



The Bryological Times



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President's Message

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At a time when the pandemic is challenging many aspects of our lives, I trust that you are all in good health and spared from any hardship, and hope that you are able to maintain your bryological activities.

In light of recent events that question the commitment of our societies to unconditional equality, fundamental human rights and economic opportunities for everyone, I wish to underline that the International Association of Bryologists welcomes all bryologists, regardless of their ethnicity, gender or faith. As an international association, we invite bryologists from across the globe to join, but we must thrive to also broaden the diversity from within the various corners of the world. Already at the meeting in Madrid in 2019, the IAB council pledged to develop further the representation of our membership and actively recruit members to council position to more accurately reflect the diversity of our members. Please join the council in insuring that IAB is open to and representing everyone. I trust that significance progress can be reported at our next meeting.

We will soon call on you to volunteer for positions in the IAB council, as the term of seven members will be ending in 2021. We will also seek a new editor for the *Bryological Times*, as Patrick Dalton's term is coming to an end. I call

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on you to consider this position, which is critical in maintaining an active newsletter that serves as a strong link among our nearly 500 members from across the globe. Please contact me if you are motivated to hold this position and serve our society.

Wishing you the best for the coming months.

Bernard



Report on the IUCN Red List Assessor Training Workshop, July 7 & 8, 2019, Madrid, Spain

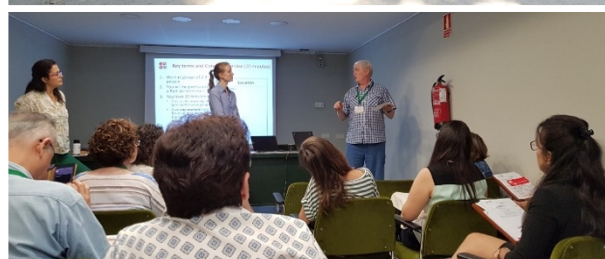
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Two days prior to the meetings of the International Association of Bryologists (IAB), the International Molecular Moss Science Society (iMOSS), and the Spanish Bryological Association (Sociedad Española de Briología, SEB), 29 bryologists hailing from 21 countries in North America, South America, Europe, Asia, Australia, and New Zealand gathered for a two-day IUCN Red List Assessor Training Workshop at the Real Jardín Botánico, Madrid. This capacity-building training initiative was organized by the Steering Committee of the IUCN Species Survival Commission's Bryophyte Specialist Group (BSG), namely Irene Bisang & Jacques van Rooy (co-chairs of the BSG), and Ariel Bergamini (Red List Authority Coordinator of the BSG). The workshop was led by IUCN-Certified Red List trainers Janet Scott (IUCN Global Species Red List Unit in Cambridge, England) and Catherine Numa (IUCN-Centre for Mediterranean Cooperation, Malaga).

In advance of arriving in Spain, participants prepared for the workshop by completing 13 hours of online training in the rules and standards used in IUCN Red List assessments. Over the course of two days the IUCN trainers reviewed key components of the online training and ensured that participants had a sound understanding of Red List assessment methodologies by overseeing multiple practice exercises.

A pertinent addition to the formal training schedule was a presentation on the nearly completed European Bryophyte Red List Project by Nick Hodgetts. Nick was the scientific lead of this project, which was managed by IUCN's European Regional Office in Brussels, and mainly funded by the European Commission's LIFE program (LIFE14PREBE001). On the final

day, participants worked in groups to produce first-draft regional and/or global assessments of rare and endangered bryophytes using previously compiled data.



In general, attendees of the workshop found the training to be very helpful and appreciated the facilitators' knowledge, experience, and willingness to find solutions to critical issues. The coffee and lunch breaks offered ample possibilities for collegial interactions and occasions to discuss specific cases of bryophyte

Red-Listing, and by the end of the two-day session it seemed that most participants felt inspired to pursue future bryophyte species assessments.

On a personal note, I greatly appreciated the opportunity to attend the training workshop and upon returning to North America shared the following items with fellow Canadians actively working on bryophyte conservation: 1) the online IUCN Red List Assessor training, which demystifies and clarifies the terminology and procedures used in assessments; 2) a recent article that is highly applicable to conservation assessments of bryophytes and other clonal and colonial organisms written by Bergamini, Bisang, et al. (2019) and published in *Lindbergia*; and 3) a mapping program called GeoCat that is very useful for mapping species occurrences and calculating critical geographic metrics required in IUCN Red List assessments. Hearing about the near-completion and success of the European Bryophyte Red List Project and meeting so many bryologists concerned with conservation was truly inspiring!

The IUCN Red List training workshop was generously funded by the Mohamed bin Zayed Species Conservation Fund; the Royal Botanic Garden (CSIC), Madrid, Spain; the IAB, represented by IAB council member Matt von Konrat; and the IUCN (workshop facilitator staff time). Special thanks to Jesús Muñoz, Real Jardín Botánico, for providing a fabulous setting for collegial interactions.

More about the IUCN Bryophyte Specialist Group: <https://www.iucn.org/commissions/ssc-groups/plants-fungi/plants/plants-a-m/bryophyte-mosses-liverworts-and-hornworts>

Website of the IUCN red-listing workshop: <https://www.bryology2019.com/iucn-red-listing-workshop/>

Online IUCN Red List Assessor Training: <https://www.conservationtraining.org/course/index.php?categoryid=23>

European Bryophyte Red List Project: <https://www.iucn.org/regions/europe/our-work/european-red-list-threatened-species/life-european-red-lists>

Bergamini A, Bisang I [joint first authors], Hodgetts N, Lockhart N, Van Rooy J, Hallingbäck T (2019) Recommendations for the use of critical terms when applying IUCN red-listing criteria to bryophytes. *Lindbergia* 42: 1–6. doi: 10.25227/linbg.01117. <https://doi.org/10.25227/linbg.01117>

GeoCAT: <http://geocat.kew.org/>



First Top 10 list of threatened Bryophytes published

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The Top 10 Initiative of the IUCN SSC Bryophyte Specialist Group aims to identify at least 10 species at high risk of extinction from each continent and properly assign them to an IUCN Red List category. The first Top 10 list of threatened Bryophytes have recently been published for the continent of Africa (Van Rooy, Bergamini and Bisang, 2019). Fifty lost or threatened species in Africa and adjacent islands in the tropics, identified by experts on the bryoflora of the continent, served as candidates for the selection of the Top 10 species at high risk of extinction. Each species on this candidate list is discussed at the hand of its taxonomy, distribution, habitat, threat and current global or regional Red List status as far as previously assessed.

