



The Canadian Botanical Association Bulletin

Bulletin de l'Association Botanique du Canada

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Interim Presidents' Message



As many of you know, the CBA/ABC Board is now operating under a unique structure.

This year should have marked the transition for the President Elect, Santokh Singh, to his role as the President. Unfortunately, Santokh needs to step away from this role for health reasons. Our by-laws also explicitly state that the President cannot continue past their term. As a temporary solution, three of us who served as former Presidents have agreed to act as Interim President. Over the next few months, we will work out how the role of the President will be shared. While the CBA operates under a set of by-laws and operating procedures, we are also an organization where people pitch in when needed. We are therefore confident that our Association is resilient, and we can all work together to keep the CBA/ABC a vibrant organization during this unprecedented period. We wish Santokh a speedy recovery and look forward to working with all of you.

Sincerely,

Nicole Fenton, Christian Lacroix, John Markham

The Canadian Botanical Association Bulletin

The CBA Bulletin is issued three times a year (March, September and December) and is freely available on the CBA website. Hardcopy subscriptions are available for a fee.

Information for Contributors

All members are welcome to submit texts in the form of papers, reviews, comments, essays, requests, or anything related to botany or botanists. For detailed directives on text submission please contact the Editor (see below). For general information about the CBA, go to the website: www.cba-abc.ca

Executive Editor

Dr. Erin Zimmerman

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Next issue

Texts for the next issue, 57(3), must be received by November 1, 2024

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Bulletin de l'Association Botanique du Canada

Le Bulletin de l'ABC paraît trois fois par année, normalement en mars, septembre et décembre. Il est envoyé à tous les membres de l'ABC.

Soumission de textes

Tous les membres de l'Association sont invités à envoyer des textes de toute nature concernant la botanique et les botanistes (articles, revues de publication, commentaires, requêtes, essais, etc.). Tous les supports de texte sont acceptés. Pour des renseignements détaillés sur la soumission de textes, veuillez consulter le rédacteur (voir ci-dessous). Infos générales sur l'ABC à l'url suivant: www.cba-abc.ca

Rédactrice en chef

Dr. Erin Zimmerman

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Prochain numéro

La date de tombée des textes du prochain numéro, le no 57(3), est le 1 novembre 2024



Spiranthes romanzoffiana

Photo by Mihai Costea

Interested in bryophytes and lichens? We have several projects open!

We are looking for motivated future MSc and PhD students to fill the following fully-funded projects in plant ecology, most with a special focus on bryophytes and lichens. All of the projects are lead or co-lead by CBA members Nicole Fenton and several collaborators, including CBC members Annie Desrochers (UQAT) and Mélanie Jean (U. of Moncton). We are looking for students to start between Winter 2025 and Winter 2026. To express your interest, please send a **letter of interest** along with **copies of your transcripts** (which may be unofficial) and a **recent CV** to the contacts for each individual project which are listed below the description.

We are a small university with a very active graduate studies programme in forest ecology and management (>200 students) in the Institut de Recherche sur les Forêts (IRF) in North Western Québec (UQAT) Check out our Instagram or Facebook page for more information (Institut de Recherche sur les Forêts - UQAT (@irf_uqat); www.facebook.com/irfuqat). All of your favourite outdoor activities are just moments away!

Masters in forest ecology and management projects

Project 1: This MSc project aims to study the potential of various restoration methods and technosoils on the capacity of plants to establish themselves there naturally and artificially, as well as to evaluate the contribution of these islands of vegetation to ecosystem services such as biodiversity and carbon sequestration. The student will be registered at the University of Quebec in Abitibi-Témiscamingue, in the master's program in ecology and management of forest ecosystems. A scholarship of \$21,000 per year for two years is offered. Contact Annie Desrochers (annie.desrochers@uqat.ca) or Nicole Fenton (nicole.fenton@uqat.ca).



Fig. 1 Some of the technosoils included in the project.

Project 2: In North Western Québec, aspen plantations are rich in epiphytic lichens that are absent in the surrounding natural forests. This surprising discovery brings interesting research opportunities. In this MSc project we would like to use these plantations to study the dispersal of epiphytic lichens, and how it is influenced by the composition of the surrounding landscape. Specifically, we would like to answer the question – is the epiphytic lichen community in aspen plantations more diverse in forested landscapes? A scholarship of \$21,000 per year for two years is offered. Contact Annie Desrochers (annie.desrochers@uqat.ca) or Nicole Fenton (nicole.fenton@uqat.ca).



Fig. 2 Epiphytic lichens.

PhD in forest ecology and management projects

Project 3: This PhD project will study the biogeography of mining impacts, including the relative vulnerability of bryophytes and their phytobiome to mining dust in two biogeoclimatic domains. This topic is highly interdisciplinary and draws on several fields of study: bryology, microbiology and mining engineering. We examine in more detail the marked differences in detected metal levels between sites in the south (on the Cadillac fault) and those located further north (off the fault). While geological features distinguish these two regions, climatic and ecological characteristics also differ (e.g., mixed vs. coniferous boreal forest). In addition, the intensity of human development along the Cadillac fault line may contribute to the overall level of pollution in the region. The research will also allow an initial assessment of the biogeography of the bryophyte phytobiome, by comparing their composition and function between two biogeographic zones. A scholarship of 24 000\$ per

year for four years is available for this project. Co-supervised by Nicole Fenton at UQAT and Christine Martineau at the Canadian Forest Service this project offers the opportunity to balance field and lab methods and time in Rouyn-Noranda and Québec City. Contact Nicole Fenton (nicole.fenton@uqat.ca) or Christine Martineau (christine.martineau@nrccan-rnccan.gc.ca) to express your interest.

Project 4: The term “dendromicrohabitat” refers to the network of small habitats present on trees, such as cavities, cracks, broken branches or the fruiting bodies of saproxylic fungi. Research conducted in Europe shows that they host a very large diversity of species, both animal and plant or fungal. Trees supporting dendromicrohabitats are often large, old or senescent, and are therefore more abundant in old forests. The rejuvenation and simplification of forests caused by forest management therefore threatens dendromicrohabitats and the species associated with them. However, most of our knowledge on dendromicrohabitats comes from the temperate forests of Europe. In Canada, and more generally in the boreal forest, we know little about the dynamics of dendromicrohabitats, the species associated with them and the threats they face. This doctoral project therefore aims to determine which factors promote the development of dendromicrohabitats in natural and managed forests in Quebec, as well as to begin to identify which species and groups of species are associated with them. *We are not currently targeting a particular taxonomic group and wish to give the student selected for this the opportunity to provide their expertise.* A scholarship of 24 000\$ per year for four years is available for this project. Co-supervised by Maxence Martin and Nicole Fenton of UQAT. Contact Maxence Martin (maxence.martin2@uqat.ca) or Nicole Fenton (nicole.fenton@uqat.ca) to express your interest or to find out more!

Project 5: In this PhD project we would like to establish an exhaustive assessment of the contribution of bryophytes to nitrogen inputs in representative stands of the forests of Quebec. Bryophytes are considered important contributors to N inputs in boreal coniferous forests of northern Europe, but their contribution in coniferous forests of eastern Canada remains poorly understood. Data on the contribution of bryophytes to N input in deciduous forests are scarce, if not nonexistent in Quebec. Bryophytes are generally considered to be weak sources of N in these types of forests due to their low abundance. In addition, deciduous forests are located further south in the province where atmospheric deposition of N, which is greater than in the north, could constrain the NBF of bryophytes. However, no systematic study has tested the validity of these two hypotheses. Although relatively rare on the ground, bryophytes are abundant on tree trunks in deciduous forests and the NBF capacity of these bryophytes remains to be evaluated. In Quebec, the gradual decrease in N deposition observed over the last few decades suggests that the relative contribution of bryophytes to the N balance is increasing across the province. In a context of climate change affecting stand distribution and forest productivity, it is important and urgent to characterize the contribution of bryophytes to N inputs in the context of the forests of Quebec. A scholarship of 24 000\$ per year for four years is available for this project. Co-supervised by Nicole Fenton of UQAT and Mélanie Jean of Université de Moncton,



Fig 3 Bryophyte carpet in spruce moss forest

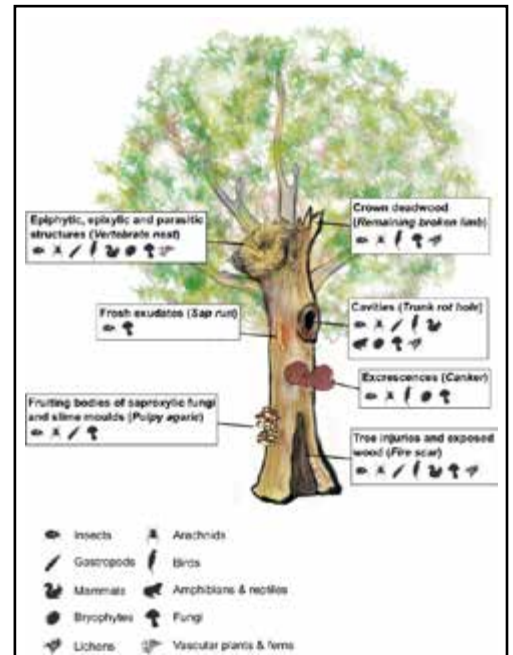


Fig. 4 Different types of dendromicrohabitats

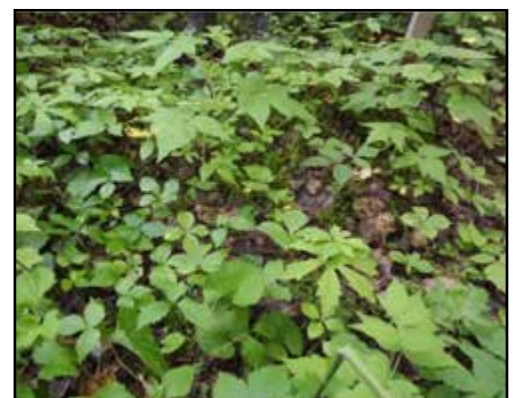


Fig. 5 Bryophytes in deciduous understory

the student will have the opportunity to travel across the province of Québec and spend time in both supervisors' institutions. Contact Nicole Fenton (nicole.fenton@uqat.ca) or Mélanie Jean (melanie.jean@umoncton.ca) to express your interest.

Project 6: The Abitibiwinni Anishinabe Nation is administering a 230 km² protected area surrounding Lake Chicobi in northwestern Québec that includes four ecological reserves. This area is also rich in oral and written history and includes several archeological sites. Within the paradigm of Indigenous Protected and Conserved Areas, Land guardians need complete inventories and efficient monitoring to be able to play their management and governance roles. Past studies have documented the relationship between the diversity and composition of plant communities and areas that were regularly used by Indigenous peoples. In this context, with this PhD project we propose an interdisciplinary project examining the spatial distribution of biological and cultural richness and Indigenous knowledge across this landscape. First the PhD student will determine the interaction between historical use of the territory and distribution of floristic richness (vascular plants, bryophytes) and the spatial distribution of species of interest, *Crataegus* spp. (hawthorn), *Allium schoenoprasum* (chives). We will use this information to then predict sites that may have been lost to the oral history of the community. Second, as the area has been influenced by millennia of use by the Abitibiwinni First Nation and extractive industries, the student will reconstruct the disturbance history of the territory using multiple methods: remote sensing (aerial photos from the 1940s onwards), government databases, dendroecology, and interviews with the steward families. The results of this history will allow the community to identify areas to protect or to restore. A scholarship of 24 000\$ per year for four years is available for this project. Co-supervised by Nicole Fenton and Hugo Asselin of UQAT, the student will have the opportunity to be a member of both IRF and the School for indigenous studies, via the two co-supervisors at UQAT. Contact Nicole Fenton (nicole.fenton@uqat.ca) or Hugo Asselin (hugo.asselin@uqat.ca) to express your interest.



