

Contents Table des matières

President's Message
Page 21

Association News
Page 23

News From The Sections
Page 27

Association Awards
Page 29

Obituary for André Bouchard
Page 33

Book Review
Page 35

Life After Graduation
A Report
Page 36

Chlorofilms Contest
Page 37



Native Plant Emblems of
Canada
13. Northwest Territories
E. Small and P.M. Catling
Page 38

CBA/ABC Board 2010-2011
Page 48

The Canadian Botanical Association Bulletin



Bulletin de l'Association Botanique du Canada

September/Septembre 2010. Volume 43 No.2/N°2

Message du Président: un temps pour la reconnaissance!

Cher(e)s membres de l'ABC:

Au moment où j'écris ces lignes, je ressens encore l'énergie et l'enthousiasme de notre rencontre scientifique conjointe (SPNHC-ABC) à Ottawa au début de Juin. Avec des conditions météorologiques clémentes, le congrès nous a offert une occasion splendide d'apprendre des nouveautés botaniques (du moins pour moi!) tout en rencontrant nos ami(e)s de longue date et la chance d'en faire des nouveaux, et aussi redécouvrir les charmes nombreux de la capitale fédérale. Il n'y a pas de meilleure façon d'explorer le *Canada Botanica* qu'avec des collègues botanistes enthousiastes!

Les points culminants furent nombreux, initiés par la présentation d'ouverture énergétique et perspicace du Dr. Paul Hebert sur le "Recensement biologique global", et la grande finale avec la conférence commémorative Weresub "Voyages avec un lichenologue", admirablement rendue par le Dr. Irwin Brodo, une présentation gravée dans ma mémoire comme un merveilleux mélange de science, de créativité, d'humanité et d'art.

Mentionnons d'abord notre reconnaissance profonde pour l'équipe de 14 membres du Comité organisateur local pour les SPNHC-ABC, avec Jean Marc Gagnon en chef de file, représentant une excellente synergie entre le Musée canadien de la Nature, l'Université d'Ottawa, et le département d'Agriculture et Agroalimentaire Canada. Nous sommes reconnaissants aussi au Dr. Jeff Saarela, notre (maintenant ancien!) vice-président, qui a fourni des liens étroits entre l'ABC et le comité organisateur, et au Dre Laurie Consaul, pour son aide précieuse avant et pendant la conférence. La rencontre conjointe des deux sociétés nous a fourni des points de vue complémentaires et opportuns appréciés par tous. La plus haute reconnaissance de notre société, la Médaille Lawson, a été présentée au Dr. Paul Cavers, pour l'ensemble de ses contributions dans le domaine de la biologie et écologie des "Mauvaises Herbes" (malherbologie). Comme mes collègues et amis, nous avons tous ressenti une grande joie et fierté pour Paul et pour ses nombreuses réalisations, autant scientifiques que personnelles. Félicitations Paul pour ce grand prix bien mérité!

Notre attention est maintenant tournée vers Halifax (L'Université St-Mary) où nous nous rencontrerons pour le Congrès "Plant Canada 2011". Le comité directeur, composé de membres des 6 sociétés, incluant l'ABC, continue à élaborer un programme sur le thème ambitieux "Adaptation des plantes aux changements



Dr. Hugues Massicotte

Canadian Botanical Association Bulletin

The CBA Bulletin is issued three times a year (in theory in March, September and December) and is available to all CBA members in electronic format or for an additional fee, in hard copy.

Information for submitting texts

All members are welcome to submit texts in the form of papers, reviews, comments, essays, requests, or anything related to botany or botanists. Any medium is acceptable for submission but electronic documents are likely to speed up the publication. For detailed directives on text submission please contact the Editor (see below). For general information about the CBA, go to the web site: <http://www.cba-abc.ca>

Association botanique du Canada Bulletin

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. L'utilisation de documents électroniques peut accélérer la publication. 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: <http://www.cba-abc.ca>

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Next issue / Prochain numéro

Texts for the next issue, **43(3)**, must be received **before November 8th 2010**. La date de tombée des textes du prochain numéro, le no **43(3)**, est le **8 novembre 2010**.
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environnementaux". Le comité scientifique élabore présentement une variété de colloques; il n'est donc pas trop tard pour participer et partager vos idées sur l'agenda scientifique (pour en savoir plus, voir la note sur Plant Canada ailleurs dans le Bulletin). Il est temps d'indiquer sur votre calendrier notre rendez-vous à St-Mary, N.E., du 17 au 21 juillet 2011.

L'ABC continue d'être vibrante grâce au dévouement d'innombrables volontaires. La majorité du travail essentiel survient dans les coulisses et n'est pas toujours suffisamment reconnu. Mentionnons donc ici nos plus sincères remerciements au Dr. Rodger Evans, notre président sortant: en plus d'organiser un excellent congrès à Wolfville l'année dernière, il a su naviguer les eaux présidentielles avec brio ces 2 dernières années. Très peu d'individus peuvent prétendre avoir (sur-)vécu un mandat simultané de présidence et vice-présidence! Bravo Rodger! Nous espérons être capables encore de bénéficier de tes conseils judicieux en tant qu'ancien président.

Avec notre conseil d'administration, composé de disciples enthousiastes et capables, incluant deux étudiantes au doctorat (Julia Nowak et Christina Lord), j'espère poursuivre plusieurs initiatives, comme celle du rapprochement entre l'ABC et le BSA, en créant une meilleure liaison entre les étudiants diplômés des deux sociétés. Le contexte scientifique et social courant signifie des changements importants et rapides dans le monde des sciences et les efforts combinés des deux sociétés peuvent ajouter du poids pour les enjeux scientifiques de l'heure. Sans aucun doute, nous en reparlerons plus dans les futurs numéros du Bulletin.

Je voudrais finalement exprimer une autre note de reconnaissance au Dr. Christian Lacroix, qui a terminé le cycle de 6 ans de tâches présidentielles avec l'ABC.

Christian n'a pas ménagé son énergie, ses conseils judicieux et son enthousiasme bilingue, et j'espère que nous pourrions continuer à bénéficier de son support pour de nombreuses années à venir. Je manquerais à mon devoir aussi si j'oubliais de remercier ma collègue, la Dre Frédérique Guinel, qui a gracieusement accepté d'être la présidente élue. C'est avec grand plaisir que je planifie de travailler plus régulièrement dans le futur avec Frédérique. Allié de l'appui de l'ABC, j'espère renforcer notre position en tant que joueur-clé dans les sciences botaniques au Canada et en Amérique du Nord.

Très sincèrement

Hugues Massicotte

President's Message: Thoughts of gratitude!

Dear CBA Members:

As I write this, I can still feel the energy and enthusiasm of the joint SPNHC-CBA in Ottawa at the beginning of June. Blessed with beautiful weather, the meeting offered a splendid opportunity to learn new things in botanical sciences (at least for me!), meet old friends and make new ones, and rediscover an exciting part of the Canadian landscape! How better to unravel the riches of Canada Botanica than with like-minded botanist friends? Highlights were numerous, initiated by an energetic and insightful keynote address by Dr. Paul Hebert on the census of all life, and a grand finale with the Memorial Weresub Lecture on "Travels with a lichenologist", admirably given by Dr. Irwin Brodo, a presentation etched in my mind as a wonderful mingling of science, creativity, humanity and artistry.

A note of appreciation should go to the 14 members of the SPHNC-CBA Local Organizing Committee (Jean Marc Gagnon and team), who represented great synergy between the Canadian Museum of Nature, The University of Ottawa, and Agriculture and Agri-Food Canada. Among others, we are grateful to Dr. Jeff Saarela, our past Vice-President, who provided strong liaison between the CBA and the Organizing Committee, and to Dr. Laurie Consaul, for invaluable help before and during the meeting. The joint gathering of the two societies provided a complementary and timely blend of interests appreciated by all. The highest recognition from our Society, the Lawson Medal, was presented to Dr. Paul Cavers for his lifetime contributions in weed biology and ecology. As colleagues and friends, we all felt great joy and pride for Paul's many scientific and personal achievements. Congratulations Paul on this richly deserved and meritorious award! We are now shifting our attention to Halifax (St-Mary's University) where we will all meet with Plant Canada 2011 (www.plantcanada2011.ca). The steering committee, composed of members from 6 societies, including the CBA, continues to work very hard to develop a program on the multifaceted theme "Plant adaptation to

environmental change". The scientific committee is currently designing the symposia; therefore it is not too late to participate and to share ideas for the scientific agenda (read more on Plant Canada elsewhere in the Bulletin). Time to mark your calendar for St-Mary's, N.S., July 17-21st 2011. The CBA continues to be strong because of the dedicated effort of countless individuals. Most of the essential work occurs behind the scenes and is not always adequately recognized. Our most sincere thanks are extended to Dr. Rodger Evans who is stepping down as President. In addition to organizing a very successful meeting in Wolfville in 2009, he provided tremendous leadership for us these last 2 years. Few individuals can claim to be overlapping and successful President and V-P! Congratulations Rodger! We are looking forward to his ongoing mentorship as Past-President.

Along with our current Board of Directors, composed of enthusiastic and capable individuals, including 2 Ph.D. students (Julia Nowak and Christina Lord), I hope to pursue some of Rodger's initiatives, one of them being the rapprochement between the CBA and the Botanical Society of America, starting with a better liaison for the graduate students of the 2 societies. These are times of rapid and significant changes in the world of botanical sciences, and combined efforts on some issues can only add greater political and public impact. Undoubtedly, there will be more on this topic in future issues of the Bulletin.

I also would like to extend our deepest note of appreciation to Dr. Christian Lacroix, who has ended a 6-year cycle of presidency-associated tasks with the CBA. Christian has not spared his energy, council and bilingual enthusiasm on our behalf, and I hope we can still count on his council for many years to come. Merci Christian pour tes efforts énormes pour l'association, appréciés par nous tous! I would be remiss if I did not also thank my colleague Dr. Frédérique Guinel, who gracefully accepted to have her name put forward as President-Elect. I am looking forward to working with Frédérique and welcome her insightful and thoughtful participation. With the support of the CBA membership, I look forward to my presidency and assisting in strengthening our position as a key player in the Canadian and North American Botanical Sciences.

Most sincerely,
Hugues Massicotte

Association news Nouvelles de l'association

Order of Canada for Dr. Stan Hughes



Dr. Stan Hughes

Dr Stanley Hughes, the eminent mycologist, was appointed to the Order of Canada in July 2010, for his lifetime contribution to the field of mycology, particularly for his seminal work on the classification of various fungi and moulds, and for his mentoring of young scientists.