We hope that this publication will motivate bryologists to get involved and identify the most threatened Bryophytes in their region and draw up a Top 10 list for their (sub)continent. We will come back with more details later this winter, but would like to encourage anyone who is interested in contributing to contact us already now.

The bryophytes of Europe, comprising 1,817 species, have recently been comprehensively

assessed using IUCN Red-listing criteria, with financial support from the European Commission's Environmental Protection programme, LIFE. The "European Red List of Mosses, Liverworts and Hornworts" was officially launched on 27 September 2019, and is available at

<https://portals.iucn.org/library/node/48520>

During the preparation of the European Red List it became apparent that a revision of some of the critical terms that are regularly used when red-listing organisms according to IUCN methodology would greatly benefit the project and ensure a consistent application of the IUCN criteria. Recommendations for the use of these critical terms when applying IUCN red-listing criteria to bryophytes have now been published in a paper by Bergamini et al. (2019). This paper presents refined and largely pragmatic definitions of the critical terms 'generation length', 'mature individual' and 'severe fragmentation'. We believe that this publication of the refined critical terms will help to promote their use for regional or national Red Lists and further increase consistency of assessments among regions and assessors.

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Van Rooy J, Bergamini A, Bisang I (2019) Fifty shades of red: Lost or threatened bryophytes in Africa. *Bothalia* 49: a2341. <https://doi.org/10.4102/abc.v49i1.2341>



Wildfire behaviour and impacts on bryophytes in high conservation value *Nothofagus* – *Ceratopetalum* Gondwana cool temperate rainforest in northern New South Wales, Australia.

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The *Nothofagus-Ceratopetalum* cool temperate rainforests of northern New South Wales support a rich diversity of bryophytes (Downing et al. 2014). The 2019/20 wildfire season in northern NSW has seen biodiversity impacts on a scale, duration and intensity not seen perhaps since 1968 or 1916. Like previous significant wildfire events, it was preceded by an extended spring drought and localised fire weather creating significant containment and resourcing challenges for fire-fighting authorities (Figs. 3, 4). These fires have impacted every level of plant community, including bryophytes which have been substantially devastated. Across NSW, 5.4 million hectares of land have burnt, including 2.7 million ha of national park and 0.9 million ha of state forest. In northern NSW, Gondwana rainforests burnt in 2013, 2014, 2017, 2018 and 2019/2020 with several reserves exceeding their minimum fire free intervals in their reserve fire management strategies. Fifty-four percent of the NSW components of the Gondwana Rainforests



Nothofagus moorei rainforest Willi Willi National Park (Image credit Neil Pash).

of Australia World Heritage property have been affected by fire during the 2019/2020 wildfire season, and 35% of the total extent of NSW rainforests affected by fire. Further remote sensing and field-based analyses are underway to identify the severity of wildfire effects of these rainforest stands.

The development and maintenance of an appropriate fire regime for Gondwana rainforests is a particularly complex challenge for land managers where extensive tracts of fire sensitive rainforest (which require fire exclusion) are interspersed with fire tolerant sclerophyll communities in remote terrain with limited containment options. Systematic observations of wildfire behaviour and the associated biodiversity impacts in *Nothofagus*–*Ceratopetalum* cool temperate rainforest are unreported in the scientific literature. The 2019/20 wildfire season in northern NSW provides a rare opportunity to examine this phenomenon using an existing long-term forest plot monitoring network established in 1957 in order to inform the recovery process. Resurveying transects that were established in more recent years to investigate bryophyte distribution in the rainforests may provide data to indicate the extent of fire damage. Total crown scorch occurred on rainforest stand margins where fire intensity was at its greatest. Within the larger stands of rainforest however, impacts were less pronounced due to the rate of spread being constrained by fuel characteristics such as patchy low biomass fuels which eventually resulted in self-extinguishment. The most significant ecological impacts of the fire events were damage and structural collapse of a proportion of the mature canopy dominant rainforest trees.

The Stockyard East wildfire (**Fig. 1**) originated on 25/10/2019 from a suspected lighting ignition. It burnt 86,934 ha before being ‘set to out’ on 27/12/2019. Where it burnt deep into rainforest it was burning across sites not burnt since 1956. Elsewhere it burnt again the margins of rainforest stands burnt in the Brushy Mountain Complex wildfire of 2013 (**Fig. 2**). The Stockyard East wildfire is effectively part of a larger complex of wildfire incidents in northern

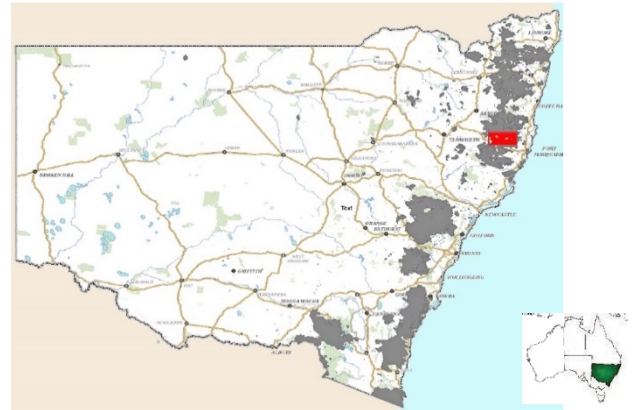


Fig. 1. The current 2019/20 fire season across northern NSW effectively commenced in late August 2019 and continues into 2020. The fire polygons (hashed/grey areas) are current to 12/01/2020. The Stockyard East wildfire and the contiguous Mines Road Bril and Dingo Creek wildfires are in the red insert box. Source: NSW RuralFireService.

NSW which commenced in August 2019 and are still being contained.

