily from ABN newsletter no. 49 where a testimony was prepared for Helen's 75th year.

Helen's extensive list of publications dates back to 1964:
https://www.utas.edu.au/__data/assets/pdf_file/0009/316656/abn_49.pdf

List of selected publications:

Ramsay H.P. (2011) Australian Mosses - New chromosome numbers and compilation of chromosome data. *Telopea* 13(3): 577-619.

Cairns, A., Meagher, D and **Ramsay, H.P**. 2019. A revised checklist of the moss flora of the Australian Wet Tropics. *Telopea* 22: 1-30. https://doi.org/10.7751/telopea13208

Downs K. & **Ramsay, H.P**. (2019) Clergyman, Bryologist, Advocate: Reverand W. Watts in the Richmond River District (parts 1& 2). *Australasian Bryological Newsletter* 73 & 74.

Ramsay HP, Cairns A, Meagher D (2017) *Macromitrium erythrocomum* (Bryophyta: Orthotrichaceae), a new species from tropical Queensland, Australia. Telopea 20: 261–268.

Ramsay, H. P., Seppelt, R. D., and Downing, A. J. (2018a). Additional notes, corrections and sporophyte descriptions for *Mesochaete* (Bryopsida: Aulacomniaceae) in Australia. *Telopea* 2: 1-8. https://doi.org/10.7751/telopea12181

Ramsay H P, Seppelt R D, and Downing A J. **(**2018b) *Trematodon* (Bryopsida: Bruchiaceae) in Australia: unravelling the conundrum. *Telopea* 21: 101-119. https://doi.org/10.7751/telopea12444

Ramsay H P, Seppelt R D, and Downing A J. (2020) The genus *Trematodon* (Bruchiaceae) in Australia. *Telopea* 23: 1-19. dx.doi.org/10.7751/telopea12856

Spence J.R & **Ramsay H.P.** (2019) Revised keys and additional nomenclatural changes in the Bryaceae (Bryopsida) in Australia. *Telopea* 15: 143-148. https://doi.org/10.7751/telopea13056

Patricia Selkirk
Australia

I was born in Newcastle, New South Wales, Australia. I became interested in bryophytes during my third year of Botany studies at the University of Sydney, Australia, with lectures from Tony Martin. I was intrigued at their dominant haploid generation, enabling, as I thought, a fairly direct influence of their environment on their growth. My fourth (Honours) year, under the supervision of Geoff Berrie, was devoted to establishing specimens of wild-collected *Riccia fluitans* (as we thought) in axenic culture on both nutrient solution and nutrient agar. This was successful, and allowed experimentation on the effects of changing the nutrient environment of the thallus. This project laid the foundation for a PhD project under Geoff Berrie's supervision, during the same years as Helen Ramsay was studying moss karyotypes with him, and Obchant Thaithong (then Obchant Na-thalang) was studying Australian *Riccia* spp. taxonomy and distribution under Roger Carolin's supervision in the same department.

In due course I found that the plant I had started with was not *R. fluitans* but *R. canaliculata*, but nevertheless there were many interesting observations to be made on the effects of varying culture conditions on this and other species I established in culture. My interest in the interactions of plants with their environment has remained as a particular interest, both in the laboratory and in the field. Post PhD, while enjoying time at home with small children, I continued the part-time plant biology teaching I'd started as a student, first at University of Sydney, later at Macquarie University. In 1979 I started as a full-time senior tutor in Biology at Macquarie University teaching a third-year subject Plant Diversity and Evolution. Over the years I tutored and lectured in many biology subjects until I retired as a Senior Lecturer in 2002.

In 1979 I also stepped back into research work (alongside the teaching I loved) when an opportunity arose for a summer's fieldwork on subantarctic Macquarie Island, working together with bryophyte taxonomist Rod Seppelt. Here was an environment very different from my home location in temperate Sydney, with a vegetation rich in bryophytes in a wildly beautiful location! I didn't resist!

Between 1979 and 2005 I was fortunate in having opportunities to conduct fieldwork with ANARE (Australian National Antarctic Research Expeditions) on subantarctic Macquarie and Heard Islands and at Casey Station in Antarctica, with New Zealand Antarctic Programme (now Antarctica New Zealand) at Scott Base and in the McMurdo Dry Valleys, and with the French IPEV (Institut Polaire Emile Victoire) on subantarctic Îles Kerguelen. These are all places with

harsh environments where bryophytes are important components of the vegetation. They are also all beautiful places, regarded as very special by those who have worked there.

In such environments field work is of necessity a communal activity, and I've shared voyages, helicopter flights, field huts, tents and research projects with many colleagues, students, and students-who-became-colleagues. Different scientists working together (and publishing together, see below) brought different areas of expertise together—a bonus all round! My interest in the interactions of plants (particularly bryophytes) with their environment involved me in projects including vegetation history (including fossil moss leaves from a former lakebed), moss species distributions in a local area, island-wide vegetation mapping, investigating bryophytes and cushion plants on subantarctic terraced landforms, molecular genetics studies of Antarctic mosses including identifying dispersal patterns, and colonisation of historic buildings by bryophytes and vascular plants.

These fascinating and beautiful places in which I've been privileged to work inspired my interest beyond the plants, in the environments themselves, including the influence of humans upon them. Subantarctic Macquarie and Heard Islands and the French Austral Lands and Sea are now recognised as World Heritage Areas. In the words of the Antarctic Treaty's 1991 Madrid Protocol on Environmental Protection, Antarctica is designated as "a natural reserve, devoted to peace and science". With colleagues I've contributed to documenting some of the human-mediated deleterious changes to these environments and their biota. I applaud the work of the many who are working diligently to remediate deleterious human impacts of the past and to minimise future human impacts, helping to conserve these rare, important, fascinating, beautiful Antarctic and subantarctic environments and their biota. Those lovely bryophytes are important components of their biota, and there's scope for lots more fascinating peaceful science!

Patricia was recognised and awarded the Companion of the Order of Australia in the Queen's birthday honours in June 2022 for eminent service to science and conservation, particularly through research of Antarctic and sub-Antarctic terrestrial ecosystems, to tertiary education, and as a mentor and champion for women and the Australian Antarctic Medal in 2004 for her 'outstanding service' in support of Australian Antarctic expeditions', as a 'trail blazer, teacher, and inspirational role model for women scientists in Antarctica'. She is considered a pioneer of Australian Antarctic Science.

List of selected publications:

Selkirk, P.M. 1979. Effect of nutritional conditions on sexual reproduction in Riccia. *The Bryologist*, 82(1):37-46.

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Selkirk, P.M. and Selkirk, D.R. 1982. Late Quaternary mosses from Macquarie Island. *Journal of the Hattori Botanical Laboratory*, 52:167-169.

Selkirk, P.M. and Seppelt, R.D. 1987. Species distribution within a moss bed in Greater Antarctica. *Symposia Biologica Hungarica* 35:279-284.

Downing, A.J., Seppelt, R.D. and **Selkirk, P.M.** 1988. Analysis of bryophyte distribution patterns on subantarctic Macquarie Island. Colloque sur Les Ecosystèmes Terrestres Subantarctiques, 1986, Paimpont, C.N.F.R.A. 58:177-182.

Adamson, D.A., Whetton, P. and **Selkirk, P.M.** 1988. Warming on Macquarie Island: temperature changes reflecting Southern Hemisphere circulation and the Southern Oscillation. *Papers and Proceedings of the Royal Society of Tasmania*, 122:107-112.

Selkirk, P.M., Seppelt, R.D. and Selkirk, D.R. 1990. *Subantarctic Macquarie Island: Environment and Biology*. Cambridge University Press: Cambridge. 285pp.

Selkirk, P.M. 1992. Climate change and the subantarctic. in Quilty, P.G. (ed) *Impact of Climate Change, Australia-Antarctica*. Canberra: AGPS, pp43-51.

Adam, K.D., **Selkirk, P.M.,** Connett, M.B. and Walsh, S.M. 1997. Genetic variation in populations of the moss *Bryum argenteum* in East Antarctica. in Battaglia, B., Valencia, J. and Walton, D.W.H. (eds) *Antarctic Communities: Species, Structure and Survival.* Cambridge University Press pp 33-38.

Selkirk, P.M., and Adamson, D.A. 1998. *Structural vegetation and drainage of Macquarie Island, map, 1:25 000.* Published by Australian Antarctic Division, Hobart. (edition 2, 2001).

Selkirk, P.M., Skotnicki, M.L., Ninham, J.A., Connett, M.B., and Armstrong, J. 1998. Genetic variation and dispersal of *Bryum argenteum* and *Hennediella heimii* populations in the Garwood Valley, Southern Victoria Land. *Antarctic Science* 10:423-430.

Bergstrom, D.M. and **Selkirk, P.M**. 1999. Bryophyte propagule banks in feldmarks on subantarctic Macquarie Island. *Arctic, Antarctic and Alpine Research* 31:202-208.

Skotnicki, M.L., **Selkirk, P.M.,** Broady, P., Adam, K.D. and Ninham, J.A. 2001. Dispersal of the moss *Campylopus pyriformis* on geothermal ground near the summits of Mt Erebus and Mt Melbourne, Ross Sea region, Antarctica. *Antarctic Science* 13: 280-285.

Whinam, J., **Selkirk, P.M.,** Downing, A.J. and Hull, B. 2004. Return of the megaherbs: plant colonisation of derelict ANARE Station buildings on subantarctic Heard Island. *Polar Record* 40:235-243.

Briggs, C.L., **Selkirk, P.M.** and Bergstrom, D.M. 2006. Facing the furious fifties: the contractile stem of the subantarctic megaherb *Pleurophyllum hookeri* (Asteraceae). *New Zealand Journal of Botany* 44:187-197.

Downing, A.J., Brown, E., Oldfield, R.J., **Selkirk, P.M**., Coveny, R. 2007. Bryophytes and their distribution in the Blue Mountains Region, New South Wales. *Cunninghamia* 10(2): 225-254.

Frenot, Y., Chown, S., Whinam, J.P., **Selkirk, P.M**., Convey, P., Skotnicki, M.L. and Bergstrom, D.M. 2005. Biological invasions in the Antarctic: extent, impacts and implications. *Biological Reviews* 80: 45-72.

Skotnicki, M.L. and **Selkirk, P.M.** 2006. Plant biodiversity in an extreme environment: genetic studies of origins, diversity and evolution in the Antarctic. in Bergstrom, D.M., Convey, P. and Huiskes, A.H.L. (eds) *Trends in Antarctic Terrestrial and Limnetic Ecosystems.* Kluwer. pp161-175.

Bergstrom, D.M. and **Selkirk, P.M.** 2007. Human impacts on sub-Antarctic terrestrial environments. *Papers and Proceedings of the Royal Society of Tasmania* 141(1): 159-167.

Perpetua Turner
Australia

I was born Perpetua Blanks, in Melbourne, Australia, but from the age of 5 to my late teens I grew up in Bendigo amongst Box-Ironbark forests regrowing after the Victorian gold mining era. Surrounded by the Australian bush and given the opportunity of a childhood adventuring outdoors, my choice of career was destined to focus on the natural world.

After finishing college, I moved back to Melbourne, graduating from The University of Melbourne School of Botany in 1996 with a BSc.Hons in Ecology. My Hons project was supposed to be an investigation into the response of fire on a species of *Kunzea*, but as final year exams clashed with when I was required to do the necessary pre-treatment field work, led and supervised by Prof. Mark Burgman, I instead settled on a project investigating how well vegetation communities based on vascular plants could be used as surrogates for the bryological flora. Under the guidance of the father of Australian bryology, the late Dr George Scott, and supported by bryologists Lucille Turner and Dr David Meagher, I was sucked into the fascinating miniature world that is bryology.

In my Hons year I was called 'Moss Lady'. George Scott named those of us new to bryology as 'budding protonema', a term I proudly now pass on. After my first-class Hons degree, I successfully gained a position as Scientific Officer with the Victorian Government. Over the next three years I travelled the state, mapping vegetation communities from the mountains to the sea, and had the opportunity to see firsthand successional processes and bryophyte survival in harsh environments. I learned how integral bryophytes were to early succession, stabilising the soil and creating nursery sites. Fascinated by alpine ecology, I decided this was what I wanted to study, and I was successful in obtaining a PhD scholarship to the University of Melbourne and the University of Tasmania. The choice of university was hard; to continue to study bryophyte ecology was not.

The fact that I still live in Tasmania is tell-tale of the choice I made. And, instead of alpine bryology, my dissertation, supervised by Prof. Jamie Kirkpatrick, centred on the conservation ecology of bryophytes in wet eucalypt forest. Publications from this work found the bryophyte flora in these forests was not at risk under the logging regime employed. But now, 20 years on, with shorter logging rotations and mature forest elements at risk of declining with a changing climate (fire), the risk is heightened.

A career in bryophyte and vascular plant ecology has opened many doors. Working with Dr Dana Bergstrom, I ventured to Heard and Macquarie Islands and published on the effects of climate change on vascular plants. Here, the discovery of a twelfth vascular plant species on Heard Island was a highlight. Post-doctoral research with the Bushfire CRC, Forestry Tasmania and the University of Tasmania questioned the use of the stand-replacing fire paradigm as a basis for production forestry; practices now better reflect natural disturbance in forested landscapes. Research with the Forest Practices Authority of Tasmania has reported on the ecology of threatened species and tree ferns in Australian forests. I currently work with the Tasmania Fire Service, working in planning to reduce bushfire risk whilst protecting the things we value. Bryology has mostly flourished through expertise in non-vascular plants on the Tasmanian Threatened Species Scientific Advisory Committee and student supervision of projects on topics such as the value of coarse woody debris for bryophytes, the effects of logging on tree ferns and their epiphytes, and successional patterns of bryophytes in wet eucalypt forests.

Whilst the adventures have been rewarding, the most fulfilling aspect of my career has been the people. Bryologists feature strongly; they have stayed with me since my first Australasian Bryophyte Workshop in Brisbane in 1996 and their support has never, ever stopped. Now I find myself fitting into their leadership and mentor shoes and I am forever grateful for the roads they have forged to follow.

List of selected publications:

Donoghue, S. and **Turner, P.A.M**. A review of Australian tree fern ecology in forest communities. Austral Ecology, 47(2): 145-165. https://onlinelibrary.wiley.com/doi/abs/10.1111/aec.13103

Turner P.A.M., Kirkpatrick J.B and Pharo, E.J. (2011) Dependence of bryophyte species on young, mature and old growth wet eucalypt forest. *Biological Conservation* 144**,** 2951–2957. http://eprints.utas.edu.au/11983/

Browning B.J., Jordan G.J., Dalton P.J., Grove S.J., Wardlaw T.J., **Turner P.A.M**. (2010) Succession of mosses, liverworts and ferns on coarse woody debris, in relation to forest age and log decay in Tasmanian wet eucalypt forest. *Forest Ecology and Management* 260, 1896–1905. http://eprints.utas.edu.au/10593/

Hodge D.A., Pharo E.J., Dalton, P.J., & **Turner, P.A.M.** (2009) Successional patterns of terrestrial bryophytes along a wildfire chronosequence in the wet eucalypt forests of southern Tasmania. *Tasforests* 67 – 76. http://www.warra.com/documents/publications/Hodge_etal_2009.pdf

Turner P.A.M., Balmer J. & Kirkpatrick J.B. (2009) Stand-replacing wildfires? The incidence of multi-cohort and single-cohort *Eucalyptus regnans* and *obliqua* forests in southern Tasmania. *Forest Ecology and Management* 258, 366-75. http://eprints.utas.edu.au/9883/

Turner P.A.M. & Kirkpatrick J.B. (2009) Do logging, followed by burning, and wildfire differ in their decadal scale effects on tall open-forest bryophytes and vascular plants *Forest Ecology and Management* 258, 679-86. http://eprints.utas.edu.au/8976/

Turner, P.A.M. and Kirkpatrick, J.B. and Pharo, E.J. (2006) Bryophyte relationships with environmental and structural variables in Tasmanian old growth mixed eucalypt forest. *Australian Journal of Botany* 54**,** 239-247. http://eprints.utas.edu.au/1881/

Bergstrom, D.M., **Turner, P.A.M.**, Scott, J.J., Copson, G. and Shaw, J.D. (2006). Restricted plant species on sub-Antarctic Macquarie and Heard Islands. *Polar Biology* 26, 532-539. https://www.researchgate.net/publication/225815575_Restricted_plant_species_on_sub-Antarctic_Macquarie_and_Heard_Islands

Pharo, E.J., Kirkpatrick, J.B., Gilfedder, L., Mendel, L., and **Turner, P.A.M.** (2005) Predicting bryophyte diversity in grassland and eucalypt-dominated remnants in subhumid Tasmania. *Journal of Biogeography*. 32, 2015–2024. http://eprints.utas.edu.au/1884/

Turner, P.A.M., Scott, J.J. and Rozefelds A.R. (2005). Probable long distance dispersal of *Leptinella plumosa* Hook.f. to Heard Island: habitat, status and discussion of its arrival. Polar Biology 29, 160-168. DOI:10.1007/s00300-005-0035-z

For more publications go to:

https://peptalkecology.wordpress.com/publications/

Jennie Whinam
Australia

Professionally, I am more of an ecologist, than a bryologist. I became interested in peatlands when I started my degree at the Australian National University as a mature age student in 1980 under the guidance of the late Prof Geoff Hope, a palynologist and paleoecologist, who first sparked my interest in peatlands.