Fig. 6 *Crataegus chrysocarp* var *chrysocarpa*;
Photo by Étienne Léveillé Bourret

Project 7: Understanding the vegetation communities of different wetland types within the Waskaganish territory from a Cree science and a western science perspective. The justification of protected areas in terms of indigenous knowledge, biodiversity, and in terms of carbon storage is important in indigenous territories. We propose, using Cree knowledge, to determine the vegetation and carbon storage potential of the different wetland types (from coastal to more inland) within the Waskaganish Cree Nation territory. The Phd student will discuss with community members as well as use existing maps and remote sensing and field survey data provided by the Minister of Environment, and will carry out additional field surveys as needed. Using this ensemble of knowledge, we will determine whether existing science classifications are supported by Cree knowledge. Based on the relative success of this process we will propose vegetation types for the area that represent both world views. Using these vegetation types (or either Cree or science perspectives) we will map their relative abundance and regional importance, including proximity and accessibility as criteria. Using existing knowledge on the carbon storage capacity of blue carbon ecosystems and inland peatland ecosystems we will also determine the relative importance of ecosystem types and areas of the territory for carbon storage. A scholarship of 24 000\$ per year for four years is available for this project. Co-supervised by Nicole Fenton and Hugo Asselin of UQAT, the student will have the opportunity to be a member of both IRF and the School for indigenous studies, via the two co-supervisors at UQAT. Contact Nicole Fenton (nicole.fenton@uqat.ca) or Hugo Asselin (hugo.asselin@uqat.ca) to express your interest.



Fig. 7 Typical peatland in Cree territory

Research Report: Response of Understorey Flora to Disturbance Synergies

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Boreal forests, known for their rich biodiversity, are significantly supported by understorey plants, the dominant vegetation on the forest floor. These plants, both vascular and non-vascular, play crucial roles in soil stability, carbon sequestration, nutrient cycling, and moisture regulation (Turetsky, 2003). However, their existence is increasingly threatened by natural and human-induced disturbances. Therefore, our research project aims to explore the impacts of multiple disturbances on understorey plants in two distinct ecological regions of Quebec: Abitibi-Lowlands and Lake Matagami. This study combines pre-existing data with additional fieldwork to provide a comprehensive understanding of these impacts. We utilized datasets from eight previous projects conducted between 2015 and 2023 (Chaieb et al., 2015; Castonguay, 2016; Barbé et al., 2017; Barbé et al., 2020; Yin et al., 2022; Noualhaguet et al., 2023; Indorf, 2023; Hernandez unpublished). Using the “forêt ouverte” mapping platform, we prepared disturbance maps for forest fires, insect outbreaks (spruce budworm and tent caterpillar), harvested areas, mines, forest roads, and hydroelectric transmission lines.



The disturbance maps highlighted 842 plots: 747 disturbed and 95 undisturbed. Various buffer distances were applied: 200m for fire, harvesting, and mining; 60m for insect outbreaks; and 100m for forest roads and transmission lines. A contingency table illustrated the distribution of plots among different disturbance types and ecosystem types (coniferous, deciduous, and mixed) (Fig 1).

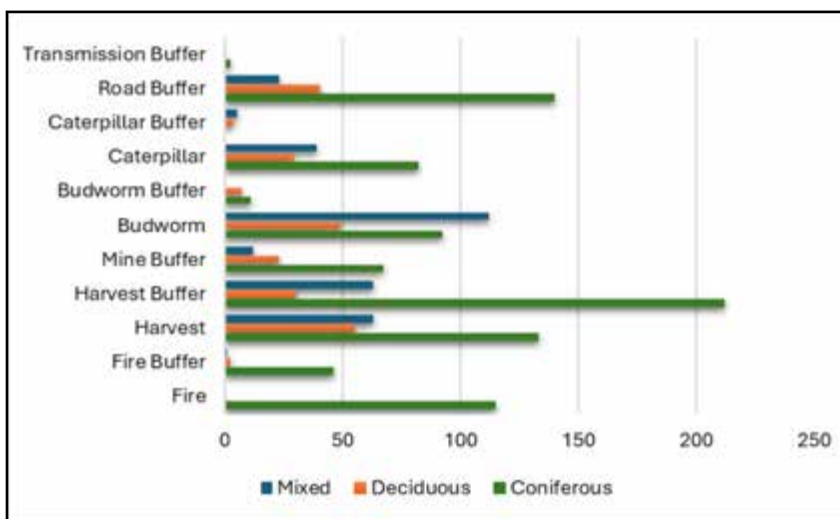


Fig 1: The total number of plots based on disturbances and forest ecosystem types as obtained from the compiled datasets

Disturbances were categorized into direct-direct (e.g., fire and harvest) and direct-indirect (e.g., core disturbance with a buffer) combinations (Tables 1 & 2). Additionally, plots were selected based on criteria of accessibility (within 500m of an accessible road) and ecosystem types.

Table 1: Total number of plots from existing data according to direct-direct types of disturbances

Disturbances	Coniferous	Deciduous	Mixed
Fire+Harvest	34	0	0
Harvest+Budworm	18	19	63
Caterpillar+Harvest	8	3	12
Caterpillar+Budworm	52	18	30

Table 2: Total number of plots from existing data according to direct-indirect types of disturbances

Disturbances	Coniferous	Deciduous	Mixed
Budworm+Harvest_Buffer	48	19	46
Caterpillar+Harvest_Buffer	50	10	23
Caterpillar+Road_Buffer	29	12	12
Budworm+Road_Buffer	22	21	18
Fire+Transmission_Buffer	0	0	0
Harvest+Transmission_Buffer	0	0	0
Caterpillar+Transmission_Buffer	0	0	0
Budworm+Transmission_Buffer	0	0	0

We added 25 sampling plots using stratified sampling methods to ensure adequate geographic representation. In each 5m × 10m plot, we recorded ecosystem type, canopy density, dominant tree species, organic layer thickness, and soil texture. Canopy density was measured in four cardinal directions and averaged for accuracy. Bryophytes were sampled from various microhabitats (tree bases, roots, dead wood, stumps, snags, rocks, and ground/litter) using the floristic habitat sampling technique, while vascular plants were sampled using 1m × 1m quadrats placed randomly within the plot (Fig 2).

This research is expected to identify the impact of individual and/or compound disturbances on the diversity and composition of understory communities. These results will potentially contribute to enhancing our understanding of implementing sustainable management practices for the conservation and management of understory communities at a landscape scale in the boreal biome.

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- Barbé, M., Bouchard, M., & Fenton, N. J. (2020). Examining boreal forest resilience to temperature variability using bryophytes: Forest type matters. *Ecosphere*, 11(8), e03232. <https://doi.org/10.1002/ecs2.3232>
- Castonguay, J. (2016). Dynamique des communautés de



Fig 2: Understorey vegetation sampled across ecosystem types (A: coniferous forest, B: deciduous forest, C: mixed forest) with bryophytes in different microhabitats (D: tree base, E: deadwood, F: stump, G: ground, H: rock) and vascular plants from quadrats (I)

bryophytes dans la pessière à mousses de la forêt boréale: Rôle des îlots de rétention après coupe.

Chaieb, C., Fenton, N., Lafleur, B., & Bergeron, Y. (2015). Can We Use Forest Inventory Mapping as a Coarse Filter in Ecosystem Based Management in the Black Spruce Boreal Forest? *Forests*, 6(12), 1195–1207. <https://doi.org/10.3390/f6041195>

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Noualhaguet, M., Work, T. T., Soubeyrand, M., & Fenton, N. J. (2023). Bryophyte community responses 20 years after forest management in boreal mixedwood forest. *Forest Ecology and Management*, 531, 120804. <https://doi.org/10.1016/j.foreco.2023.120804>

Turetsky, M. R. (2003). The Role of Bryophytes in Carbon and Nitrogen Cycling. *The Bryologist*, 106(3), 395–409. <https://doi.org/10.1639/05>

Yin, X., Martineau, C., & Fenton, N. J. (2022). Synergistic effects in mine offsite landscapes: Predicted ecosystem shifts could exacerbate mining effects on bryophyte community structure. *Ecological Indicators*, 144, 109555. <https://doi.org/10.1016/j.ecolind.2022.109555>



Platyanthera psycodes
Photo by Mihai Costea

New Graduate – Maxime Thomas, Ph.D.

I recently finished my Ph.D in Environmental Sciences at Université du Québec en Abitibi-Témiscamingue under the supervision of Profs. Nicole J. Fenton, Hugo Asselin, and Mebarek Lamara. My thesis was entitled “Effect of anthropogenic disturbances on two culturally salient plant species.” Studying culturally salient species, i.e., species important both in terms of the ecosystem and in the culture of certain populations, is a means to better understand the consequences of disturbances. To do so, we worked in collaboration with three Indigenous communities in eastern Canada. Discussions with community members led to the selection of two culturally salient species to study, *Rhododendron groenlandicum* and *Vaccinium angustifolium*, as well as two disturbances of concern, mining activities and hydroelectric development. We assessed the effect of these disturbances on both species by comparing the phenolic content of plants near and away from the disturbances. For *V. angustifolium*, we complemented this approach by evaluating the role of soil properties and microbiome in the response of plants to disturbances. We also evaluated the effect of two large scale disturbances, climate change and logging, on the presence of these two species in the future via modelling. With this thesis, we contributed to the understanding of both the environmental and cultural effects of anthropogenic disturbances and hope to prove that studying culturally salient species is a good means to assess the effects of disturbances.



The peer-reviewed articles produced during my thesis are:

- Thomas M., Boulanger Y., Asselin H., Lamara M., Fenton N.J. (2024). How will climate change and forest harvesting influence the habitat quality of two culturally salient species? *Science of the Total Environment*. <https://doi.org/10.1016/j.scitotenv.2024.172148>
- Thomas M., Lamara M., Asselin H., Fenton N.J. (2023). Effects of industrial disturbances on the flavonoid concentration of *Rhododendron groenlandicum*. *Botany*. Canadian Science Publishing. <https://doi.org/10.1139/cjb-2022-0136>
- Thomas M., Lamara M., Desjardins Y., Asselin H., Fenton N.J. Unraveling the interplay of the soil microbiome and (poly)phenol content in blueberry in response to disturbances. To be submitted.

I am now working at the Laurentian Forestry Centre as a postdoctoral fellow on a project about the effect of mining on invertebrate diversity.

Update from *Botany*, the Official Journal of the CBA

We had an amazing time connecting with CBA members and the broader plant science community at Plant Canada in Winnipeg. *Botany* was a proud sponsor of the conference, including the Iain and Sylvia Taylor Award for Best Student Poster. Thank you to the Plant Canada organizers for a great conference. Congratulations to all the presenters and award winners!

@Botany Journal is on Twitter/X

Let's stay in touch: Follow our new account [@Botany_Journal](https://twitter.com/Botany_Journal) to learn about upcoming journal initiatives, special issues, and new plant science.

***Botany* now has [a dedicated page](#) on ResearchGate**

Our publisher, Canadian Science Publishing, has partnered with ResearchGate to enhance the discoverability and visibility of the research we publish. This means that when your paper is published in *Botany*, it will be automatically added to ResearchGate and your author user profile.



Call for Papers: The intrinsic value of botanical gardens and herbariums

We invite submissions for a special collection highlighting the importance of living plant collections at botanical gardens and arboreta and preserved collections in herbariums. The value of such collections spans a broad array of disciplines from phylogeny and taxonomy to ecology and phytogeography. Collections have been and continue to be valuable sources of material and data that can be used to answer a variety of questions from distribution histories to impacts of climate change. Consider submitting a research article based on data obtained from collections, provide a commentary on best practices used to curate collections and/or challenges associated with maintaining collections, or even a methodology paper based on data from collections.

Submission deadline: February 12, 2025

Submission instructions: <https://cdnsiencepub.com/topic/botany-herbariums>

Stay tuned for upcoming calls for papers on exciting special issues focused on Indigenous Knowledge and Approaches to Botanical Research, the UN Decade of Ocean Science, Seed Development, and more! We welcome special issue and collection proposals from CBA members.

Discover new research and a home for yours

Botany is published by Canadian Science Publishing, a not-for-profit and community-driven publisher. We invite you to join us on our mission of making high-quality, peer-reviewed scientific knowledge discoverable and accessible for everyone:

- Participate in publishing webinars and workshops
- Gain experience as a peer reviewer or editor in programs for early career researchers
- Collaborate with peers in curated special issues and collections
- Advance research by serving on the editorial board or as a peer reviewer
- Receive support through society meeting sponsorships and awards
- Engage in community-driven initiatives

Have an idea or want to get involved? We want to hear from you!