Nothofagus moorei canopies support a diverse and abundant epiphytic canopy flora of ferns, orchids, lichens, liverworts and mosses many of which are endemic to Gondwana rainforests. Species of bryophytes colonising upper tree canopies are very different from species colonising ground substrates such as fallen logs, tree buttresses and rocks. Canopy species are intermittently exposed to fogs and mists but must

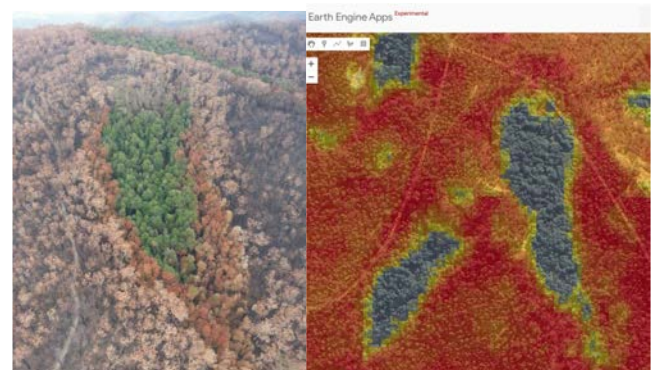


Fig. 2. Small stand of cool temperate rainforest in Werrikimbe NP showing typical 2013 Brushy Complex wildfire shadowing (upper image credit Andrew Marshall NSW NPWS) between intensely burnt pale tree crowns of *Eucalyptus campanulata* forest, scorched rainforest crowns on patch edges (brown crowns) and unburnt green crowns. The margins of this stand burnt were burnt again in November 2019 (bottom).

also be able to tolerate periods of high light levels and temperatures 3–4 °C higher than those of the rainforest understorey. The ignition of these canopy bryophyte mats was an unexpected impact of the ember attack and has not been reported previously in the Australian literature.

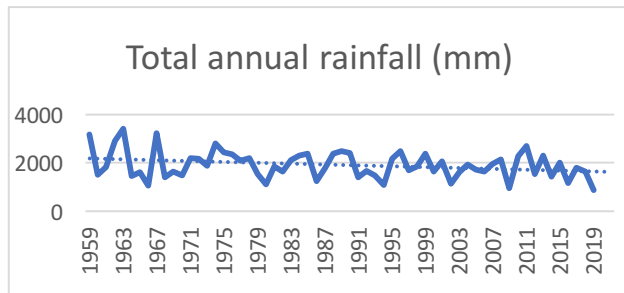


Fig. 3. The December 2019 wildfire season coincided with the lowest annual rainfall since local records commenced in 1959. Superimposed on this seasonal trend is a longer-term reduction in annual rainfall. Data from Willi Willi NP climate monitoring (Peacock unpubl.) based on BOM station 060068.

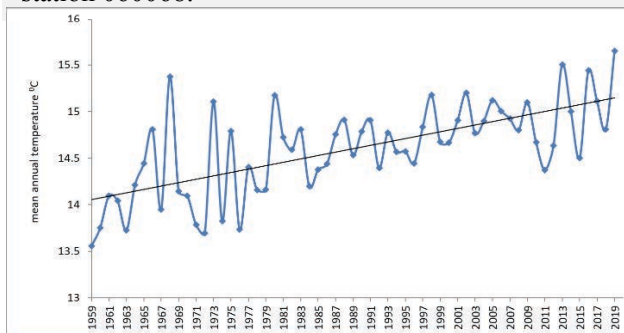


Fig. 4. The December 2019 wild fire season coincided with the highest mean annual temperature since local records commenced in 1959. Superimposed on this seasonal trend is a longer-term increase in mean annual temperature consistent with IPCC projected global warming scenarios (<http://www.ipcc.ch/report/ar5>). Data from Willi Willi NP climate monitoring (Peacock unpubl.) based on BOM station 060068.

Fire Impacts on Bryophyte communities

Our studies of bryophytes in Werrikimbe and Willi Willi National Park demonstrate that buttresses of both *Nothofagus* and *Ceratopetalum* are important substrates for bryophytes. The impact of fire on buttresses appears to be substantial.

In Australia, there have been relatively few studies of bryophyte recolonization after fire;