When I moved to Tasmania with my husband (Russell Bauer, my loyal field assistant), I completed my Honours research on the string bogs of Mt Wellington (1985), under the supervision of Prof Jamie Kirkpatrick and onto what was to become a life-long passion - the ecology of Tasmanian *Sphagnum* peatlands for my PhD thesis (1990). So, technically my bryology research has focussed on mainly one genus of moss, *Sphagnum* (albeit one of the most interesting, diverse and widely distributed species), with a bit of work on its closely related, Tasmanian endemic, sister species *Ambuchanania leucobryoides* and forays into the world of the beautiful and resilient Antarctic and Subantarctic mosses with my colleagues Dr Patricia Selkirk and Dr Mary Skotnicki.

Sphagnum occurs from Subantarctic Macquarie Island, Tasmania and the eastern mountain ranges of mainland Australia and continues north to the Arctic boreal zone. It is a genus that has a profound influence on its ecosystem acidifying the peats which allow it to flourish with a suite of other plant species well adapted to this often waterlogged and acid environment. Over long periods of time it helps store water, filter sediments and pollutants to form carbon-rich peatland landscapes. My work on *Sphagnum* peatlands led to my appointment to the Main Board of the International Mire Conservation Group (IMCG) completing my term as Chair from 2004 to 2012. Later I became the English editor of the IMCG benchmark publication 'Mires and Peatlands of Europe' (2017). This diverse specialist group has focussed on the science and conservation of peatlands globally and afforded me the opportunity to visit peatland landscapes from Tierra del Fuego, Colombia, throughout Europe and the United Kingdom, up to the mountains of Georgia and Armenia.

As part of a French RAMSAR nomination, I was invited to study the remarkable *Sphagnum* peatlands of the French islands of St Paul and Amsterdam in 2007, where new species of *Sphagnum* were identified (with Prof Kjell-Ivar Flatberg). Here, *Sphagnum* moss is confined to volcanic vents on Ile St Paul (meaning that you have warm rubber boots!) and the spectacular vista of a *Sphagnum* landscape in a drowned caldera on Ile Amsterdam.

I have enjoyed working with Australian ecologists, such as the late Roger Good, Keith McDougall, Gen Wright, David Keith and Arn Tolsma (all endlessly keen to discuss the wonders of *Sphagnum* moss) and contributed to Alpine *Sphagnum* Bogs and Associated Fens being nationally listed as an endangered community under the Commonwealth Environment Protection and Biodiversity Conservation Act. This community faces threats from climate change (evapotranspiration in the warmest month is a limiting factor for distribution in Australia), bushfires and feral animals (feral horses, pigs and deer). I participated in trialling various techniques in early post-fire restoration programs in Australia's Kosciuszko and Namadgi National Parks for over a decade after widespread and devastating bushfires in 2003. It's surprising how one genus of endlessly fascinating moss has opened so many opportunities in science and conservation and over the past 35 years has taken me to so many amazing landscapes across the globe.

Marianne Worley
Australia

I first began working in ecology and conservation in Australia in the late 1990s. I've had an eclectic career, working on the conservation of both threatened flora and fauna for state governments and consultancies, but I've always had a passion for community ecology, and since completing a PhD at Monash University, Australia, on the drivers of bryophyte diversity in Victorian cool temperate rainforest, bryophytes have been closest to my heart.

My doctorate in the early 2000s investigated the effects of habitat patchiness at the micro, forest-stand and landscape scales on the diversity of bryophytes in cool temperate rainforest. In 2009, the Black Saturday fires in Victoria burnt about half of the rainforest patches in which I'd previously conducted research. Thus, sadly, I was provided with an opportunity to investigate the effects of fire on rainforest. It was a slow process of grieving to observe the loss of rainforest patches, at first and most catastrophically, smaller patches at higher elevation sites, and then more slowly, the erosion of the edges of larger rainforest patches by the cumulative, longer-term effects of fire and logging disturbance.

Observing the impacts of such a catastrophic wildfire event galvanised me to focus my efforts on being a part of mitigating the impacts of climate change on Australian temperate rainforests. This, and taking time away to raise young children, prompted me to branch out from science for several years into the world of fiction and nature writing, in an attempt to connect through the heart and to more viscerally allow people to experience the effects of climate change.

Now, with kids slightly older, I'm refocusing on how climate change and fire are affecting cool temperate rainforest in Victoria, with a particular focus on its dependent biota. Bryophytes mean so much to me; as symbols of resilience and persistence, of wise and intricate adaptation to their particular circumstances, and as beings whose beauty still takes my breath away.

List of selected publications:

Worley M (2012) Impacts of the 2009 Kilmore East-Murrindindi bushfires on cool temperate rainforest in the Victorian Central Highlands. Black Saturday Victoria 2009 Natural values fire recovery program Project No.2, Department of Sustainability and Environment, State of Victoria: Melbourne.

Worley M (2007) Effects of habitat patchiness on bryophyte diversity across multiple scales in *Nothofagus cunninghamii*-dominated cool temperate rainforest in the Victorian Central Highlands. PhD Thesis, Monash University, Clayton.

Dell M, **Worley M**, McMullan-Fisher SJM and Casanova MT (2020) An assessment of conservation priorities and actions for bryophytes, algae and fungi in response to Victoria's 2019-2020 bushfires. Technical Report DOI: 10.13140/RG.2.2.21042.32967.

Worley M (2021) 'A Special Place' Column, pp. 13–14 In GreenSpirit Magazine 23 (2), Rewilding, Eds. M Van Eyk McCain, I Mowll & J Angus: London.

Worley M (2016) 'Green and Belonging' pp. 37–49 In Deep Green Living, Ed. Marian Van Eyk McCain, GreenSpirit (GreenSpirit Book Series: London). ISBN: 9780993598302.

Bennett J, Harley D, **Worley M**, Donaldson B, Andrew D, Geering D, Povey A & Cohen M (2000) 'Watching Wildlife Australia' Lonely Planet Publications: Melbourne. ISBN: 9781864500325.

Mereia Tabua
Fiji

My first encounter with bryophytes was via a textbook while undertaking an introductory plant biology course during my undergraduate days. I was not particularly keen on having to learn the life cycle of an organism that I could not relate to or had never heard of before. Fast forward four years later and I was drafting a proposal for my Master of Science thesis that would see me undertake the mammoth task of a comparative study of epiphytic bryophytes along an elevational gradient on Viti Levu, Fiji's main island; the first ecological study of its kind for Fiji.

In 2011, a year prior to commencing my thesis, I was very fortunate to accompany a group of visiting bryologists, lichenologists, and pteridologists, carrying out field work on Viti Levu and Kadavu. It was during this cryptogam expedition that I first met Dr. Matt von Konrat, my mentor and very good friend, who has been my bryology beacon over the years and continues to render his unwavering support at every juncture of my career to-date. It was also on this same expedition that the cornerstone of my career was formed, where I ventured into a field that no one else in Fiji specialized in.

Three weeks of bryo-exploration and hands-on learning in the field and I was genuinely intrigued by these microplants. Upon returning to the herbarium in Suva, Ms. Laura Briscoe, a fellow bryologist, showed me the ropes on how to further examine their microscopic details. That's what sealed the deal for me. I was immensely fascinated by how they came to life under the microscope, showing off their distinguishable characteristics, by just simply adding water to a dried specimen.

Ironically, it's their microscopic size and details that has been the greatest challenge working with this group of plants, other than not having any other resident bryologists in Fiji, with whom I can consult. One of the greatest pleasures, however, is that I get to hike mountains and track through forests where most people have never stepped foot, while attempting to document the diversity and distribution of bryophytes in Fiji and other neighboring island countries. My most memorable experience so far has been encountering the incredible difference in bryoflora between the forested

areas and the lava flow scrubs on the volcanic crater, Mata o le Afi, on the island of Savai'i in Samoa.

On a slightly broader note, since taking on this field of study, the majority of rapid biodiversity assessments for Fiji now include preliminary checklists of bryophytes and ecological notes. This is pivotal in shedding some light on this often neglected group of plants. I am also privileged to be an elected council member for the International Association of Bryologists, a member of the Bryophyte Specialist Group for the IUCN Species Survival Commission, and the Associate Editor for the Bryological Times.

Photos courtesy of Elia Nakoro and Peter de Lange.

Jessica Beever
New Zealand

I was born Jessica Spragg in Hamilton, New Zealand, and have New Zealand Māori ancestry (Ngāti Toa, Te Ati Awa and Ngāti Mutunga iwi) on my mother's side, as well as English and Scottish forebears who emigrated several generations ago to seek life in a new land. My earliest memories of the natural world include family picnics by fast-flowing forest streams, cold water, but sun-baked rocks, on the slopes of the mountain Taranaki, near our next home in New Plymouth. We moved to Auckland City when I was 5 years old, but some 10 years later my mother, a school-teacher, took me on several Adult Education trips to Mt Taranaki, and the mountains of the central North Island. The tutors were all university specialists in aspects of natural history: geology, birds, entomology, and botany and made a great impression on a 15-year-old. We learnt to recognise and name many vascular plants (no bryophytes yet). Botany degrees (B.Sc. and M.Sc.) at the University of Auckland followed. There I got to know my future husband, fellow botanist Ross Beever. In 1969 we travelled to England for PhDs at the University of Leeds.

The Spragg family had a bach (holiday home) built by my father in the forest of the Waitakere Ranges, where Ross and I began our married life and my fascination with mosses really began. Allison and Child's *Mosses of New Zealand* being on the book-shelf gave the impetus for my first attempt at keying out a moss. An auspicious choice—what could have been simpler—*Catharomnion ciliatum* - no other moss in our flora has a hairy margin! Thanks to the generosity of Allan Fife, I was later asked to revise *Mosses of New Zealand*. Conferences early in my career, in Sydney, Australia (1981) and Tokyo, Japan (1983), together with a year in the U.K. (1980–81), gave opportunities to see mosses in foreign habitats and to cement friendships with many bryologists. Some of these folk have now died, and I treasure the memories, in particular with Ilma Stone (wonderful collaboration on *Fissidens*), with Tadashi Suzuki whose trip to New Zealand was a prize as "employee of the year" from his Japanese work-place (with minimal language in common, and much enthusiasm, we also shared *Fissidens*, he opening my eyes to the micro-*Fissidens* species), Zen Iwatsuki, who came to New Zealand with Janice Glime to study the mosses of our thermal areas, Eric Watson and Harold Whitehouse, each coming to a part of the world they had always wanted to visit for its bryophyte flora.

I have been a frequent participant in the annual John Child Bryophyte Workshops from their inception in 1983, and a member of the Department of Conservation's expert panel on threatened bryophytes. Ross and I were long-time members of the Offshore Islands Research Group, whereby I was able to document the mosses of many of New Zealand's northern offshore islands, sometimes

with our two children along if permits allowed. In 1992 a monotypic, endemic moss genus, *Beeveria*, was named by Allan Fife.

At present I am a Research Associate of Manaaki Whenua - Landcare Research, working on the *Flora of New Zealand: Mosses*, my current project being the Pottiaceae.

Photo courtesy of Gael Donaghy.

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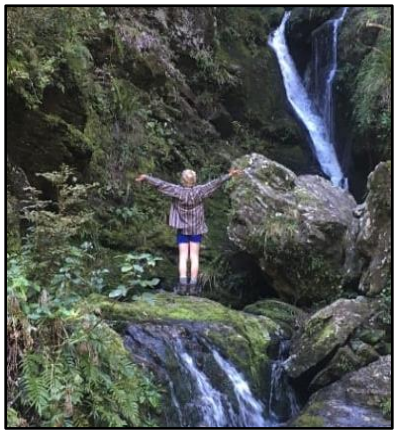
Daniella Damm
New Zealand

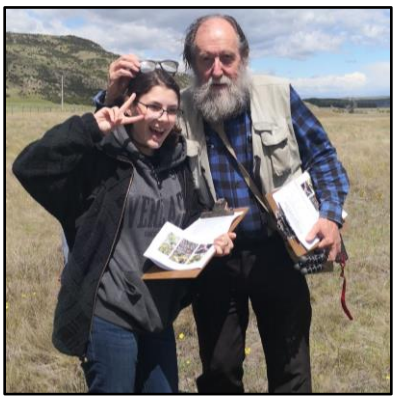
I'm a third year student at Otago studying Botany and Marine Science. I was born and raised in Ōtautahi and have spent a lot of time in Banks Peninsula, and now due to my studies, in Dunedin. I stumbled upon a focus in bryophytes on my first botany field trip when John mentioned the extra bryophyte and lichen labs he ran, and I jumped at the chance! I've always marvelled in the beauty of mosses (something which probably stems from my mother's interest in them. We would always point out particularly lichen-covered twigs and mossy vignettes - drawn to the unique textures, shapes and colours. My mother is a florist and interior designer, so our house was always full of flowers and those lichen-covered branches.) but I'd never really looked so closely at them before. As beautiful as they are in abundance in the environment, they have a whole new beauty under the microscope- it highlights their great variety too. It has been such a pleasure practising keying them out, learning their features and the vocabulary. I'd have to say my ultimate happy place is swimming in the ocean or in a mossy forest. Learning more about bryophytes has definitely heightened my appreciation of them.



Stella Fish
New Zealand

I have always been interested in plants and even had a favourite moss patch in an alley near my childhood home. Moving to Otago, New Zealand to study I spent my free time at Woodhaugh Gardens hunting for whatever plants I could find. I was gifted a hand lens and suddenly became a terrible person to walk with due to the distractions of bryophytes on garden walls, footpaths and trees. After finding a lichen distorted with several lichenicolous fungi I was put in contact with John Steel who runs non-vascular labs twice a week. I've been going ever since. An interest in taxonomy arose after spending many hours investigating *Canalohypopterygium tamariscinum* and through my work curating the bryophytes at the Otago Herbarium. I'm focusing on the Lejeuneaceae with intentions to do post-graduate studies in liverwort taxonomy.

Jessica Paull
New Zealand



I grew up in Nevada's Great Basin Desert, so plants were never a significant part of my daily life. The occasional bush would hide snakes or scorpions and should be avoided, and a rare tree was just a respite from the sun. My upbringing meant that flowers, trees, and botanical things were largely alien and unusual things to me. Luckily for me, I've always been drawn to things that are both alien and unusual. Fungi are still some of the world's most mysterious, fascinating organisms. Naturally, I thought that I would find my calling in studying fungi. With conviction, I came to New Zealand to pursue this dream.

I signed up for the first fungal foray I could find, and it was there I met the incredible John Steel. He must have seen some potential in me, and graciously continued to take me around and show me New Zealand plants and fungi. I was focused on fungi, so that was the main point of our trips at the time. However, mushrooms are impermanent and seasonal. What would we look at in between the spring and autumn months? The large, vascular plants are stunning, but as I said, the mainstream has never been where my interests lie. So, we started looking at bryophytes. I must admit, I wasn't enamoured at first.

We started by playing a game: liverwort or moss. John would show me a bryophyte he'd found in the bush and ask me to identify which category it belonged to. I'd always guess, and I was always wrong. I couldn't understand what John was so clearly seeing in these tiny plants that I was missing. So, I looked closer. That was the beginning of the end. The closer I looked, the more diversity and beauty I found. These tiny plants held so much unexpected magnificence, hidden away from us because of their size and a human indifference to looking at smaller things. What was once a "green patch" that I'd use as a cushion became a site of discovery where I could examine a hidden world of plants for literal hours.

And with bryophytes, the closer you look, the more beautiful they get. Microscopically, the cellular structure and arrangement is just as diverse as their physical growth forms. Truly, I feel so lucky to be able to research them. Studying bryophytes feels like the world's best kept secret—it feels like knowing about the forest within forests.

Aimee Pritchard
New Zealand

I was born in Dunedin, New Zealand and growing up in rural New Zealand allowed me to spend lots of time outdoors and pursue my passion of the natural world. From a young age I was always interested in Botany and knew that I wanted to study at university so I set myself on that path. Little did I know that it would lead me into the unknown, dynamic world of bryology.

I have been interested in bryology for twelve years, when I first encountered it in a botany laboratory, in my undergraduate degree. I became fully interested in bryology after looking down the microscope and seeing something I had never seen before. As I got further into identifying bryophytes and reading into their Ecology, I got hooked. I did many of my undergraduate projects with a bryology component, which led to me being awarded the Tom Moss Award for students in Bryology, in 2011 and attending the annual New Zealand Bryology conferences, eventually organising one on the beautiful Stewart Island, in Southern New Zealand.

I was fortunate enough to have highly knowledgeable people around me, namely Allan Fife and John Steel, who gave much of their time to teach me and encourage my newfound passion. After completing my bachelor's degree, I went on to work for the Department of Conservation, in New Zealand, as a Bryologist for three years. Primarily working on a national project to measure carbon in our forests, and surveying biodiversity. I then took a few years off, before returning this year, to embark on a Master's degree in Botany, with a focus in Bryology. More specifically, measuring whether bryophyte biodiversity can be used as an environmental indicator for soil and ecosystem health by surveying exotic plantations versus native forest. I am really enjoying working in a field that keeps challenging me and takes me to beautiful places.

SOUTH AMERICA

Juçara Bordin
Brazil

My name is Juçara Bordin. I was born in 1978 in Caxias do Sul, in the south of Brazil. Since I was a child I was always in touch with nature because I helped my parents with some work on the farm. My brother and I liked to walk in the woods, find pine nuts and swing on the trees! My first contact with mosses was when we collected mosses to use as floor mats in our playhouses!

I decided to study Biology because I liked plants. However, I only became interested in bryophytes after graduation. Dr. Ronaldo Wasum (in memoriam) my adviser and I started to develop a project about biomonitoring using bryophytes, but we discovered that none of us knew how to identify the species. We also discovered that no bryologists were working in the south of Brazil. So, Dr. Ronaldo encouraged me to go to São Paulo to do an internship at the Instituto de Botânica de São Paulo with Dr. Olga Yano to learn how to identify species. He also advised me to become a bryologist to work in our state as no one here was working with bryophytes.