- Dr. Liette Vasseur, Co-Editor-in-Chief: lvasseur@brocku.ca
- Dr. Shelley Hepworth, Co-Editor-in-Chief: ShelleyHepworth@Carleton.Ca
- Rachel Pietersma, Journal Development Specialist: Rachel.Pietersma@cdnsiencepub.com
- Editorial office: botany@cdnsiencepub.com



News from the Ecology & Conservation Section

By Jenny McCune

(1) We enjoyed a Bryophyte Workshop during the **PLANT Canada meeting in Winnipeg** this July. We spent the morning in a beautiful bog, and the afternoon learning about bryophyte identification in the teaching lab at the University of Manitoba.

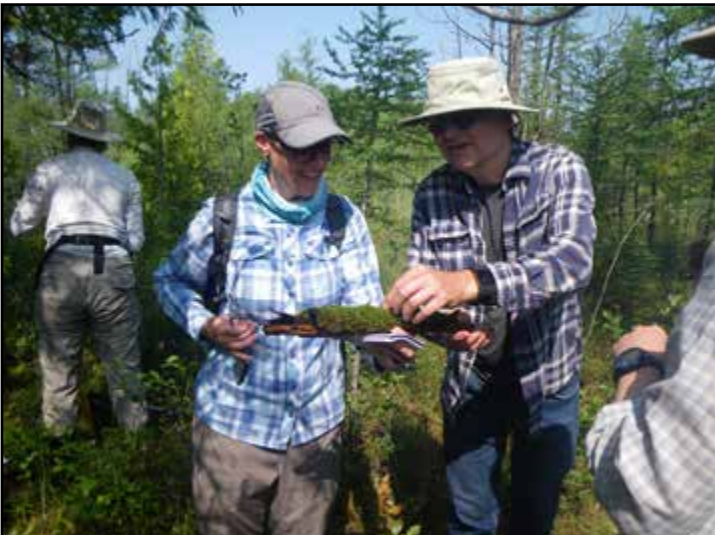
Special thanks to Jennifer Doubt and Adam Storey from the Canadian Museum of Nature for leading us. Carla Zelmer kindly arranged the lab space and John Markham found the best bog.



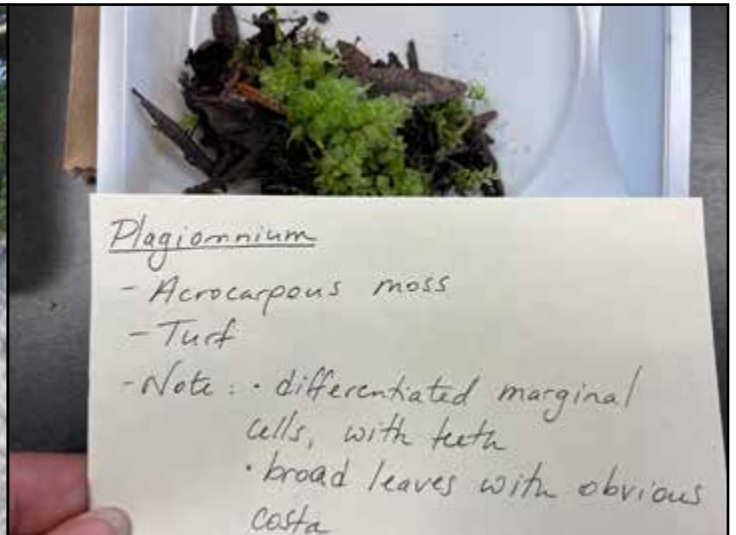
Jennifer Doubt, curator of botany at the Canadian Museum of Nature, gives us a primer on the lives and intricacies of bryophytes. Photo by Jenny McCune.



Examples of three moss types: acrocarps, sphagnum, and pleurocarps. Photo by Jenny McCune.



Nadia Cavallin (Royal Botanical Gardens) and Tony Szumigalski examine some bryophytes. Photo by Jenny McCune.



A sample awaits its time under the microscope. Photo by Jen Dyson.

(2) I am still working on a draft of a new CBA position paper on plant translocation as a recovery tool. There is a position paper from 2014 here: <https://www.cba-abc.ca/resources/position-papers/>. My own opinion is that we have been over-cautious in this realm: <https://canadiangeographic.ca/articles/conservation-translocation-helping-endangered-plants-recover/>

I am interested in members' opinions on this. If you haven't already, do send your comments and suggestions to jl.mccune@uleth.ca

(3) Congratulations to Dr. Ming Ni, winner of this year's J. Stan Rowe award for the best student paper in plant ecology. Dr. Ni's paper is:

Ni, M. and Vellend, M., 2024. Soil properties constrain predicted poleward migration of plants under climate change. *New Phytologist*, 241(1), pp.131-141.

(4) If you are a University research lab, non-governmental organization, consulting firm or other organization that **does plant ecology in Canada**, please contact me (jl.mccune@uleth.ca) with a brief description of your plant ecology or conservation-related work, and the link to your webpage so I can include it in the Ecology and Conservation Section CBA webpage.



Utricularia cornuta

Photo by Mihai Costea

STUDENT AWARDS 2024

By Mihai Costea

PORSILD - CONSAUL AWARD

For the best paper in systematics, evolution and biodiversity.

Pour le meilleur article en systématique, l'évolution et la biodiversité.

Judges: Julissa Roncal and Jeff Saarela

Winner: Tia Harrison

Queen's University

Harrison, T.L., Z.A. Parshuram, M.E., Frederickson and J.R. Stinchcombe. 2024. Is there a latitudinal diversity gradient for symbiotic microbes? A case study with sensitive partridge peas. *Molecular Ecology* 33: e 17191. <https://doi.org/10.1111/mec.17191>

Abstract

Mutualism is thought to be more prevalent in the tropics than temperate zones and may therefore play an important role in generating and maintaining high species richness found at lower latitudes. However, results on the impact of mutualism on latitudinal diversity gradients are mixed, and few empirical studies sample both temperate and tropical regions. We investigated whether a latitudinal diversity gradient exists in the symbiotic microbial community associated with the legume *Chamaecrista nictitans*. We sampled bacterial DNA from nodules and the surrounding soil of plant roots across a latitudinal gradient (38.64–8.68°N). Using 16S rRNA sequence data, we identified many non-rhizobial species within *C. nictitans* nodules that cannot form nodules or fix nitrogen. Species richness increased towards lower latitudes in the non-rhizobial portion of the nodule community but not in the rhizobial community. The microbe community in the soil did not effectively predict the non-rhizobia community inside nodules, indicating that host selection is important for structuring non-rhizobia communities in nodules. We next factorially manipulated the presence of three non-rhizobia strains in greenhouse experiments and found that co-inoculations of non-rhizobia strains with rhizobia had a marginal effect on nodule number and no effect on plant growth. Our results suggest that these non-rhizobia bacteria are likely commensals—species that benefit from associating with a host but are neutral for host fitness. Overall, our study suggests that temperate *C. nictitans* plants are more selective in their associations with the non-rhizobia community, potentially due to differences in soil nitrogen across latitude.



STAN ROWE AWARD

Best paper in plant ecology.

Meilleur article en écologie végétale.

Judges: Ellen McDonald, Tess Grainger, and Eric Lamb

Winner: Ming Ni

Université de Sherbrooke

Ni, Ming and M. Vellend. 2024. Soil properties constrain predicted poleward migration of plants under climate change. *New Phytologist* 241: 131-141. <https://doi.org/10.1111/nph.19164>



Abstract

- Many plant species are predicted to migrate poleward in response to climate change. Species distribution models (SDMs) have been widely used to quantify future suitable habitats, but they often neglect soil properties, despite the importance of soil for plant fitness. As soil properties often change along latitudinal gradients, higher-latitude soils might be more or less suitable than average conditions within the current ranges of species, thereby accelerating or slowing potential poleward migration.
- In this study, we built three SDMs – one with only climate predictors, one with only soil predictors, and one with both – for each of 1870 plant species in Eastern North America, in order to investigate the relative importance of soil properties in determining plant distributions and poleward shifts under climate change.
- While climate variables were the most important predictors, soil properties also had a substantial influence on continental-scale plant distributions. Under future climate scenarios, models including soil predicted much smaller northward shifts in distributions than climate-only models (c. 40% reduction).
- Our findings strongly suggest that high-latitude soils are likely to impede ongoing plant migration, and they highlight the necessity of incorporating soil properties into models and predictions for plant distributions and migration under environmental change.

LUELLA WERESUB MEMORIAL AWARD

Best paper in mycology

Le meilleur article en mycologie

Judges: Az Klymiuk, Gavin Kernaghan, and Yan Wang

Winner: Sarah J. Adams

Acadia University

Adams, S. and A. K. Walker. 2023. Diversity of fungi from marine inundated wood from the Bay of Fundy, Nova Scotia, Canada. *Botanica Marina* 66(4): 319-329. <https://doi.org/10.1515/bot-2023-0005>

Abstract

Marine fungi play an integral role in the decomposition of intertidal organic substrata but remain understudied in cold-water habitats including Atlantic Canada. Marine inundated wood from the intertidal zone was sampled from 30 sites along the Bay of Fundy coastline in Nova Scotia, Canada. Wood types studied included attached and loose intertidal wood, and driftwood. Emergent fungi were cultured and identified using ITS (internal transcribed spacers) rDNA barcoding. Two hundred and twenty cultures representing 86 fungi are reported. Sixty-one fungi were new records for the Bay of Fundy, 41 are first records from the marine environment, and 19 fungi are potentially new to science. Fungi identified



included eight obligate marine fungi, with the remaining fungi being facultatively marine. Eight ascomycetes were soft rot fungi; this ecological strategy for decaying woody material in cold-water marine environments is discussed. Historical records and roles of wood type and site on fungal colonization are discussed.

TAYLOR STEEVES AWARD

Best paper in plant development, structure or morphology.

Le meilleur article concernant le développement, la structure ou la morphologie végétale.

Judges: Christian Lacroix and Carol Wenzel

Winner: Brandi Zenchyzen

University of Alberta, Edmonton

Zenchyzen, B., S. Carey, G. Antochi-Crihan and J. C. Hall. 2023. Developmental and genetic basis of the androgynophore in *Gynandropsis gynandra*. *American Journal of Botany*, 110(7): p.e16193. <https://doi.org/10.1002/ajb2.16193>

Abstract

Premise: Flowering plants have evolved a vast array of floral features involved in plant–pollinator interactions. A feature that seemingly increases the chance of pollen transfer is the androgynophore, a stalk-like structure that raises the reproductive organs of the flower. However, little is known about the developmental and genetic basis of this structure despite its presence in multiple, distantly related taxa. Here, we address this gap by investigating *Gynandropsis gynandra* (Cleomaceae), a species with a prominent androgynophore.

Methods: We combined morphological and anatomical analyses with a comparative transcriptomic study to provide a detailed description of the androgynophore throughout development, examine global gene expression patterns, and identify candidate genes putatively involved in androgynophore elongation.

Results: The radially symmetric androgynophore of *G. gynandra* rapidly lengthens primarily via cell elongation. Despite its structural uniformity, androgynophore development is characterized by complex gene expression patterns including differential expression of floral organ identity genes and genes associated with organ development and growth in *Arabidopsis thaliana*.

Conclusions: Our morphological characterizations and high-quality transcriptome for *G. gynandra* suggest that the androgynophore is a novel structure formed via elaboration of both the receptacle and base of reproductive organs because it is structurally like an elongated internode but expresses the genetic repertoire typically associated with the reproductive organs. The drastic increase in cell length and uniform structure elevates the androgynophore as a potentially powerful model for cell elongation.



IAIN AND SYLVIA TAYLOR AWARD

Sponsored in 2024 by Canadian Science Publishing

Best student poster presented at the CBA Annual Meeting.

Le meilleure affiche étudiante présentée a l'assemblée annuelle de l'ABC.

Judges: Mihai Costea, Jenny McCunne, Shelley Hepworth, and Elizabeth Schultz

Winner: Risham Osahan

Carleton University

Title: Breaking free: insights into auxin and ethylene control of abscission zone patterning in *Arabidopsis*.