Dr Hughes was born in Llanelli, South Wales and is a graduate of the University of Wales at Aberystwyth, (B.Sc; M.Sc; D.Sc), where he specialized in mycology. After working at Cardiff University, he was appointed as assistant mycologist at Kew in the UK. He

moved to Canada in the early fifties, where he worked as mycologist at the ECORC (Eastern Cereal and Oilseed Research Centre) at Agriculture Canada until 1983, when he became an Honorary Research Associate, a position he still holds today, at the age of 92.

His research in microfungi has earned him recognition and many accolades including the Jakob Eriksson Gold Medal, Royal Academy of Science (1969), the George Lawson Medal from the Canadian Botanical Association (1981), and the Distinguished Mycologist Award from the Mycological Society of America (1985). He was elected a Foreign Member of the Linnean Society of London in 1986. In addition, Dr Hughes has served as President of the Mycological Society of America, and Vice-President of the International Mycological Association. He is also Fellow of the Royal Society of Canada.

Dr Hughes was also a founding member of the National Botanic Garden of Wales, and has donated his entire professional library, some 10,000 items, to the garden's Library.

Llongyfarchiadau mawr, Dr Hughes!

Professor Vipen K. Sawhney awarded an earned D.Sc. by the University of Saskatchewan.



A well-known member of the CBA has been awarded a D.Sc. by his university.

Vipen Sawhney, a past President of the CBA and contributor at many meetings, is well known for his research on plant reproduction, particularly pollen development and male sterility in plants, and is recognized internationally. His group has demonstrated the importance of the tapetum, hormones and environmental factors for pollen development. Most recently Professor Sawhney's lab has applied a battery of modern proteomics technologies to determine the key proteins involved in pollen and tapetum development. This cutting edge research has yielded very important information regarding several proteins and their functions during pollen development.

Professor Sawhney's research also has important applications in the area of hybrid seed production. Hybrids are important to agriculture because they show increased vigor and have a higher yield. Professor Sawhney has developed a male-sterile mutant in tomato, which is attracting considerable attention internationally for hybrid seed production and has been licensed to a seed company in Italy and transferred to agricultural universities in China, Mongolia and India.

In addition to being a highly respected and successful scientist, Professor Sawhney has won awards for his teaching prowess, including the College of Arts and Science Teaching Excellence Award and the University of Saskatchewan Master Teacher Award. He is known for his enthusiasm for plant biology and his compassion for his students, both undergraduate and graduate. He is truly a gifted teacher.

Professor Sawhney is also a talented administrator. He directed the affairs of the Department of Biology as Head, was appointed Rawson Professor for distinguished service, served as Vice President and President of the Canadian

Botanical Association, and President of the International Association of Sexual Plant Reproduction. His contributions to the Canadian Botanical Association were recognized with the Mary Elliott Service Award and recently by the Association's most prestigious award, the Lawson Medal, for the excellence of his lifetime contribution to Canadian botany.

Larry Fowke



Teaching awards for two CBA members at Thompson Rivers University.

Thompson Rivers University Teaching Excellence Awards are presented to those instructors who exemplify the best qualities of teachers, both in and out of the classroom.



Dr. Lyn Baldwin (left) and Dr Cindy Ross-Friedman with their teaching awards.

Dr. Lyn Baldwin

Lyn Baldwin is described by students as dynamic, competent, and caring. A former student says that she had no idea of the beauty and excitement of the plant world until she made her way into Lyn Baldwin's second year vascular plants course. Lyn's lectures are almost always entertaining and engaging yet this never comes at a sacrifice in content. A student who is grateful that she took that first class with Lyn does not believe that she would now be pursuing a master's degree in ecology without Dr. Baldwin's direction. Another student says that through taking field trips, getting to review papers, writing research proposals, and learning how to give good presentations, Lyn's class was the most valuable one she has taken in her undergraduate career thus far. Many colleagues are also very much impressed with Baldwin, exemplified by their adaptation of an illustrated and narrative journal that Lyn uses for students to observe deeply and accurately identify local species of the natural world of botany.

Dr. Cynthia Ross Friedman

Many of Cynthia Ross Friedman's students and colleagues supported her nomination for this Teaching Excellence Award. New students have said they are pleasantly surprised by Cindy's warm and supportive manner, and her clear, energetic and informative teaching style. Cindy's students say that her lectures are interesting with good examples and injections of her own research. Students say that her passion for teaching is matched by her passion for research, and often makes herself available day and night

for student assistance. Cindy is flexible in her course scheduling and uses an array of media to engage students in her lectures. Colleagues have described their positive impressions of Cindy's teaching methods, and even admit to learning from Cindy's lectures themselves. Colleagues attest to the quality of undergraduate researchers under Cindy's guidance, and point out Cindy's fine editorial skills overseeing students' well written theses and published papers in botanical journals, a wonderful reflection on the Biological Sciences department and TRU. Beyond TRU, the Editor of the Canadian Botanical Association Bulletin points out that what Cindy has brought to the Teaching section will ensure that teaching botany has a high profile in the association for many years.

Photo and article courtesy of TRU Office of Advancement



L'Université Laval awards an honorary degree to André Bouchard posthumously, in June 2010.

Le recteur de l'Université Laval, Denis Brière, remettra le diplôme et les insignes de "Docteur honoris causa" à André Bouchard à titre posthume, en tant que spécialiste en science de la nature et en aménagement du territoire, et chef de file de l'étude de l'écologie végétale. For complete obituary see page 33 of this issue.

Attention CBA/ABC Students and Members Supervising Students!!!

In the very near future, CBA/ABC and BSA will be embarking upon an initiative to "virtually" bring the students of our two societies closer together. Currently, the BSA is in the process of adding CBA/ABC students to their membership. Soon you will receive an email welcome, that will include access to the on-line version of the **American Journal of Botany**, plus a note from the **BSA Student Representatives to the Board** inviting them to participate in the BSA student web page and student list-serve. Once these sites are set up we will be allowing our student Board Representatives to share the **CBA/ABC Bulletin** with their American counterparts. This is the first step in an initiative to have a more cohesive botanical presence in North America. As this offer is only available to students that have paid dues for 2010, please make sure that your students are registered members of CBA/ABC!!!

ANNUAL REPORT FOR BOTANY (July 2009 - June 2010)

Barry J. Shelp, Co-Editor R. Larry Peterson FRSC, Co-Editor

1. Changes to Editorial Board:

Completion of term as Associate Editor: Mark Roberts, Hagurdeep Saini, and Vigdis Vandvik
Associate Editors Appointed: Jean Rivoal and Jacques Brisson

2. Special Issues Published:

CSPP 2008. Guest Editors: John T. Arnason, A. Johnson, Christiane Charest, Susan Aitken, Tim Xing, Leonid Savitch, Brian Miki - published July 2009
Schofield Festschrift. Guest Editors: René Belland and Iain Taylor - published April 2010

3. Reviews/Minireviews/Commentaries published: =13

4. Reviews/Minireviews/Commentaries in progress: = 5.

General Information:

Prize awarded in 2010 for most cited paper: "Inference of higher-order conifer relationships from a multi-locus plastid data set" by Hardeep S. Rai, Patrick A. Reeves, Rod Peakall, Richard G. Olmstead, and Sean W. Graham, Volume 86 Issue 7, 658-669.

Timeline for the transition from NRC Research Press to the not-for-profit company Canadian Science Publishing:

Publishing:

January 13, 2010 – Submission approved by Treasury Board for transition to the private sector.

February 2010 – Cameron Macdonald, Bruce Dancik, and Ken Davey first incorporators of the new corporation.

March 2010 – Canadian Science Publishing (CSP) received incorporation papers from Corporations Canada.

April 2010 – Interim board with Ken Davey as Chair and Cameron Macdonald as Executive Director met for first time; discussion of membership of new board and other issues.

September 2010 – Official transfer of operations from NRC Press to CSP.

November 2010-January 2011 – Hiring of Editorial Assistants.

April 2011 - Assistant to the Editors of Botany in place.

TABLE 1. GENERAL INFORMATION ON MANUSCRIPTS

Category	Calendar year				
	2005	2006	2007	2008	2009
No. manuscripts handled	424	405	424	383	322
No. manuscripts accepted	173	149	124	137	110
No. manuscripts rejected or withdrawn	251	256	300	246	212
% rejected or withdrawn	59	63	71	64	66
2-yr Impact factor	1.058	1.193	0.985	1.078	
5-yr Impact factor				1.415	



R. Larry Peterson

TABLE 2. MANUSCRIPTS PUBLISHED BY CATEGORY (July-June)

Category	Number of manuscripts			% Distribution		
	2007-08	2008-09	2009-10	2007-08	2008-09	2009-10
Cell & Molecular Biology	6	7	4	5	5	3
Ecology	47	44	37	38	34	32
Mycology and Plant-microbe Interactions	17	14	16	14	11	14
Paleobotany	0	1	1	0	.5	.5
Physiology & Biochemistry	10	11	15	8	9	13
Structure & Development	20	14	19	16	11	16.5
Genetics	13	8	10	10	6	9
Systematics	10	30	14	8	23	12
Phycology	1	1	0	1	.5	0
TOTAL	124	130	116	-	-	-



UPDATE on PLANT CANADA 2011

"Plant adaptation to environmental change"

St-Mary's University (Halifax, July 17-21st)

Sponsoring societies: CSA, CSHS, CSPP, CBA, CPS and CWSS

www.plantcanada2011.ca

The Plant Canada steering committee (composed of members from the 6 societies, including the CBA) is connecting monthly to work on all aspects of the meeting. In addition, the scientific and publications committee also meet monthly to develop the scientific program. The multifaceted theme of the meeting is "Plant adaptation to environmental change". At a glance, the meeting will offer 2.5 days (Monday 18, Wednesday 20, Thursday 21 am) of concurrent scientific proceedings plus 1 day devoted to tours (4 promising tours are currently planned). Two plenary speakers are confirmed and several proposals for symposia are under discussion, at different stages of planning. The CBA is currently considering these and examining how our proposals might best fit with others. A tentative list of symposia titles is given below as an example of how the CBA might contribute. In Ottawa, some members had excellent suggestions for symposia and indicated interest in participating/organizing one. You will be contacted soon. We hope to have the symposia and many speakers confirmed in the next 2 months.