In 2006 I moved to São Paulo to start my Master's under the guidance of Dr. Olga Yano. My dissertation was a floristic study of urban bryophytes from the municipality of Caxias do Sul and we discovered 50 new occurrences for the state of Rio Grande do Sul! In São Paulo, I met Dr. Denilson Fernandes Peralta who also encouraged me to continue my studies.

For my Doctorate, also supervised by Dr. Yano, I studied the family Fissidentaceae for Brazil and we described a new species: *Fissidens pseudoplurisetus* Bordin, Pursell & Yano. During my Doctorate I had the opportunity to go to the Antarctic for the first time to study the bryophytes from that continent, later participating in eight more scientific expeditions to the Antarctic and one to Patagonia.

In 2012 I returned to Rio Grande do Sul and now I am an adjunct professor at the Universidade Estadual do Rio Grande do Sul. I am a professor in the Biology and Pedagogy degree and also in the Graduate Program. I advise undergraduate and master's students and co-advise doctoral students at other Institutions. My main line of research is floristics and taxonomy aiming to know and protect species and biodiversity, especially in the south of Brazil. However, with the assistance of two undergraduate students, we started the development of two new lines of research: bryophytes applied to phytoremediation and the study of the bioactive compounds of bryophytes,

both with the help of researchers in the fields of Chemistry, Biochemistry and Physiology. We have learned a lot about these new areas and how important bryophytes are, not only for biodiversity as a whole, but also for their potential uses.

I'm also involved in teacher training projects, Environmental Education, Science dissemination and teaching, especially with the use of digital games. I joined the group that developed a digital game about Brazilian Biomes and another game about bryophytes of Brazilian Pampa for children and young students. The games are available for Android at:
https://play.google.com/store/apps/details?id=com.LLG.JornadaBiomas
https://play.google.com/store/apps/details?id=com.LLG.JornadaBriofitasPampa

I am very grateful to God for guiding me on this journey and also to my family who is my safe haven! I hope to be able to inspire and contribute to the increase of new scientists, and especially see further involvement from girls and women! I strongly believe that we have to spread knowledge outside the University, to schools, teachers, students and encourage these young students to be interested in nature, in the conservation of biodiversity and also in bryophytes!

Meu nome é Juçara Bordin. Eu nasci em Caxias do Sul, no Sul do Brasil, em 1978. Desde criança tive contato e interesse pela natureza pois acompanhava meus pais em alguns trabalhos no sítio. Eu e meu irmão gostávamos de andar no mato, achar pinhão e nos balançar nos cipós! Meu primeiro contato com os musgos foi nessa época, quando nós coletávamos musgos para usá-los como tapetes no chão das nossas casinhas de brinquedo!

Escolhi fazer Graduação em Biologia porque gostava das plantas. Porém, só comecei a me interessar pelas briófitas no final do curso. Junto com meu orientador, Dr. Ronaldo Wasum (in memoriam), começamos a desenvolver um projeto de biomonitoramento utilizando briófitas, porém, logo descobrimos que nenhum de nós sabia identificar as espécies! Também descobrimos que não haviam briólogos trabalhando no Rio Grande do Sul ou no Sul do Brasil. Então, Dr. Ronaldo me incentivou a ir para São Paulo fazer um estágio no Instituto de Botânica de São Paulo, com Dra. Olga Yano, para aprender a identificar as espécies. Ele também me incentivou a tornar-me uma brióloga para trabalhar no nosso estado, já que ninguém estava trabalhando com briófitas aqui.

Em 2006 fui morar em São Paulo para começar o Mestrado sob orientação da Dra. Olga Yano. Minha dissertação foi um estudo florístico das briófitas urbanas do município de Caxias do Sul e nós descobrimos 50 novas ocorrências para o estado do Rio Grande do Sul! Em São Paulo, conheci o Dr. Denilson Fernandes Peralta, que também me incentivou a continuar meus estudos.

No Doutorado, também orientada pela Dra. Yano, estudei a família Fissidentaceae para o Brasil e nós descrevemos uma nova espécie: *Fissidens pseudoplurisetus* Bordin, Pursell & Yano. Durante o Doutorado tive a oportunidade de ir pela primeira vez para a Antártica estudar as briófitas daquele continente, participando posteriormente de mais 8 expedições científicas para a Antártica e uma para a Patagônia.

Em 2012 voltei para o Rio Grande do Sul e, atualmente, sou professora adjunta na Universidade Estadual do Rio Grande do Sul. Sou professora nos cursos de Biologia e Pedagogia e também na Pós-Graduação. Oriento alunos de Graduação e Mestrado e sou co-orientadora de alunos de Doutorado em outras instituições. Minha principal linha de pesquisa é a florística e taxonomia visando conhecer e conservar as espécies, especialmente no Rio Grande do Sul. Porém, com o incentivo de duas alunas de graduação, iniciamos o desenvolvimento de duas novas linhas de pesquisa com briófitas: Briófitas aplicadas à fitorremediação e Estudo dos compostos bioativos de briófitas, ambas com o auxílio de pesquisadores da área da Química, Bioquímica e Fisiologia. Tem sido desafiante trabalhar nestas áreas pois tenho pouco conhecimento sobre o assunto! Mas temos aprendido muito e percebido quanto as briófitas são importantes, não só para a biodiversidade como um todo, mas também pelo potencial de uso que elas possuem.

Também estou envolvida com projetos de formação de professores, Educação Ambiental, divulgação e ensino de Ciências, especialmente com o uso de jogos digitais! Participei da elaboração de um jogo digital sobre os biomas brasileiros para estudantes das séries iniciais e outro jogo sobre as briófitas do Pampa brasileiro. Os jogos estão disponíveis para Android em: https://play.google.com/store/apps/details?id=com.LLG.JornadaBiomas e https://play.google.com/store/apps/details?id=com.LLG.JornadaBriofitasPampa
Eu sou muito grata a Deus por me guiar nesta caminhada e também a minha família que é meu porto seguro! Espero poder inspirar e ajudar na formação de novos cientistas, especialmente, meninas e mulheres! Acredito muito que temos que levar o conhecimento para fora da Universidade, para as escolas, professores, estudantes e incentivar estes jovens estudantes a se interessarem pela natureza, pela conservação da biodiversidade e também pelas briófitas!

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Aline Matos de Souza
Brazil

I was born in Ilhéus, one of the first cities to be founded in Brazil. It is a coastal city, where there are beautiful landscapes, and rich flora, even if seriously anthropized. Since I was a kid, I had always been interested in plants, especially flowers, which had always enchanted me. However, the interest in bryophytes only occurred after the middle of my degree in Biology at the Universidade Estadual do Sudoeste da Bahia (UESB). Initially, I was frustrated with Botany, the way it used to be taught in Brazilian high schools, and I didn't want to research this area of science. But upon entering college, I began to fall in love with this science, initially dedicating myself to the study of Pteridophytes. A friend, Dr. Anderson Ferreira Pinto Machado, encouraged me to look at bryophytes. When I started looking at bryophytes in the field and being curious to know these little plants, I came across a microscopic new world. I felt that I was dealing with the history of the world, manipulating plants so ancient and excellent in the task of persisting in nature, despite its limitations. I was enchanted by the morphophysiological adaptations, with their shapes and colors. I realized that many people did not see them in the field and that in Brazil there was (and still is) a gap in the knowledge of bryophytes. This was in 2010.

At the college I studied for graduation, there were no professors specializing in bryophytes, and to learn about bryophytes, I signed up for a summer course offered by Prof. Dr. Cid José Passos Bastos at the Universidade Federal da Bahia (UFBA). With what I learned in this summer course, I was able to develop my first research project on the diversity of bryophytes in a fragment of the urban forest in Vitória da Conquista, Bahia, Brazil, under the guidance of Prof. Dr. Cecília Oliveira de Azevedo (Orchidologist - UESB). Upon finishing my degree in Biology, in 2013, I immediately entered the Master's degree at the Universidade Estadual de Feira de Santana (UEFS), under the guidance of Prof. Dr. Luis Pascholati Gusmão (Mycologist-UEFS) and co-supervision of Prof. Dr. Emilia de Brito Valente (Bryologist - UEFS). My master's research aimed to know the species of bryophytes that occurred in an ecotone area (transition between the Atlantic Forest and the Caatinga) in the state of Bahia, Brazil. During my master's research, I collected many species of the genus *Plagiochila*, and I became interested in the group. Thus, in 2015, when starting my doctorate, I was strongly influenced by Prof. Dr. Denilson Fernandes Peralta (Bryologist - IPA), to start research on *Plagiochila* species that occur in Brazil. Since the beginning of the research, I have noticed an urgent need to identify specimens from the various collections of Brazilian bryophytes, and also to review the nomenclatural types of the cited species for the country. I defended my Ph.D. in 2019, and many of my thesis results are being submitted for publication. I currently work as a teacher at the Department of Education of the State of Bahia, in Brazil, guiding

introductory scientific research for high school students in the public school system. Recently I had the privilege of becoming a mother and have been trying to balance the roles of motherhood, research, and teaching as best I can.

Eu nasci em Ilhéus, uma das primeiras cidades a serem fundadas no Brasil. É uma cidade litorânea, onde existem belíssimas paisagens, e uma rica flora, mesmo que seriamente antropizada. Desde pequena, sempre me interessei por plantas, principalmente pelas flores, que sempre me encantaram. No entanto, o interesse pelas briófitas só ocorreu a partir da metade do meu curso de licenciatura em Biologia na Universidade Estadual do Sudoeste da Bahia (UESB). Inicialmente, senti-me frustrada com a Botânica, pela forma como costumava ser ensinada nas escolas de ensino médio do Brasil, e não queria fazer pesquisas sobre o assunto. Mas ao ingressar na faculdade, comecei a me apaixonar por essa ciência, inicialmente dedicando-me ao estudo das Pteridófitas. Um amigo, o Dr. Anderson Ferreira Pinto Machado teve o papel fundamental de me instigar a olhar para as briófitas. Quando comecei a olhar para as briófitas em campo, e a ter curiosidade de conhecer aquelas pequenas plantas, deparei-me com um microscópico mundo novo. Sentia que estava lidando com a história do mundo, manipulando plantas tão antigas e excelentes na tarefa de persistirem na natureza, mesmo com suas limitações. Encantei-me com as adaptações morfofisiológicas, com suas formas e cores. Percebi que muitas pessoas não as viam em campo, e que no Brasil existia (e ainda existe) uma lacuna sobre o conhecimento das briófitas. Isso foi em 2010.

Na faculdade que estudei a graduação, não havia professors especializados em briófitas, e para aprender sobre elas, me inscrevi em um curso de verão oferecido pelo briólogo Prof. Dr. Cid José Passos Bastos na Universidade Federal da Bahia (UFBA). Com o que aprendi nesse curso de verão, pude desenvolver minha primeira pesquisa sobre a diversidade de briófitas de um fragmento de mata urbano em Vitória da Conquista, bahia, Brasil, sob a orientação da Profa. Dra. Cecília Oliveira de Azevedo (Orquidóloga - UESB). Ao terminar a Licenciatura em Biologia, em 2013, ingressei imediatamente no Mestrado na Universidade Estadual de Feira de Santana, sob orientação do Prof. Dr. Luis Pascholati Gusmão (Micólogo-UEFS) e co-orientação da Profa. Dra. Emilia de Brito Valente (Brióloga - UEFS). Minha pesquisa de mestrado objetivava conhecer as espécies de briófitas que ocorriam em uma área de ecótono (transição entre a floresta atlântica e a caatinga) no estado da Bahia, no Brasil. Durante minha pesquisa de mestrado coletei muitas espécies do gênero Plagiochila, e acabei me interessando pelo grupo. Assim, em 201 5, ao iniciar o doutorado, fui fortemente influenciada pelo Prof. Dr. DenilsonFernandes Peralta (Briólogo - IPA), a iniciar uma pesquisa sobre as espécies de Plagiochila que ocorrem no Brasil. Desde o começo da pesquisa percebi uma necessidade urgente de identificar os espécimes das várias coleções de briófitas brasileiras, e de também revisar os tipos nomenclaturais das espécies citadas

para o país. Defendi o doutorado em 2019, e muitos dos resultados da minha tese estão sendo enviados para publicação. Atualmente atuo como professora na Secretaria de Educação do Estado da Bahia, no Brasil, orientando pesquisas de iniciação científica de estudantes de ensino médio da rede pública de ensino. Recentemente tive o privilégio de me tornar mãe, e tenho tentado equilibrar as funções da maternidade, da pesquisa e do ensino da melhor forma possível.

Catalina Montoya Molina
Colombia

My name is Catalina Montoya Molina, and I am a recent Biology graduate from the University of Antioquia. I was born in Medellín, a city in the department of Antioquia, Colombia. What made me love biology at first was the fact that I lived in a house in the field, so during all my childhood and youth I had the privilege to live among nature, trees, animals and the mountainous landscapes of my beloved Antioquia, which is also very rich in bryophytes. So, when I started my degree in Biology, in the first general botany lab, it was scheduled to study bryophytes, and the first time I saw a bryophyte down the microscope it was love at first sight, there is no another way to say it. Its' unconceivable shapes that seemed nothing like I had seen before in my life, and because of that, its unexplainable beauty, had just fascinated me in a way that still today keeps overwhelming me. Unfortunately, in my university there was no bryology teacher, and that bryology lesson occurred only in that first Botany lab, and never again in Botany or in another subject in the following semesters of my career did I have another class about bryology.

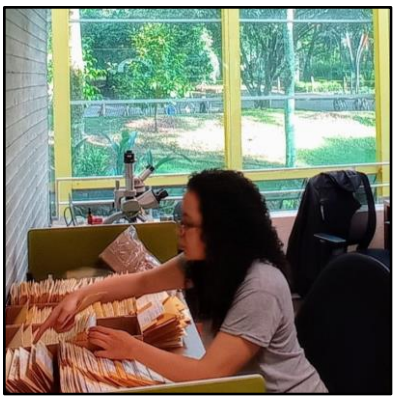
Some semesters later, an unforgettable day, more casually than anything, I met in the Herbarium of my university (HUA) a biologist who worked with bryophytes as a consultant, so he started to teach me my first lessons in bryophyte taxonomy. The time I spent with him was short because he left the country to do his Master's degree. However, I kept studying bryophytes on my own, with the literature that he lent me, and with the books available in the Herbarium library. Fortunately, I was lucky because HUA has the second largest bryophyte collection in the country, with 15,000 specimens, so I had too many bryophytes for learning. So during that time I explored all the bryophyte families, genera and species present in Antioquia and Colombia that are stored in HUA. I did not need too much time to realize that there was a particularly complicated and frustrating liverwort genus: that was *Plagiochila.*

Some months later, another wonderful casual meeting happened: Professor Jaime Uribe came to visit HUA looking for some endangered species that could be in Antioquia. So, I asked him to teach me, and that changed my perspective of bryology and biology in general. He was the first real bryologist and specialist that I had met in my life, so that encouraged me even more to keep on learning about bryophytes. As I had to think about my undergraduate thesis, I asked him to teach me about liverworts, particularly *Plagiochila*, the most frustrating group that I had studied. By that time, my botany teacher, Ricardo Callejas, took me to another herbarium, at the Botanical Garden of Medellín Joaquín Antonio Uribe (JAUM). There was a small and sadly forgotten

bryophyte collection that I started to curate and organize. It helped me to learn about another detail of bryophyte collections - curation. I asked for all of the *Plagiochila* collections from another herbarium there and started my graduate thesis: "A synopsis of the genus *Plagiochila* (Plagiochilaceae) in the department of Antioquia, Colombia" which is in the process of being published.

During the second half of my undergraduate degree and until now I have had the chance to explore bryophyte taxonomy, by curating the bryophyte collections of various herbaria like HUA, JAUM and MEDEL, and have visited places all around Colombia in which I have collected and enriched the JAUM bryophyte collection. I enjoy sharing my knowledge, so I have been in different activities teaching about bryophytes in secondary schools, and rural communities. I also had the chance to participate in a project which explored bryophyte diversity of dry forest relicts in Valle del Cauca and was in an activity that evaluated the IUCN red list of Colombian bryophyte species. I am seriously interested in continuing my studies on bryophytes, and as I like taxonomy, I want to continue my research in taxonomy and phylogenetics from an integrative perspective.

Mi nombre es Catalina Montoya Molina, y soy bióloga recién graduada de la Universidad de Antioquia. Nací en la ciudad de Medellín ubicada en el departamento de Antioquia, Colombia. Lo que en principio me llevó a enamorarme de la Biología fue el hecho de vivir en una casa en el campo, razón por la cual durante toda mi infancia y juventud tuve el privilegio de vivir entre naturaleza, árboles, animales y los montañosos paisajes de mi amada Antioquia que, además es muy rica en briófitos. Así que cuando entré al pregrado de Biología, durante el primer laboratorio de Botánica General, en el cual teníamos planeado estudiar briófitos y vi por primera vez un briófito al microscopio, sentí amor a primera vista, no existe otra manera de expresarlo. Sus formas inconcebibles que no se parecían a absolutamente nada que hubiera visto antes en mi vida, y por eso mismo, su inexplicable belleza, me fascinaron de tal manera que aún hoy día continúan abrumándome. Desafortunadamente en mi Universidad no había un profesor de Briología, y las lecciones de briología quedaron en ese primer laboratorio de Botánica General, y nunca más en dicha materia ni en otra en los semestres subsiguientes vi otra lección que abordara algún tema de briología.