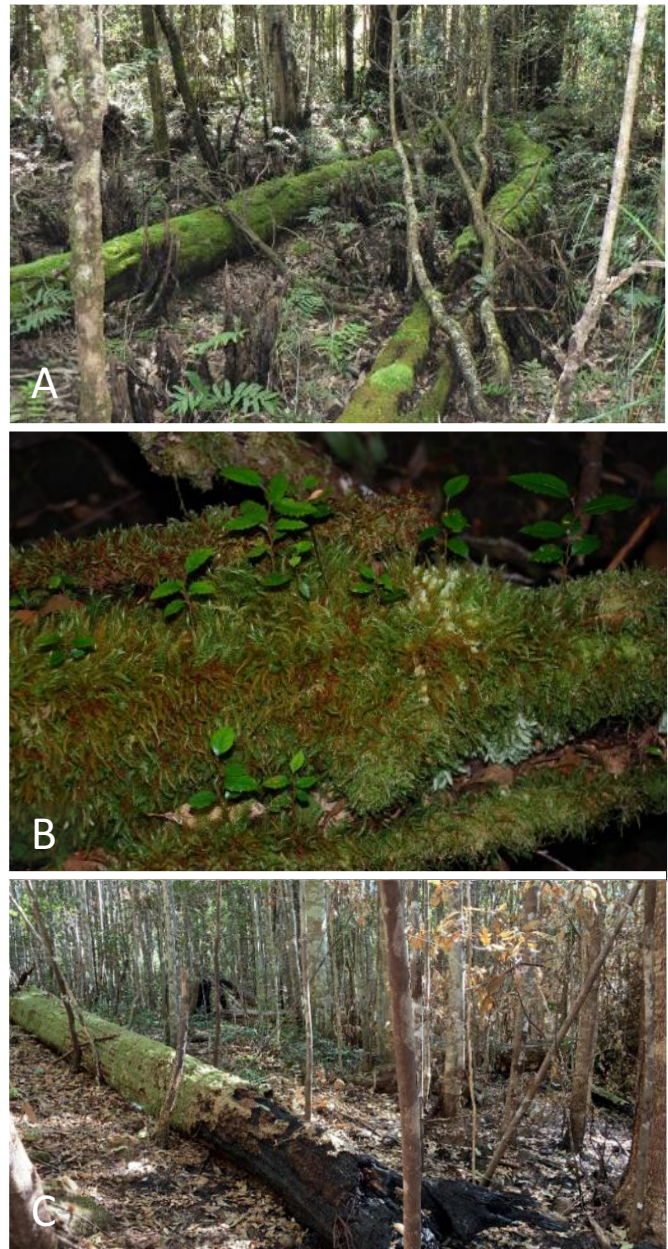
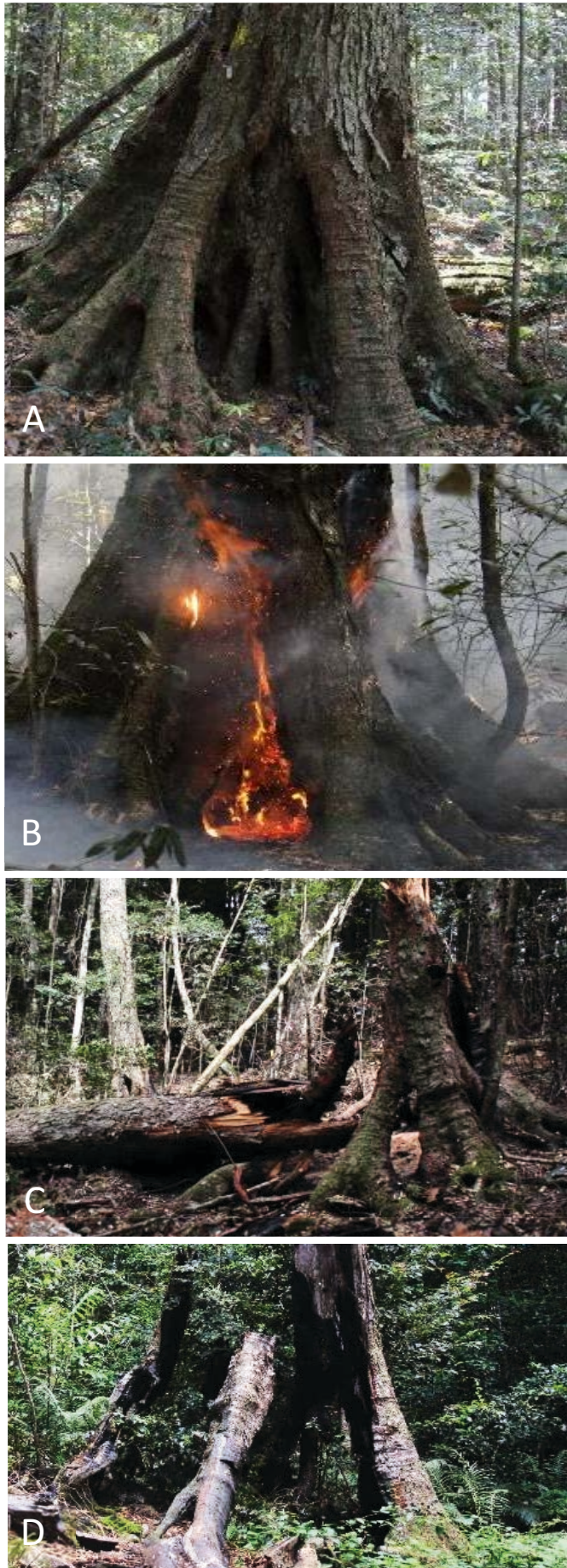


Fig. 5. Bryophytes (mosses, liverworts, hornworts) are an abundant and conspicuous component of the Gondwana rainforest floor. Most occupy fallen log and bark substrates. Fallen logs create a large surface area for bryophyte colonisation with a mean surface area of 709 m²/ha. Photograph prior to wildfire. (Image credits Peacock). **A, B:** Fallen logs with their abundant cover of bryophytes provide the preferred regeneration substrate for many species of rainforest canopy species. The soil surface has many antagonisms to successful seedling recruitment including giant earthworm castings, megapode scratching and toxic levels of aluminum. **C:** Many fallen logs ignited in 2019 leading to the loss of their bryophytic and regenerating tree seedling cover.



most focus on bryophyte recolonization of soil, rather than on fallen logs, rocks and tree buttresses. Most studies are from Tasmania (Ferguson et al. 2009; Duncan & Dalton 1982, Cremer & Mount 1965), although in more recent years, there have been studies in NSW (Pharo et al. 2013) and Western Australia (Ward et al. 2017; Wills et al. 2018).

We established systematic monitoring transects for bryophyte presence/absence data in *Nothofagus* rainforests of Werrikimbe and Willi Willi National Parks prior to the current wildfire season, and so it is hoped that these may prove to be a useful basis for documenting recolonization in areas where bryophyte communities have been completely annihilated and for revegetation where communities have been less severely impacted.

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Fig. 6. The typical sequence of delayed or lagged tree mortality in *N. moorei* following fire buttress damage. **A:** Unburnt, 2012. (Photo: Peacock). **B:** On fire, 2013. **C:** Collapsed tree, 2015. **D:** Remnant tree buttress and colonizing understorey species, 2018.

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“Blooming” of *Buxbaumia viridis* in Estonia: the case of mild winter

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Buxbaumia viridis is an epixylous moss belonging to the species lists of European Habitat Directive (HD) and Bern Convention. Although it has been evaluated as out of threat

(LC) at the European level recently (Hodgetts et al. 2019), it belongs in threat categories in several country lists (Hodgetts et al. 2015). Since 2004 this species belongs to the strictest protection category in Estonia and since 2005 it is in state monitoring programme.