Mise À Jour sur le CONGRÈS PLANT CANADA 2011

"Adaptation des plantes aux changements environnementaux"

Université St-Mary (Halifax, le 17 juillet-21)

parrainé par les sociétés SCA, SCSH, SCPP, ABC, SCP et SCM

www.plantcanada2011.ca

Le comité directeur de Plant Canada (composé de membres des 6 sociétés, y compris l'ABC) est en contact mensuel pour travailler sur tous les aspects du congrès. De plus, le comité scientifique se rencontre régulièrement aussi pour élaborer le programme scientifique. Le thème du congrès est "Adaptation des plantes aux changements environnementaux".

En bref, le congrès offre 2.5 jours (lundi 18, mercredi 20 et jeudi 21 matin) pour les débats scientifiques et 1 journée est consacrée aux excursions (4 excursions prometteuses sont présentement prévus). Les orateurs des deux séances plénières sont confirmés et plusieurs propositions pour colloques sont à différents stades de planification. L'ABC examine présentement ces propositions et essaie de voir comment nous pouvons intégrer nos propositions au sein des autres. Une liste préliminaire des colloques est donnée ci-dessous afin de mieux voir où nous pouvons contribuer. À Ottawa, certains d'entre vous avaient d'excellentes suggestions pour les colloques et ont manifesté leur intérêt à y participer ou en organiser un. Nous vous contacterons bientôt. Nous

SCPP:

S#1 Physiological responses of plants to climate change

S#2: Plant adaptations to abiotic stress

CSA:

S#1 Water resources and climate change

S#2 Biodiversity and climate change

S#3 Agronomy and human health

CSHS:

S#1 Horticulture and Environment-1 Berry production in protected culture

S#2 Horticulture and Environment-2 An agro-ecosystem approach to understanding and reducing environmental stress in sustainable fruit and vegetable production systems

CWSS:

S#1 New weeds in Canada

S#2 New crops as potential new weeds

S#3 Mitigation of new weed threats

Respectfully submitted

Hugues Massicotte and Marian Munro

Letter to the Canadian Museum of Nature,

At the Annual General Meeting in Ottawa on June 3rd, a motion put forward by Tim Dickinson was passed to the effect

"CBA applauds the reopening of the Canadian Museum of Nature but notes with considerable disappointment the absence of a botanical (plants and fungi) display, such as that which existed previously." The President was asked to write a letter to the Museum. The letter was sent, signed by both the past president and current president.

Prince George, July 31st, 2010

To Judith Price, Canadian Museum of Nature

Dear Ms. Price,

On behalf of the CBA/ABC, we would like to thank you for allowing us access to a "Night at the Museum" on Thursday evening June 3, as part of the scientific program for the joint SPNHC-CBA meeting. It was most enjoyable to see the new museum, and to have a chance to explore it on our own was truly a delightful experience. We thoroughly enjoyed many of the exhibits, and were especially taken by the live frog display, the blue whale skeleton and the mineralogy exhibits. From many of our colleagues' comments, it is clear that they too enjoyed their visit. It was our first visit to the museum (and a short visit we will admit) and it is evident that an immense amount of work has been devoted to the conception of exhibits, many with cleverly designed sections for children's activities and learning. The building is also an architectural marvel.

However, for some of my colleagues as well as ourselves, it seemed that the Museum at this time may be under-representing two very important Kingdoms of the natural world, those of the plants and fungi. These 2 groups are mentioned of course several times, but it seems more as a background for exhibits such as the charismatic megafauna and paleontology (it is difficult to compete with dinosaurs, we will admit!).

Nevertheless, one might imagine an exhibit on the value of plants to mankind (now or in the past), or an exhibit on the diversity of plants and ecosystems in Canada, or perhaps an exhibit describing some of the intriguing ways that plants make a living (autotrophic, mycoheterotrophs, carnivorous, etc). Plant exhibit ideas could incorporate the carbon cycle and how critical plants and fungi are in this cycle; exhibits on fungi could highlight their pharmaceutical properties, or the strange lives they form with lichens. A display on symbiosis might show alliances that plants and other life forms participate to that are key to many biological processes on this planet.

We do realize that one must make choices when decisions are taken to finalize the scope of the exhibits for a Museum, however, the world of plants and fungi are not only fundamental to our existence but they are also quite fascinating! We are sure that members of the CBA (and most likely SPNHC) would be happy to provide suggestions and/or input should the museum decide to undertake to create a botanical or mycological display some time in the future. Again, our warmest congratulations on the reopening of this beautiful museum and we wish you the very best during the remaining summer and fall season.

Yours sincerely,

Hugues B. Massicotte, and Rodger Evans,
President, CBA/ABC Past-President, CBA/ABC

No response has been received to date. (Ed.)

News from the Sections

News from the Mycology Section (August 2010)

There was a great turnout for the mycology section meeting held in Ottawa (18 persons present), including an NSERC representative who visited the section meeting. Our notetaker volunteer was Linda Tackaberry.



The 2 symposia co-organized between our section and the Systematics and Phytogeography section were well received and well attended. It was a pleasure working with Shannon Berch and Tim Dickinson to get it all organized.

There was no Weresub winner this year. However, we discussed the Award (for best published paper of the year authored by a student in mycology and/or lichenology) and the importance of letting students know how to apply. (The award value is \$1000).

We also discussed possible candidates for the Weresub Memorial lecture for Plant Canada 2011. Several excellent suggestions will be followed up by Hugues M. and Shannon B.

A number of suggestions for possible topics for future symposia were made by Michele Piercey-Normore, Yolande Dalpé, Mary Berbee among others. Some suggestions included: a) climate change and lichen response (broaden it to symbiosis response perhaps, or combine it with other societies?); b) fungal metabolites (for lichenized and non-lichenized fungi); c) industry angle (bio-pulping, biofermentation); d) aquatic fungi.

Judges for Cing-Mars Award for 2011 were selected:

Michele P.-N. with Hugues as an alternate.

We had an extensive discussion, initiated by Keith Seifert, regarding the difficulty arising (from an international perspective), of not having a "Canadian Mycological Association" and, therefore, no real Canadian representative or contact persons to serve as links to other international organizers (IMC, ICOM, etc) when they might be interested in Canadian input for such international meetings. A question arose "Could the chairs of the mycology section, or CBA president, be such a contact person for the Canadian scene?"

As always, we welcome anyone interested in joining the Myco-section, as well as all myco-comments/thoughts!

Hugues Massicotte (Shannon Berch in absentia)

Systematics and Phytogeography Section

There was a good turn-out at the sectional meeting. For next year, the suggestion was made to try to get local botanists in the Maritimes to suggest ideas on how we might proceed. Paul Catling has volunteered to coordinate this task. Ideas for symposia might follow.

This year, we have had two symposia so far, both very successful. The symposium about the role and status of Canadian herbaria was very well attended and a success from the response by invited speakers and the audience. Hugo Cota-Sanchez volunteered to be a Lionel Cinq Mars judge and the new chair of the section.

Hugo Cota-Sanchez

Ecology Section

The Ecology and Conservation section was quite active in 2009-2010. From the successful sessions of last year on the discussion on SARA, a short summary was published in the CBA Bulletin and another session was organized for this year's meeting on the issue of re-introduction. The discussion on student and life after graduation was a great success and a short article summarizing the discussion is published in this issue of CBA Bulletin. There were great nominations for the Rowe award and the winner was announced at the banquet. See page 29.

We had continued to encourage discussing issues of listing of species at risk with our various constituencies. In terms of themes for next year's meeting with Plant Canada, there were some recommendations to match the theme of the conference on climate change. A tentative title for a symposium was: implications of management on native species in various ecosystems in face of climate change. Several topics were suggested for the student activities for the 2011 meeting such as how to publish, speaking with media, grant proposals, working with stakeholders (e.g. conservation groups, communities, etc.), mentor and mentored, political actions workshop, tool box for vulgarisation and outreach and public communication, etc. For the panel discussion, after several possible topics, the suggested title recommended was: Moving populations: where can they go and how can they survive?

The judges for the various awards were selected for the 2011 meeting. Finally, Paul Cavers reported on the changes occurring within NRC Press and the transition towards a not-for-profit organization. It was also proposed that Plant Canada takes the initiative to have a publication committee to oversee the monographs and to move forward and work on the peer review process, editing, etc. This suggestion was endorsed by the section as a consensus. Finally, Christine invited students to send a short profile of 250 words on your research project, along with a photo to Jane Young as part of the on-going series on graduate student research.

Liette Vasseur

Plant Development Section

This year we had a successful plant development meeting in Ottawa. Sixteen members participated in the Section meeting including new students. Great turnout! Dr. Arunika Gunawardena will be the new chair for the next two years. The Plant Development section would like to thank Dr. Moira Galway and Dr. Christian Lacroix for judging students oral presentations for the "Lionel Cinq-Mars Award" and Dr. Hugues Massicotte for organizing the Lionel Cinq-Mars judges in Ottawa.

Dr. Rodger Evans will be the judge for the Lionel Cinq-Mars Award for next year CBA/ABC at Plant Canada in Halifax 2011. Two possible ideas for symposia were suggested: adaptation to climate change by non-model species and the effects of climate change on symbiosis. More suggestions are welcome!

Students are encouraged to submit applications for the Taylor A. Steeves Award to the current chair of the development section (Dr. Arunika Gunawardena, Biology Department, Dalhousie University, arunika.gunawardena@dal.ca) before March 31st 2011. This award was established to honour Taylor Steeves for his

numerous contributions to the CBA and to botany.

Arunika Gunawardena

The Teaching Section

CBA/ABC Ottawa 2010 The CBA/ABC Teaching Section had a wonderful morning session in Ottawa. The session opened with an excellent special lecture on teaching by Kate Frego of the University of New Brunswick and 3M Teaching Fellow. Her presentation, entitled, "Calling or Culling: The Influence of our Teaching Metaphors," was relevant and extremely well-received. Two superb contributed papers followed: one was a very practical and interesting presentation on a lab exercise entitled, "Cleaning Up: Making Soap with Plant Materials" delivered by student Leah Dalrymple. Leah's presentation was awarded an Honourable Mention by the Lionel Cinq-Mars Judges! The other contributed paper was an entertaining and educational co-presentation by the innovative team of Art Fredeen and Jane Young (University of Northern British Columbia), who talked to us about, "A New Upper Division Plant Structure and Function Course with a Society and Environment Context." The session was rounded out by a Teaching Panel, who discussed "Best Botanical Teaching Practices: Reaching Students in the Classroom, Lab, and Field." A summary of the panel can be found as a special article in the next issue of the Bulletin! Moderated by Frédérique Guinel (Wilfrid Laurier University) and Vipen Sawhney (University of Saskatchewan), the panel, consisting of Mihai Costea (Wilfrid Laurier University), Art Davis (University of Saskatchewan), Kate Frego (University of New Brunswick), Larry Peterson (University of Guelph), and Jane Young (University of Northern British Columbia), encouraged stimulating discussion amongst themselves and the audience. The Teaching Section thanks everyone for their outstanding contributions, and also wishes to acknowledge the work of the "Iain and Sylvia Taylor" Best Student Poster Judges in Ottawa 2010, Frédérique Guinel, John Markham, Christine Maxwell (judging coordinator), and Marian Munro.