Algunos semestres después, un día inolvidable, más por casualidad que otra cosa, conocí en el Herbario de mi universidad (HUA) a un biólogo que trabajaba consultoría de briófitos, quien comenzó a enseñarme mis primeras lecciones de briología. El tiempo que pasé con él fue corto, pues el salió del país poco después a realizar su maestría. Sin embargo, continué estudiando briófitos por mi cuenta con la literatura que él me había brindado y con los libros que estaban disponibles en la biblioteca del herbario. Afortunadamente HUA contiene la

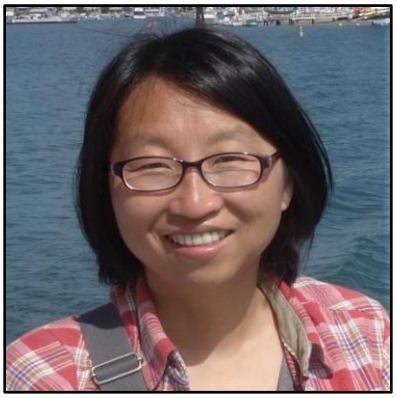
segunda colección de briófitos más grande del país con 15.000 ejemplares, razón por la cual tuve muchísimos briófitos para aprender. Así que durante ese tiempo exploré todas las familias, géneros y especies de briófitos presentes en Antioquia y Colombia que están almacenados en HUA. Sin embargo, no necesité mucho tiempo de estudio para darme cuenta de que había un género de hepáticas particularmente complicado y frustrante: ese era *Plagiochila.*

Algunos meses después, ocurrió otra maravillosa casualidad: el profesor Jaime Uribe fue de visita a HUA buscando especies amenazadas de briófitos que pudieran estar en Antioquia. Entonces le pedí que me enseñara, y ello cambió por completo mi perspectiva de la briología y de la biología en general. Él fue el primer briólogo especialista que conocía en mi vida, lo cual me motivó aún más a continuar estudiando briófitos. Como era hora de ir pensando en mi tesis de pregrado, le pedí que me enseñara sobre hepáticas, particularmente sobre *Plagiochila,* el grupo más frustrante que yo había estudiado. Por aquellos tiempos, mi profesor de botánica, Ricardo Callejas me llevó al herbario del Jardín Botánico de Medellín Joaquín Antionio Uribe (JAUM). Allí había una pequeña y lamentablemente olvidada colección de briófitos que comencé a curar y organizar. Ello me ayudó a aprender otros detalles sobre curaduría de colecciones de briófitos. Así que pedí en préstamo todas las colecciones de *Plagiochia* a JAUM y realicé mi trabajo de grado titulado "Sinopsis del género *Plagiochila* (Plagiochilaceae en el departamento de Antioquia", que actualmente se encuentra en proceso de publicación.

Durante la segunda mitad de mi carrera en Biología y hasta ahora he tenido la oportunidad de explorar la taxonomía de briófitos, curando las colecciones de varios herbarios como HUA, JAUM y MEDEL, y he visitado lugares en todo Colombia en los cuales he colectado y enriquecido la colección de briófitos de JAUM. Me gusta enseñar, razón por la cual he estado en diferentes actividades enseñando sobre briófitos en colegios de secundaria y comunidades campesinas. También tuve la oportunidad de participar en un proyecto que exploraba la diversidad de briófitos de relictos de bosque seco en el Valle del Cauca, y estuve en una actividad de evaluación de especies de briófitos amenazadas según los criterios de la UICN en Colombia. Estoy muy interesada en continuar mis estudios con briófitos, y así como me gusta la taxonomía, quiero continuar mi investigación en filogenética y taxonomía desde una perspectiva integrativa.

SOUTHEAST ASIA

Sun Yue
China



I was born in inner Mongolia in China. I love nature. My first experience with identifying plants was in my childhood when I needed to find some food for my rabbits. I studied biology at the University of Science and Technology of China. At that time, I found plants were my favorite. Then I went to the Shanghai Institute of Plant Physiology of Chinese Academy of Science for my PhD degree. I did research about leaf development regulation using *Arabidopsis* as research material and got a PhD in genetics. Because I felt my knowledge about plants was still very limited, I applied for a job in the East China Normal University which has one of the best plant taxonomy departments in China.

At the beginning, I studied an *Arabidopsis* auxin metabolism mutant uro (upright rosette). Later I thought I needed a simpler research system. Through Prof. Wang Youfang and Prof. Zhu Ruiliang, I became aware of bryophytes and the first moss model plant *Physcomitrella*. In order to learn research methods of *Physcomitrella*, I went to Prof. Ralf Reski's lab in Freiburg University in Germany and Prof. Hasebe's lab in the Institute for Basic Biology in Japan. With their assistance I set up a well working moss culture and study system in Shanghai.

I am very interested in the developmental process of mosses. Several other mosses besides *Physcomitrella* are cultured in my lab. One of them is *Sphagnum*. After carefully observation and a lot of attempts, my lab set up methods for culturing *Sphagnum* protonema and protoplast isolation. Further molecular biology study methods are tested in my lab also. We found that *Sphagnum* is quite different from other mosses especially its thalloid protonema stage during its early development.

Currently, my major research interests are focused on the early developmental stages of mosses including *Sphagnum* and *Physcomitrella*. I hope to find some developmental clues about the transition of higher plants onto land.

我喜爱大自然。小时候为兔子寻找食物的经历使我开始观察、甄别植物。在中国科学技术大学学习生命科学的时候，我产生了深入了解植物的兴趣。此后，我进入中科院上海植物生理生态研究所攻读博士。我以拟南芥为材料，研究了植物叶片发育过程中极性分化，获

得了遗传学博士学位。毕业后我觉得自己对于植物的了解依然非常有限，就申请进入到华东师范大学工作，因为那里有中国最好的植物分类学研究者。

我的独立研究工作最初是围绕一个拟南芥生长素代谢稳态调控突变体 uro (upright rosette) 开展的。很快我意识到需要一个更加简单的植物体系才能开展我所感兴趣的研究。在王幼芳教授和朱瑞良教授的引导下，我开始接触苔藓植物，也了解了模式苔藓小立碗藓。我先后到德国 Reski 教授实验室和日本的 Hasebe 教授实验室进行了访问研究。在他们的帮助下，在上海建立了苔藓培养和研究体系。

我对于苔藓植物的早期发育非常感兴趣。除了小立碗藓以外，我们还培养了一些其它藓。其中就有泥炭藓。经过仔细观察和反复尝试，我们实验室成功建立了泥炭藓原丝体培养的方法和原生质体分离方法。我们发现泥炭藓的发育过程与其它苔藓差别很大，特别是发育早期的叶状原丝体阶段。现在我们正在尝试建立包括转基因方法在内的泥炭藓其它分子生物学研究方法。

目前，我的主要研究兴趣集中在苔藓植物的早期发育过程，主要研究对象是泥炭藓和小立碗藓。我希望我能找到一些关于高等植物开始踏上陆地的发育学线索。

List of selected publications:

Wenqian Zhao, Zeling Li, Yongyue Hu, Min Wang, Shirui Zheng, Qiuping Li, Youfang Wang, Lin Xu, Xiaofang Li, Ruiliang Zhu, Ralf Reski, **Yue Sun**, Development of a method for protonema proliferation of peat moss (*Sphagnum squarrosum*) through regeneration analysis, New *Phytologist*, 2019, 221: 1160–1171.

Yue Sun, Yang Yang, Zheng Yuan, Jutta Ludwig Müller, Chen Yu, Yanfei Xu, Xinghua Shao, Xiaofang Li, Eva L. Decker, Ralf Reski, Hai Huang, Overexpression of the *Arabidopsis* gene UPRIGHT ROSETTE reveals a homeostatic control for indole-3-acetic acid (IAA), *Plant Physiology*, 2010, 153: 1311-1320.

Manju C. Nair
India

I was born on 1st May 1975 in Peerumadu, a hilly village in the Western Ghats of Idukki district in the south Indian state of Kerala. I am the child of a civil servant and was educated in different schools in different districts. I went to school in Vellikulam, Vagamon of Idukki district, High School Karippur in Nedumangad, Thiruvananthapuram, Higher Secondary School in Malampuzha and Government Moyan Model Girls High School in Palakkad district. I received my Pre Degree, Bachelor of Science and Master of Science degrees from Government Victoria College in Palakkad.

I have a keen interest in taxonomy and was influenced by Dr. K. Murugan, a lecturer in taxonomy. He inculcated my interest in doing moss taxonomy, and I spent my free time examining bryophyte specimens. After completing my Master's I then pursued a bachelor's degree in Education, after which I moved to Kerala Forest Research Institute (KFRI) in Peechi, Thrissur district of Kerala, where I took up a Project Fellow position. This involved documenting the biodiversity of Kerala. While collecting literature on bryophyte taxonomy I found that very few studies had been conducted on bryophytes of the Western Ghats. At the time there was no one suited to supervise bryophyte-related research for PhD studies. So my project mentor Dr. P.S. Easa suggested I reach out to Prof. (Dr.) P.V. Madhusoodanan at University of Calicut who is a well-known Pteridologist. He was very happy to guide me but advised that I would have to do the work on my own. I took up the challenge and joined a Ph.D. programme in 2001. The title of my thesis was 'Eco-Systematic studies on Bryophytes of Wayanad, Kerala'.

During the course of my Ph.D program, I connected with many reputable bryologists, both nationally and internationally, who helped me with my research and to complete my Ph.D. on time. During the World Conference of Bryologist at the National Botanical Research Institute (NBRI), Lucknow in 2002, I met several bryologists like Dr. Goffinet, Dr. Zen Iwatsuki, Dr. Beata Pap, Dr. Sanna Huttunen, Dr. Virendra Nath, Dr. A.K. Asthana, Dr. Ajit Pratap Singh, Dr. S.C. Srivastava, and Dr. D.K. Singh, to name a few. I stayed on for a few more days at NBRI after the conference and studied the basics of identification, herbarium specimen preparation and collected literature pertaining to taxonomy. During this time, I also had the opportunity to stay with Dr. Beata Pap, Herbarium Curator from Budapest, Hungary, and had good discussions with her on bryophytes. She introduced me to Dr. Tamas Pocs who helped identify and confirm several specimens during my Ph.D. work. Other bryologists who helped me with specimen identification included the late Dr. Frahm, Dr. Bill Buck, Dr. Jesus Munoz, and Dr. L.T. Ellis. Dr. L.T. Ellis, who is the Curator of bryophytes at the Natural History Museum (BM) also helped me with loan specimens for

clarification. After my Ph.D. I had built a strong, healthy bond with bryologists from all over the world. One of the biggest challenges I found during my research period was the lack of literature on bryophytes of Western Ghats. Support by the Linnean Society, in the form of an award, helped me procure many books and resources on Bryology.

I published my thesis as a book in 2005. This book has helped many students and teachers with their studies. After my Ph.D. I received a Young Scientist award from the Department of Science and Technology (DST) Fast Track Scheme and joined the Postdoctoral Fellowship (PDF) program with the Botany Department of Calicut University. My research topic was 'Systematic and Molecular (RAPD) studies on mosses of Southern Western Ghats'. During this tenure I published on three new species and several new additions of bryophytes to Western Ghats. After the PDF I moved to Zamorins Guruvayurappan College, Kozhikode as a Guest Faculty. Six months after this I received funding from the KSCSTE (Kerala State Council for Science, Technology and Environment) 'Back-to-Lab' scheme for women scientists, to conduct research on the topic 'Systematic studies on the bryophytes of Northern Western Ghats', at Malabar Botanical Garden (MBG), Calicut. Five months later I got a permanent position as Assistant Professor at Zamorin's Guruvayurappan College (ZGC). After getting the permanent faculty position on 16th March 2011, the funding agency of the 'Back-to-Lab' scheme converted my role to Principal Investigator of the project and provided one fellow at Malabar Botanical Garden. The project was successfully completed by 14th October 2013. I was actively involved in the research activities of the Malabar Botanical Garden and was given an additional project from the KSCSTE Ecology and Environment scheme, on the 'Exploration, taxonomic characterization and establishment of Conservation Repository of Bryophytes of Kerala'. Through this project we were able to construct a conservatory for bryophytes at MBG and conserved several species of bryophytes from Western Ghats.

Despite my busy teaching schedule, I made time for studying bryophytes. Several papers were published and presented in conferences and symposia. In 2013, I submitted another project proposal on 'Systematic and molecular characterisation of the family Fissidentaceae (Bryophyta) of Western Ghats' to the DST Fast Track scheme with Zamorin's Guruvayurappan College as the research centre. Prior to this in 2012, my application for Research Guideship at Calicut University was successful so the fellow who joined in the aforementioned project was able to continue with her Ph.D. In 2016 the project was completed, and the project fellow continued her work till 2018 when she submitted her Ph.D. In 2016, I submitted another project to KSCSTE Science Research Scheme titled 'Taxonomy of Bryophytes of Peechi-Vazhani Wildlife Sanctuary' and completed this by 2019. During the course of these projects five students enrolled in Ph.D. programmes on different topics. Ms. Prajitha, who was the Project Fellow in the KSCSTE Back-to-Lab programme registered for Ph.D. on the topic 'Bryophytes of Malabar Wildlife Sanctuary', and Mr. Rejilesh V.K. who worked on the Conservatory project researched the topic 'Bryophytes of Mathikettan Shola National Park'. Both were registered at MBG. The other three Ph.D. students were registered

at ZGC. Deepa K.M. studied Marchantiales of South India, Chandini V.K. studied Lejeuneaceae of Kerala and Mufeed B. studied the taxonomy of bryophytes of Anamudi Shola National Park. In 2021 we published the work of Dr. Mufeed and in 2022 the work by Dr. Manjula K.M. as books. Many bryologists from all over the world have helped me with identification and confirmation of several species. This includes Dr. M. A. Bruggeman-Nannenga of Netherlands; Mr. Uwe Schwarz of Germany; Dr L.T. Ellis, Senior Curator, Natural History Museum; Dr. A.E. Dulip Daniels, Dean & Professor, Scott Christian College, Nagercoil, Tamil Nadu; Dr. D.K. Singh, Senior Scientist (Rtd.); Dr. Devendra Singh, Botanical Survey of India, Kolkata; Dr. A.K. Asthana, Principal Scientist & Group Leader, Bryology Laboratory, CSIR- National Botanical Research Institute, Lucknow.

I have published more than 100 research papers in national and international journals and presented several papers in conferences and symposia. I have also published around 15 species as new to science and several new records of species to Asia, India, Western Ghats and Kerala. Since March 2022, I am continuing my passionate research on bryophytes at my alma mater, the Department of Botany, University of Calicut.

List of selected publications:

https://scholar.google.com/citations?user=smqK60AAAAAJ&hl=en

Ida Haerida
Indonesia

I was born in Bogor in a green environment and lots of plants, therefore, from childhood, I have been interested in forests and plants. The first time I saw the leaf structure of a small leaf of *Lejeunea* under a microscope shown to me by the late Willem Meijer, when he visited our herbarium around the year 2000 was amazing, a truly unexpected thing to view. This was probably the first time I fell in love with liverworts. Willem Meijer taught me the technique of making preparations to be observed with a microscope. He taught me many things and so began my journey to appreciate liverworts.

I obtained my Botany degree in 2000, and my Master's degree in Botany from the IPB Graduate School in Bogor (2009). I work as a researcher at the Herbarium Bogoriense, especially in Systematics of Liverworts. In this herbarium I am also the curator of the bryophyte collections and in particular the liverworts.

In 2005, during training to identify the species of bryophytes and lichens held at Biotrop, I met Prof. Benito Tan and Prof. Gradstein. They were both teachers at the training. I am increasingly interested in bryophytes, both moss, and liverworts, but more interested in liverworts, possibly because there are no liverwort experts in our herbarium. This has increased my interest in this group more and more.

Apart from these experts, I also learned a lot from Prof. Tomio Yamaguchi from Hiroshima University on how to collect bryophytes in the field, how to process them, etc. Based on this fieldwork experience I gained a lot of knowledge about the very important function of bryophytes in the forest.

My research focuses on the biodiversity of Bryophytes in Indonesia as many parts of the islands are still unexplored thoroughly and this study will cover my interest in Phytogeography. I want to know why one species of liverwort can exist in a very far location even across continents. I also act as a supervisor at several universities (such as Mulawarman University, East Kalimantan and Bangka Belitung University, Babel) in the special field of bryophyte taxonomy. There are many things I want to know about liverworts. I want to study more and more about these little creatures, particularly *Frullania*.

Saya lahir di Bogor di lingkungan yang masih hijau oleh tetumbuhan, sehingga besar kemungkinan hal ini menyebabkan saya sudah tertarik dengan hutan dan tumbuh-tumbuhan sejak kecil.

Almarhum Willem Meijer adalah orang pertama yang mengajarkan saya tentang lumut khususnya lumut hati (*Hepaticae* / *Marchantiophyta*), ketika beliau datang ke Herbarium Bogoriense sebelum tahun 2000. Pada saat itu saya diperlihatkan struktur sehelai daun *Lejeunea* (lumut hati) di bawah mikroskop. Ketika itu pula saya merasa apa yang saya lihat adalah suatu benda yang luar biasa, aneh tapi sungguh indah. Dan itu yang membuat saya pertama kali jatuh hati pada lumut hati. Willem Meijer juga mengajarkan saya teknik membuat preparat untuk diamati di bawah mikroskop. Dia mengajari saya banyak hal dan memulai perjalanan saya untuk mempelajari lumut hati.

Saya memperoleh gelar Botani pada tahun 2000, dan gelar Magister Botani dari Sekolah Pascasarjana IPB di Bogor (2009). Saya bekerja sebagai peneliti di Herbarium Bogoriense, khususnya di Sistematika Lumut Hati. Di herbarium ini saya juga bertindak sebagai kurator untuk koleksi lumut, khususnya lumut hati.