Authors: Risham Osahan and Shelley Hepworth

Abstract

Abscission is a critical developmental process that leads to the detachment of plant organs. In *Arabidopsis thaliana*, pollination triggers the abscission of floral organs by signaling cell separation responses in abscission zones (AZs) at the base of sepals, petals, and stamens. As abscission approaches, AZ cells form a proximal separation layer that secretes hydrolytic enzymes and a distal lignified layer that serves as a mechanical brace. Phytohormones auxin and ethylene play an important role in regulating abscission by inhibiting and promoting organ detachment, respectively. How these hormones influence AZ structure and differentiation has been unclear. Experiments in wild-type plants showed that AZs form their distinct layered structure about one position before organs detach. By manipulating hormone pathways, our findings reveal that auxin is essential in ordering the cellular architecture of AZs. Exogenous application of auxin caused disorganized AZs and inhibited layer differentiation, whereas the inhibition of auxin transport led to the earlier formation of AZ layers. By contrast, ethylene influenced the timing of abscission and layer formation without changing AZ morphology. In ethylene-treated plants, AZ layers formed in unopened flower buds suggesting that AZs are responsive to ethylene before pollination. Our research highlights distinct roles for auxin and ethylene in AZ differentiation. Future work will explore how boundary genes that define and organize AZ cell structure interact with auxin and ethylene to control the timing of AZ layer differentiation.



LIONEL CINQ-MARS AWARD

Sponsored in 2024 by Plant Canada

Best oral presentations as a contributed paper at the CBA/ABC Annual Meeting

La meilleure présentation oral e d'un étudiant en tant que contribution a la réunion annuelle de l'ABC/CBA.

Judges: Mihai Costea, Jenny McCunne, Shelley Hepworth, and Elizabeth Schultz

Winner: Jacalyn Gray

University of Manitoba

Title of oral presentation: Prevalence and consequences of interspecific pollen transfer in a montane community.

Authors: Jacalyn Gray and Anne Worley

Abstract

Many pollinators visit multiple plant species, causing pollinators to carry and deposit diverse pollen loads. Research on how pollen load composition and donor identity affect seed set is needed to understand how changes in floral communities may affect plant fitness. Pollen from close relatives may decrease reproductive success due to their ability to germinate, clog pistils and usurp ovules, whereas pollen from distantly related donors may have negligible effects. However, when pollinator activity is low, flowering neighbours may enhance pollinator visitation and cause a positive relationship between conspecific and heterospecific pollen deposition. I investigated the fitness consequences of pollen donor-recipient relatedness and pollinator sharing within two populations of *Polemonium brandegeei*, a montane herb with diverse pollinators, and its co-flowering communities. First, I conducted experimental hand pollinations including mixes of conspecific pollen and heterospecific pollen from a closely and distantly related species.

I used general linear mixed models to test the prediction that congeneric donors decrease *P. brandegeei* pollen germination and seed set. Distantly related donors had no effect on *P. brandegeei* reproduction, although closely related donors decreased pollen germination, seed set and seed weight. Second, I collected open pollinated stigmas from all abundant co-flowering species in the communities. I used pollen transfer networks and major axis regressions to test the prediction that pollinator sharing within communities (pollen loads containing heterospecific pollen) results in increased conspecific pollen deposition and germination. Pollinator sharing was common between co-flowering species in both of my study communities. All sampled species received or donated heterospecific pollen. However, most species received little heterospecific pollen in each pollen load and heterospecific pollen was typically from distantly related species, resulting in neutral and facilitative relationship between co-flowering species. This study suggests that pollinator sharing between native co-flowering species can be common and beneficial in plant communities. However, competition may occur if closely related species begin to co-flower due to range changes or phenological shifts.



LAURIE-CONSAUL NORTHERN RESEARCH SCHOLARSHIP

Generously sponsored by Mark Armstrong

Winner: Katerina Coveny
Wilfrid Laurier University

Project: The impact of permafrost thaw on caribou lichen across the Northwest Territories.



TRAVEL BURSARIES

Christina Rossi, Wilfrid Laurier University
Laura Super, University of British Columbia

UNDERGRADUATE AWARDS

Organizer: Santokh Singh

Science Atlantic Conference (March 15, 2024)

Best oral presentation: Kate Pennyfather, Dalhousie University

Best poster: Alyssa Babb, Mount Saint Vincent University

Ontario Biology Day (March 25-26)

(with help from Peter Ryser)

Best oral presentation: Natasha Agostini, McMaster University

Best poster: Maha Jahangir, University of Toronto, Mississauga

University of Victoria Faculty of Science Honours Fest (March 18)

(with help from Patrick von Aderkas)

First prize: Em Creasy

Second prize: Maddy Mazur



Castilleja coccinea

Photo by Mihai Costea

Mary E. Elliott Award 2024

Nicole Fenton, Julian Star, Mihai Costea

The Mary E. Elliott Service Award is presented for meritorious service to the CBA/ABC. It is with heartfelt appreciation that **we present the 2024 Mary Elliott Award to Deborah Metsger.**

For many years, Deborah, or Deb, has been the center around which both the executive and everyday life of the Association have revolved. Her remarkable tenure as Secretary from 2018 to 2023 has been nothing short of transformative for our Association. We should first mention that the tenure of the Secretary is two years, with the possibility of a successive, second term. Deb served not only two terms but also an additional fifth year to help the new President, Mihai Costea, and Treasurer, Peter Ryser orient themselves through the maze of new tasks, and ensure that all required duties are fulfilled properly. Deb's dedication to the CBA has been unparalleled!



Deb at ROM's Florals exhibition in 2020.

The Secretary role is one of the most (if not the most) demanding in the Association because it involves keeping track of all the activities, organizing meetings, recording minutes, drafting resolutions, and ensuring the compliance with different provincial and federal reporting deadlines. In addition, the Secretary is the “glue” of the Association, the indispensable but invisible force that binds together Directors, Section Chairs and members in a single life form. All the support letters have emphasized the smooth running of the Association during Deb's overextended service. As if this were not enough, Deb took the secretary role further by embarking on a massive administrative overhaul. Frederique Guinel, former President (2012-2014) of CBA, aptly described this effort: *“Behind the scenes, Deb dedicated countless hours to reviewing the CBA Policy Manual and Terms of References for the CBA Awards. We met 16 times during the Fall of 2020, each session lasting up to two hours, to clarify and refine these critical documents. This intensive work extended to meetings with the President, Nicole Fenton, and involved exchanging numerous drafts, even on December 24 and 31. There is no reprieve for the brave!”* The conclusion of this “reboot” was detailed in the *CBA Bulletin* supplement 54(1) in spring 2021. Deb's work included expanding the Association's scope to incorporate IDEA (DEI) principles, creating a new filing system and migrating the storage of the CBA documents to the cloud, streamlining executive job descriptions, and ensuring compliance with all the not-for-profit requirements. Only Deb's boundless energy and dedication could have driven this enormous task.

Deb has also been an invaluable co-chair of the Systematics, Evolution and Biodiversity Section between 2017 and 2020 together with Geraldine Allen. She has been an organizer and participant in multiple Symposia for CBA annual meetings (e.g., “Floristics for the Future”, 2007; “Roles and status of Canadian Herbaria”, 2010). She has regularly contributed articles to the *CBA Bulletin* (e.g., “Planting Life in Crisis: the Schad Gallery of Biodiversity A Community Effort”, 43(3): 60-63 [2010]), news reports (“CBA/ABC Master Planting Science Team Sponsorships for 2021–2022” 54(2):3 [2021]), book reviews (e.g., “Field Study: Meditations on a Year at the Herbarium” by Helen Humphreys, 54(3): 16-18 (2021), and tributes (“Memories and Reminiscences of Dr. George Argus”, 56(1): 16-22 [2023]), besides contributing photos and her time in the herbarium for the preparation of other articles for the *CBA Bulletin* (e.g., “With the Wild Basket Team from the Timiskaming First Nation” By Moira Galway, Frederique Guinel, & Shelley Hepworth 55(2): 38-44 [2022]; “A Tribute to James

Herbert Soper, 1916-2012” by Erich Haber, 45(2): 65-67 [2011]). Timothy Dickinson, a past Treasurer of CBA, remarked, “*Deb was an enthusiastic representative of ROM Botany at many CBA/ABC annual meetings. One memorable instance was in 2010 when she guided several University of Toronto undergraduates to Ottawa to present posters based on their work in the ROM herbarium. She also co-organized various herbarium-related colloquia, symposia, and workshops for our annual meetings!*”

A passionate ambassador for botany, Deb is the curator at the Royal Ontario Museum, and she manages an impressive Green Plant Herbarium with *circa* one million specimens. This role is more than an institutional job responsibility and academic pursuit for Deb; it is about connecting people with nature and plants. She is an accomplished author of several plant field guides, including the ROM *Field Guide to Wildflowers of Ontario* (2004) and *Trees of Ontario* (2023), and regularly speaks to nature groups, spreading her infectious enthusiasm for all things botanical.



Award created by David Sweet of Wood Bee Turnings.

On a personal note, Nicole, Julian and Mihai would have been lost as presidents without Deb’s unwavering support. Our weekly Friday afternoon check-ins ensured prompt attention to Association business and the steady progress of larger projects. Her boundless energy and passion for the Association and botany continually remind us why we are proud members of this Association. Working closely with Deb has been a privilege, and we deeply cherish the friendship that has grown from our teamwork.

In conclusion, we can think of no other person who has given as much or as selflessly to the association over many years. Although only a small token of recognition, this award is a wholehearted “thank you” to Deb for the positive impact she has had on our tight-knit community.

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Mary Elliott Service Award was first presented in 1978 in memory of Mary E. Elliott, a distinguished plant pathologist and mycologist who spent 28 years with Agriculture Canada at the Central Experimental Farm in Ottawa. She was well known for her work on the taxonomy and biology of the Sclerotiniaceae. In 1975, she became Curator of the National Mycological Herbarium. Mary was also very active in identifying fungi for the public and in contributing to and editing (1970-71) a publication of the Biosystematics Research Institute for public information called *Greenhouse-Garden-Grass*. Mary E. Elliott was the victim of a homicide in September, 1976. At the time of her death, she had just completed four consecutive years of service on the Board of Directors (as Secretary, Vice President and President), and was just beginning her term as Past President. You can read more here:

Savile, D. 1977. “Mary Elizabeth Elliott (1923-1976)”. *Mycologia*. 69 (3): 460–462. <https://doi.org/10.1080/2F00275514.1977.12020084>

Also, find here a [list of previous recipients of the Mary Elliott Award](#).

Prix Mary E. Elliott 2024

Le prix Mary E. Elliott est décerné pour des services méritoires rendus à l'ABC. C'est avec une profonde gratitude que nous présentons la lauréate du prix Mary Elliott en 2024, Deborah Metsger.

Pendant de nombreuses années, Deborah, ou « Deb », a été la personne centrale autour de laquelle l'exécutif et la vie quotidienne de l'Association ont tourné. Son remarquable mandat de secrétaire, de 2018 à 2023, n'a été rien de moins que transformateur pour notre association. Il convient tout d'abord de mentionner que le mandat de la secrétaire est de deux ans avec la possibilité d'un second mandat successif. Deb a servi, non seulement deux mandats, mais aussi une cinquième année supplémentaire pour aider le nouveau président, Mihai Costea, ainsi que le trésorier Peter Ryser, afin de les orienter dans le labyrinthe des nouvelles tâches et à s'assurer que toutes les fonctions requises soient remplies correctement. Le dévouement de Deb à l'ABC est sans égal !



Deb with *Betula alleghaniensis*.