CBA/ABC at Plant Canada in Halifax 2011 The Teaching Section is planning a half-day session dedicated to contributed papers and special symposia. Lyn Baldwin of Thompson Rivers University, who has won a teaching award and is highly respected by peers and students alike, has agreed to give a seminar. Frédérique Guinel will also help to shape the theme of the session, which will focus on engaging students and writing in the biological sciences.

Teaching Website Marian Munro, the Teaching Section's "webmaster extraordinaire", has the website up and running at www.teachingbotany.org. If you have teaching materials you want to share, please send to Marian (marian@teachingbotany.org) or to Christine for the Bulletin. Encourage fellow teachers and classmates to send materials!

Cindy Ross Friedman

Conference photos

More photos will be available in the next issue of the Bulletin and also see the 600 photos on the conference website.

www.spnhc.cba2010.org/

Association Awards 2010

The Lawson Medal

First awarded at the 1969 Annual Meeting, the Lawson Medal, the most prestigious award of the CBA/ABC, 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". It is named in honour of Dr. George Lawson, who is generally regarded as Canada's first professional botanist. Lawson Medals may be awarded each year in two categories of eligibility:

(A) Recognition of a single outstanding contribution to botanical knowledge

(B) Recognition of cumulative, lifetime contributions to Canadian botany

This year, the Lawson medal is awarded to Dr. Paul Cavers in recognition of lifetime contributions to Canadian botany. Paul received a BSc in Agronomy from the University of Toronto, and a PhD in

Agricultural Botany from the University of Wales. In 1963 he joined the faculty of the University of Western Ontario as a lecturer, and has remained there ever since, currently holding the title of Professor emeritus in Biology. During that time Paul has authored or co-authored more than 130 papers, as well as an impressive list of technical reports, presentations, book chapters and book reviews.

Paul, numerous letters of support were submitted on your behalf and all of them were consistent on several themes, your tremendous list of accomplishments, your service to Canadian Botany, and international recognition as a preeminent weed scientist. Highlights from your long list of accomplishments include an Outstanding Teacher Award from the Weed Science Society of America, as well as CBA's Mary Elliott award for service in 2000. Paul was also part of the initial committee formed to investigate the formation of Plant Canada in 1998, and was a part of their executive until 2005. Finally, your many supporters speak very highly of your initiation and ongoing work with the series "*The Biology of Canadian Weeds*", "*The Biology of Invasive Alien Plants in Canada*", as well as your contributions as Editor of the NRC monograph series.

The comments are numerous, and I choose but a few to share with you:

"He has played a major role in tying together the purely academic with the applied aspects of weed research, and in doing so brought together those working in academia and those in agricultural research stations to the benefit of both parties. Not only is Paul recognized as the leading weed expert in Canada and North America, but he is recognized internationally."

"Dr. Cavers has been a master at explaining difficult concepts in a manner that can be understood by those who do not have sufficient background on the subject. He has watched his students' performance and progress closely, and inspired and encouraged them to be excellent scientists by conducting novel research and publishing their findings in high-ranking scientific journals."

"...I want to paint a more intimate picture of Dr. Cavers as a mentor and teacher... many professional Canadian plant ecologists look back fondly on their experience with Dr. Cavers. If the truth be told, many of these would probably not be plant ecologists at all without the influence of Dr. Cavers."

Dr. Cavers, on behalf of the Canadian Botanical Association / L'association botanique du Canada, congratulations on your prestigious award!

The Mary Elliott Award

There were no nominations for this award this year! Please give some thought to nominating a deserving individual for next year.

AWARDS FOR PAPERS PUBLISHED BY STUDENTS

J. Stan Rowe Award

This award was established to celebrate the life and work of Canadian Plant Ecologist Stan Rowe (June 11, 1918 to April 6, 2004).

The winner of the Rowe award this year is Carissa Brown for her paper entitled: "Linking past land use, recent disturbance, and dispersal mechanism to forest composition" published in *Biological Conservation* and co-authored with Dr. Céline Boutin.



Carissa Brown in the field



Dr. Paul Cavers and his wife, Joan, with daughters, Alison(left) and Brenda (right)

Alf Erling Porsild Award

This award was established to honor the memory of the eminent Arctic botanist Alf Erling Porsild. It is awarded in recognition of the best paper published in the field of systematics and phytogeography by a graduate student.

The winner of the Alf Erling Porsild Award this year is Eugenia Lo for her paper entitled "Population genetic structure of diploid sexual and polyploid apomictic hawthorns (*Crataegus*; Rosaceae) in the Pacific Northwest" published in *Molecular Ecology* and co-authored with Sasa Stefanovic and Tim Dickinson.

Eugenia Lo receiving her award from Dr. Rodger Evans



Taylor Steeves Award

This award was established to honour Taylor Steeves who has made numerous contributions to the CBA/ABC and to botany. It is awarded in recognition of the best paper published in the field of plant development by a graduate student

This year, the award goes to Julia Nowak for her paper entitled: "Developmental comparison of leaf shape variation in three *Chamaedorea* species" published in 2009 in *Botany* and co-authored with Adam Nowak and Usher Posluszny.



Julia Nowak

Luella K. Weresub Award. There was no winner of this award this year

Student Awards For Oral And Poster Presentations.

Lionel Cinq-Mars Award

This award was established in 1976 "for the best oral presentation by a student of his or her own research, as a contributed paper at the Annual Meeting". In 1978 the award was named in memory of Lionel Cinq-Mars, a charter member of CBA/ABC and a member of the first Executive (1965-66). Cinq-Mars (1919-1973) was an expert field botanist, amassing a personal herbarium of about 10,000 sheets. He was considered an expert on the genera *Viola* and *Amelanchier*.

Oral presentations were evaluated by a panel of judges chaired by the President-Elect, Hugues Massicotte. The judges were Christian Lacroix, Art Fredeen, Liette Vasseur and Moira Galway.

The winner was Elizabeth Da Silva, University of Ottawa, for her paper titled "Influence of an invasive plant species on plant pollinator interactions: Evidence for facilitation". The paper was co-authored with V. M. King and R.D.Sargent.

Honourable mentions were given to Leah Dalrymple, University of New Brunswick at St John, for her paper, "Cleaning up: making soap with plant materials", co-authored with K. Frego; and Christina Lord, Dalhousie University, for her paper, "The lace plant: a new model organism to study both developmental and induced programmed cell death", co-authored with A. Gunawardena.



From left to right. Elizabeth Da Silva, Hugues Massicotte, Christina Lord and Leah Dalrymple.

Iain and Sylvia Taylor Award

The Canadian Botanical Association gives an award for the best student poster presented at the Annual Meeting. The award is made in honor of Iain and Sylvia Taylor, two members who have for many years actively contributed to the development of the CBA. The posters were judged by a committee composed of Marian Munro, John Markham, and Frédérique Guinel, chaired by Christine Maxwell.

The winner was Lauren Schewe, University of Saskatchewan, for her poster "A microscopic study of the initiation and development of floral organs of flax (*Linum usitatissimum*)" co-authored with V.K. Sawhney and A.R. Davis.

Three honourable mentions were awarded. Julie Arsenault, of Université de Québec for her poster "Bryophyte flora associated with decaying black spruce logs in black spruce forest", co-authored with Y. Bergeron and N. Fenton. Marta Heckel of the University of Toronto for her poster "Unusual rhizome vasculature in *Maianthemum*", and Emily Macdonald for her poster, "The construction of nodulation maps to study nodule distribution in legumes" co-authored with J. Zupancic, F. Guinel, and N. Znotinas, of Wilfred Laurier University.

The awards were presented by Cindy Ross Friedman, chair of the Teaching Section.

From left to right Cindy Ross-Friedman (Chair of Teaching Section) Julie Arsenault, Marta Heckel, Emily Macdonald and Lauren Schewe.



Student Travel Awards And Bursaries

John Macoun Travel Bursary

This cash award, named in honour of John Macoun in 1988 provides partial financial assistance for travel to the Annual Meeting to a student (or students) presenting a paper in the Lionel Cinq-Mars competition or a poster in the Taylor competition.

John Macoun (1831-1920) was official botanist on five major Canadian expeditions and was, in 1881, appointed Botanist to the Geological and Natural History Survey of Canada. He was also a member of the Botanical Society of Canada (1860-62) and was a founding fellow of the Royal Society of Canada.

This year, travel awards were awarded to 5 students:

- Leah Dalrymple - University of New Brunswick, St. John
- Christina Lord - Dalhousie University
- Emily Macdonald - Wilfred Laurier University
- Anuar Rodrigues - University of Toronto
- Brinda Timsina - University of Manitoba, Winnipeg

From left to right, Rodger Evans, Leah Dalrymple, Anuar Rodrigues, Emily Macdonald, Christina Lord and Brinda Timsina.



Keith Winterhalder Undergraduate Travel Award

This award was established in 2006 and is in honor of Keith Winterhalder, a long time member and former president of the Association, for his outstanding contributions to the Association and for his never-failing interest and encouragement of the student members of the CBA/ABC.

This year, 5 travel awards were awarded to:

- Marielle Babineau - Université de Montréal
- Marta Heckel - University of Toronto
- Leigh Joseph - University of Victoria
- Lyssa Martin - Thompson Rivers University
- Lauren Schewe - University of Saskatchewan

From left to right, Rodger Evans, Marielle Babineau, Marta Heckel, Lyssa Martin, Leigh Joseph and Lauren Schewe



Regional Undergraduate Awards

Ontario Biology Day

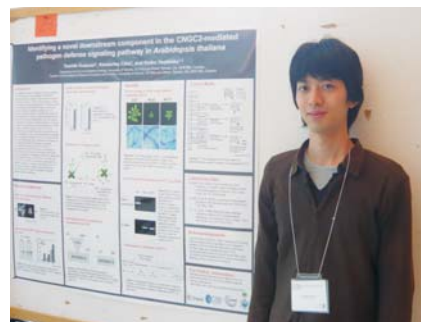
Two Undergraduate awards were presented at The Ontario Biology Day which was held on March 12th and 13th, 2010 at York University.