Pada tahun 2005, selama pelatihan identifikasi bryofita (lumut) dan lichens (lumut kerak) yang diadakan di Biotrop, saya bertemu dengan almarhum Prof. Benito Tan dan Prof. SR Gradstein. Mereka berdua adalah pengajar pada pelatihan tersebut. Saya semakin tertarik dengan lumut, baik lumut sejati maupun lumut hati, tetapi lebih tertarik pada lumut hati, mungkin karena tidak ada ahli lumut hati di herbarium kami. Ini semakin meningkatkan minat saya pada grup ini.
Selain para ahli tersebut, saya juga belajar banyak dari Prof. Tomio Yamaguchi dari Hiroshima University tentang cara mengumpulkan lumut di lapangan, cara mengolahnya, dll. Berdasarkan pengalaman kerja lapangan ini saya mendapatkan banyak pengetahuan tentang fungsi yang sangat penting dari populasi lumut di hutan.

Penelitian saya berfokus pada keanekaragaman hayati Lumut. Masih banyak bagian pulau yang masih belum dijelajahi secara menyeluruh di Indonesia dan penelitian ini akan mencakup minat saya pada Fitogeografi. Saya ingin tahu lebih jauh mengapa satu spesies lumut hati bisa hidup di lokasi yang sangat jauh bahkan melintasi benua.

Selain meneliti, saya juga menjadi dosen pembimbing beberapa orang mahasiswa strata 1 yang sedang menyelesaikan skripsinya di beberapa universitas (seperti Universitas Mulawarman, Kalimantan Timur dan Universitas Bangka Belitung, Babel) khususnya bidang taksonomi lumut.
Masih banyak hal yang ingin saya ketahui tentang lumut hati. Saya ingin belajar lebih banyak lagi tentang makhluk-makhluk kecil ini, khususnya Frullania yang akan menjadi subjek studi saya di masa depan.

Ainun Nadhifah
Indonesia

Hello from the archipelago country, Indonesia! I was born in East Java, Indonesia in 1990. I obtained my degree in Biology (B.Sc. Hons.) from Sebelas Maret University, Surakarta, Central Java, in 2012. I have been interested in bryophytes since the third year of university when visiting the moss garden at Cibodas Botanical Garden, West Java in 2011 as part of the field trip of the plant systematics course. At that time, I saw that the moss garden was very beautiful, unique, and I saw different species with various sizes and growth forms. I did not have any intention to do research in bryophytes, just admiring the beauty of them.

I was a teaching assistant for a Plant Systematics course at Sebelas Maret University during 2009 - 2012. After completing my tertiary education, I worked as a freelance tutor in a tutoring institution in Central Java. Since 2014, I have worked as a researcher at the National Research and Innovation Agency (formerly Indonesian Institute of Sciences/Lembaga Ilmu Pengetahuan Indonesia – LIPI) and was assigned to Cibodas Botanical Garden. It was from this time that I started to deeply learn about bryophytes, did some research and found that they were interesting! My research interests include systematics, biodiversity, and conservation of bryophytes, with an emphasis on the tropics.

In 2020, I earned my master's degree in biology (M.S. conc. Cell Biology and Molecular Biology) at the University of South Florida (USF), Tampa, USA. During my masters, I was a volunteer at the USF Herbarium, helping the curator in digitizing specimens of the Florida Plant Atlas, helping the scientist to develop an interactive key of the mosses of Central Florida. I was also a visiting scholar at the Field Museum, Chicago, undertaking the Field Museum's field guide training (Developing rapid color guides illustrating the distinction between plant groups) and developing an online checklist under the project "Bryophyte flora (mosses, liverworts, hornworts) of Indonesia" through the Bryophyte Portal (http://bryophyteportal.org/portal/projects/index.php?pid=16). During this time, I was awarded the student travel grants from USF Herbarium, USF World, and the International Association of Bryologists to participate in the 2019 Bryology conference in Madrid, Spain as a poster presenter.

Other bryological experiences include the workshop Taxonomic capacity building of Bryophytes, held by ASEAN Centre for Biodiversity (ACB), supervised by Benito C. Tan (2014) and a participant of the online mini seminar: Hornwort Biology and Systematics with Juan Carlos Villareal Aguilar as an instructor, held by the Eagle Hill Institute (2021). It was interesting when

I participated in ACB workshop, we learned and worked in the classroom, the field, and the laboratory. I felt like that was an ideal training although in a very short time. For hornwort training, it was online but still interesting.

As a person without a bryological background, when I first started in bryology it was really challenging, yet interesting! Challenging because we were working with very tiny plants, new terms, and having to work with microscopes. I still remember the first time I tried to make slides; I tried a hundred times but finally made it!

I have some publications, mostly published in national journal (https://scholar.google.com/citations?user=dOfjpPsAAAAJ&hl=id). I have been working on the diversity of Indonesian bryophytes (mosses, liverworts, hornworts). I have also published a guide for beginners with several colleagues from different institutions (can be downloaded at https://fieldguides.fieldmuseum.org/sites/default/files/rapid-color-guides-pdfs/1270_bryophytes_for_beginners_indonesian_version.pdf). The guide is adapted from the English version, because I realized that most Indonesians find difficulties in learning bryophytes in foreign languages (mostly in English, Dutch, German). So, we published an Indonesian version, with the illustrations mostly from Indonesian species.

Recently, I published the checklist "An archipelago within an archipelago: A checklist of liverworts and hornworts of Kepulauan Sunda Kecil (Lesser Sunda Islands), Indonesia and Timor-Leste (East Timor)" together with Lars Söderström (Norwegian University of Science and Technology), Anders Hagborg (Field Museum), Matt Von Konrat (Field Museum) and other bryologists from Indonesia (2021).

Apart from research activities, I have also been interested in education, this includes garden tours, as a guest lecturer in universities, and supervising interns, particularly in bryology. I am an active member of the International Association of Bryologists since 2018 and continue to participate in the Worldwide Engagement for Digitizing Biocollections (WeDigBio). Currently, I am continuing my research work on bryophytes, with more focus on liverworts and hornworts.

Salam dari negara kepulauan, Indonesia! Saya lahir di Jawa Timur pada tahun 1990. Saya menyelesaikan S1 - Biologi dari Universitas Sebelas Maret, Surakarta pada tahun 2012. Saya mulai tertarik dengan tumbuhan lumut ketika sedang melaksanakan kuliah lapangan pada mata kuliah Taksonomi Tumbuhan di Kebun Raya Cibodas. Saat itu saya melihat taman lumut yang ada di sana dan melihat berbagai jenis lumut dengan bentuk yang unik dan berbagai macam ukuran. Ketika itu saya hanya sekedar mengagumi taman lumut dan sama sekali tidak terpikir untuk melakukan penelitian tentang lumut.

Sebelumnya, saya merupakan asisten praktikum pada mata kuliah Taksonomi Tumbuhan di Jurusan Biologi FMIPA UNS pada tahun 2009-2012. Setelah lulus, saya bekerja sebagai tutor mata pelajaran Biologi di sebuah lembaga bimbingan belajar di Jawa Tengah. Sejak tahun 2014, saya bergabung dengan Lembaga Ilmu Pengetahuan Indonesia atau LIPI (saat ini telah berganti menjadi Badan Riset dan Inovasi Nasional atau BRIN) dan mendapatkan penugasan di Kebun Raya Cibodas. Pada saat inilah saya mulai belajar lebih banyak tentang tumbuhan lumut dan melakukan penelitian di bidang tersebut. Saya tertarik pada bidang sistematika, keanekaragaman, dan konservasi tumbuhan lumut, khususnya di daerah tropis.

Pada tahun 2020, saya menyelesaikan studi S2 di bidang Biologi (konsentrasi pada Biologi Sel dan Molekuler) di University of South Florida (USF), Tampa, Amerika Serikat. Selama studi S2, saya menjadi volunteer di herbarium USF untuk membantu kurator dalam mendigitalisasi spesimen untuk Atlas Tumbuhan Florida dan membantu profesor dalam mengembangkan kunci identifikasi interaktif tumbuhan lumut khususnya di daerah Central Florida. Pada saat itu saya juga melakukan "Independent Study" ke Field Museum, Chicago, dan mendapatkan pelatihan pembuatan petunjuk lapangan. Selama di sana saya mengerjakan proyek "Bryophyte flora (mosses, liverworts, hornworts) of Indonesia", mengembangkan petunjuk lapangan untuk pemula dan mengembangkan checklist online pada sebuah portal (Bryophyte Portal) yang dapat diakses pada http://bryophyteportal.org/portal/projects/index.php?pid=16). Sebagai mahasiswa S2, saya juga aktif mengikuti seminar dan konferensi. Saya mendapatkan pendanaan perjalanan (student travel grants) dari herbarium USF, USF World, dan International Association of Bryologists (IAB) untuk mengikuti konferensi internasional (2019 Bryology conference) sebagai presenter poster di kota Madrid, Spanyol.

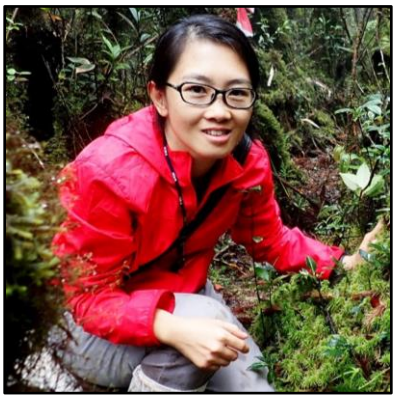
Pengalaman lainnya di bidang briologi antara lain mengikuti workshop Taxonomic capacity building of Bryophytes (peningkatan kapasitas di bidang briologi), yang diselenggarakan oleh ASEAN Centre for Biodiversity (ACB) dan belajar bersama Benito C. Tan (2014) dan sebagai peserta dalam workshop Hornwort Biology and Systematics (Biologi dan Sistematika Lumut Tanduk) yang diadakan oleh Eagle Hill Institute (2021) bersama Juan Carlos Villareal Aguilar.
Kegiatan workshop yang diselenggarakan oleh ACB terdiri dari pembelajaran di dalam kelas, pengamatan di lapangan, dan juga pengamatan di laboratorium. Saya merasa workshop tersebut sangat ideal untuk meningkatkan kemampuan di bidang briologi meskipun dalam waktu yang cukup singkat. Meskipun demikian, workshop tentang biologi lumut tanduk yang dilaksanakan secara online juga cukup menarik.

Sebagai orang yang tidak memiliki latar belakang di bidang briologi, saya mengalami banyak tantangan dalam mempelajarinya. Bidang ini sangat menantang karena kita harus bekerja dengan tumbuhan yang berukuran sangat kecil, mempelajari istilah-istilah baru, dan harus bekerja di bawah mikroskop. Saya memiliki pengalaman ketika pertama kali belajar membuat preparat irisan

daun lumut, saya harus mencoba hingga ratusan kali sampai akhirnya berhasil memperoleh preparat yang bagus.

Beberapa publikasi saya dapat dilihat pada laman Google Scholar (https://scholar.google.com/citations?user=dOfjpPsAAAAJ&hl=id). Kegiatan penelitian saya terutama pada keanekaragaman tumbuhan lumut di Indonesia. Saya dengan beberapa kolaborator juga mempublikasikan petunjuk untuk pemula yang ingin mengenal tumbuhan lumut yang dapat diunduh pada laman https://fieldguides.fieldmuseum.org/sites/default/files/rapid-color-guides-pdfs/1270_bryophytes_for_beginners_indonesian_version.pdf. Petunjuk tersebut disajikan dalam Bahasa Indonesia untuk lebih memudahkan masyarakat dalam mempelajari tumbuhan lumut. Pada tahun 2021, saya bersama beberapa kolaborator internasional di antaranya Lars Söderström (Norwegian University of Science and Technology), Anders Hagborg (Field Museum), dan Matt Von Konrat (Field Museum), serta para peneliti tumbuhan lumut di Indonesia mempublikasikan checklist lumut hati dan lumut tanduk di Kepulauan Sunda Kecil dan Timor Leste dengan judul *An archipelago within an archipelago: A checklist of liverworts and hornworts of Kepulauan Sunda Kecil (Lesser Sunda Islands), Indonesia and Timor-Leste (East Timor).* Selain kegiatan penelitian saya juga tertarik pada bidang pendidikan terutama mengedukasi masyarakat termasuk di antaranya kegiatan pemanduan, sebagai dosen tamu pada beberapa universitas, serta membimbing mahasiswa dalam kegiatan magang dan penelitian terutama di bidang briologi. Saya merupakan anggota aktif dari organisasi International Association of Bryologists sejak tahun 2018 dan berpartisipasi dalam kegiatan Worldwide Engagement for Digitizing Biocollections (WeDigBio). Fokus penelitian saya saat ini pada kelompok lumut hati dan lumut tanduk.

Gaik Ee Lee
Malaysia



My name is Gaik Ee Lee and I was born in Ipoh, Malaysia. As I look back, it never crossed my mind that I would become a biologist or bryologist, to be specific. I must thank God for His leading and provision for the past 18 years on this path of never-ending discovery of these tiny plants, aka bryophytes. It all started in my undergraduate days in the Universiti Kebangsaan Malaysia when I was required to take a cryptogam subject. Since then, I have been exceptionally fascinated with bryophytes. The final year project in my bachelor's degree and master's degree was on moss diversity in two rainforests in Peninsular Malaysia, i.e. Royal Belum State Park and Krau Wildlife Reserve.

In 2007, I met Prof. Robbert Gradstein in the biennial training course on Biodiversity and Conservation of Bryophytes and Lichens at SEAMEO-BIOTROP, Bogor, Indonesia. He encouraged me to study liverworts in Malaysia. With the motivation and support of Dr Ahmad Damanhuri and Prof. Abdul Latiff Mohamad, I pursued my PhD in liverworts with the thesis's title: A systematic revision of the genus *Lejeunea* Lib. in Malaysia. I was awarded a National Science Foundation Scholarship Award (NSF) of Malaysia for this project. In 2008, on receipt of a short-term Research Scholarship to Germany, I extended my knowledge of liverworts, particularly *Lejeunea*, from Prof. Robbert Gradstein. In 2010, I again received a short-term Research Scholarship to Japan, joining the team of Prof. Hironori Deguchi and learning molecular techniques (DNA extraction, PCR and sequencing). I completed my PhD in 2012 and then was awarded a postdoctoral fellowship from the Universiti Kebangsaan Malaysia. One year later, I moved to Germany to join the late Prof. Jochen Heinrichs laboratory in Munich at the Ludwig Maximilian University, where an Alexander von Humboldt Foundation postdoctoral fellowship enabled me to work on the systematics and biogeography of *Lejeunea*. Also, under the sponsorship of the Humboldt Foundation, I obtained a Europe Research Stay to the EGR, Hungary and worked on several *Lejeunea* projects with Prof. Tamás Pócs.

I am currently working as a senior lecturer at the Universiti Malaysia Terengganu teaching Taxonomy and Systematics of Organisms, Principles of Ecology, Scientific Writing in Biology, and Bryology. Recently, I received research grants both nationally and internationally for projects on epiphyllous liverworts in Malaysia. I am the first and, thus far, the only woman biologist studying liverworts in Malaysia. Being the first is not easy and always challenging. Still, the guidance and support from skilled and experienced mentors like Prof. Robbert Gradstein, Prof. Tamás Pócs, the late Prof. Jochen Heinrichs, Dr Ahmad Damanhuri and Prof. Abdul Latiff Mohamad have made my journey a fruitful and well-pursued one.

Nama saya Gaik Ee Lee dan saya dilahirkan di Ipoh, Malaysia. Merenung balik perjalanan saya sebagai ahli penyelidik, saya tidak pernah terfikir untuk menjadi seorang ahli biologi, khasnya ahli briologi. Saya bersyukur kepada Tuhan atas berkat dan rahmat-Nya selama 18 tahun yang lalu dalam perjalanan saya menerokai tumbuh-tumbuhan kecil yang dikenali sebagai briofit. Pengalaman saya dengan briofit bermula semasa zaman sarjana muda saya di Universiti Kebangsaan Malaysia apabila saya mengambil kursus kriptogam. Sejak itu, saya tertarik dengan keunikan briofit. Projek tahun akhir ijazah sarjana muda dan sarjana saya adalah mengenai kepelbagaian lumut jati di hutan-hutan di Semenanjung Malaysia iaitu Taman Negeri Royal Belum dan Rizab Hidupan Liar Krau.

Pada tahun 2007, saya menghadiri kursus latihan mengenai Biodiversiti dan Pemuliharaan Briofit dan Liken di SEAMEO-BIOTROP, Bogor, Indonesia dan berkenalan dengan Prof. Robbert Gradstein. Beliau mendorong saya memulakan kajian lumut hati di Malaysia. Dengan bimbingan dan sokongan Dr Ahmad Damanhuri dan Prof. Abdul Latiff Mohamad, saya memulakan pengajian saya ke peringkat PhD dengan tajuk tesis: Semakan sistematik genus *Lejeunea* Lib. di Malaysia. Saya telah menerima Anugerah Biasiswa National Science Foundation (NSF) Malaysia untuk projek ini. Sepanjang tempoh pengajian tersebut, saya turut menerima dua biasiswa lain yang membolehkan saya mendapatkan latihan di luar negara iaitu Biasiswa Penyelidikan Jangka Pendek ke Jerman untuk mendalami pengetahuan morfologi lumut hati, terutamanya *Lejeunea* dengan Prof. Robbert Gradstein, dan Biasiswa Penyelidikan Jangka Pendek ke Jepun untuk mempelajari teknik molekul (pengekstrakan dan penjujukan DNA, dan PCR) dengan kumpulan Prof. Hironori Deguchi. Pada tahun 2012, saya berjaya menamatkan PhD saya dan meneruskan kajian pasca-kedoktoran di Universiti Kebangsaan Malaysia. Pada tahun 2014, saya telah menerima biasiswa pasca doktoral Yayasan Alexander von Humboldt untuk menjalankan kajian sistematik dan biogeografi *Lejeunea* bersama dengan kumpulan arwah Prof. Jochen Heinrichs di Munich di Ludwig Maximilian University. Selain itu, di bawah tajaan Yayasan Humboldt, saya juga memperoleh Europe Research Stay di EGR, Hungary dan mengkaji beberapa projek *Lejeunea* bersama Prof. Tamás Pócs.