La fonction de secrétaire est l'une des plus exigeantes (si ce n'est la plus exigeante) de l'Association car elle implique de suivre toutes les activités, d'organiser des réunions, de rédiger des résolutions et des procès-verbaux et de veiller au respect des différentes échéances provinciales et fédérales en matière de rapports. En outre, la secrétaire est le « liant » de l'Association, la force indispensable mais invisible qui lie les directeurs, les présidents de section et les membres en une seule équipe. Toutes les lettres de soutien ont mis l'accent sur le bon fonctionnement de l'Association pendant le service prolongé de Deb. Comme si cela ne suffisait pas, elle a amené le rôle de secrétaire encore plus loin en se lançant dans une refonte administrative massive. Frédérique Guinel, ancienne présidente (2012-2014) de l'ABC, a décrit cet effort avec justesse : « *En coulisses, Deb a consacré d'innombrables heures à la révision du manuel des politiques de l'ABC et des termes de référence pour les prix de l'ABC. Nous nous sommes réunis 16 fois au cours de l'automne 2020, chaque session durant jusqu'à deux heures, afin de clarifier et d'affiner ces documents essentiels. Ce travail intensif s'est prolongé par des réunions avec la présidente, Nicole Fenton, et a nécessité l'échange de nombreux projets, même les 24 et 31 décembre. Il n'y a pas de répit pour les courageux ! La conclusion de ce « redémarrage » a été détaillée dans le supplément 54(1) du Bulletin de l'ABC au printemps 2021. Le travail de Deb comprenait l'élargissement du champ d'action de l'Association pour intégrer les principes de l'IDEA (DEI), la création d'un nouveau système de classement et la migration du stockage des documents de l'ABC vers le « cloud », la rationalisation des descriptions de poste des cadres et la garantie de la conformité avec toutes les exigences relatives aux organisations à but non lucratif. Seule l'énergie et le dévouement sans limites de Deb auraient pu mener à bien cette tâche gigantesque.* »

Deb a également été une coprésidente inestimable de la section Systématique, évolution et biodiversité entre 2017 et 2020 avec Geraldine Allen. Elle a organisé et participé à de nombreux symposiums lors des réunions annuelles de l'ABC (par exemple : « Floristics for the Future », 2007 ; « Roles and status of Canadian Herbaria », 2010). Elle a régulièrement publié des articles dans le Bulletin de l'ABC (par exemple : « Planting Life in Crisis: the Schad Gallery of Biodiversity A Community Effort », 43(3) : 60-63 [2010]), à des rapports d'actualité (« CBA/ABC Master Plantin Science Team Sponsorships for 2021-2022 » 54(2):3 [2021]), à des critiques de livres (par exemple : « Field Study : Meditations on a Year at the Herbarium » par Helen Humphreys, 54(3) : 16-18 (2021), et des hommages (« Memories and Reminiscences of Dr. George Argus », 56(1) : 16-22 [2023]), en plus de fournir des photos et de consacrer du temps à l'herbier pour la préparation d'autres articles pour le Bulletin de l'ABC (par exemple : « With the Wild Basket Team from the Timiskaming First Nation » par Moira Galway, Frederique

Guinel, & Shelley Hepworth 55(2) : 38-44 [2022] ; « A Tribute to James Herbert Soper, 1916-2012 » par Erich Haber, 45(2) : 65-67 [2011]). Timothy Dickinson, ancien trésorier de l'ABC, a déclaré : « Deb a représenté avec enthousiasme la botanique ROM lors de nombreuses réunions annuelles de l'ABC/ABC. Un exemple mémorable a eu lieu en 2010 lorsqu'elle a guidé plusieurs membres étudiants de premier cycle de l'Université de Toronto à Ottawa pour présenter des affiches basées sur leur travail dans l'herbier du ROM. Elle a également coorganisé divers colloques, symposiums et ateliers liés à l'herbier pour nos réunions annuelles ! »

Ambassadrice passionnée de botanique, Deb est conservatrice au Musée royal de l'Ontario et gère un impressionnant herbier de plantes vertes comptant environ un million de spécimens. Pour Deb, ce rôle représente plus qu'une responsabilité professionnelle institutionnelle et une poursuite académique, il s'agit de mettre les gens en contact avec la nature et les plantes. Elle est l'auteure accomplie de plusieurs guides de terrain, dont le ROM *Field Guide to Wildflowers of Ontario* (2004) et *Trees of Ontario* (2023), et elle s'adresse régulièrement à des groupes de protection de la nature pour leur faire part de son enthousiasme contagieux pour tout ce qui touche à la botanique.

D'un point de vue personnel, Nicole Fenton, Julian Star et Mihai Costea auraient été perdus à la présidence sans le soutien indéfectible de Deborah. Les réunions hebdomadaires du vendredi après-midi ont permis de s'occuper rapidement des affaires de l'Association et de faire progresser régulièrement les projets d'envergure. Son énergie débordante et sa passion pour l'Association et la botanique nous rappellent sans cesse pourquoi nous sommes fiers d'être membres de cette Association. Travailler en étroite collaboration avec Deb a été un privilège et nous chérissons profondément l'amitié qui est née du travail en équipe.

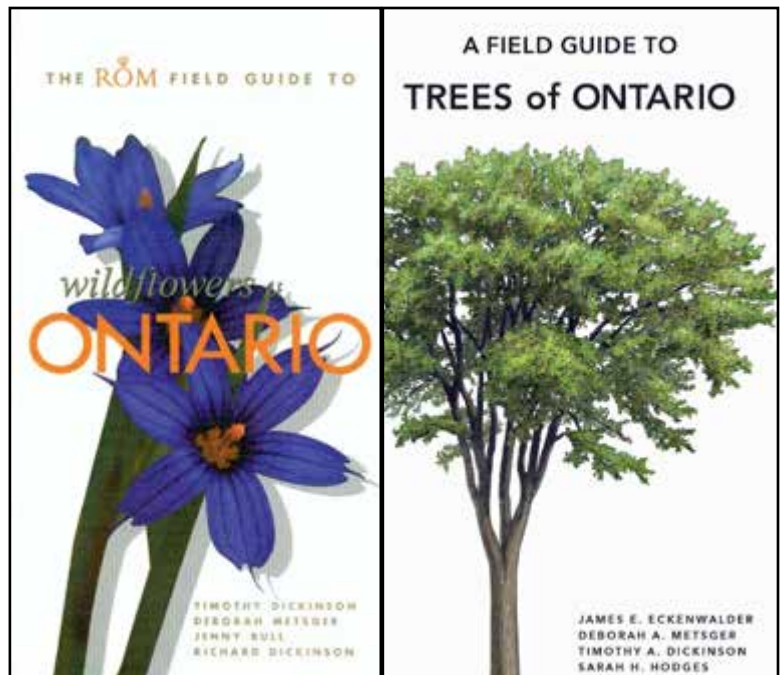
En conclusion, nous ne connaissons aucune autre personne qui ait donné autant et de manière aussi intéressée à l'Association pendant ces nombreuses années. Bien qu'il ne s'agisse que d'une petite marque de reconnaissance, ce prix est un remerciement sincère à Deborah pour l'impact positif qu'elle a eu sur notre communauté très unie.

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Le prix de service Mary Elliott a été décerné pour la première fois en 1978 en mémoire de Mary E. Elliott, une éminente phytopathologiste et mycologue qui a passé 28 ans à la Ferme expérimentale centrale d'Ottawa pour le compte d'Agriculture Canada. Elle était bien connue pour ses travaux sur la taxonomie et la biologie des Sclerotiniaceae. En 1975, elle est devenue conservatrice de l'Herbier mycologique national. Mary était également très active dans l'identification des champignons pour le public et dans la contribution et l'édition (1970-71) d'une publication de l'Institut de recherche en biosystématique destinée à l'information du public et intitulée *Greenhouse-Garden-Grass* (serre-jardin-herbe). Mary E. Elliott a été victime d'un homicide en septembre 1976. Au moment de sa mort, elle venait d'achever quatre années consécutives de service au sein du conseil d'administration (en tant que secrétaire, vice-présidente et présidente) et commençait tout juste son mandat de présidente sortante.

Pour en savoir plus, cliquez ici : Savile, D. 1977. "Mary Elizabeth Elliott (1923-1976)". *Mycologia*. 69 (3) : 460-462. <https://doi.org/10.1080%2F00275514.1977.12020084>

Consultez également [la liste des précédents lauréats du prix Mary Elliot](#).



Dr. Barbara Hawkins: Recipient of the Canadian Botanical Association's Magister Teaching Award in 2024

Mihai Costea

After not awarding the Magister Teaching Award for seven years it is with great pleasure that CBA/ABC presents **Dr. Barbara Hawkins**, the recipient of this award in 2024. With a career spanning 34 years at the University of Victoria (UVic), Dr. Hawkins is on a mission to “inspire students with the wonders of plants” and has made significant contributions to plant biology education, mentorship, curriculum development, and community outreach.

Dr. Hawkins' teaching portfolio is extensive, covering a wide range of plant biology topics from introductory to advanced levels. Courses such as BIOL 324 (Biology of Land Plants), BIOL 334 (Plants and People), BIOL 366 (Plant Physiology), and BIOL 325 (Tree Biology) showcase her ability to engage students across all stages of their academic journey. She also taught other popular courses, including Stress Physiology of Plants (BIOL 453), and a non-major course Applied Plant Physiology (BIOL 338). Dr. Hawkins has played a pivotal role in shaping the Biology curriculum at UVic. As Chair of the Undergraduate Curriculum Committee for six years, she led efforts to design learning paths for various sub-disciplines and spearheaded the creation of the Forest Biology Concentration. Her tenure also saw the accreditation of the undergraduate program with the College of Applied Biologists of British Columbia, and the development of the Combined Degree in Biology and Mathematics Statistics. Dr. Hawkins' commitment to curriculum innovation is evident in her creation of new courses and the redesign of graduate courses into intensive workshops, providing students with a dynamic and relevant education.



A hallmark of Dr. Hawkins' teaching is her innovative approach to course design and delivery. In BIOL 325, she introduced practical, hands-on activities such as whole tree cross-sections, allowing students to directly engage with the material and develop critical thinking skills. Her adaptation to online teaching during the COVID-19 pandemic further underscores her commitment to providing high-quality education. She successfully converted the BIOL 324 Lab Manual for online learning, ensuring students continued to receive a comprehensive educational experience despite the challenges posed by remote instruction. Her teaching, whether in lectures or labs, is characterized by her enthusiasm and dedication to student learning.

Dr. Hawkins has supervised or co-supervised 22 MSc students and six PhD students. At the same time, she served as a member of 70 graduate supervisory committees and as an external examiner for 20 graduate theses. Her mentorship style is hands-on and collaborative, often involving fieldwork and practical lab experience. Former students praised her for being supportive, accessible and kind, creating a nurturing environment that emphasizes quality over quantity. Dr. Hawkins' ability to foster a sense of collaboration rather than hierarchy has left a lasting impact on her students, many of whom have gone on to successful careers in academia and beyond. She has also been deeply committed to enhancing the undergraduate research experience. Dr. Hawkins has mentored 35 undergraduate students, including 11 NSERC Undergraduate Science Research Award recipients. Her efforts to revive the Biology Undergraduate Society, including the creation of the BUGS website and organizing “Meet the Professor” nights, reflect her dedication to building a supportive academic community. Dr. Hawkins' role as an Honours Advisor, which involves organizing weekly meetings, reading theses, and attending defenses, further demonstrates her commitment to student success. Dr. Hawkins' impact on her students is profound and multifaceted. She was described by students as “enthusiastic, passionate, and kind,” with a reputation for fairness and dedication. Her support extends beyond the classroom, as illustrated by her care for a student who fell ill during the pandemic. This personal touch, combined with academic rigor, creates a learning environment where

students felt valued and motivated to succeed. Dr. Hawkins' influence is evident in the numerous appreciative letters and emails from students who highlighted her role in their academic and personal growth.

Last but not least, Dr. Hawkins extends her passion for plant biology beyond the university, actively engaging with the broader community. She has served as the University coordinator for the Vancouver Island Regional Science Fair for six years and has been a judge for 20 years. Her outreach efforts include giving talks to local organizations, guiding school field trips, and hosting public tours and workshops. Dr. Hawkins' involvement in events such as IdeasFest, Science Rendezvous, and Explore UVic highlights her dedication to promoting science education to diverse audiences. Her extensive outreach activities, documented in nearly three pages of her CV, underscore her passion for educating people of all ages about the importance of plant biology.

In conclusion, Dr. Barbara Hawkins embodies all the qualities celebrated by the Magister Teaching Award. Her contributions to teaching, curriculum development, student mentorship, and community outreach have left an indelible mark on the UVic Biology Department, academic community and public at large. Dr. Hawkins' unwavering commitment to education and her students makes her a most deserving recipient of this award and an example to all of us who teach at different institutions across Canada.