The award for the best oral presentation went to Daniel Anstett from the Department of Ecology and Evolutionary Biology at the University of Toronto. Daniel gave an excellent and interesting oral presentation on "Conditions favorable for lichen growth and development". He was very enthusiastic about his project which turned out to be rather difficult.



Daniel Anstett in the field

The award for the best poster went to Yoshiaki Koizumi from the Department of Cell and Systems Biology at the University of Toronto. Yoshiaki presented a poster entitled "Identifying a novel downstream component in the CNGC2-mediated pathogen defense signaling pathway in *Arabidopsis thaliana*". His supervisor is Dr. Keiko Yoshioka whose research focuses on plant-microbe interactions.



Yoshiaki Koizumi with his poster

Annual Regional University Science Undergraduate Research Day in BC

This was held at the University of the Fraser Valley on March 26th 2010. Two CBA/ABC regional undergraduate awards were handed out by Ron Wilen of UFV.

Best Poster in the Discipline of Botany (Canadian Botanical Association Prize) - Andrew Owusu "Proteins from Dwarf Mistletoe: A Basis for Gender Differentiation"

Best Oral Presentation in the Discipline of Botany (Canadian Botanical Association Prize) - Arvin Dwarka "Identification of A Gender-Specific Marker in the Genome of Dwarf Mistletoe"

The supervisor in both cases was Cindy Ross-Friedman.



Photo (left) Andrew Owusu receiving his award



Photo (right) Arvin Dwarka receiving his award

Rising Stars of Research 2010

In its third year now, Rising Stars of Research has become the most prestigious cross-disciplinary undergraduate research conference in Canada. The University of British Columbia hosted Rising Stars of Research 2010 from August 18-21, 2010.

The Association is a sponsor of the conference and also awards a prize for the best botanical poster.

This year the conference was attended by Cindy Ross Friedman, who also presented the CBA/ABC award.

The Winner of the CBA/ABC Prize for Best Poster in the Discipline of Botany is Pamela Belter, University of Alberta, for her poster titled, "Parasitic mycorrhizal fungi alter root foraging behaviour of *Achillea millefolium*".

Pamela Belter receiving her award from Cindy Ross Friedman.



Obituary

ANDRÉ B. BOUCHARD 1946 - 2010

ANDRÉ B. BOUCHARD 1946 - 2010

La communauté scientifique du Canada tout entier a perdu, le 4 mars 2010, l'un de ses grands scientifiques, l'écologiste et biologiste André B. Bouchard, professeur titulaire au Département de sciences biologiques de l'Université de Montréal et chercheur à l'Institut de recherche en biologie végétale (IRBV). André était titulaire d'un B. Sc. en sciences biologiques de l'Université de Montréal (1968), d'une maîtrise en écologie de l'Université McGill (1970) et a obtenu son Ph. D. de l'Université Cornell en 1975. La même année, André acceptait un poste conjoint entre la Ville de Montréal et l'Université de Montréal. Il deviendra conservateur du Jardin botanique et professeur d'écologie au département de sciences biologiques. Le mandat d'André Bouchard, tout en étant très clair, c'est-à-dire redémarrer les activités scientifiques au Jardin botanique et favoriser le développement de l'Institut, était immense et nécessitera un doigté extraordinaire ! Ce mandat, André Bouchard l'a réalisé en développant au Jardin botanique, en quelques années, une division de recherche composée de jeunes chercheurs d'envergure qui accroîtront le rayonnement scientifique de l'institution et participeront activement à la création en 1991 de l'Institut de recherche en biologie végétale communément appelé IRBV.

Tout en assumant son rôle de conservateur au Jardin botanique, André a poursuivi une carrière scientifique de très haut niveau. Il a été un spécialiste de l'écologie des communautés végétales et du paysage, de l'aménagement du territoire, de la maîtrise intégrée de la végétation et de l'évolution des écosystèmes agro-forestiers périurbains. Ses travaux de recherche, reconnus internationalement et ses très nombreuses publications scientifiques sur la végétation du sud-ouest du Québec et de Terre-Neuve, lui ont valu, en 1990, le prix Michel-Jurdant en sciences de l'environnement, accordé par l'Association canadienne-française pour l'avancement des sciences (ACFAS). Plus récemment, en 2005, l'Association des biologistes du Québec lui a décerné le prix Georges-Préfontaine.

Le Québec a aussi perdu un scientifique très engagé dans la préservation des écosystèmes. Sa grande intelligence, ses qualités de stratège, son jugement sans faille lui ont toujours permis de faire progresser les causes qui lui tenaient tant à cœur : l'écologie, l'environnement mais toujours dans une perspective humaine. André s'est notamment fait connaître en 1975 par la fondation de la Société d'animation du Jardin et de l'Institut botanique (devenue Amis du Jardin botanique en 1991), puis par plusieurs luttes sociales auxquelles il a participé, dont celle pour la sauvegarde de la forêt de Saraguay sur l'île de Montréal à la fin des années 70 et qui mena à la création des parcs-nature à sur le territoire de l'île de Montréal. Plus récemment, en 2004, à titre de commissaire de la Commission d'étude sur la gestion de la forêt publique québécoise, présidée par M. Guy Coulombe, on lui doit entre autre la recommandation centrale du rapport, soit la gestion écosystémique de la forêt publique.

Au-delà d'avoir été un scientifique prolifique, André Bouchard avait aussi beaucoup à cœur le désir et le plaisir de communiquer sa passion aux plus jeunes. Rassembleur hors pair, formidable pédagogue et doté d'un dynamisme communicatif exceptionnel, il a dirigé plus de 45 étudiants à la maîtrise et au doctorat, devenant ainsi un modèle pour



plusieurs générations de jeunes chercheurs et écologistes qui occupent aujourd'hui des postes aux niveaux gouvernemental, institutionnel ou universitaire. Par ailleurs, il laisse un héritage important, car plusieurs de ses étudiants gradués occupent aujourd'hui des postes de professeurs dans des universités canadiennes, et sont donc en mesure de poursuivre son œuvre.

Au début des années 1980, au côté de Pierre Bourque, André a été de tous les grands projets du Jardin botanique de Montréal. C'est durant cette période que de nombreux jardins seront réaménagés; la Roseraie, le Ruisseau fleuri, le Jardin Leslie-Hancock, etc. Par ailleurs, c'est aussi durant cette période que les jardins thématiques seront réalisés : Jardin et pavillon japonais, Jardin de Chine, la Maison de l'arbre et d'autres institutions d'envergure comme le Biodôme et l'Insectarium.

Plus particulièrement pour la Chine, André aura joué un rôle déterminant dans la réalisation du Jardin de Chine et de l'établissement des relations avec l'Empire du Milieu. Il séjourna en Chine avec toute sa famille (sa conjointe Cécile, et ses trois enfants Célinie, Antoine et François) de septembre 1990 à mai 1991, peu de temps après les tragiques événements de la Place Tien'anmen (Juin 1989). Ce séjour en Chine où André étudiera plus particulièrement la flore médicinale de Chine aura permis la mise en place de relations permanentes et solides basées sur un profond respect et une recherche de compréhension mutuelle entre deux cultures très différentes. En résumé, comme conservateur, André a établi la crédibilité scientifique du Jardin. La contribution d'André ayant été si importante, les projets qu'il a réalisés étant si nombreux qu'il est difficile de les présenter adéquatement dans cet article. Mais on pourrait dire tout simplement qu'André n'a pas enrichi sa carrière avec cette grande institution qu'est le Jardin botanique mais il a plutôt développé et fait progresser le Jardin botanique en utilisant ses nombreux talents, ses compétences, sa passion et son grand dévouement !

Une des dernières contributions d'envergure d'André aura été de nous faire connaître une facette peu connue de Marie-Victorin : ses expéditions et sa passion pour Cuba à travers une riche correspondance qu'entretenait Marie-Victorin avec le frère Léon, alors en poste à La Havane. André a mis alors tout son talent d'historien, de botaniste et d'humaniste pour nous faire découvrir un nouveau « Marie-Victorin ». Les retombées de ces travaux de recherche auront été nombreuses : de nombreux articles, un livre « Marie-Victorin à Cuba, Correspondance avec le frère Léon » publié aux Presses de l'Université de Montréal en 2007 et finalement,

une magnifique exposition intitulée « Sous le soleil de Cuba » et présentée dans la salle Jacques-Rousseau du Complexe d'accueil depuis le 5 décembre 2008.

Enfin, on ne peut passer sous silence la contribution majeure d'André dans l'aboutissement du projet du Centre sur la biodiversité, une réalisation issue de ce partenariat unique entre le l'Université de Montréal et le Jardin botanique et qui sera inauguré en novembre prochain. Le Centre sur la biodiversité sera sans aucun doute un élément marquant dans l'histoire du Jardin et de l'Université de Montréal et illustre parfaitement la pensée qu'André a véhiculée durant toute sa carrière au Jardin et à l'IRBV, l'importance de la recherche qui doit viser rien de moins que l'excellence et du partenariat entre deux grandes institutions, le Jardin botanique de Montréal et l'Université de Montréal. L'histoire du Jardin botanique de Montréal est à la fois riche et complexe. Des hommes remarquables tels que Marie-Victorin, Henry Teuscher et Pierre Bourque, ont tour à tour fondé, créé et renouvelé cette magnifique institution. À cette liste, il faut assurément ajouter André Bouchard.

Le Jardin botanique a perdu l'un des ses plus fidèles ambassadeurs et l'un de ses bâtisseurs. J'ai perdu un fidèle ami, un mentor, mais j'aurai eu cet immense privilège d'avoir pu le côtoyer et de m'enrichir à ses côtés pendant plus de trente ans.