The occurrence of *Buxbaumia viridis* in Estonia was for a long time based only on records from 1920-ies on West-Estonian islands Abruka and Ruhnu, so the species was even considered as regionally extinct in the first bryophyte red list of Estonia in 1988. First contemporary records of *Buxbaumia viridis* were found in 1999 during inventories of woodland key habitats on island Hiiumaa. Since then we have searched it from possible habitats regularly. In 2008, the first record from Saaremaa island was registered, and in 2012 the species was re-found on Ruhnu island. Although the species seemed to have distribution only on western islands, one locality was found also in the central part of Estonia in 2015. Some localities of this species have presumably vanished. Repeated inventories in autumn of 1998 and 2019 on the island Abruka have been so far unsuccessful, and to re-find it seems rather unrealistic, because a heavy storm in 1968 destroyed almost all coniferous stands there (coniferous wood is the main substrate where *Buxbaumia viridis* have been found in Estonia).

During the last red list assessment 2017 in Estonia, the species was evaluated as vulnerable (VU) (Ingerpuu et al. 2018) and for that time 43 habitat records were registered on the Estonian Nature Information System. Population status of this species is monitored at three localities on Hiiumaa Island since 2005, with monitoring step of 5 years. Based on three repeated monitoring events, its status is evaluated as favourable (Vellak & Ingerpuu 2017), since the number of inhabited substrate units was found to be stable. The monitoring as well as previous inventories were conducted in late autumn since then the species can be detected by new sporophytes. Emerging of new sporophytes in late autumn are reported also in Sweden and England (Wiklund 2002, Atherton et al. 2010).

Recently the number of known localities of *Buxbaumia viridis* have risen notably, forming 68 habitat records for now (**Fig. 1**). Two new records were registered by conservation specialist in island Hiiumaa between spring 2018 to spring 2019 and in total three new records from islands Saaremaa, Hiiumaa and Ruhnu as well as the first two records from island Vormsi during the inventories of the Estonian Naturalist's Society's Woodland Key Habitat project between October 2019 to January 2020. In addition, inspired of the current mild winter (mean temperature in January was +3.3 °C, which is twice as high as usual) and no snow coverage, special inventories were performed nearby the known two localities in Saaremaa by Maarja Nõmm and Rein Nellis in January 10-26 and February 3-5, 2020, focusing on potentially suitable forest stands. Their inventories resulted on 18 new habitat records in Saaremaa. Highest number of individuals (substrate units) was found nearby Võhma village, where in one locality 25 logs with 205 sporophytes, and in another 24 logs with 286 sporophytes were counted (see also **Fig. 2**). The most prosperous finding was an old spruce log with 180 capsules near Järise village. Surprisingly the species was found growing also in alvar forests, which has drier microclimate compared to its characteristic habitats - old-growth fresh boreal forests. According to our earlier experiences, *Buxbaumia viridis* inhabits only well decayed logs in shady conditions. But in January we found some sporophytes of the species also on well decayed fine woody debris and stumps, growing in middle-aged and/or sanitary managed forest stands.

Results presented above indicate that *Buxbaumia viridis* can be found also in a mild and snowless winter in Estonia and may inhabit fine size logs adjacent to viable old growth populations. Indeed, humidity as well as abundant presence of large decayed logs are crucial conditions for this species to produce sporophytes (e.g. Wiklund 2003; Spitale & Mair 2015). However, population monitoring in Hiiumaa showed that *Buxbaumia viridis* seldom inhabits new logs in the vicinity of already occupied logs. This might be caused by very slow growth of its protonema

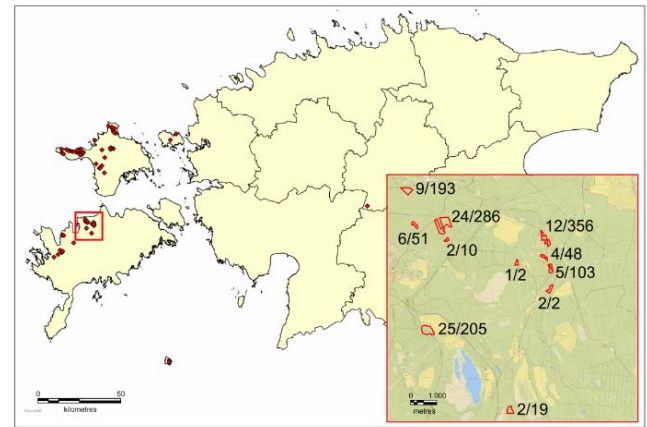


Fig. 1. Registered habitat records of *Buxbaumia viridis* in Estonia (large map) and habitats in Saaremaa island, near Võhma village (zoomed map). Numbers on the map indicate the number of substrates inhabited (left) and number of capsules (right) found per habitat.

(Wiklund 2002) and specific demands for associated bryophyte species (Holá et al. 2014). Therefore, such exceptional winters should be highlighted for additional inventories of this threatened species in Estonia to explore exhaustively its distribution and to evaluate its population size. Still, the question will remain, whether the climate change causes continuing warming of winters in Northern Europe and will it favour the growth and distribution of *Buxbaumia viridis* in the future, particularly if combined with increasing pressure of forest management and related loss of well decayed large logs in the forest landscape (see Lõhmus & Kraut 2010).



Fig. 2. A pine log with 103 sporophytes of *Buxbaumia viridis* in total was counted January 14, 2020 near Võhma village (photo by Maarja Nõmm).

Acknowledgements. We are thankful to Renno Nellis and Indrek Tammekänd, member of the inventory team of Estonian Naturalist's Society Woodland Key Habitat project, who kindly shared their findings. We are thankful to Nele Ingerpuu for the scientific discussion and valuable comments to the manuscript.