Barbara Hawkins : Récipiendaire du prix Magister de l'Association Botanique Canadienne en 2024

Translated to French by Frédérique Guinel

Après ne pas avoir décerné le Prix Magister de l'enseignement pendant sept ans, l'ACB/ABC le présente cette année à **Dr. Barbara Hawkins** avec un très grand plaisir. Avec une carrière de 34 ans à l'Université de Victoria (UVic), Dr Hawkins a eu pour mission d'inspirer les étudiants avec les merveilles des plantes" et a apporté des contributions significatives à l'enseignement de la biologie végétale, au mentorat, à l'élaboration de programmes d'études, et à la sensibilisation de la communauté.

Le portfolio d'enseignement de Dr. Hawkins est vaste et couvre un large éventail de sujets liés à la biologie végétale, de l'introduction aux niveaux avancés. Des cours tels que BIOL 324 (Biologie des plantes terrestres), BIOL 334 (Les plantes et les hommes), BIOL 366 (Physiologie végétale), et BIOL 325 (Biologie des arbres) démontrent sa capacité à impliquer les étudiants à tous les stades de leur parcours académique. Dr. Hawkins a également enseigné d'autres cours populaires, notamment le cours Physiologie du stress chez les plantes (BIOL 453) et un cours non majeur, le cours Physiologie végétale appliquée (BIOL 338). Elle a aussi joué un rôle essentiel dans l'élaboration du programme d'études en biologie à l'Université de Victoria. En tant que présidente du comité des programmes de premier cycle pendant six ans, elle a dirigé les efforts visant à concevoir des parcours d'apprentissage pour diverses sous-disciplines et a été le fer de lance de la création de la concentration en biologie forestière. Au cours de son mandat, elle a également obtenu l'accréditation du programme de premier cycle auprès du College of Applied Biologists of British Columbia et a mis au point le diplôme combiné en biologie et en statistiques mathématiques. L'engagement de Dr. Hawkins en faveur de l'innovation dans les programmes d'études est évident dans la création de nouveaux cours tels que BIOL 325 et la refonte des cours de troisième cycle en ateliers intensifs, offrant aux étudiants une formation dynamique et pertinente.

L'une des caractéristiques de l'enseignement de Dr. Hawkins est son approche innovante de la conception et de la mise en œuvre des cours. Dans le cours BIOL 325, elle a introduit des activités pratiques, telles que des coupes transversales d'arbres entiers, permettant aux étudiants de s'impliquer directement dans la matière et

de développer des compétences en matière de pensée critique. Son adaptation à l'enseignement en ligne pendant la pandémie de COVID-19 souligne encore son engagement à fournir un enseignement de haute qualité. Elle a converti avec succès le manuel de laboratoire BIOL 324 pour l'apprentissage en ligne, en veillant à ce que les étudiants continuent à bénéficier d'une expérience éducative complète malgré les défis posés par l'enseignement à distance. Son enseignement, qu'il s'agisse de cours magistraux ou de laboratoires, se caractérise par son enthousiasme et son dévouement à l'apprentissage des étudiants.

Dr. Hawkins a supervisé ou co-supervisé 22 étudiants en maîtrise et six étudiants en doctorat. En même temps, elle a été membre de 70 comités de supervision de diplômés et examinatrice externe de 20 thèses de diplômés. Son style de mentorat est pratique et collaboratif, impliquant souvent un travail sur le terrain et une expérience en laboratoire. Les anciens étudiants l'ont félicitée pour son soutien, son accessibilité et sa gentillesse, créant un environnement stimulant qui met l'accent sur la qualité plutôt que sur la quantité. Sa capacité à favoriser un sentiment de collaboration plutôt que de hiérarchie a laissé un impact durable sur ses étudiants, et beaucoup d'entre eux ont poursuivi une carrière fructueuse dans le monde universitaire et au-delà. Elle s'est également beaucoup investie dans l'amélioration de l'expérience de recherche des étudiants de premier cycle. Dr. Hawkins a encadré 35 étudiants de premier cycle, dont 11 lauréats d'une bourse de recherche en sciences de premier cycle du CRSNG. Les efforts qu'elle a déployés pour relancer la Biology Undergraduate Society, notamment la création du site web BUGS et l'organisation de soirées "Meet the Professor", témoignent de sa volonté de créer une communauté universitaire solidaire. Le rôle de Dr. Hawkins en tant que conseillère en spécialisation, qui consiste à organiser des réunions hebdomadaires, à lire des thèses et à assister à des soutenances, témoigne également de son engagement en faveur de la réussite des étudiants. L'impact de Dr. Hawkins sur ses étudiants est profond et multiforme. Les étudiants l'ont décrite comme "enthousiaste, passionnée et gentille", avec une réputation d'équité et de dévouement. Son soutien s'étend au-delà de la salle de classe, comme en témoigne l'attention qu'elle a portée à un étudiant tombé malade pendant la pandémie. Cette touche personnelle, associée à la rigueur académique, crée un environnement d'apprentissage où les étudiants se sentent valorisés et motivés pour réussir. L'influence du Dr. Hawkins est évidente dans les nombreuses lettres et courriels de remerciement de ses étudiants qui soulignent son rôle dans leur développement académique et personnel.

Enfin, le Dr. Hawkins étend sa passion pour la biologie végétale au-delà de l'université, en s'engageant activement auprès de la communauté au sens large. Elle a été coordinatrice universitaire de la foire scientifique régionale de l'île de Vancouver pendant six ans et a été juge pendant 20 ans. Dans le cadre de ses activités de sensibilisation, elle donne des conférences à des organisations locales, encadre des excursions scolaires et organise des visites et des ateliers publics. La participation de Dr. Hawkins à des événements tels que IdeasFest, Science Rendezvous et Explore UVic souligne sa volonté de promouvoir l'enseignement des sciences auprès de divers publics. Ses nombreuses activités de sensibilisation, documentées sur près de trois pages de son CV, soulignent sa passion pour l'éducation des personnes de tous âges à l'importance de la biologie végétale.

En conclusion, Barbara Hawkins incarne toutes les qualités célébrées par le prix Magister de l'enseignement. Ses contributions à l'enseignement, à l'élaboration des programmes, à l'encadrement des étudiants et à la sensibilisation de la communauté ont laissé une marque indélébile sur le département de biologie de l'Université de Victoria, la communauté universitaire et le grand public. Son engagement inébranlable à l'égard de l'éducation et de ses étudiants fait d'elle une lauréate très méritante de ce prix et un exemple pour tous ceux d'entre nous qui enseignent dans différents établissements au Canada.



Award created by David Sweet of Wood Bee Turnings

Lawson Medal 2024

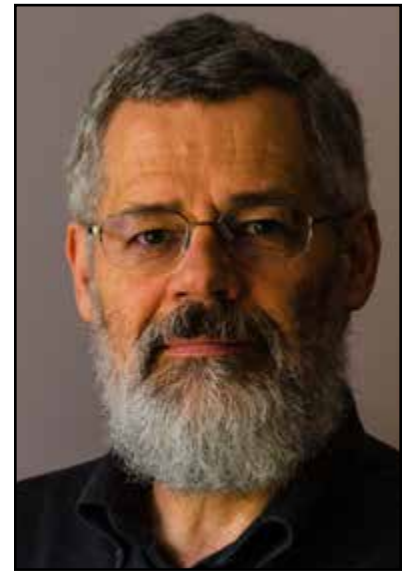
Lawson Medal, the most prestigious award of the Canadian Botanical Association, was established “to provide a collective, formal expression of the admiration and respect of botanists in Canada for excellence in the contribution of an individual to Canadian botany.”

The 2024 winner of the Lawson Medal in the category B, “recognition of cumulative, lifetime contributions to Canadian botany,” is **Dr. Lawrence David Harder of the University of Calgary**. Next, find a portrait of the recipient skilfully sketched by Dr. Anna Hargreaves from McGill University.

A portrait of Lawrence David Harder

Anna Hargreaves, McGill University

Professor Harder grew up in rural Alberta, did his BSc and MSc at the University of Alberta, and PhD in Toronto. The defining period of his career has been the 33 years spent as a professor in the Biology Department of the University of Calgary. His research has focused on what is surely the greatest challenge of being a plant: how to find a mate when rooted to the ground. Lawrence Harder is an outstanding choice for this award, and I have been thinking carefully about which aspects of his career I should tell you about to best demonstrate this. What most exemplifies ‘lifetime contributions to Canadian botany’? I think, for Prof. Harder, the answer is his contributions to: 1) the international field of botany, particularly the ecology and evolution of plant reproduction; 2) Canadian botany itself, via sustained, detailed ecological studies of Canada’s flora; and 3) training and mentoring of young plant biologists.



1) Contributions of lasting, international scope

Multiple letters of recommendation and emails speak eloquently to the impact of Prof. Harder’s work on plant reproduction, which extends far beyond Canada. Prof. Harder is an outstanding scientist who has reshaped the study of plant reproduction globally. He is a meticulous thinker, who gains remarkable insights by not shying away from biological details. An excellent example is his work on pollen fates, which all reference-letter writers mention because it has been so influential. Pollen fates are inherently hard to study as pollen is small and annoying to work with, and seemingly impossible to trace in wild populations on its journey from anthers to stigmas. Where others were happy to study the much more tractable female side of plant reproduction (pollen receipt on stigmas, seed production), Lawrence Harder recognized how much we were missing by ignoring the other (male) half of the story. With James Thomson (University of Toronto), he identified *Erythronium* lilies with a pollen colour polymorphism as an opportunity to study how pollen moves in a population, and particularly how much pollen is lost by the bees that move it (e.g. Harder & Thomson 1989, cited 590x). Whereas it’s common for 50% of female gametes (ovules) to be pollinated, they showed that less than 1% of male gametes (pollen) ever make it to a conspecific stigma, and argued that this should select strongly for adaptations to increase male reproductive success. In other words, the side of pollination that most botanists had been happily ignoring might in fact be driving most of floral evolution.

Building on his detailed empirical study of pollen fates, Harder constructed a theoretical framework for how

pollen succeeds or gets wasted, and the impacts this has on both seed production and plant evolution. Through this lens, whole classes of floral adaptations came into focus as mechanisms for minimizing pollen waste and improving male fitness. Poricidal anthers, for example, hold pollen internally until vibrated by a bee. These were thought to chiefly protect pollen from would-be pollen thieves, but thanks to Prof. Harder's work are now also understood to maximize pollination efficiency by preventing bee pollinators from taking too much at one time.

One of my favourite photos of Lawrence shows only his hand holding a *Dodecatheon* (now *Primula* section *Dodecatheon*) flower, giving new meaning to its common name 'shooting star'. The flower is releasing an outrageous stream of pollen, having just had its buzz-pollination mechanism triggered (by an electric toothbrush! A testament to Prof. Harder's ingenuity in the field; Figure 1).

The remarkable thing about Prof. Harder's career is that the above work is just one of many examples of how he made enormous contributions by seeing things that others brushed off. Prof. Harder and colleague Marcelo Aizen redefined the 'pollen limitation' concept to include not just the quantity but the quality of pollen deposited on stigmas (Aizen & Harder 2007 and Harder & Aizen 2010, cited > 800x), changing how decades of pollen-limitation experiments are interpreted. Prof. Harder and Spencer Barrett drove the merging of pollination biology and plant mating systems, fields which had counter-intuitively gone their separate ways. As pollination network studies were taking off under the assumption that all floral visitors were equal, Prof. Harder showed that a surprising number of visitors actually reduce seed production by stealing lots of pollen while depositing little or none (Hargreaves, Harder, Johnson 2009, cited 250x). Prof. Harder also waded into the debates on pollinator declines, for example showing that apparent impacts on agriculture were partly because crop pollination needs were rapidly outpacing the global stock of agricultural honey bees (Aizen & Harder 2009, cited > 1390x).



Fig 1. *Dodecatheon* buzz, left Mihai Costea, right Anna Hargreaves.

Prof. Harder has made these advances by combining careful thought and observation, detailed and creative experiments, and a deep and rigorous statistical understanding. He is, as Chris Eckert notes, a scientist's scientist, who sets the bar incredibly high. He represents Canada on the world stage with quiet, unassuming confidence, and razor sharp but gently-delivered insight. He has published >120 papers, has been invited to speak all over the world, and has been cited more than 18,000 times.