Gilles Vincent

Directeur

Jardin botanique de Montréal

ANDRÉ B. BOUCHARD 1946 - 2010

On March 4, 2010, the Canadian scientific community lost one of its great scientists, ecologists and biologists, André B. Bouchard, senior professor in the Biological sciences department of the Université de Montréal and research scientist at the Institut de recherche en biologie végétale (Plant Biology Research Institute) (IRBV). André completed his Bachelor's degree (B.Sc.) in Biological sciences at the Université de Montréal (1968), his Master's degree in Ecology at McGill University (1970), and his Ph. D. at Cornell University in 1975. That same year, André accepted a joint appointment between the City of Montreal and the Université de Montréal as the director of the Montreal Botanical Garden, and as a teacher of ecology in the Biological Sciences department. André Bouchard's mandate, to restart the scientific activities at the Botanical Garden and to promote the institute's development, was a tremendous task and required extraordinary skill. In just a few years, André Bouchard fulfilled this mandate by developing a research division at the Botanical Garden composed of a team of ambitious young researchers who would enhance the institution's influence while participating actively in the creation of the Institut de recherche en biologie végétale (Plant Biology Research Institute), commonly referred to as IRBV.

While taking on his role as the Botanical Garden's director, André pursued a very successful scientific career. He specialized in plant community and landscape ecology, land-use planning, integrated methods of plant management, and in the evolution of peri-urban agro-forested ecosystems. His internationally-renowned research, as well as his many scientific publications on vegetation in Quebec's south west region and in Newfoundland, earned him the Michel-Jurdant prize in environmental sciences, in 1990, awarded by the *Association canadienne-française pour l'avancement des sciences* (ACFAS). More recently, in 2005, he was awarded the Georges-Préfontaine prize by the Association des

biologistes du Québec.

Quebec also lost a scientist who was highly dedicated to ecosystem preservation. His great intelligence, his skills as a master strategist, and his unfailing judgment all enabled him to advance the causes that were dear to his heart: namely ecology and the environment, but always with a human perspective. André particularly distinguished himself, in 1975, through the foundation of the *Société d'animation du Jardin et de l'Institut botanique* (later becoming *Amis du Jardin botanique/Friends of the Garden*, in 1991), and then by taking on many social causes, such as the fight for the preservation of the Saraguay forest on the island of Montreal in the 70s, which led to the creation of a network of urban woodlands on the island. More recently, in 2004, as a Commissioner of the Commission for the study of public forest management in Quebec, presided over by Mr. Guy Coulombe, he was responsible, amongst others, for the report's main recommendation, for ecosystem management of public forests.

Beyond being a prolific scientist, André Bouchard also gained great enjoyment from communicating his passion to the youth. An outstanding unifier, an amazing teacher, and a dynamic and exceptional communicator, André was in charge of more than 45 graduate students, becoming a model for many future generations of young researchers and ecologists who now occupy prominent jobs at the governmental, institutional and university levels. Moreover, he leaves behind an important legacy, as many of his former graduate students now hold jobs as professors in Canadian universities and are able to pursue his work.

At the beginning of the 1980's, at the side of Pierre Bourque, André was actively involved in all the big projects of the Montreal Botanical Garden. It is during this period that many of the gardens were redesigned; the Rose Garden, the Flowery Brook, the Leslie-Hancock Garden, etc. It is also during this time that the theme gardens were built: the Japanese Garden and Pavilion, the Chinese Garden, the Tree House and other important institutions, such as the Biodome and the Insectarium.

In particular, André played a leading role in the Chinese Garden's creation and in establishing relations with the Middle Kingdom. He traveled to China with his whole family (his wife Cécile and his three children, Célinie, Antoine and François) from September 1990 to May 1991, shortly after the tragic events of Tiananmen Square in June 1989. This stay in China, where André got the opportunity to study in detail the medicinal plants of China, allowed the establishment of permanent and solid relationships based on deep respect and a mutual comprehension of the two different cultures. In short, as a director, André established the scientific credibility of the Garden. André's contribution was so vast, and the projects that he realized were so many, that it is impossible to adequately present them all in this article. But one could simply say that André did not further his own career with this great institution, the Botanical Garden, but rather promoted and enhanced the Garden using his many talents, his skills, his passion and his great dedication!

One of André's last great contributions was to reveal one lesser-known aspect of his idol and a founder of the Botanical Garden, Brother Marie-Victorin: his trips and his passion for Cuba, discovered through a rich correspondence between Marie-Victorin and Brother Leon, then in post in Havana. André used all his talents as a historian, a botanist and a humanist to allow us to discover this new Marie-Victorin. The results of his research were numerous: his many articles, a book entitled *Marie-Victorin à Cuba, Correspondance avec le frère Léon* published at Presses de l'Université de Montréal, in 2007, and

finally, a beautiful exhibition *Under the Cuban sun with Marie-Victorin*, presented at the salle Jacques-Rousseau of the Administration building since December 5th, 2008.

Last, but not least, we cannot overlook André's major contribution in the realization of the Montreal Biodiversity Center project, a partnership between the Université de Montréal and the Botanical Garden, which will be unveiled next November. The Biodiversity Center will undoubtedly be a milestone in the Garden's history, as well as in the history of the Université de Montréal, and it perfectly illustrates the vision André had all throughout his career at the Garden and the IRBV, which was the importance of research aimed at nothing but excellence, and the partnership between two great institutions, the Montreal Botanical Garden and the Université de Montréal. The history of the Montreal Botanical Garden is a

rich and complex one. Remarkable men, such as Marie-Victorin, Henry Teuscher and Pierre Bourque, founded, created and reinvented this wonderful institution. To this list, we must assuredly add André Bouchard.

The Botanical Garden lost one of its most loyal ambassadors and contributors. I've lost a dear friend and a mentor, but I can say I've had the immense privilege of knowing him, and growing and evolving by his side for more than 30 years.

Gilles Vincent
Director
Montreal Botanical Garden

Book Review

Naczi, Robert F.C. & Bruce A. Ford [editors] 2008. *Sedges: Uses, Diversity, and Systematics of the Cyperaceae*. Monographs in Systematic Botany from the Missouri Botanical Garden, Volume 108. Missouri Botanical Garden, St. Louis, Missouri, USA. xi + 298 p. ISBN 978-1-930723-72-6 [hard cover] (ISSN 0161-1542 for the "Monographs") Price: US\$75.00

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This book is a collection of 14 articles originally presented as conference contributions on the "Sedges 2002." This was the first international conference devoted to Cyperaceae and was held 6-8 June 2002 on the campus of Delaware State University.

Articles in the book deal with the whole family of Cyperaceae, several groups of species, and even a single species. The geographical scope covered by the authors ranges from global distributions to occurrences in a single National Forest. Most of the botanical disciplines are well represented: the book covers ethnobotany, weed science, phytogeography, plant ecology, and taxonomy.

The first two articles, one by David A. Simpson and the other by Charles T. Bryson and Richard Carter, cover the use of Cyperaceae. Compared with grasses, the sedge family members have limited economic importance. The lists of weedy species are comprehensive and the long and exhaustive tables of species take up a large section of the first one hundred pages of the book. Even so, compared to the grasses the sedge family contains a much smaller number of cultivated species and only a relatively small part of the sedge family is weedy. I hope the full lists will be made accessible on a searchable web site.

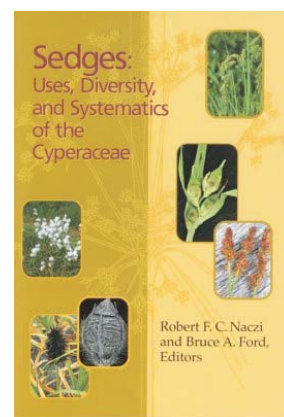
The next section contains five chapters dealing with phytogeography and ecology of sedges *sensu lato*. The phytogeography of the sedge family in the Coastal Plains of North America is nicely covered in Bruce A. Sorrie's contribution. Philip E. Hyatt illustrates the distribution of sedges in Kisatchie National Forest in Louisiana, USA. This forest forms a mosaic of holdings over seven parishes and hosts 59 *Carex* species. The distribution of *Carex* taxa is compared to the ecological classification of "landscape-scale" plant communities. The next chapter has a monospecific focus: it deals with the population and cover structure in Pennsylvania of a globally rare sedge, *Carex polymorpha*. The size of the plots used in this study (10 x 10 m for trees and woody shrubs, and 2 smaller 1 x 1 m plots) was far too small for sampling this type of vegetation. The authors also sampled only those stands which had at

least some *Carex polymorpha* growing in them. This gives skewed and biased results. The vegetation composition was distilled into cladograms in which the species composition and other information were lost—I would prefer to have had vegetation tables of relevés (plots) and the species growing in them.

The next contribution by Jacques Cayouette was a distinct improvement. He distilled his *Carex* experience into a balanced article on the phytogeography and taxonomy of the 97 species of *Carex* growing in the Quebec/Labrador flora north of 54th parallel. Taxonomic problems exist, he says, in 46% of them. *Carex* taxonomists and molecular botanists will find this chapter a source of inspiration. The remaining seven chapters are devoted to the taxonomy of various groups of the sedge family.

Studies of the allozyme variation in the genus *Carex* from 1986 to 2001 are summarized in the article by Leo P. Bruederle et al. Allozyme studies of over 50 species indicate that the rhizomatous sedges are predominantly outcrossing, whereas the cespitose sedges are more inbreeding. A similar situation was found in grasses by G.L. Stebbins. Phylogeny and patterns in *Carex* sect. Ouales ... are discussed in Andrew L. Hipp's chapter. ITS and 5.8S sequences of 79 species of the section Ouales and 28 other species of the subgenus *Vignea* were analyzed. The study concluded that *Carex illota* does not belong to section Ouales, a section that without the sedge is monophyletic. Based on the DNA analyses, a monophyletic section Ouales should also include the Asiatic *Carex maackii* and the Euro-Asiatic *Carex bohemica*.

The *Carex acuta* complex of section Phacocystis is treated in the chapter by Julie A. Dragon and David S. Barrington. A study of two spacers, ITS and ETS, revealed four monophyletic clades within this section. The taxonomic implications of this study were published recently in the *American Journal of Botany* (96:1896-1906. 2009).



Bruce A. Ford, Robert F.C. Naczi, and Julian R. Starr combine morphological analysis with the DNA analysis in their study of the section *Phyllostachyae* (*Carex backii*, *C. saximontana*, etc.). The number of species now recognized in section *Phyllostachyae* has doubled over a ten-year period.