Sekarang, saya merupakan pensyarah kanan di Universiti Malaysia Terengganu dan mengajar kursus Taksonomi dan Sistematik Organisma, Prinsip Ekologi, Penulisan Saintifik dalam Biologi, dan Briologi. Kebelakangan ini, saya berjaya mendapatkan geran penyelidikan di peringkat kebangsaan dan antarabangsa untuk projek mengenai lumut hati epifil di Malaysia. Saya merupakan orang yang pertama dan setakat ini, satu-satunya penyelidik biologi wanita yang mengkaji lumut hati di Malaysia. Sebagai seorang yang pertama, perjalanan saya tidak pernah mudah, sebaliknya kian mencabar. Namun begitu, atas bimbingan dan tunjukajar mentor-mentor yang mahir dan berpengalaman seperti Prof. Robbert Gradstein, Prof. Tamás Pócs, arwah Prof. Jochen Heinrichs, Dr Ahmad Damanhuri dan Prof. Abdul Latiff Mohamad, perjalanan saya membuahkan hasil yang baik dan bermakna.

Photo courtesy of Hung Yung Tang

List of selected publications:

Lee G.E. & S.R. Gradstein. 2021. Guide to the genera of liverworts and hornworts of Malaysia. Hattori Botanical Laboratory Publisher. 234 pp.

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Nirmala Pradhan
Nepal

Nirmala Pradhan, Professor of Botany and a reputed bryologist started her bryophyte research about three and half decades back when there were almost no one working on this lower plant group in Nepal. Dr. Pradhan who was born in Kathmandu started her bryophyte research when she was doing her Master's dissertation on this plant in Kathmandu Mountains. Very little research and lack of relevant literature on Nepalese bryophytes was the main problem at that time which attracted her to initiate this research on these plants of Nepal. Her extensive studies across the country added several new records and also contributed with several research papers and three books which now are significant sources of references for students and bryophyte researchers in the country. She also has contributed significantly for the establishment of a bryophyte section at the Natural History Museum in Kathmandu which possibly is the largest collection of this plant group in the country. Her PhD research revealed the diversity of this plant group below 1000 m of elevations across this Himalayan country.

Dr. Pradhan also worked on Nepalese specimens of bryophytes deposited at the British Museum of Natural History for a few months under the Darwin Initiative Program and brought out a book on *Materials for a Checklist of Bryophytes of Nepal* which was published by the British Museum, UK. Her next book, *Bryophytes: Collection, Preservation and Identification (Reference to Nepal)* was published by the Department of Plant Resources in 2018 and recently the book entitled *A Handbook of the Bryophytes of Nepal* Vol. I (2021) was also published by the same Department of Nepal Government. She has been credited with more than three dozen research papers and many feature and popular articles published in the leading newspapers and magazines.

वनस्पति विज्ञानका प्राध्यापक डा निर्मला प्रधानको जन्म काठमाडौंमा भएको हो। वनस्पति विज्ञानमा उहाँको पहिलेदेखि नै रुचि भएको हुँदा स्नातकोत्तर अध्ययन उहाँले वनस्पति शास्त्रमा नै सम्पन्न गर्नुभयो । उहाँको स-साना समूहका वनस्पतिहरू खासगरी झ्याउ प्रजातिहरुमा बढी रुची रहेको हुँदा स्नातकोत्तर तहमा गरिने अनुसन्धानमा पनि उहाँले काठमाडौंको पहाडमा पाइने यस्ता साना झ्याउ प्रजातिका वनस्पतिहरुलाई नै आफ्नो अनुसन्धानको विषय बनाउनु भयो। यस साना प्रजातिका वनस्पतिहरुबारे अनुसन्धान तथा यससम्बन्धी लेखहरूको धेरै अभाव रहेको थियो। उहाँले त्रिभुवन विश्वविद्यालय अन्तर्गतको प्राकृतिक विज्ञान सङ्ग्रहालयमा रही करिब ३५ वर्ष भन्दा बढी यसै ब्रायोफाइटा समूहका वनस्पतिहरुमा अनुसन्धान कार्य गर्नुभयो र हाल पनि सो कार्य जारि नै छ। उहाँले हालसम्म आफूले अनुसन्धान गरेको आधारमा तीन दर्जनभन्दा बढी अनुसन्धानात्मक लेखहरु तथा तीनवटा पुस्तकहरु प्रकाशन

गरिसक्नुभएको छ। यसै निम्नस्तरीय वनस्पतिका विभिन्न पक्षहरुलाई लिएर धेरै साधारण लेखहरु पनि प्रकाशन गर्नुभएको छ । प्राकृतिक विज्ञान संग्रहालय मा उहाँले पहिलोचोटि ब्रायोफाइटा प्रजातिका वनस्पतिहरुको एउटा छुट्टै शाखा विस्तार गर्नुभयो जुन नेपालको सबैभन्दा बढी यस समूहका वनस्पतिहरूको संकलनको केन्द्र रहेको छ। यसबाट धेरै विद्यार्थी तथा अनुसन्धानकर्ताहरु लाभान्वित भएका छन्। उहाँले प्रकाशन गर्नुभएका लेखहरु धेरैको लागि अनुसन्धान स्रोत बनेको छ । समुद्र सतहबाट एक हजार मिटरको उचाई भन्दा कम स्थानमा रहेको नेपालको दक्षिणी तराई भेकमा पाइने यस ब्रायोफाइटा वनस्पतिहरूमा उहाँको विद्यावारिधि भएको थियो र यस अनुसन्धानलाई एउटा महत्वपूर्ण रुपमा लिएको छ । उहाँले प्रकृतिक बिज्ञान सङ्ग्रहालय, बेलायतमा डार्विन इनिसिएटिब योजना अन्तर्गत नेपालका ब्रायोफाइटा सम्बन्धी अनुसन्धान कार्यहरु पनि गर्नुभयो र यससम्बन्धी एउटा पुस्तक पनि त्यहाँबाट प्रकाशन गर्नुभएको थियो । सो बाहेक डा, प्रधानले यसै बिशेष सम्बन्धित अन्य दुई पुस्तकहरू पनि नेपाल सरकारको वनस्पति अनुसंधान केन्द्रबाट प्रकाशन गर्नुभयो ।

List of selected publications:

Pradhan, N., Long, D.G. & Joshi, S.D. 2007c. *Monosolenium tenerum* Griff. (Marchantiopsida, Monosoleniaceae) in Nepal. *Cryptogamie, Bryologie* 28(3): 243-248.

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Janejaree Inuthai (เจนจรี อินทุทัย)
Thailand

I was born in 1985, in Songkhla province, which is located on the eastern coast of peninsular Thailand. I grew up playing outside in rich natural environments. I am interested in exploring the forests and its enormous diversity is endlessly fascinating and beautiful.
I realized that each species has its role in nature, even bryophytes. Even though they are very tiny, they are still amazing. So, I decided to study Biology for my bachelor's degree and started to study bryophytes when I was in third year under the encouragement, help and guidance of my advisor, Assoc. Prof. Dr. Sahut Chantanaorrapint. My senior project topic was "Preliminary surveys on bryophytes of terrestrial plant communities on coastal sandbars in the peninsula of Thailand".

I love to investigate the variations of their morphological characters. I feel that exploring the small and beautiful structures of bryophytes is very interesting. They not only play a very important role in the environment in terms of biological factors, but they are also home for other small organisms. So, their diversity and ecological roles need attention.

I studied the diversity of vascular plants for my Master's degree for a broader experience, then, I worked on bryophytes again for my Ph.D. My thesis topic was "A taxonomic study of the genus *Drepanolejeunea* (Spruce) Steph. (Lejeuneaceae, Marchantiophyta) in Thailand and Malay Peninsula" I received the B.Sc. in Biology, the M.Sc. in Botany, and Ph.D. in Biology from Faculty of Science, Prince of Songkla University, Thailand, in 2008, 2010 and 2016, respectively.
I joined the Department of Biology, Faculty of Science, Thaksin University, as a lecturer in 2014-2015. Since May 2017, I have been a lecturer in the Department of Biotechnology, Faculty of Science and Technology, Thammasat University.

My current research interests include plant morphology and taxonomy, particularly in the leafy liverwort genus *Drapanolejeunea*. Only a few women are studying bryophytes in Thailand. I am very proud to be one of them. It comes with many opportunities and challenges. Because the bryophytes are a little-known group of plants in the country, so many people are still curious about them. I am always happy to have a chance to tell others how special these tiny plants are. I would love to say "beauty is all around for those who are looking for".

ฉันเกิดเมื่อปีพ.ศ. 2528 ในจังหวัดสงขลา ซึ่งตัวจังหวัดตั้งอยู่บริเวณชายฝั่งตะวันออกของคาบสมุทรไทย
ฉันเติบโตมาท่ามกลางสภาพแวดล้อมทางธรรมชาติที่สมบูรณ์ ฉันมีความสนใจที่จะออกสำรวจป่า
เพราะความหลากหลายของอย่างมหาศาลของมันนั้นน่าหลงใหลและสวยงามอย่างไม่มีที่สิ้นสุด

ฉันตระหนักดีว่าสิ่งมีชีวิตแต่ละชนิดย่อมมีบทบาทของตนทางธรรมชาติไม่เว้นแม้แต่ไบรโอไฟต์
เพราะถึงแม้ว่าไบรโอไฟต์จะมีขนาดเล็กมากแต่พวกมันช่างน่าอัศจรรย์ ดังนั้นฉันจึงตัดสินใจเข้าศึกษาในสาขาวิชาชีววิทยา สำหรับปริญญาตรี
และเริ่มต้นเรียนรู้เกี่ยวกับไบรโอไฟต์ขณะที่เรียนอยู่ชั้นปีที่ 3 โดยได้รับแรงบันดาลใจ ความช่วยเหลือ และคำแนะนำต่าง ๆ
จากอาจารย์ที่ปรึกษาของฉัน คือ รองศาสตราจารย์ ดร.สหัช จันทนาอรพินท์ หัวข้อโครงงานทางสำหรับสำเร็จการศึกษาขณะนั้น คือ
การสำรวจไบรโอไฟต์เบื้องต้นในบริเวณสังคมพืชบกตามสันทรายชายฝั่งของคาบสมุทรไทย
ฉันชอบที่จะสังเกตตรวจสอบความแปรผันของลักษณะทางสัณฐานวิทยาของมัน ฉันรู้สึกว่าการได้สำรวจโครงสร้างเล็ก ๆ
ที่สวยงามของไบรโอไฟต์นั้นน่าสนใจ ไบรโอไฟต์ไม่ได้มีบทบาทสำคัญต่อสิ่งแวดล้อมในแง่ของปัจจัยทางชีวภาพเท่านั้น
แต่ไบรโอไฟต์ยังทำหน้าที่เป็นเสมือนบ้านให้กับสิ่งมีชีวิตตัวเล็ก ๆ นานาชนิดอีกด้วย
ดังนั้นความหลากหลายของไบรโอไฟต์ตลอดจนบทบาททางนิเวศวิทยาเป็นสิ่งที่ควรให้การสนใจ
สำหรับการเรียนต่อในระดับปริญญาโท
ฉันเลือกศึกษาเกี่ยวกับความหลากหลายของพืชมีท่อลำเลียงทั้งนี้เพื่อประสบการณ์ที่กว้างขวางมากยิ่งขึ้น
หลังจากนั้นฉันจึงกลับมาศึกษาด้านไบรโอไฟต์ต่ออีกครั้งในระดับปริญญาเอก หัวข้อวิทยานิพนธ์ของฉัน คือ
การศึกษาอนุกรมวิธานของลิเวอร์เวิร์ตสกุล *Drepanolejeunea* (Spruce) Steph. (Lejeuneaceae, Marchantiophyta)
ในประเทศไทยและคาบสมุทรมลายู ฉันสำเร็จการศึกษาทั้งระดับปริญญาตรี สาขาวิชาชีววิทยา ปริญญาโท สาขาวิชาพฤกษศาสตร์
และปริญญาเอก สาขาวิชาชีววิทยา จากมหาวิทยาลัยสงขลานครินทร์ เมื่อปีพ.ศ. 2551 พ.ศ. 2553 และ พ.ศ. 2559 ตามลำดับ
ฉันเข้าร่วมเป็นส่วนหนึ่งของสาขาวิชาชีววิทยา คณะวิทยาศาสตร์ มหาวิทยาลัยทักษิณ ในฐานะอาจารย์มหาวิทยาลัย ในปี พ.ศ. 2557-2558
จากนั้นตั้งแต่เดือนพฤษภาคม พ.ศ. 2560 เป็นต้นมา ฉันทำงานเป็นอาจารย์ สังกัดสาขาวิชาเทคโนโลยีชีวภาพ คณะวิทยาศาสตร์และเทคโนโลยี
มหาวิทยาลัยธรรมศาสตร์
งานวิจัยที่ฉันสนใจในปัจจุบัน ได้แก่ สัณฐานวิทยาและอนุกรมวิธานของพืช โดยเฉพาะอย่างยิ่งในลีฟฟี่ลิเวอร์เวิร์ตสกุล *Drepanolejeunea*
ผู้หญิงที่ศึกษาเรื่องไบรโอไฟต์ในประเทศไทยมีจำนวนน้อยมาก ฉันรู้สึกภูมิใจมากที่ได้เป็นหนึ่งในจำนวนนั้น
ซึ่งนั่นมาพร้อมกับโอกาสและความท้าทายมากมาย เพราะไบรโอไฟต์เป็นกลุ่มพืชที่น้อยคนในประเทศนี้จะรู้จัก
ดังนั้นผู้คนส่วนใหญ่จึงยังมีความสงสัยใคร่รู้เกี่ยวกับพืชกลุ่มนี้อยู่มาก
ฉันจึงมีความสุขเสมอที่ได้รับโอกาสให้ถ่ายทอดเรื่องราวความพิเศษของพืชขนาดเล็กกลุ่มนี้ให้กับคนอื่น ๆ ฉันรักที่จะพูดว่า
“ความสวยงามมีอยู่เสมอ สำหรับใครก็ตามที่กำลังมองหามัน”

List of selected publications:

Inuthai, J. and Sridith, K. 2010. The vegetation structure on the granitic inselberg in Songkhla province, Peninsular Thailand. *Thai Forest Bulletin (Botany)* 38: 74–89. https://li01.tci-thaijo.org/index.php/ThaiForestBulletin/article/view/24384

Inuthai, J., Zhu, R.-L. and Chantanaorrapint, S. 2014. *Drepanolejeunea actinogyna* (Lejeuneaceae), a new species from southern Thailand. *The Bryologist* 117(2): 165–169. https://doi.org/10.1639/0007-2745-117.2.165

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Inuthai, J., Chantanaorrapint, S. and Zhu, R.-L. 2021. The liverwort genus *Drepanolejeunea*

subgenus *Rhaphidolejeunea* (Lejeuneaceae, Marchantiophyta) in Thailand. *Phytotaxa*, 522(1), 001-014. https://doi.org/10.11646/phytotaxa.522.1.1

Inuthai, J., Chantanaorrapint, S., Poopath, M., Tetsana, N., Kiewbang, W. and Suddee, S. 2021. *Corybas papillatus* (Orchidaceae), a new orchid species from peninsular Thailand. *PhytoKeys*, 183, 1-7. https://doi.org/10.3897/phytokeys.183.71167

Rossarin Pollawatn (ดร.รสริน พลวัฒน์)

Thailand

I am a lecturer in the Department of Botany at Chulalongkorn University in Bangkok, Thailand. I was born on 8 April 1970 in Trang, a small town located on the western side of the Buntad Mountain in southern Thailand. When I was young, I would look to the mountains and wonder about the life forms that lived in that area. I visited the mountains many times to take photos of mushrooms, plants and animals along the trail to the waterfall. After I completed secondary school from Saparachinee school in Trang, I pursued my bachelor's degree of Science in Biology (B. Sc.) at the Department of Biology, Faculty of Science, Prince of Songkla University, Songkhla Province. This is where my journey as a plant taxonomist started. I completed my senior project, on a family of flowering plants, titled "Taxonomy of family Sapindaceae in southern Thailand". I was very impressed with this project because it answered my questions about plants in forests that I never knew.

Working in plant taxonomy motivated me to apply for a Master's degree of Science in Botany (M. Sc.) at the Department of Botany, Faculty of Science, Chulalongkorn University in Bangkok. My goal was to investigate other methods of solving problems in plant taxonomy and focused my research on a fern species complex. My thesis was titled "Biosystematics of the fern *Pyrrosia eberhardtii* (Christ) Ching (Polypodiaceae) in Thailand" and my advisor was Dr. Thaweesakdi Boonkerd. This research gave me hands-on experience with other ferns and bryophytes too. At the time I was already familiar with many species of ferns found in the forest but was oblivious to all the tiny bryophytes around them. I was fortunate that Associate Professor Dr. Obchant Thaithong started a bryology course in 1995 for students who majored in Botany. Through her course my eyes opened to the world of bryophytes and that is when I first started to study bryophytes. In 1998, I became a lecturer at the Department of Botany, Chulalongkorn University. I learned more about bryophytes in many areas and was keen to revise some families for the flora of Thailand.