2) Understanding the ecology and evolution of Alberta's flora

While Prof. Harder's work is always motivated by improving our theoretical understanding of plants, he builds this theory on an impressive understanding of natural history. If I have a research question and need to find the study system to answer it with, I ask Lawrence. A walk in Kananaskis Alberta with Prof. Harder is a treat (if you can get him to put away his macro lens and walk!). He knows not only the plants' names, but the weird and fascinating details of their lives that make botany so much fun. And while his field work is by no means limited to Canada, he has uncovered wonderful features of Canadian plants by using them to test theory for the past 40 years. The shooting star-electric toothbrush story is but one example. He used tiny, carnivorous *Pinguicula* to test theory about resource allocation, by feeding it fruit flies to vary resource availability (Figure 2). He studied how elephant's head *Pedicularis* (Figure 3) is 'handed' in its interactions with bee pollinators. With Jannice Friedman, he reinvigorated the study of wind pollination in grasses, showing that the under-appreciated inflorescences of Poaceae are also highly evolved to facilitate pollination. Prof. Harder has worked on a diverse set of Alberta's

plants, advancing not just our understanding of where they are or how they are related, but how they work, evolve, and knit together ecological communities.

3) Advancing the study of botany in Canada and abroad

Botany is only half about plants; the other half is the people who study them. Prof. Harder has trained and mentored botanists around the world. Past students and postdoctoral fellows of his are now themselves professors of plant ecology and evolution across Canada, including at McGill, Queen's, University of Manitoba, and University of Alberta, not to mention Japan, Argentina, England, South Africa and the USA. He is an inspiring mentor, pushing his students to think deeply, know their plant study systems thoroughly, and write beautifully. He co-advised my MSc thesis and I am grateful for the chance to work with him. He is equally generous with his time for colleagues, and has helped many a struggling botanist think through puzzling data and wrestle with unruly analyses to gain insights into the mysterious inner lives of plants.

Lawrence Harder is a Canadian treasure. If you have not heard of him, it is only because he abhors self-promotion. Which makes it all the more fun for me and his letter-writers to sing his praises, and to nominate him as an outstanding candidate for the Lawson Medal.



Fig. 2. *Pinguicula vulgaris*. Photo by Mihai Costea



Fig. 3. *Pedicularis groenlandica*.
Photo by Mihai Costea.

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Dr. George Lawson (1827–1895) was born in Scotland. He obtained his Ph.D. from the University of Giessen in Germany in 1857. The following year, he accepted an appointment as Professor of Chemistry and Natural History at Queen's College (now University) in Kingston, Ontario. He was instrumental in the foundation of the Botanical Society of Canada, which met from 1860 until 1862. In 1863, Lawson abruptly left Queen's for Dalhousie. At Dalhousie he was active in the Nova Scotia Institute of Science and was a founding fellow of the Royal Society of Canada. From 1885-1895, he was Secretary of Agriculture for Nova Scotia. In 1891, he helped to establish the Botanical Club of Canada (1891-1910) and was its President until his death. Please see a [list of previous recipients of the Lawson Award](#) and a more comprehensive [portrait of George Lawson](#). Also see: http://www.biographi.ca/en/bio/lawson_george_12E.html

Médaille Lawson 2024

La médaille Lawson, le prix le plus prestigieux de l'Association Botanique du Canada, a été créée "pour fournir une expression collective et formelle de l'admiration et du respect des botanistes au Canada pour l'excellence de la contribution d'un individu à la botanique canadienne."

Le lauréat 2024 de la médaille Lawson dans la catégorie B, "*reconnaissance des contributions cumulatives de toute une vie à la botanique canadienne,*" est le Dr. Lawrence David Harder de l'Université de Calgary. Vous trouverez ci-dessous un portrait du lauréat habilement esquissé par le Dr. Anna Hargreaves de l'Université McGill.

Un portrait de Lawrence David Harder

Anna Hargreaves, Université McGill

Le professeur Harder a grandi dans la campagne albertaine, a obtenu sa licence et sa maîtrise à l'université de l'Alberta et son doctorat à Toronto. La période déterminante de sa carrière a été les 33 années qu'il a passées en tant que professeur au département de biologie de l'université de Calgary. Ses recherches se sont concentrées sur ce qui est certainement le plus grand défi pour une plante : comment trouver un partenaire lorsqu'on est enraciné dans le sol. Lawrence Harder est un choix exceptionnel pour ce prix, et j'ai réfléchi attentivement aux aspects de sa carrière qui démontrent ceci au mieux. Comment peut-on illustrer la "contribution de toute une vie à la botanique canadienne"? Je pense que, pour le professeur Harder, la réponse est sa contribution 1) au domaine international de la botanique, en particulier à l'écologie et à l'évolution de la reproduction des plantes ; 2) à la botanique canadienne elle-même, par le biais d'études écologiques détaillées et soutenues de la flore canadienne ; et 3) à la formation et à l'encadrement de jeunes biologistes des plantes.



Lawrence Harder on a trip to Argentina
in patch of *Alstroemeria aurea*.

1) Contributions de portée durable et internationale

De multiples lettres de recommandation et courriels témoignent avec éloquence de l'impact des travaux du professeur Harder sur la reproduction des plantes, qui s'étend bien au-delà du Canada. Le professeur Harder est un scientifique exceptionnel qui a remodelé l'étude de la reproduction végétale à l'échelle mondiale. C'est un penseur méticuleux, qui a acquis des connaissances remarquables en n'hésitant pas à s'intéresser aux détails biologiques. Un excellent exemple est son travail sur le devenir du pollen, que tous les auteurs des lettres de référence mentionnent parce qu'il a été si influent. Le devenir du pollen est intrinsèquement difficile à étudier, car le pollen est petit et difficile à manipuler, et il est apparemment impossible de suivre son parcours des anthères aux stigmates dans les populations sauvages. Là où d'autres se contentaient d'étudier l'aspect femelle de la reproduction des plantes (réception du pollen sur les stigmates, production de graines), Lawrence Harder s'est rendu compte de tout ce que nous manquons en ignorant l'autre moitié (mâle) de l'histoire. Avec James Thomson (Université de Toronto), il a identifié les lys *Erythronium* présentant un polymorphisme de couleur du pollen comme un système pour étudier la façon dont le pollen se déplace dans une population, et en particulier la quantité de pollen perdue

par les abeilles qui le déplacent (par exemple Harder & Thomson 1989, cité 590x). Alors qu'il est courant que 50 % des gamètes femelles (ovules) soient pollinisés, ils ont montré que moins de 1 % des gamètes mâles (pollen) parviennent jusqu'à un stigmate conspécifique, ce qui, selon eux, devrait entraîner une forte sélection en faveur d'adaptations visant à accroître le succès reproductif des mâles. En d'autres termes, l'aspect de la pollinisation que la plupart des botanistes avaient joyeusement ignoré pourrait en fait être à l'origine de la majeure partie de l'évolution florale.



Fig 1. *Dodecatheon* buzz, left Mihai Costea, right Anna Hargreaves.

S'appuyant sur son étude empirique détaillée du devenir du pollen, Harder a élaboré un cadre théorique sur la manière dont le pollen réussit ou est gaspillé, et sur l'impact que cela a à la fois sur la production de graines et sur l'évolution des plantes. Dans cette optique, des catégories entières d'adaptations florales sont apparues comme des mécanismes permettant de minimiser les déchets de pollen et d'améliorer la condition physique des mâles. Les anthères poricides, par exemple, retiennent le pollen à l'intérieur jusqu'à ce qu'une abeille les fasse vibrer. On pensait qu'elles protégeaient principalement le pollen des voleurs potentiels, mais grâce aux travaux du professeur Harder, on sait maintenant qu'elles maximisent l'efficacité de la pollinisation en empêchant les abeilles pollinisatrices de prendre trop de pollen à la fois.

L'une de mes photos préférées de Lawrence montre uniquement sa main tenant une fleur de *Dodecatheon* (*Primula* section *Dodecatheon*), ce qui donne un nouveau sens à son nom anglais commun (étoile filante). La fleur libère un flot impressionnant de pollen, car son mécanisme de pollinisation vient d'être déclenché (par une brosse à dents électrique !). Un témoignage de l'ingéniosité du professeur Harder sur le terrain ; figure 1).

Ce qui est remarquable dans la carrière du professeur Harder, c'est que le travail susmentionné n'est qu'un exemple parmi tant d'autres de la façon dont il a apporté d'énormes contributions en voyant des choses que d'autres ignoraient. Harder et son collègue Marcelo Aizen ont redéfini le concept de "limitation du pollen" pour y inclure non seulement la quantité mais aussi la qualité du pollen déposé sur les stigmates (Aizen & Harder 2007 et Harder & Aizen 2010, cités > 800x), changeant ainsi l'interprétation de décennies d'expériences sur la limitation du pollen. Harder et Spencer Barrett sont à l'origine de la fusion de la biologie de la pollinisation et des systèmes d'accouplement des plantes, des domaines qui de manière contre-intuitive avaient suivi des voies différentes. Alors que les études sur les réseaux de pollinisation prenaient leur essor en partant du principe que tous les visiteurs floraux étaient égaux, le professeur Harder a montré qu'un nombre surprenant de visiteurs réduisaient en fait la production de graines en volant beaucoup de pollen tout en n'en déposant que peu ou pas du tout (Hargreaves, Harder, Johnson 2009, cité 250x). Le professeur Harder s'est également immiscé dans les débats sur le déclin des pollinisateurs, en montrant par exemple que les impacts apparents sur l'agriculture étaient en partie dus au fait que les besoins de pollinisation des cultures dépassaient rapidement le stock mondial d'abeilles domestiques agricoles (Aizen & Harder 2009, cité > 1390x).



Fig. 2. *Pinguicula vulgaris*. Photo by Mihai Costea

Le professeur Harder a réalisé ces avancées en combinant une

réflexion et une observation approfondies, des expériences détaillées et créatives, ainsi qu'une compréhension statistique profonde et rigoureuse. Comme le fait remarquer Chris Eckert l'exemple par excellence du scientifique. Il représente le Canada sur la scène internationale avec une assurance tranquille et sans prétention, et une perspicacité aiguisée mais délivrée avec douceur. Il a publié plus de 120 articles, a été invité à s'exprimer dans le monde entier et a été cité plus de 18 000 fois.

2) Comprendre l'écologie et l'évolution de la flore de l'Alberta

Si le travail du professeur Harder est toujours motivé par l'amélioration de notre compréhension théorique des plantes, il fonde cette théorie sur une connaissance impressionnante de l'histoire naturelle. Si j'ai une question de recherche et que je dois trouver le système d'étude pour y répondre, je demande à Lawrence. Une promenade dans le Kananaskis en Alberta avec le professeur Harder est un régal (si vous arrivez à le convaincre de ranger son objectif macro et de marcher !). Il connaît non seulement le noms des plantes, mais aussi les détails étranges et fascinants de leur vie qui rendent la botanique si amusante. Et bien que son travail sur le terrain ne se limite pas au Canada, il a découvert de merveilleuses caractéristiques des plantes canadiennes en les utilisant pour tester la théorie au cours des 40 dernières années. L'histoire de l'étoile filante et de la brosse à dents électrique n'est qu'un exemple parmi d'autres. Il a utilisé la minuscule plante carnivore *Pinguicula* pour tester la théorie de l'allocation des ressources, en la nourrissant de mouches à fruits pour faire varier la disponibilité des ressources (figure 2). Il a étudié comment la tête d'éléphant *Pedicularis* (figure 3) est "prise en main" dans ses interactions avec les abeilles pollinisatrices. Avec Jannice Friedman, il a relancé l'étude de la pollinisation par le vent chez les graminées, en montrant que les inflorescences des Poaceae sont également très évoluées pour faciliter la pollinisation. Le professeur Harder a travaillé sur un ensemble varié de plantes de l'Alberta, faisant progresser non seulement notre compréhension de leur emplacement ou de leurs liens, mais aussi de leur fonctionnement, de leur évolution et de la façon dont elles tissent des communautés écologiques.



Fig. 3. *Pedicularis groenlandica*.
Photo by Mihai Costea.