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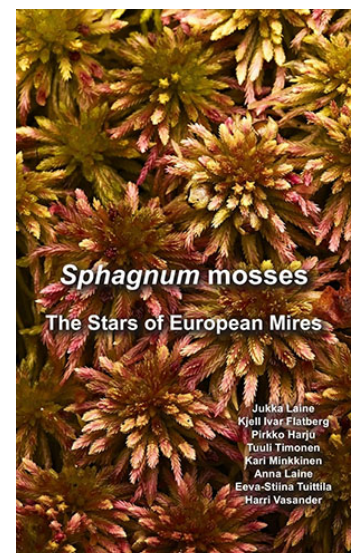
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I'll say at the outset that I think this is a great book. It has become my go-to reference for northern Sphagna and I have recommended it to collectors and ecologists who wanted to own a single book on *Sphagnum* diversity and identification, including those working primarily in North America. The authors recognize 60 European species and of those about 56 (considering a few cases of taxonomic uncertainty) are reported from North America. The



Bryophyte Flora of North America (BFNA) treatment for *Sphagnum* (McQueen & Andrus 2007) recognizes some 92 species; the higher number partly reflects greater diversity because of some warm-temperate/subtropical species that we have, but are absent from Europe. It also reflects the rather narrow species concepts employed in the BFNA treatment. Two allopolyploid species, *S. skyense* and *S. troendelagicum*, occur in Europe but not north America.

The book reflects important recent discoveries in *Sphagnum* taxonomy including the separation of *S. beothuk* from *S. fuscum*, and the division of *S. magellanicum* into two taxa, *S. divinum* and *S. medium* (with *S. magellanicum* s. str. limited to South America). These species occur in North America so the book will facilitate increased awareness by North American collectors and ecologists. It also includes some very much northern taxa that occur in North America; for example, *S. mirum* in the section *Squarrosa*, *S. tundrae* and *S. venustum* in the *Acutifolia*. I could of course express uncertainty or disagreement about the taxonomic status of some species within difficult complexes, but these authors are imminently qualified to have highly respectable opinions of their own. We studied the *S. subsecundum* complex in North America and concluded that *S. inundatum*, recognized in this book, cannot be distinguished in our area (Shaw et al. 2012). Our data did not, however, explicitly assess European patterns of variation and the type of *S. inundatum* is European. Other taxonomic issues in European *Sphagnum* diversity and taxonomy that need further study include the “*S. recurvum* complex”, specifically the relationships of *S. isoviitae* and *S. brevifolium* to *S. fallax*, and *S. viride* to *S. cuspidatum*, also in the *Cuspidata*.

The book includes extremely informative and valuable introductory sections describing peatland ecology, *Sphagnum* distributions, and morphological variation/terminology. *Sphagnum* has such unique morphology that it is unfamiliar even to many active bryophyte collectors, so that section is much appreciated.

Each species is well illustrated, including beautiful and informative field photographs. I like photographic documentation of microscopic characters because they illustrate what the identifier actually sees under a microscope better than do line drawings, however good. Some of the more highly magnified photos are uneven such that the diagnostic structure of leaf pores, for example, are hard to discern. But in general, they are very useful. The illustrations are accompanied by text describing macro- and microscopic characters, “special characteristics” (i.e., diagnoses), ecology, and distributions for each species. Notwithstanding practical limitations on total book length, it might have been useful to include an additional section describing patterns of variation explicitly. As in any plant group, some characters are more variable than others within species and by including just one or a few photos of leaves, for example, the book understates intraspecific variation. Stem leaves, diagnostic in many groups of *Sphagnum*, vary in ways that often confuse collectors. My predecessor and mentor, Lewis Anderson, always reminded us when struggling with a difficult identification that “Plants Vary”, and in fact he kept an engraved sign stating that near his microscopes in the herbarium. *Sphagnum* is a difficult group (which is what makes it fun) and this book goes a long way toward increasing our understanding of this gorgeous and ecologically important genus.

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IAB Travel Award Recipients

Sonja Thielen (University of Tübingen)



My name is Sonja Thielen and I'm a doctoral candidate at the University of Tübingen in Germany.

Last summer I was supported by an IAB travel award to present my poster on "Moss-water-interactions: effects of

dehydration and hydration on moss surface structures" at the IAB meeting in Spain, 2019, and to take part in the field trip to Sierra de Gredos. During these days, I met many great bryologists from all over the world, could discuss my research topics with them, and didn't only get invaluable feedback but also fresh motivation. It was also very interesting to see and hear about the research from other bryologists and to get to know so many amazing people - and to start thinking about possible collaborations in the future... I already look forward to the next IAB meeting in Québec!



Mathilde Ruche, Teaching assistant UniGE / CJBG

I started my PhD in September 2018 at the University of Geneva (UniGE) and the Conservatory and Botanical Garden of the City of Geneva (CJBG) in Switzerland. My research consists

of exploring the micro-morphology and anatomy of peristomes across the monophyletic and species-rich Dicranidae in order to unravel evolutionary patterns of the haplolepideous peristome. During the Bryology19-IAB meeting in Madrid, I presented my poster entitled «Micro-morphology and anatomy of the peristome in the Dicranales: exploring the use of Technovit 7100 Methacrylate embedding resin for microtome sectioning». Presenting my first poster on my current research with a 2 minutes oral presentation in this international bryology meeting was a great opportunity for me. Secondly, it was the occasion for me to present my work in front of the bryological community, to meet and introduce myself to potential collaborators working on haplolepideous mosses and finally to discuss with professional bryologists and fellow students in a pleasant place that is the Royal Botanical Garden of Madrid. Additionally, I had the chance to collect some *Dicranum scoparium* Hedw., a model species for my project, during the field excursion to La Pedriza.

Marta Nieto-Lugilde (University of Murcia)



My name is Marta Nieto-Lugilde, I was finishing my PhD at Universidad de Murcia about the genus *Ceratodon* in South Europe, when I had the opportunity to enjoy the IAB meeting in Spain (2019). The title of my presentation was "Testing the evolutionary history of *Ceratodon purpureus*, the sister species *C. amazonum*, and the recombinant *C. ×conicus*", It was very interesting to talk with specialists and discover the large number of people interested in my results. In general, the meeting was a great

opportunity to meet people interested on bryophytes from other countries, including some who offered me possibilities of postdoctoral positions! I really enjoyed exchanging experiences and knowledge with other bryologists in the more relaxed environment on the fieldtrip to the Gredos Mountains, and I learned a lot! Thank you for giving me this experience!

Ainun Nadhifah University of South Florida,



**USA /
Indonesian
Institute of
Science (LIPI)**

Title of poster:
Mosses of Central
Florida: Current
progress in their
documentation
and in
development of
new identification
tools.