Phylogeny of the unispicate taxa in the tribe Cariceae is addressed in the chapter by Julian R. Starr, Stephen A. Harris, and David A. Simpson. This chapter is an anomaly in this collection, since it is the second part of an article; the first part was published earlier in the 2007 volume of *Systematic Botany* (29: 528-544). The chapter can be hard to follow for those who have not read the first part.

Preliminary results of the study of the neotropical genus *Pleurostachys* by William Wayt Thomas and Marccus Alves reveal 23 species, including 5 new undescribed ones. The

DNA results call for modification of the earlier sectional division of the genus.

In the last chapter, A. C. Araújo et al. present the cladistic analysis *Rhynchospora*, section *Pluriflorae*. The results show that the subsectional division has to be revised.

The articles in this volume cover a wide variety of problems in the genus *Carex* and touch on some problems of the whole Cyperaceae family. On the negative side, the topics and taxa dealt with in this volume are those that occur in Eastern North America--western *Carex* taxa receive brief treatment. On the positive side, this collection is a great source of information and I found the extensive bibliographies useful, even more useful than bibliographies available electronically on the internet.

Adolf Ceska

Life after graduation: A report of a panel discussion held on May 19th 2009 at the CBA/ABC meeting at Acadia.

By L. Vasseur, Brock University



Stepping out into the new world after graduating from an undergraduate or graduate degree can be scary at first. But at the same time, it's the discovery of a new world. How do we get there? How should we prepare ourselves? What are the characteristics and skills that will help us? What challenges will we face? What is the right way to get to the best position? These are all excellent questions. Can we get the right answers from textbooks? I don't think so. This is why, in collaboration with others, we've organized two discussion panels at conferences (Canadian Botanical Association and Ocean Management Research Network) to explore these issues and get the points of view of people¹ who went through post secondary education programs to become professionals in academia, in industry, in NGO's, in government, or in any other field. This article briefly summarizes some of the main points or lessons learned from the two discussions. Interestingly, while there were some commonalities, there were also different points underlined in both sessions.

All participants stated that while our higher education systems are great in getting us started, along the path other skills and knowledge needed to be acquired over time. In fact, it was very clear, "you never stop learning".

The take home message is to never give up; there are always new things to learn. It is important for any job to be persistent and keep up with new ideas. Languages, for example, are huge assets, especially for people who intend to work with the federal government, or with international industries or organizations. In all jobs, it is clear that oral and writing skills are essential. In this new world of electronics, literacy skills are dramatically changing. However, in any position, people have to learn to communicate in a normalized/standard fashion. Text messaging utilizes only 70 terms to cover communications! This is a battle ground. On one side, new graduates used to abbreviations and phonetic texting will have to adapt to a world of complex, classic text production. There should also be transition courses for some to learn and create real sentences (or possibly other workshops for bosses to translate texting to real meaning!)

This brings us to another skill, not always easy to acquire, which would be team playing. Seems simple? How many times do we hear "I'm part of a team but I don't want to be

disturbed or slowed down."? To get or to keep a job, new graduates will benefit from practice of being a good team player. Be adaptable! If you're not flexible, you may find yourself alienated or searching for new employment. Greater flexibility will always help anyone find a job. Nowadays, job descriptions are changing very rapidly and without adjustment, no one can survive. This is especially true with technology. Who would have predicted even in the 1980's that desktop computers and VHS would become almost extinct? Not keeping in touch with technology (i.e. know your IT personnel and be good friends with them) can cost you a job these days.

Advisors at schools, colleges or universities can always inform students of courses that will be useful for their degree considering the basic requirements to graduate. Now is this enough? Already we mentioned oral and writing skills. How many students are highly motivated to take courses or electives in these matters? As mentioned by participants we often underscore the roles or importance of these skills... until interview time. So adding personal training can be a great way to get ahead of the pack. Never forget that others are competing for the same positions that you are. For example, if you're interested in academia, pedagogy skills can be useful (even attending one or two training workshops can make a difference). Attending seminars can be a valuable way to learn and, as we'll see later, get the right contacts. It goes back to advice often mentioned in both sessions; never stop learning! It is also useful to speak to others about their jobs. Ask them what they do, learn about them. The more you know about a position, the greater your chances to obtain such positions or at least to know what you'll need in terms of expertise.

You never know what life can bring you. How often have we been surprised by an opportunity or an offer that we didn't expect? Most people can tell you that it has happened to them. The next logical question is how do we react to these events? The main advice from mentors is to not close your eyes to possibilities. The use of a mentor is important in the case of uncertainty and indecision. While some opportunities may sound great, once you have weighed all the pros and cons, you may find out that it's not worth it. You can also build your own path and keep doors open. Many participants encouraged students to get to know the

people in their fields. Networking is essential nowadays to maintain a list of people who can serve as referees, monitors, etc. Plan in advance. Even if this may be sometimes difficult financially or otherwise, attending conferences or other events can help connect with potential employers. Attending seminars can have some impacts; but only if you participate. Interact with people, meet the speakers, ask questions. It comes down to one sentence, don't be shy! You're not alone.

As students finishing a degree we often have this feeling that no one understands the anxiety we may have. Accept all advice but ultimately this is a personal journey. This brief communication suggests a few steps or tricks that can be useful. It's important to realize that you're not alone. But being as prepared as possible can help reduce the level of anxiety or uncertainty. Yet all the best advice in the world will not be helpful unless you also persist. Never give up. The current market is very volatile, but jobs can be found anywhere and in various spheres from industry to academia

or governmental agencies. Being flexible and mobile will always give you an edge during a competition. Being adaptable to these changes will also be an advantage for you and for future employers.

In the end, what remains important is that you feel positive and happy in your career choices. Changes are then always easier to accept. It is no surprise that the prominent commonality across the various fields of employment was that people were guided by, and successful at, doing the things they loved. Perhaps this is the secret to success and what gives us the drive and determination to keep learning and acquiring new skills.

Contributors include: Adrienne Sinclair (co-chair of the Ecology section of the CBA, Environment Canada), Mariam Munro (CBA, Nova Scotia Museum of Natural History), Ed Reekie (CBA, Acadia Univ.), Nick Hill (CBA, Dalhousie Univ.), Chris Eckert (CBA, Queen's Univ.), Steve Stevens (DFO-OMRN), Steve Plante (OMRN, UQAR), and Colleen Mercer-Clarke (OMRN, private sector/Dalhousie Univ.).



Chlorofilms contest

Winners of Plant-Biology Video Contest Announced by ChloroFilms Project at Penn State University

Winners of an international competition organized at Penn State University for new plant-biology videos on YouTube have been announced. The winners, whose awards include a share of over \$5,000 in cash prizes, are the second group of awardees in a series of competitions organized by the nonprofit collaborative project ChloroFilms, which was started by Daniel Cosgrove, the Eberly Chair of Biology at Penn State. ChloroFilms has awarded \$13,600 in prizes since the competitions began in 2009. "ChloroFilms promotes the creation of fresh, attention-getting, and informative videos about plant life," Cosgrove said. The winning videos, as well as all the contest entries, are on the ChloroFilms web site at <http://www.chlorofilms.org/>. Two Grand Prizes of \$1,000 are being announced for the second group of winners. One of the Grand Prizes goes to Noah Flanigan of Murfreesboro, Tennessee for his entry titled "Kenaf Callus Hoedown" -- a lively and quirky music video using stop-motion techniques to illustrate process of culturing plant tissue. Another Grand Prize goes to David Livingston of Raleigh, North Carolina, for his video "Arabidopsis Flower in 3D," which illustrates the internal anatomy of flower stalks using microscopic sectioning and

3D reconstruction. The awards also include four first prizes of \$500 each and five second prizes of \$250 each.

Another ChloroFilms competition is now underway. All videos for the new competition must be submitted by 8 December 2010. For more information about contest requirements, see <http://www.chlorofilms.org/>. ChloroFilms is a nonprofit collaborative project started by Cosgrove at Penn State University with support from the Education Foundation of the American Society of Plant Biologists, the Botanical Society of America, **the Canadian Botanical Association**, and the Penn State Institutes for Energy and the Environment. With the help of volunteers at colleges and universities around the globe, ChloroFilms is working to combine video, Internet, and social-networking technologies to promote a greater appreciation and understanding of plant life and to make the best plant-biology videos easy to find from its website at [ChloroFilms.org](http://www.chlorofilms.org/).

Daniel Cosgrove: (+1)814-863-3892, DCosgrove@psu.edu
VIDEOS

The winning videos, as well as all the contest entries, are on the ChloroFilms web site at <http://www.chlorofilms.org/>

Congratulations!

Deep Shafullah and Christian Lacroix (University of PEI) won one of the three second place prizes in the 2nd Chlorofilm competition for their entry titled "A leaf is born", which can be seen at:

<http://www.chlorofilms.org/?module=Pages&func=display&pageid=15#223>

BIOLIEF 2011 - 2nd World Conference on Biological Invasions and Ecosystem Functioning. Mar del Plata, Argentina, November 21-24, 2011.

BIOLIEF 2011 will be a forum for the presentation, discussion, and synthesis of research on biological invasions in its broadest sense. The conference will place a particular emphasis on studies concerning the impact of invasive species on ecosystem functioning and/or services, irrespective of taxonomic groups or ecosystem types. However, studies on any other ecological aspect of biological invasions will also be welcome. Topics such as the spread of invasive species into ecosystems, the biogeography and history of species introductions, and the community or species-level impact of biological invasions will also have an important coverage in the final conference program.

Contact: Jorge L. Gutiérrez, E-mail: biolief@grieta.org.ar

For more information about this meeting, visit our website (<http://www.grieta.org.ar/biolief/>). You can also follow us in Facebook for news and updates (<http://www.facebook.com/?ref=home#!/pages/BIOLIEF-2011/126444150720221?ref=sgm>).

NATIVE PLANT EMBLEMS OF CANADA

13. The Northwest Territories

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FLORAL EMBLEM: Mountain Avens

SYMBOLISM

Mountain avens is an excellent symbol of the Northwest Territories. The species provides a creamy white floral carpet over many gravel flats and rocky terrain, bringing impressive beauty to the landscape. It reflects the hardness of the people in adapting to the stressful climate in one of the most extensive (and last) regions of wilderness in the world. The species is a dominant plant of the arctic tundra, and thus has an impact on many other arctic species. It is also a popular plant with First Nations people, and so reflects their important presence.