3) Faire progresser l'étude de la botanique au Canada et à l'étranger

La botanique ne concerne qu'à moitié les plantes, l'autre moitié étant les personnes qui les étudient. Le professeur Harder a formé et encadré des botanistes dans le monde entier. Ses anciens étudiants et boursiers postdoctoraux sont aujourd'hui eux-mêmes professeurs d'écologie et d'évolution des plantes dans tout le Canada, notamment à McGill, à Queen's, à l'université du Manitoba et à l'université de l'Alberta, sans oublier le Japon, l'Argentine, l'Angleterre, l'Afrique du Sud et les États-Unis. C'est un mentor inspirant, qui pousse ses étudiants à réfléchir en profondeur, à connaître à fond leurs systèmes et à rédiger de bons articles. Il a codirigé ma thèse de maîtrise et je suis reconnaissante d'avoir eu la chance de travailler avec lui. Il est tout aussi généreux de son temps pour ses collègues et a aidé de nombreux botanistes en difficulté à réfléchir à des données déroutantes et à donner du sens à des analyses difficiles afin de mieux comprendre la vie mystérieuse des plantes.

Lawrence Harder est un trésor canadien. Si vous n'avez pas entendu parler de lui, c'est uniquement parce qu'il a horreur de l'autopromotion. C'est pourquoi il est d'autant plus agréable pour moi, et les personnes qui ont supporté sa nomination, de chanter ses louanges et de le désigner comme candidat exceptionnel à la médaille Lawson.

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George Lawson (1827-1895) est né en Écosse. Il obtient son doctorat à l'université de Giessen en Allemagne en 1857. L'année suivante, il est nommé professeur de chimie et d'histoire naturelle au Queen's College (aujourd'hui Université) à Kingston, en Ontario. Il contribue à la fondation de la Société Botanique du Canada, qui a fonctionné de 1860 à 1862. En 1863, Lawson quitte brusquement Queen's pour Dalhousie. À Dalhousie, il est actif au sein de l'Institut des sciences de la Nouvelle-Écosse ; plus tard, il sera l'un des membres fondateurs de la Société Royale du Canada. De 1885 à 1895, il est secrétaire à l'agriculture de la Nouvelle-Écosse. En 1891, il participe à la création du Botanical Club of Canada (1891-1910), dont il est le président jusqu'à sa mort. Voir la [liste des précédents lauréats du prix Lawson](#). Voir aussi : http://www.biographi.ca/en/bio/lawson_george_12E.html

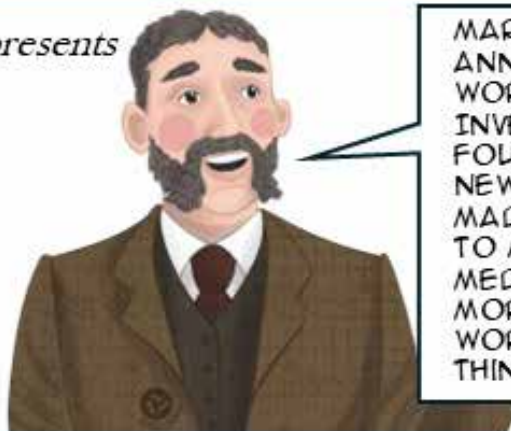


Cypripedium arietinum

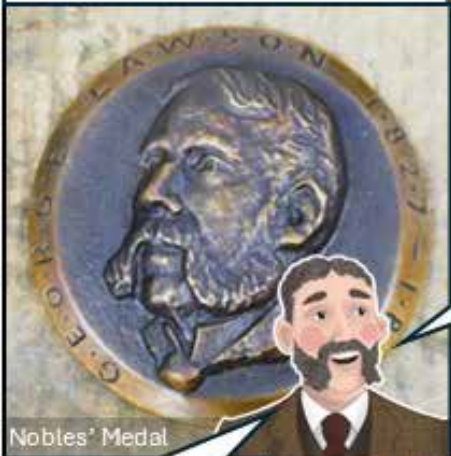
Photo by Mihai Costea

George Lawson *presents*

HOW MEDALS ARE MADE



MARVELLOUS NEWS!
ANNE BRUNEAU HAS
WORKED WITH
INVERNESS ART
FOUNDRY, QC, TO HAVE
NEW LAWSON MEDALS
MADE. IN A FITTING NOD
TO MEDAL WINNERS,
MEDAL-MAKING TAKES
MORE CAREFUL, HARD
WORK THAN YOU MIGHT
THINK.



Nobles' Medal

IT ALL STARTS WITH
A SCULPTED MODEL.
VICTOR TOLGESY'S
ORIGINAL LAWSON
MODEL IS LONG
GONE, SO ANNE
USED MILDRED
NOBLES' 1972
MEDAL AS A
STARTING POINT.
FOR NOW, HOWEVER,
WE'LL USE THE
EXAMPLE OF THIS
CHARMING CAT.



Carved model cat by Anne Renard

THE SCULPTED
MODEL IS
PAINTED WITH
SILICONE OR
RUBBER TO
MAKE A MOLD.



Foundryworker Hélène Bruneau and in-process silicone molds



Mold #1

THE SQUISHY
SILICONE MOLD
THEN GETS
REINFORCED
WITH PLASTER.



Red wax cast within the silicone / plaster mold



Cast with casting jets

NEXT, A RED WAX CAST IS MADE AND FITTED WITH WAX CASTING JETS THAT WILL
MOLD THE TUNNELS INTO WHICH MOLTEN BRONZE WILL EVENTUALLY BE POURED.

THE WAX CAST IS DIPPED ONCE A DAY IN LIQUID PORCELAIN, OVER THE COURSE OF ABOUT TWO WEEKS, AND THEN BAKED AT 800°C FOR 30 MINUTES.



Vat of porcelain



Kiln



VOILÀ! A CERAMIC MOLD!

Ceramic mold

BRONZE INGOTS HEATED TO 1200°C MELT AND GET POURED INTO THE MOLD...



Bronze ingots



Anne and the melting furnace



Crucible for molten bronze



Sand bin



Cast emerging from the mold

...CREATING A VERY HOT CAST BRONZE REPLICA OF THE ORIGINAL SCULPTURE, WHICH IS COOLED IN SAND AND BROKEN OUT OF THE MOLD.

THE DUSTY CASTS ARE THEN POLISHED!



Freshly-unmolded casts



Polished Lawson medal

YOU MIGHT THINK THAT WOULD BE THE END OF IT, BUT IT'S NOT. NEXT, THEY ARE ARTFULLY WEATHERED, TO PROTECT THEM AND TO BRING OUT THEIR BEST APPEARANCE.

EACH MEDAL IS REPEATEDLY SOAKED IN ACID, THEN RINSED OFF, THEN ABRADED...



Apprentice Anne weathers medals alongside foundry employee Suzanne Grenier



...THEN EVENLY COATED WITH IRON NITRATE AND BLASTED WITH FLAMES, ON A PEDAL-OPERATED TURNTABLE.



Foundry staff member Mélanie Arcand continues the patina process



FINALLY, A RINSE TO STOP OXIDATION, AND TWO COATS OF PROTECTIVE WAX!



Victor Tolgesy's initials in Lawson's collar

SIX NEW MEDALS, ALL TRUE TO NOBLES' MEDAL RIGHT DOWN TO THE INITIALS OF THE SCULPTOR WHO FIRST CREATED THE MEDALS IN 1969, ARE NOW EXPERTLY MOUNTED ON WALNUT PLAQUES, READY FOR NEW HONOUREES.



Foundry owner Emmanuel Descoutières

AND THAT IS HOW LAWSON MEDALS ARE MADE. THANKS FOR DROPPING BY!

THANKS ALSO TO...

- ARTIST **SHELBY BOHN** (SHELBYBOHN.COM) FOR DRAWING ME "BACK TO LIFE" TO TELL THIS STORY (AND SO HANDSOMELY, IF I MAY SAY SO MYSELF)
- **INVERNESS ART FOUNDRY** FOR CASTING THE MEDALS, HOSTING ANNE & FRÉDÉRIQUE, AND PERMITTING THE USE OF PHOTOS
- **BENOÎT SAITO** FOR VERY HELPFUL COMMENTS THAT IMPROVED THE TEXT
- **SCOTT REDHEAD** AND **DAOM** FOR USE OF MILDRED NOBLES' MEDAL

PHOTOS: ANNE BRUNEAU & FRÉDÉRIQUE GUINEL
LAYOUT: JENNIFER DOUBT

THIS FEATURE IS PART OF A SERIES ON THE LAWSON MEDAL, STARTING IN BULLETIN 56 (D).



Checking in on Hamilton's Biodiversity

Kasia Zgurzynski, Natural Areas Inventory Coordinator
Hamilton Conservation Authority

Approximately once every ten years since 1993, there has been a Natural Areas Inventory (NAI) in Hamilton to assess the state of the biodiversity that calls this municipality home. The current NAI, Nature Counts 3, is now a work in progress. It is expected to run from 2024-2026, with a publication released in 2027 detailing the work. The Hamilton Conservation Authority (HCA), Hamilton Naturalists Club (HNC), and City of Hamilton (the City) are eager to see this project come to fruition through our collaborative partnership. We are also working with other agencies that span the municipality, such as McMaster University, Niagara Peninsula Conservation Authority, Conservation Halton, and Grand River Conservation Authority. Some botanical surveys have been completed in urban woodlots of Hamilton, through the HNC, and more field work is being planned for later this field season. There have already been some interesting finds, including an occurrence of Back's sedge, *Carex backii*, a rare sedge which had not been found in previous NAI surveys. Further field work this year may focus on Ecological Land Classification (ELC) surveys in some of these urban woodlots.

Over the course of the next three years there will be field work and collection of data from a number of sources to put this NAI together. Past NAIs have culminated in reports that summarized sites and listed species. This NAI will be different from previous NAIs in that it will also analyse trends over the last 30 years since the first NAI. We are calling it Nature Counts 3, since the NAI completed in 2003 was called Nature Counts, and the one completed in 2014 was called Nature Counts 2. These previous NAIs will be used as a foundation on which to build the current NAI. We have been finding the data gaps that this NAI will aim to fill, based on underrepresented taxa and sites from previous NAIs, as well as including more urban areas that have not been surveyed. It will also include more of an aquatic component than previously, with fish and mussels on the radar.

We are developing a document that builds on the previous NAIs' site summaries of natural areas in the City, including physical descriptions, ELC, flora and fauna summaries, significant species, habitat cover, land use linkages, threats (invasive species, encroachment, climate change impacts, poaching and dumping, etc.), and recommendations. Another document will include the species lists of the various surveyed taxa, such as plants, birds, reptiles and amphibians, dragonflies and damselflies, butterflies and moths, mammals, and aquatic species. The goal is to hire a team of biologists to perform surveys throughout the City's natural areas to assess the current conditions for a number of indicator species, in addition to updating the full species list for the City. A separate document will likely report on trends over the last three NAIs, looking at changes in habitat and land cover, invasive species distribution, rare species and rare habitat distribution, and factors that may relate to climate change such as phenology.

There will be a more robust online component than previous NAIs as well, with public participation coming in through iNaturalist to support the project already. Public participation will be invited through events that bring volunteers together with experts to learn specific taxa that they can be tasked to identify throughout the City and submit either through iNaturalist or by contacting us directly. These include invasive species and climate change indicator species, as well as species identified as ethnobotanically significant. Building on work done by the HCA and partners over the last ten years, and comparing that to the trends witnessed over the last 20-30 years, we are hoping to develop a State of Environment report for Hamilton's Biodiversity Action Plan (BAP). The BAP is a five-year project aimed at supporting nature through the directed and coordinated actions of partner agencies and the public at large. The current NAI came up as a result of the implementation of the BAP, and will serve as a framework to collect natural heritage information that can inform decision making and policy.

The goal of Nature Counts 3 is to identify significant natural areas for protection, determine local status for various species, establish a baseline over which we can measure positive and negative changes over time, define threats and restoration opportunities across the City, and to contribute to policy and mapping amendments for

conservation purposes. Overall, we aim to assess and protect the biodiversity we share the landscape with, amidst looming threats in one of Canada's most biodiverse regions.

If you would like to get involved and you are within the Hamilton area, you are welcome to join the current Hamilton Natural Areas Inventory project on iNaturalist and start uploading observations. You may also reach out to me if you have any questions, or would like to get more information. This is a collaborative effort, where we have the opportunity to work together to better understand and protect nature for all.



Michigan lily (*Lilium michiganense*) in one of Hamilton's natural areas. Photo by author.

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