In October 2004, I received a government scholarship to pursue my Ph.D. with Dr. Jan-Peter Frahm at Nees Institute for Biodiversity of Plant, University of Bonn, Germany. My thesis titled "Systematic treatment of Sematophyllaceae (Musci) in Thailand" was completed in 2008. There were about 24 genera and 97 species which make up approximately 10% of mosses in Thailand. I had a wonderful time studying bryophytes in Europe, which included more than 20 field trips with my supervisor to collect specimens, which are stored in Frahm's herbarium, and study the ecology of bryophytes in Germany and neighboring countries. After I graduated with my Dr. rerum naturalium (Biology), I returned to Thailand to continue my job at Chulalongkorn University. I gave many lectures in morphology of bryophytes to more than 100 students enrolled in the

Biological Science program and I also taught a course in Bryology to biodiversity students every year.

I am now the curator at BCU herbarium in Chulalongkorn University. I have received a good number of research funds from the Biodiversity Research and Training Program (BRT) and the University's research fund. My research is focused on the ecology and diversity of Sphagnaceae, Polytrichaceae and Diphysciaceae in Thailand. I conduct research in areas such as the Doi Chiang Dao wildlife sanctuary, the only alpine habitat in Thailand and many limestone mountains in western Thailand. I am interested in species distribution and adaptation on granite and sandstone rocks. I love studying morphological adaptation of mosses, to learn of their survival from the effects of climate change. In the future I plan to publish a book on the ecology and diversity of mosses for students and everyone else who love mosses.

ดิฉันเป็นอาจารย์สังกัดภาควิชาพฤกษศาสตร์ จุฬาลงกรณ์มหาวิทยาลัย กรุงเทพมหานคร ประเทศไทย ดิฉันเกิดเมื่อวันที่ 8 เมษายน พ.ศ. 2513 บ้านเกิดอยู่ในจังหวัดตรังภาคใต้ของประเทศไทย ซึ่งตั้งอยู่ทางด้านทิศตะวันตกของเทือกเขาบรรทัด ในวัยเด็กดิฉันมีความสนใจเกี่ยวกับการดำรงชีวิตของสิ่งมีชีวิตในป่า ซึ่งมีโอกาสได้เที่ยวชมธรรมชาติบริเวณเชิงเขาอยู่บ่อย ๆ และชอบศึกษาความหลากหลายของเห็ด พืชและสัตว์ที่พบบริเวณเส้นทางเดินไปสู่น้ำตกหลายแห่ง หลังจากสำเร็จการศึกษาในระดับมัธยมศึกษาตอนปลายจากโรงเรียนสภาราชินี จังหวัดตรัง ดิฉันเข้าศึกษาในระดับปริญญาตรี (วท. บ.) ทางด้านชีววิทยา ใน ภาควิชาชีววิทยา คณะวิทยาศาสตร์ มหาวิทยาลัยสงขลานครินทร์ ซึ่งเป็นจุดเริ่มต้นในการเรียนรู้การเป็นนักอนุกรมวิธานพืช ฉันได้เรียนรู้เรื่องราวเกี่ยวกับพืชมากมายและทำโครงงานวิทยาศาสตร์ชื่อ อนุกรมวิธานของพืชวงศ์เงาะในภาคใต้ของประเทศไทย (Taxonomy of family Sapindaceae in southern Thailand) การทำโครงงานวิทยาศาสตร์ทำให้ดิฉันต้องการที่จะเรียนรู้วิธีการต่าง ๆ ที่นำมาใช้แก้ปัญหาในการจัดทำอนุกรมวิธานของพืชเพิ่มมากขึ้น จึงได้สมัครเข้าเรียนต่อในระดับปริญญาโท (วท. ม.) ทางด้านพฤกษศาสตร์ ที่ภาควิชาพฤกษศาสตร์ คณะวิทยาศาสตร์ จุฬาลงกรณ์มหาวิทยาลัย โดยจัดทำวิทยานิพนธ์ชื่อ ไบโอซิสเทมาติกส์ของประชากรเฟิร์นลิ้นกุรัมในประเทศไทย (Biosystematics of the fern *Pyrrosia eberhardtii* (Christ) Ching (Polypodiaceae) in Thailand) โดยมีอาจารย์ที่ปรึกษาคือ ศาสตราจารย์ ดร.ทวีศักดิ์ บุญเกิด ซึ่งการทำวิทยานิพนธ์ในระดับปริญญาโททำให้ได้รับประสบการณ์ในการเรียนรู้ความหลากหลายและนิเวศวิทยาของพืชกลุ่มเฟิร์นและกลุ่มไบรโอไฟต์ที่มักจะเจริญอยู่ด้วยกัน ซึ่งในขณะนั้นดิฉันได้มีโอกาสลงทะเบียนเรียนวิชา ไบรโอโลยี (Bryology) เปิดสอนโดย รองศาสตราจารย์ ดร.อบฉันท์ ไทยทอง ทำให้ได้มีโอกาสศึกษาภาคสนามอีกหลายครั้งเพื่อศึกษาพืชกลุ่มไบรโอไฟต์มากยิ่งขึ้น ต่อมาในปี พ.ศ. 2541 ดิฉันได้บรรจุเป็นอาจารย์ในภาควิชาพฤกษศาสตร์ จุฬาลงกรณ์มหาวิทยาลัย และเริ่มศึกษาความหลากหลายทางด้านไบรโอไฟต์อย่างจริงจัง พร้อมทั้งมีเป้าหมายที่จะศึกษาทบทวนพืชกลุ่มไบรโอไฟต์ในประเทศไทย ซึ่งมีเพียงข้อมูลรายชื่อเท่านั้น ในเดือนตุลาคม พ.ศ. 2547 ดิฉันเดินทางไปศึกษาในระดับปริญญาเอกที่มหาวิทยาลัยบอนน์ (University of Bonn) ในสถาบัน Nees Institute for Biodiversity of Plant โดยมี ศาสตราจารย์ ดร. เจน-ปีเตอร์ ฟราห์ม (Professor Dr. Jan-Peter Frahm) เป็นอาจารย์ที่ปรึกษาวิทยานิพนธ์ระดับปริญญาเอกชื่อ Systematic treatment of Sematophyllaceae (Musci) in Thailand ซึ่งเป็นการศึกษาทบทวนมอสส์วงศ์ที่มีประชากรมากที่สุดในประเทศไทย พบ 24 สกุล จำนวน 97 ชนิด คิดเป็น 10 เปอร์เซนต์ของประชากรมอสส์ที่เคยรายงานในประเทศไทย

การศึกษาในประเทศเยอรมนีเป็นโอกาสที่ดีทำให้ได้มีโอกาสเรียนรู้ด้านความหลากหลายและนิเวศวิทยาของไบรโอไฟต์ในประเทศแถบยุโรปเพิ่มมากขึ้น โดยมีการศึกษาภาคสนามมากกว่า 20 ครั้ง เพื่อเก็บตัวอย่างไบรโอไฟต์ และรักษาสภาพตัวอย่างไว้ใน Frahm's herbarium มหาวิทยาลัยบอนน์ หลังจากได้รับปริญญาเอก (Dr. rer. nat.) ดิฉันกลับประเทศไทยเพื่อปฏิบัติหน้าที่เป็นอาจารย์สอนนิสิตในระดับปริญญาตรี ภาควิชาพฤกษศาสตร์ จุฬาลงกรณ์มหาวิทยาลัย โดยสอนวิชาในกลุ่มวิทยาศาสตร์ชีวภาพ
ซึ่งได้นำหัวข้อสัณฐานวิทยาของไบรโอไฟต์มาสอนให้กับนิสิตที่ลงทะเบียนเรียนวิชาชีววิทยามากกว่า 100 คนต่อปี และเปิดสอนวิชาไบรโอโลยี (Bryology) สำหรับนิสิตกลุ่มสาขาความหลากหลายของพืช รวมทั้งทำงานวิจัยทางด้านไบรโอไฟต์โดยได้รับทุนสนับสนุนจากโครงการ Biodiversity Research and Training Program (BRT) และจุฬาลงกรณ์มหาวิทยาลัย ในการทำวิจัยเรื่องต่าง ๆ
ที่เกี่ยวข้องกับนิเวศวิทยาและความหลากหลายของมอสส์วงศ์ Sphagnaceae, Polytrichaceae และ Diphysciaceae ในประเทศไทย
รวมถึงการศึกษาความหลากหลายของไบรโอไฟต์ในป่าเขาหินปูนในพื้นที่ต่าง ๆ เช่น เขตรักษาพันธุ์สัตว์ป่าดอยเชียงดาว
และเทือกเขาหินปูนภาคตะวันตกของประเทศไทย
รวมถึงการศึกษาลักษณะการปรับตัวและการกระจายพันธุ์ของมอสส์ในพื้นที่หินทรายและหินแกรนิต
เพื่อศึกษาผลกระทบและการปรับตัวต่อสภาวะโลกร้อน
ในอนาคตดิฉันมีเป้าหมายในการผลิตหนังสือเกี่ยวกับความหลากหลายและนิเวศวิทยาของมอสส์ สำหรับนักศึกษาและผู้ที่สนใจพืชกลุ่มมอสส์

List of selected publications:

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Pasakorn, A., Suriyanchaiwatthana, T. and **R. Pollawatn.** 2018. Diversity of mosses in Phu Kradueng National Park, Loei province. Thai Journal of Botany 10 (1): 31–45.

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Apawasin, W. and **R. Pollawatn.** 2010. Taxonomy of moss genus *Pogonatum* P. Beauv (Polytrichaceae) in Thailand. Senior Project Faculty of Science, Chulalongkorn University

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Phonwongtrakul, T., Dumrongrojwatthana, P. and **R. Pollawatn**. 2018. Diversity of bryophytes in Bueng Sam Nak Yai Wetland, Rayong Province. Senior Project Faculty of Science, Chulalongkorn University

Posters:

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Wijk & Margad. and *Calymperes tenerum* Muell. Hal. Special study report.
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Imwattana, K. and **R. Pollawatn.** 2015. Silver nanoparticle (AgNPs) in moss *Philonotis hastata* (Duby) Wijk & Margad.: Uptake and effect on growth. Hitachi Trophy Competition, 23-24 April 2015, Faculty of Science, Chulalongkorn University.
Patsakorn, A. and **R. Pollawatn**. 2015. A study of Genus *Sphagnum* L. (Sphagnaceae) at Phu Kradung National Park, Loei Province. Poster Abstract: The 9th Botanical Conference of Thailand. 3-5 June 2015, Ambassador Hotel, Bangkok, Thailand.
Patsakorn, A. and **R. Pollawatn.** 2016. *Octoblepharum pocsii* Magill & B. H. Allen (Calymperaceae), a New Record to Thailand from Phu Kradueng National Park, Loei Province. Poster Abstract: The 6th Conference on Taxonomy and Systematics in Thailand. 25-27 June 2016, Khon Kaen University, Khon Kaen, Thailand.

Phiangphak Sukkharak (รองศาสตราจารย์ ดร.เพียงพักตร์ สุขรักษ์)

Thailand

I am an associate professor at Burapha University in Thailand. I completed my primary and secondary schools in Nan, where I was born in 1982. Later, I continued my high school and Bachelor's degree in Chiang Mai because I obtained the Development and Promotion of Science and Technology Talents project scholarship provided by Thai government to support students with a scientific interest to study up to a doctorate degree.

My interest in bryophytes started when I joined the Forest Restoration Research Unit of Chiang Mai University's Biology Department (FORRU-CMU) as a volunteer during my second year of Bachelor's degree at Chiang Mai University. Because of their beauty, when going into the research nursery, I always looked for bryophytes growing in the germinating area and on the floor. I wanted to know more about this interesting group of plants so I submitted a proposal to the Biodiversity Research and Training program of Thailand and got the financial support to study the bryophytes of Kun Wang community forest in Chiang Mai. I rode a motorbike alone to the Kun Wang community forest of Inthanon mountain, which is the highest mountain in Thailand at 2,565 meters asl to collect the bryophytes. I studied the morphological and anatomical details of the bryophytes and identified the specimens on my own, with the help of Sahut Chantanaorrapint for specimen verification. I also visited the Queen Sirikit Botanical Garden library to borrow bryophyte books. I was able to complete the project and return more than half of the budget awarded to me.

Although there were difficulties encountered during the study, I found out that the more I studied bryophytes, the more I loved them and would like to know more. I, therefore, continue studying the liverworts of Khao Nan in Nakhon Si Thammarat for my master's degree thesis at Chulalongkorn University in Bangkok. In 2007, I met Robbert Gradstein at the World Conference of Bryology in Kuala Lumpur, Malaysia and was invited to Göttingen, Germany to conduct a monograph of the liverwort genus *Thysananthus* for my PhD thesis under his guidance. After graduation, I wrote a monograph on *Mastigolejeunea* whereby intermediate taxa between *Thysananthus* and *Mastigolejeunea* were found. This led to the treatment of *Mastigolejeunea* as a subgenus of *Thysananthus* based on morphological and molecular evidence. Recently, I have been working on a revision of the liverwort genera of Thailand. The genera *Frullania*, *Pleurozia*, and *Metzgeria* in Thailand are revised. *Porella* and *Acrobulbus* are updated and *Syzygiella* is added to the Thai liverwort record. I am also working on *Thysananthus* and *Frullania* for the Flora of Singapore project.

I currently serve as a member of the Nomenclature Committee for Bryophytes of the International Association of Plant Taxonomists (2017-2023) and the Editorial Board of Journal of the Hattori Botanical Laboratory (2017-present). Moreover, after receiving the Young Scientist Award from the Foundation for the Promotion of Science and Technology under the Patronage of His Majesty the King in 2015 until now, I have been invited to give stimulating talks and to conduct the outreach activities for students not only in universities but also high schools throughout Thailand. My aim is to share my research experience, encourage and motivate them into scientific careers, as well as increase their awareness of this important and beautiful, yet understudied group of plants.

As a woman studying a little-known group of plants in Thailand, I am proud of what I do. I have never felt advantages, disadvantages, or regret because I have a passion for bryophytes and I believe in my ability and perseverance that keeps me doing and accomplishing anything I set my mind to.

ปัจจุบันดำรงตำแหน่ง รองศาสตราจารย์ ณ มหาวิทยาลัยบูรพา
สำเร็จการศึกษาในระดับประถมศึกษาและมัธยมศึกษาตอนต้นจากจังหวัดน่าน
ต่อมาได้ศึกษาในระดับมัธยมศึกษาตอนปลายที่โรงเรียนยุพราชวิทยาลัย จังหวัดเชียงใหม่ และระดับปริญญาตรี สาขาชีววิทยา
คณะวิทยาศาสตร์ มหาวิทยาลัยเชียงใหม่ ภายใต้โครงการพัฒนาและส่งเสริมผู้มีความสามารถพิเศษทางวิทยาศาสตร์และเทคโนโลยี (พสวท.)
ซึ่งเป็นโครงการที่ส่งเสริมนักเรียนที่สนใจเกี่ยวกับวิทยาศาสตร์และสนับสนุนให้ศึกษาด้านวิทยาศาสตร์จนถึงระดับปริญญาเอก
โดยความสนใจเกี่ยวกับไบรโอไฟต์ (bryophytes) เริ่มต้นระหว่างที่ศึกษาในระดับปริญญาตรีชั้นปีที่ 2
ขณะเป็นอาสาสมัครของหน่วยวิจัยการฟื้นฟูป่า (Forest Restoration Research Unit: FORRU) ของภาควิชาชีววิทยา คณะวิทยาศาสตร์
มหาวิทยาลัยเชียงใหม่ เพราะความสวยงามของไบรโอไฟต์ ทำให้ทุกครั้งที่เดินเข้าไปในโรงเรือนต้นกล้า
จะมองหาไบรโอไฟต์ที่เจริญอยู่บนพื้นที่เพาะต้นกล้าและพื้นของโรงเรือน และต้องการเรียนรู้เกี่ยวกับพืชกลุ่มนี้ให้มากยิ่งขึ้น
จึงเสนอโครงร่างงานวิจัยต่อโครงการพัฒนาองค์ความรู้และศึกษานโยบายการจัดการทรัพยากรชีวภาพในประเทศไทย
และได้รับการพิจารณาจัดสรรทุนวิจัยให้ดำเนินการวิจัยเกี่ยวกับความหลากหลายของไบรโอไฟต์บริเวณป่าชุมชมบ้านขุนวาง จังหวัดเชียงใหม่
โดยได้ขี่รถจักรยานยนต์ขึ้นไปเก็บตัวอย่างไบรโอไฟต์ในป่าชุมชมบ้านขุนวางซึ่งอยู่พื้นที่ดอยอินทนนท์ที่มียอดเขาที่สูงที่สุดในประเทศไทย
ศึกษาลักษณะทางสัณฐานวิทยาและกายวิภาค และระบุชนิดของไบรโอไฟต์ด้วยตนเอง และได้ความช่วยเหลือจาก รองศาสตราจารย์ ดร.สหัช
จันทนาอรพินท์ ในการตรวจสอบความถูกต้องของการระบุชนิด
ต้องไปที่สวนพฤกษศาสตร์สมเด็จพระนางเจ้าสิริกิติ์เพื่อยืมหนังสือที่เกี่ยวกับไบรโอไฟต์มาศึกษาประกอบการทำโครงการวิจัย
จนในที่สุดโครงการวิจัยก็สำเร็จและได้ส่งคืนทุนวิจัยมากกว่าครึ่งหนึ่งของที่ได้รับการจัดสรรมา
ให้แก่โครงการพัฒนาองค์ความรู้และศึกษานโยบายการจัดการทรัพยากรชีวภาพในประเทศไทย ระหว่างที่ดำเนินโครงการวิจัยนี้แม้จะลำบาก
แต่ก็พบว่า ยิ่งศึกษาไบรโอไฟต์ ก็ยิ่งรักและอยากจะศึกษามากขึ้น จึงได้เข้าศึกษาต่อในระดับปริญญาโท สาขาพฤกษศาสตร์ คณะวิทยาศาสตร์
จุฬาลงกรณ์มหาวิทยาลัย โดยทำวิทยานิพนธ์เกี่ยวกับความหลากหลายของลิเวอร์เวิร์ต (liverwort) บริเวณเขานัน จังหวัดนครศรีธรรมราช
และในปี พ.ศ. 2550 ได้พบกับ Robbert Gradstein ในงานประชุมไบรโอไฟต์วิทยาในระดับโลก (World Conference of Bryology) ณ
เมืองกัวลาลัมเปอร์ ประเทศมาเลเซีย และได้รับเชิญให้ไปศึกษาต่อในระดับปริญญาเอกที่มหาวิทยาลัยเกิททิงเงิน (University of Göttingen)
ประเทศสหพันธ์สาธารณรัฐเยอรมนี และทำวิทยานิพนธ์ในระดับปริญญาเอกในหัวข้อ การศึกษาทบทวนลิเวอร์เวิร์ตสกุล *Thysananthus*
ในระดับโลก โดยมี Robbert Gradstein เป็นอาจารย์ที่ปรึกษาวิทยานิพนธ์ หลังสำเร็จการศึกษาได้ศึกษาทบทวนลิเวอร์เวิร์ตสกุล
Mastigolejeunea ในระดับโลก และเนื่องจากพบสมาชิกที่มีลักษณะทางสัณฐานวิทยาที่ก้ำกึ่งระหว่างสกุล *Thysananthus* และสกุล