I am very grateful for the support of the IAB travel award. This small grant has had a huge impact for me as a student and as a young female scientist. It provided me a valuable opportunity to interact and impart knowledge from international scientists, especially who have expertise in tropical bryology. Apart from the poster presentation, I also had opportunity to experience the field work with the expert through the three-day excursion, which would greatly contribute to my career path in the future.

Eyvar E. Rodriguez-Quiel (University of Marburg, Germany; Autonomous University of Chiriqui, Panama)

Title of presentation: Elevational patterns of bryophyte and lichen biomass and species richness on different substrates in the tropical montane forest of Baru Volcano, Panama

It was a great experience to participate in the IAB conference and present part of my PhD project. I received comments from experts, and I

also met people from different continents who also work on related topics. The excursion, constructive and enjoyable at the same time! The closing dinner, really good! Excellent organisation, congratulations!



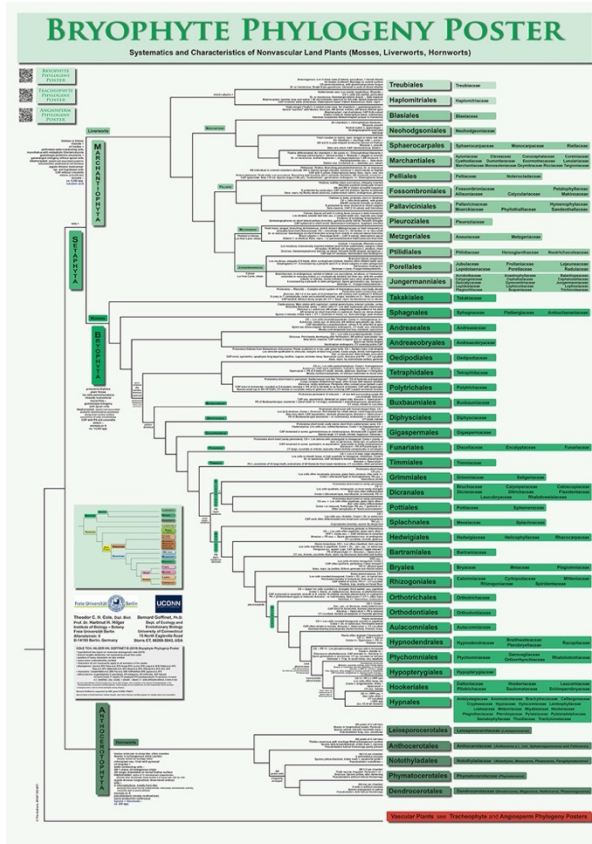
Bryophyte Phylogeny Poster

Theodor C. H. Cole | Free University Berlin, Germany | t.c.h.cole@fu-berlin.de

The plant phylogeny poster project was conceived in 2005 by Theodor C. H. Cole in preparation of a field course in South Africa. The Angiosperm Phylogeny Group (APG) had published an update in 2003 (APG II), which served as the basis for his idea of producing a visually appealing teaching tool for plant systematics depicting the evolutionary relationships that would also provide essential morphological, geographical, and phytochemical information. He chose the A0 poster format, first a "hard copy" from scratch (cardboard and glue) before drawing up an electronic version in InDesign.

His long-time friend Hartmut H. Hilger of the Freie Universität Berlin (FU) had previously produced botanical posters for teaching (of fruit types, for instance) that Ted was aware of and so the two joined up to produce, publish, and market the first German version of the APP (Angiosperm Phylogeny Poster) with DeGruyter publishers, Berlin.

Also at that time, online publishing had matured to the point where academic results could be made available worldwide by open access, one being the platform ResearchGate that had been successfully launched just shortly prior.



The English edition of the APP was endorsed and supported by Peter H. Raven and Peter F. Stevens, the latter becoming a coauthor a few years later. The online version was well received, leading colleagues from around the world to join in with versions in their own languages – a rapid and astounding development to where the project is now: 30 poster titles, 30 languages, and an international team of more than 100 botanists! The posters are regularly updated with the latest research results.

In 2011, the Bryophyte Phylogeny Poster (BPP) was launched with the supportive expertise of the bryologist Harald Kürschner of the FU Berlin. Bernard Goffinet, who had been a consultant for the project for many years, joined as a full coauthor late in 2018. Since then, the project has substantially grown with Bernard's impetus and involvement. The poster is now in 18 languages by a team of 22 collaborators (English, German, Spanish, Portuguese, Italian, French, Chinese, Japanese, Mongolian, Thai, Indonesian, Russian, Ukrainian, Polish, Swedish, Finnish, Turkish, and Lithuanian). The BPP is published as a preprint in PeerJ Preprints 7:e27571v3, <https://doi.org/10.7287/peerj.preprints.27571v3>

and was presented in the poster session at the IAB Bryology 2019 conference in Madrid.

The portfolio includes the main three A0 posters on embryophytes (APP, TPP, BPP), a general overview of the embryophytes as an A4 handout, and several A0 posters on single orders and on single families of angiosperms. The posters are available on ResearchGate and in part on PeerJ Preprints and on the homepage of Hartmut H. Hilger at <http://www2.biologie.fu-berlin.de/sysbot/>.

The team welcomes comments, feedback, and further suggestions.



New Collections Curator, Bryophytes, Lichens, & Fungi at UBC

Jeannette Whitton | Director, University of British Columbia Herbarium (UBC) | Vancouver | jeannette.whitton@botany.ubc.ca

We are excited to announce that Dr. Karen Golinski is the new Collections Curator of Bryophytes, Fungi & Lichens at UBC. She takes over from Olivia Lee, UBC's first manager of the bryophyte collection, who retired in September 2019.

Karen will focus on curating the specimens in UBC's world-class collection and updating the database in support of her commitment to biodiversity research, conservation and teaching. UBC's bryophyte collection is one of the largest and most comprehensive collections of western North America diversity, and is a tribute to the legacy of Dr. Wilf Schofield and his students. The collection was recently augmented by three important and large donations of specimens. Thanks to the efforts of Curator Emeritus Dr. Judith Harpel, UBC now houses the collections of Dr. Judith & Geoffrey Godfrey, Dr. Diana Horton, and Dr. David Jamieson.

The UBC herbarium welcomes loan requests from other institutions. Information about the collection, including the searchable database and Karen's contact information, can be found at <https://beatymuseum.ubc.ca/research-2/collections/herbarium/herbarium-bryophytes/>



In Memoriam: Lynika Strozier

Matt von Konrat | Field Museum Chicago | mkonrat@fieldmuseum.org; Laura Briscoe | New York Botanical Garden; Juan Larraín | Pontificia Universidad Católica de Valparaíso, Chile

Lynika Strozier, a talented 35-year-old Black biology instructor and scientist, sadly succumbed to COVID-19 complications on June 7, 2020. A Chicago native, Strozier was raised by her grandmother and diagnosed with a learning disorder at an early age. Despite facing many challenges throughout her life, she drew upon her grandmother's strength and encouragement and found a way to succeed academically. As she told a Chicago Tribune reporter [1], "You get knocked down so many times, you learn to pick yourself up". The turning point came when a mentor at Truman College, Chicago, U.S.A., gave her a push toward science. She went on to several positions in various research labs and earned two Masters degrees simultaneously from Loyola University Chicago and the University of Illinois at Chicago. For more than a decade, Strozier maintained an association with the Field Museum, and her work on several NSF-funded projects on liverworts, mosses, lichens, ants, and birds led to several new biodiversity discoveries. In her own words, "The Field Museum has always been my second home. I always felt comfortable as far as asking questions, support in applying to grad schools, support in my thesis writing, applying for job positions. Everyone here at the FM (Field Museum) wants you to succeed and will try their best to help guide and support you in any way they can".

Lynika started her life at the Field as a summer intern in 2009 and continued to work in various capacities at the museum until January 2020. In March, 2020, the Gantz Family Collections Center (GFCC) granted her an honorary appointment of Collections Associate in recognition of her many extraordinary accomplishments and contributions towards the museum's mission for over a decade. As a

testament to her dedication and commitment, Lynika continued in her role helping bring the collections into the 21st century with her extensive laboratory skills in the Pritzker DNA Lab. Lynika continued



to volunteer her time towards her research on liverworts until the time she passed away. Spanning those almost eleven years, she channeled her passion for research and discovery into her graduate education. Her thesis project on the phylogeography of Madagascar birds was critical towards our understanding of biodiversity. Her breadth of skills made her a rare scientist who has helped describe new species both in the zoological and botanical sciences. Strozier said, "Research allowed me to gain the confidence that I never had before". She was passionate about mentoring young students and worked with dozens over many years.

In 2012, Strozier worked on a publication [2] describing a new species of liverwort, *Frullania knightbridgei*. This was the first non-flowering plant species, and second new plant species overall, to be officially described through an electronic submission. This was very controversial almost a decade ago and cutting edge at the time as the technical rules in describing a new species had changed from paper only to online. Even though she was just beginning her research career at that time, Strozier was critical to the effort. In all of our lab and team meetings we would applaud Lynika for successfully extracting DNA, often from old dried plant material, sometimes over 30 years old and with only very little material, "Lynika has hands of gold!"

Strozier also contributed her DNA extraction capabilities to a publication [3] confirming the classification of another liverwort species into its own genus, *Neohattoria*. The systematic

placement of *Frullania herzogii* had been contentious since its description over six decades ago. Over the years it had been interpreted as either a member of the genus *Frullania* or segregated into its own genus, *Neohattoria*, due to morphological similarities with both *Frullania* and *Jubula*. Lynika's contribution of laboratory work and resulting molecular evidence provided critical support for the recognition of the genus *Neohattoria* and its inclusion within the *Jubulaceae*, together with *Jubula* and *Nipponolejeunea*. Her legacy continues as our research team has at least three manuscripts in progress, directly resulting from her laboratory work.

In 2018, Lynika completed not only one, but two master's degrees: an M.Ed. in science education from the University of Illinois, Chicago, and an M.S. in biology from Loyola University Chicago. She started a position as Science and Bio Art Laboratory Coordinator at the School of the Art Institute in 2018 and became an Adjunct Instructor at Malcolm X College in January of this year.

Working in the Botanical and Zoological Collections as well as the Pritzker DNA Lab, Lynika not only propelled research and co-authored papers, but she was an amazing and inspiring mentor and role model for scores of undergraduate and high school students. When asked in an interview during The Field Museum's 125th Anniversary celebration and launch "Is there a project you've really enjoyed working on here?" her responses epitomize her enthusiasm, energy, and dedication to students: "I wouldn't say I have a favorite project but I can say I enjoy mentoring and training students in the lab on DNA sequencing".

Lynika's passing is a sudden, tragic, and devastating loss for the Strozier family, her Museum family, and all who knew Lynika. Throughout her journey, Lynika touched so many hearts, inspiring us all. Lynika was an amazing, caring, hardworking, considerate, and loving person beloved by friends, coworkers, and colleagues. We will miss her infectious smile, boundless energy, and incredible inspiration. Lynika was a shining star.

Strozier's story is one of overcoming numerous challenges through hard work, perseverance, and strong relationships. Yet it also highlights obstacles faced by Black Americans that their white peers will likely never face. Universities and cultural institutions have a responsibility to acknowledge they have a diversity and inclusion problem and establish improved strategies to increase representation and access in STEM. The tragic nature of Strozier's death during a global pandemic and nation-wide reckoning of systemic racism led to an overwhelming show of support. Her family created a GoFundMe campaign to offset funeral and medical costs which quickly surpassed initial expectations. In concert with The Field Museum, they expanded their efforts to create a scholarship fund in Lynika's honor. Her friends and colleagues hope Chicago institutions will continue Strozier's legacy and commit to advancing more Black women in STEM. Lynika's story has drawn inspiration with many media outlets including the Chicago Tribune [4], The New York Times [5], and Nature [6].

Citations

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⁶<https://www.nature.com/articles/d41586-020-01961-x>

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Next Meeting: in 2021, Quebec Canada.

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