Mastigolejeunea จึงได้มีการศึกษาด้านสัณฐานวิทยาและความสัมพันธ์เชิงวิวัฒนาการระดับโมเลกุล และทำให้สกุล *Mastigolejeunea* ถูกลดระดับให้เป็นสกุลย่อยของสกุล *Thysananthus*

งานวิจัยที่กำลังดำเนินการอยู่ในปัจจุบัน คือ การศึกษาทบทวนลิเวอร์เวิร์ตในประเทศไทย โดยสกุลที่ได้ศึกษาทบทวนไปแล้ว ได้แก่ สกุล *Frullania* สกุล *Pleurozia* และสกุล *Metzgeria* นอกจากนี้ได้มีการเพิ่มเติมข้อมูลของสกุล *Porella* และ *Acrobulbus* ในประเทศไทยให้เป็นปัจจุบัน และได้รายงานการพบสกุล *Syzygiella* ครั้งแรกในประเทศไทย อีกทั้งยังได้ศึกษาสกุล *Thysananthus* และสกุล *Frullania* ในโครงการ Flora of Singapore project ของประเทศสิงคโปร์ และทำหน้าที่เป็นกรรมการการตั้งชื่อไบรโอไฟต์ (Nomenclature Committee for Bryophytes) ของ the International Association of Plant Taxonomists (2017-2023) และเป็นกรรมการกองบรรณาธิการของวารสาร Journal of the Hattori Botanical Laboratory (2017-ปัจจุบัน) นอกจากนี้ หลังจากที่ได้รับรางวัลนักวิทยาศาสตร์รุ่นใหม่ ประจำปี พ.ศ. 2558 จากมูลนิธิส่งเสริมวิทยาศาสตร์และเทคโนโลยีในพระบรมราชูปถัมภ์ ก็ได้รับเชิญให้บรรยายพิเศษในงานประชุมทางวิชาการและกิจกรรมทางวิชาการต่าง ๆ สำหรับนักเรียน นิสิต นักศึกษา ทั่วประเทศ โดยมีวัตถุประสงค์เพื่อถ่ายทอดประสบการณ์การทำวิจัย สร้างแรงบันดาลใจในอาชีพในด้านวิทยาศาสตร์ ตลอดจนส่งเสริมให้ตระหนักถึงความสำคัญของไบรโอไฟต์ที่มีความสำคัญโดยเฉพาะต่อระบบนิเวศ มีความสวยงามและยังมีการศึกษาเกี่ยวกับพืชกลุ่มนี้น้อย

โดยส่วนตัวรู้สึกภูมิใจที่เป็นผู้หญิงที่ศึกษากลุ่มพืชไบรโอไฟต์ซึ่งเป็นที่รู้จักน้อยมากในประเทศไทย ไม่เคยคิดว่าเป็นข้อได้เปรียบ ข้อเสียเปรียบ หรือท้อแท้แต่อย่างใด เพราะรักและสนใจไบรโอไฟต์ และเชื่อในศักยภาพและความมุ่งมั่นตั้งใจของตนเองที่จะทำงานวิจัยด้านนี้ต่อไปอย่างต่อเนื่องและทำทุกอย่างให้สำเร็จได้ดังที่ใจต้องการ

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I am recently working as an honorary research associate in the Department of Botany at Chulalongkorn University in Bangkok. Although my current research focuses on the taxonomy of Orchidaceae and Asclepiadaceae, my first research project was on bryophytes. My interest in all kinds of small plants including bryophytes developed during fourth grade in Phuket, where I was born. For my master's degree and PhD at the University of Sydney under the Colombo Plan scholarship, I decided to study bryophytes because of their cute tiny size and the fact that no Thai researcher had previously studied them.

After completing my PhD on the liverwort genus *Riccia* in Australia, I collaborated with Japanese Bryologists, Sinske Hattori and Naofumi Kitagawa, to identify and report 34 species of the liverwort genus *Frullania* in Thailand based on the specimens collected in Thailand during the expeditions of Kyoto University, Rijksherbarium, Leiden, and Aarhus University in 1957-1977. I have done research on bryophytes of mangrove forest in Chanthaburi, Krabi, Phang Nga, Ranong, Satun, and Trat provinces in Thailand and have published the list of Thai bryophytes based on the literature published from 1901 to 1979 together with Renu Sornsamran. Being the only Thai woman in Australia studying bryophytes was a great experience. I was in the same laboratory as Helen Hewson who worked on the liverwort genera *Aneura* and *Riccardia* of Borneo and had a chance to collect the plants throughout Australia.

ปัจจุบันเป็นนักวิจัยกิตติมศักดิ์ ณ ภาควิชาพฤกษศาสตร์ คณะวิทยาศาสตร์ จุฬาลงกรณ์มหาวิทยาลัย แม้ว่างานวิจัยที่ดำเนินการอยู่ในปัจจุบัน คือ อนุกรมวิธานของพืชวงศ์กล้วยไม้ (Orchidaceae) และวงศ์นมตำเลีย (Asclepiadaceae) แต่โครงการวิจัยชิ้นแรกที่ได้ดำเนินการ คือ งานวิจัยเกี่ยวกับไบรโอไฟต์ โดยเริ่มมีความสนใจในพืชที่มีขนาดเล็กและหนึ่งในนั้นคือไบรโอไฟต์ระหว่างที่เรียนชั้นประถมศึกษาชั้นปีที่ 4 ที่จังหวัดภูเก็ต จากนั้นเมื่อได้รับทุนแผนโคลัมโบ (Colombo Plan) เพื่อศึกษาในระดับปริญญาโทและปริญญาเอก ณ มหาวิทยาลัยซิดนีย์ (University of Sydney) ประเทศออสเตรเลีย จึงได้เลือกเรียนไบรโอไฟต์เพราะมีขนาดเล็ก น่ารัก และในประเทศไทยยังไม่มีผู้ที่ศึกษาเกี่ยวกับพืชนี้ โดยวิทยานิพนธ์ในระดับปริญญาเอก คือ การศึกษาลิเวอร์เวิร์ตสกุล *Riccia* ในประเทศออสเตรเลีย หลังสำเร็จการศึกษาได้ร่วมมือกับนักไบรโอไฟต์วิทยาชาวญี่ปุ่น 2 ท่าน คือ Sinske Hattori และ Naofumi Kitagawa ในการระบุชนิดลิเวอร์เวิร์ตสกุล *Frullania* จากตัวอย่างที่เก็บในประเทศไทยในโครงการสำรวจของมหาวิทยาลัยเกียวโต (Kyoto University)

พิพิธภัณฑ์พืชไรคส์ (Rijksherbarium) เมืองไลเดน (Leiden) และมหาวิทยาลัยอาร์ฮุส (Aarhus University) ในช่วงปี ค.ศ. 1957-1977 โดยได้รายงานไว้จำนวน 34 ชนิด

นอกจากนี้ได้ศึกษาไบรโอไฟต์ในพื้นที่ป่าชายเลนของจังหวัดจันทบุรี กระบี่ พังงา ระนอง สตูล และตราด และได้ร่วมกับ รองศาสตราจารย์ เรณู ศรสำราญ

ตีพิมพ์รายชื่อไบรโอไฟต์ที่พบในประเทศไทยที่ปรากฏในผลงานตีพิมพ์ระหว่างปี ค.ศ. 1901-1997

การเป็นหญิงไทยเพียงคนเดียวที่ศึกษาไบรโอไฟต์ในประเทศออสเตรเลียเป็นประสบการณ์ที่ดีมาก

โดยได้เป็นสมาชิกของห้องปฏิบัติการเดียวกันกับ Helen Hewson ซึ่งทำงานวิจัยเกี่ยวกับลิเวอร์เวิร์ตสกุล *Aneura* และ *Riccardia* ของบอร์เนียว และได้มีโอกาสเก็บตัวอย่างพืชทั่วประเทศออสเตรเลีย

List of selected publications:

Chantanaorrapint, S., Boonkerd, T., & **Thaithong, O**. (2004a). Checklist of bryophytes at the summit of Khao Luang, Hui Yang Waterfall National Park, Parchuap Kiri Khan Province, Thailand. *Natural History Bulletin of the Siam Society*, 52(2), 163-179.

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UNITED KINGDOM

Liz Kungu
England

As an only child born and growing up in post-war north London suburbia anything to do with nature was my sanity and my salvation. My first love from primary school was ornithology, but my interest soon expanded to include botany, as without the plants there would be no habitats for the birds. As the first in my family to go to university I was lucky enough to have parents who were happy to let me study whatever interested me, even though the job prospects seemed meagre. At the University of Durham, I was one of only two students, both female, in the inaugural year of a joint honours course in Botany and Geography, this in the days when UK universities still had thriving botany departments, and before ecology or environmental sciences degrees existed. After Durham I moved to the Geography Department of Queen's University, Belfast to do an MSc by research. This was early on during the start of the troubles and a month after the British troops had moved in, so it was a strange time to be doing field work in the Sperrin Mountains.

Jobs were indeed very scarce once I graduated, and so I was grateful to eventually find my dream job in 1972, as a scientific officer in the peatland research group of the Nature Conservancy, the original UK wide, nature conservation organisation. This is where my love affair with bryophytes really started. I was given a copy of The Student's Handbook of British Mosses (Dixon 1924) and The Student's Handbook of British Hepatics (MacVicar 1926) and a shoe box of peatland bryophytes to identify. The first plant I looked at was *Mylia taylorii* and yes, even though these were samples from a Scottish bog, it was *M. taylorii* and not *M. anomala*, and I was hooked, such a beautiful plant, wonderful details of cell structure, and found in such amazing habitats. In 1974 I was transferred to the Institute of Terrestrial Ecology (ITE), when the newly formed Nature Conservancy Council lost its research capability. A very retrograde step in my opinion. In ITE I was part of the Scottish soft coast survey, which again took me to superb places all around the Scottish coast to record the vascular plant flora, and my winters were spent in the lab identifying the bryophyte collections from these sites. This was my first introduction to *Entodon concinnus* which we found throughout the Hebridean machair, it having previously only been known from a couple of sites.

In 1980, when my daughter Cathy was born, I took a career break to become a full-time mum, and subsequently help run the family business and work part-time as an archaeologist, and only returned to science when the family moved to Kenya in 1990. Here I started work as an assistant

lecturer in the Botany Department of the University of Nairobi, teaching bryology amongst many other Botanical topics. It was there that Prof. John Kokwaro first encouraged me to register for my PhD. In 1991 I joined the British Bryological Society (BBS) tropical group meeting to Mt Mulanje in Malawi. This was an amazing opportunity to meet with other members of the BBS whilst studying the bryoflora of this magnificent African mountain, and one lunchtime sitting by the Thuchila River, to ask Royce Longton if he would supervise me as a PhD student to complete research on some aspect of bryophyte taxonomy, eventually settling on the revision of African Entodontaceae.

I moved to the Botany Department of The University of Reading in 1994, and studied part-time whilst looking after my young son, eventually registering for my PhD at Reading in 1997 and finally graduating in 2003. At Reading I realised that I was part of a cohort of women returning to university in later life to complete their first or higher degrees. I had started at university in an era when only 4% of UK school leavers went to university and women were a small minority as undergraduates, and very rarely completed postgraduate degrees. From Reading, I was fortunate to get an ideal job, working at the Royal Botanic Gardens Edinburgh (RBGE) on a short-term contract, looking for novel compounds of potential medicinal use in the Scottish flora, and specifically bryophytes. This gave me the opportunity to become far more involved in the running of the BBS and to widen my bryological knowledge with the guidance of the Scottish bryologists, especially with the help of David Long, David Chamberlain and Gordon Rothero. I am very grateful to them and many other members of the BBS for their patient tuition and friendship over the last two decades. I have had support from the RBGE in my bryological life, initially as an employee and subsequently as a research associate. This has enabled me to arrange numerous field meetings to under recorded areas of Scotland, in preparation for the 2014 Atlas of the British and Irish Bryophytes, to edit the Journal of Bryology for almost 12 years and to start the South-west Scotland Bryophyte Recording group. I continue as a bryologist to this day, being very proud, and slightly overwhelmed, to be elected president of the BBS, starting this year, and being appointed joint vice county recorder for VCs 72–74. The study of bryophytes has taken me to some beautiful places, with the company of many lovely people and provided much needed bryo-therapy over the years.

List of selected publications:

Kungu E.M. 2003. Taxonomic revision of African Entodontaceae. Unpublished Ph.D. thesis. The University of Reading.

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Long D. & **Kungu E.M.** 2006. Glenkinnon Burn bryophyte survey and management recommendations. Report to Forestry Commission and Community Woodland.
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Dalton N.J., **Kungu E.M.** & Long D.G. 2012. The misapplication of *Hedwigia integrifolia* P. Beauv. and identity of *Gymnostomum imberbe* Sm. (Hedwigiaceae, Bryopsida). Journal of Bryology 34(1):59–61.
Dalton N.J., **Kungu E.M.** & Long D.G. 2013. A taxonomic revision of the Hedwigiaceae Schimp. from the Sino-Himalaya. Journal of Bryology 35(2): 96–111.
Long D. & **Kungu E.M.** 2015. Recording Bryophytes in Talla & Gameshope. The Green Shed. Borders Forest Trust, December 2015.
Long D. & **Kungu L**. 2015. Meeting Report: BBS Annual Meeting and Conference 12–14 September 2014. Report on the 2014 Autumn Meeting held at the Royal Botanic Garden, Edinburgh. Field Bryology. No. 114: 36–37.

Jean Paton
England

When young, I taught myself to draw and paint flowers, which helped me to learn their names when I became a student at Bedford College in London. Previously, on a woodland floor, I had found several mosses, beautiful, thrilling - and later I was set the task of naming a collection from the Lake District. Fieldwork included a course near Aviemore, Scotland. I had found my métier and went on to gain an MSc. As an herbarium assistant at Southampton, my studies helped towards the first vice-county bryophyte flora to be mapped by hectads.

My husband Valentine 'Pat' Paton and I moved to Cornwall, where over 10 years I wrote two books. As the British Bryological Society's Recorder for Hepatics I attended field meetings, worked with colleagues on the *Census Catalogue* and contributed to the BBS Mapping Scheme. Next, I was persuaded by Jack Gardiner to work on a book on the liverworts of the British Isles, which became *The Liverwort Flora of the British Isles*. I was awarded a four-year grant-in-aid by the Royal Society in 1967 towards this work. It was the greatest pleasure to carry out fieldwork for this project. I visited many places in the British Isles, the Republic and Northern Ireland, the Hebrides, Scotland, the Isle of Man, Wales, England, the Isles of Scilly and the Channel Islands. During this time, I also worked on and published three regional bryophyte floras. When the Cambridge University Press abruptly ended our contract for the book, I carried on. *The Liverwort Flora of the British Isles* was published in 1999. Pat inked my drawings with the sure hand of an architect, David Holyoak brought my text into the digital era and publisher Basil Harley gave the work infinite care and attention. 34 years after starting on this journey, reviews were still enthusiastic. In 2000, I received an award from the Linnean Society for the illustrations and, in 2002, the International Association of Bryologists (IAB) Hattori Prize for best bryological publication in the years 1999-2000.

After that, the intensity of fieldwork lessened as trekking and mountaineering became more of a challenge. I was to engage with one more project and my *Supplement to the Liverwort Flora of the British Isles* was published in 2022. Matthew Stribley had transcribed my handwriting and helped in many ways. I have lived long and have been lucky in other respects: I have made kind friends and colleagues, was appointed MBE and have been able to take so many opportunities to share this compelling passion. The following list outlines my nationwide pursuit of the liverworts.

List of selected publications:

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