LATIN NAMES

Dryas integrifolia Vahl

The genus name *Dryas* is based on a Greek word (*druas*) for dryad. Dryads were mythological female spirits of nature (nymphs) who presided over groves and forests. They were particularly associated with oak woods, and the genus name was based on a resemblance of the tiny leaves of one of the European species to the foliage of Mediterranean region oaks. However, *Dryas* species are not inhabitants of woods. *Integrifolia* in the scientific name is Greek for entire-leaved, i.e. having leaves with margins that are not lobed or serrated.

ENGLISH NAMES

Mountain avens. Also: arctic dryad, entireleaf arctic avens, entireleaf mountain-avens, white dryad, white mountain avens.

The names white dryad and white mountain avens are also applied to the closely related *D. octopetala* (alpine dryad). "Avens" is the usual name for species of the genus *Geum*, the word tracing through Old French *avence* to Medieval Latin *avencia*, and interpreted as a kind of clover.

FRENCH NAMES

Dryade de montagne. Also: dryade à feuilles entières.

INUIT NAMES

There are numerous Inuit names for the species, many referring to the plant at different seasons, or to specific parts of the plant. The name *malikkaat* indicates significant seasonal occurrences. The word *isurramuat* refers to the fact that the flowers follow the path of the sun. The name *piluit* for the plant is also the name for a dye and seeds from it. Names for the leaves, *qasilinnait* and *atungaujat*, are also used for the plant, which is also known as "the plant that numbs the tongue". For additional information, see Aiken et al. (2007), and Mallory and Aiken (2004, which also includes informative text in Inuktitut), cited below.



Fig. 1. Mountain avens (*Dryas integrifolia*) by Lavonia R. Stockelbach (1874-1966). A collection of her paintings of Canadian provincial and territorial official flowers is associated with the herbarium of Agriculture and Agri-Food Canada in Ottawa.

HISTORY

a. Canada

Dryas integrifolia was selected as the floral emblem by the Council of the Northwest Territories on June 7, 1957. The choice was made on the advice of A.E. Porsild, Chief Botanist of the National Museum of Canada and a distinguished Arctic explorer, who had noted that the plant was extremely common in the Arctic. Numerous websites erroneously state that the floral emblem is *D. octopetala*, a very similar species. The Floral Emblem Act stated: "The flower known botanically as the *Dryas integrifolia* and popularly known as the mountain avens is adopted as the floral emblem of the Northwest Territories." In anticipation of the splitting off of Nunavut from the Northwest Territories (which occurred on April 1, 1999), a Special Committee was established in 1998 to advise on the continuing status of the official symbols, and it was suggested that mountain avens be retained as the floral symbol of the new, reduced

Northwest Territories. This recommendation was followed.

b. Foreign

Dryas octopetala was chosen as Iceland's national flower in 2004 by the country's parliament, after a nationwide public opinion poll.



Fig. 2. Mountain avens (*Dryas integrifolia*), photographed near Upernavik, Greenland. Photographs respectively clockwise from upper left: 2007: 28 June, 11 July, 11 July, 16 July. The upper two photos show plants in flower, the lower photos show plants that are developing fruiting heads. Photos reproduced by courtesy of Kim Hansen (available on Wikimedia Commons, where copyright restrictions are noted).



Fig. 3. Mountain avens (*Dryas integrifolia*) in Great Whale River area, northern Quebec, 12 July 1969. Photo by J. Cayouette.

APPEARANCE

Mountain avens is a dwarf or low-growing, long-lived shrub, usually 5-15 cm (2-6 inches) high, often trailing or forming low mats 10-100 cm (4-39 inches) in diameter. The branches often take root in the soil. The more or less smooth-edged leaves are spade-shaped, leathery, usually wooly on the undersides, small (5-25 mm or 0.2-1 inch

long), and often remain green overwinter (the foliage has been variously and contradictorily described as "evergreen", "deciduous", and "tardily dehiscent"). Flowering occurs from June to July. The flowers are bowl or saucer shaped, and have 8-10 white or creamy yellow petals. The flowers occur singly on stalks that are 2.5-15 cm (1-6 inches) long. After flowering, the styles of each flower become long and feathery, each attached to a single-seeded fruit. The fruits are dry, brown or straw-coloured, and 2-5 mm (0.08-0.2 inch) long. When immature or damp, the long, feathery, plume-like styles are twisted together so the fruits are massed in a tight head. As the fruits mature and dry out their styles unravel (giving the head of fruits the appearance of a feather duster) and the individual single-seeded fruits are scattered by the wind.

CLASSIFICATION

Family: Rose family (Rosaceae).

Six species of *Dryas*, one with two varieties, have been recognized in the Northwest Territories. The most widespread in Canada and the Northwest Territories is *D. integrifolia*. A key to the species of Canada (all of which are in the Northwest Territories) follows on the next page, and indicates where they occur in the territory. Hybridization is thought to be common where species overlap and this may lead to difficulties in identification. Hybrids with *D. octopetala* have been reported in parts of the range. There are also two named natural hybrids: *D. ×sundermannii*, a hybrid between *D. octopetala* and *D. drummondii*, recorded in Alberta; and *D. ×wyssiana*, a hybrid between *D. integrifolia* and *D. drummondii* found in Quebec.

GEOGRAPHY

Mountain avens is a common, widespread, Arctic species, native to the northern half of North America, especially the Canadian Arctic Archipelago, as well as Chukotka in Beringia, and the coastal areas of Greenland and Alaska. Isolated collections have been made in Maine, Montana, and New Hampshire. In Canada the species extends from the north of Ellesmere Island down through the Canadian Arctic Archipelago to southern Nunavut, the Labrador-Ungava Peninsula, the Gaspé Peninsula, Quebec, Jasper Park in Alberta, western Newfoundland, along the north shore of Lake Superior, and on the coasts of James Bay, Hudson Bay, and Yukon. When most of Canada was covered by mile-deep ice more than 10,000 years ago, mountain avens occupied refugial, unglaciated areas including Beringia (parts of Alaska, Yukon, and western Northwest Territories) and the High Arctic. (See Fig 4 overpage)

ECOLOGY

Mountain avens is a pioneer species, adapted to colonizing open areas. It is often found on marine beaches and gravelly regions, both habitats that are very deficient in plant nutrients. Northern gravel sites also often provide limited moisture. Such sites are difficult for most plant species to colonize, and mountain avens is unusually tolerant of the stresses presented in these situations. *Dryas integrifolia* has several adaptations suiting it to its harsh, short-season environment. The low stature is protective against drying in the wind (wind speed is considerably lower near ground level), and also lowers abrasion from sand-blasting.

Key to the Species of *Dryas* of Canada

- 1A. Flowers yellow, nodding with petals forming a bell shape; filaments hairy near the base; leaves wavy-edged from base to near tip.....*D. drummondii* (no varieties recognized, occurs in the west)
 1B. Flowers white or whitish-yellow, erect with petals spreading; filaments smooth near the base; leaves wavy-edged or wavy edged only in the basal half.....2
- 2A. Leaves wavy-edged only in the basal half, non-glandular with simple hairs on the underside.....*D. integrifolia* ...3
 2B. Leaves wavy-edged from base to near tip, glandular or not and with hairs on the underside that are simple, feathery, and/or scale-like.....4
- 3A. Leaves linear, with revolute margins and pointed tips.....*D. integrifolia* subsp. *integrifolia* (widespread)
 3B. Leaves oblong, with flat margins and rounded tips.....*D. integrifolia* subsp. *sylvatica* (local in the west)
- 4A. Leaves bearing feathery hairs, especially on abaxial midribs and petioles.....*D. octopetala* var. *kamtschatica* (occurs in MacKenzie Mountains)
 4B. Leaves bearing mostly or entirely simple hairs (gland-tipped or not).....5
- 5A. Midvein on undersurface of leaf without stalked glands but often densely hairy.....*D. crenulata* (occurs on mountains in MacKenzie Valley)
 5B. Midvein on undersurface of leaf with gland-tipped hairs.....6
- 6A. Leaves thinly hairy between the nerves.....*D. alaskensis* (occurs in the Richardson Mountains in the northwest)
 6B. Leaves densely hairy between the nerves.....*D. hookeriana* (occurs in southern MacKenzie Valley)

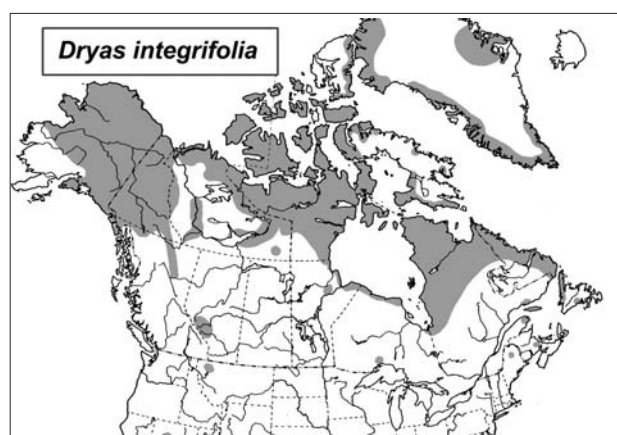


Fig. 4. North American distribution of mountain avens (*Dryas integrifolia*).

The wooliness and downward curving of the leaf margins reduces moisture loss from the tissues, and the taproot grows down to obtain moisture. the semi-evergreen nature of the leaves is a way of taking advantage of the short season during which photosynthesis can occur, since many leaves are present on the plant in early spring as soon as the warming temperature revives the plants.

Habitat

Dryas integrifolia occurs in meadows, tundra, slopes, ridges, and river terraces. it is found on both moist and dry areas, and is most abundant on calcareous (limestone), barren, rocky or gravelly ground.

Root nodules of the related *Dryas drummondii* plants have been demonstrated to contain the symbiotic nitrogen-fixing bacterium *frankia*, and the same has been claimed for *D. integrifolia*. plant species adapted to nutrient-poor soils often are associated with nitrogen-fixing microorganisms, because

of the advantage in acquiring nitrogen, the most important soil element in plant productivity. However, the evidence for nitrogen fixation in *D. integrifolia* is weak.



Fig. 5. Mountain avens (*Dryas integrifolia*) in Ukkusiksalik National Park, Nunavut. Photo taken on July 7, 1999, courtesy of Ansgar Walk.

Inter-species Relationships

Caribou eat large amounts of *D. integrifolia*; this is not surprising since it is a dominant plant on the tundra. Muskoxen, the other major ungulate species in the arctic environment, eat lesser amounts. The immature fruits are consumed by numerous species of small rodents as well as several species of birds.

Pollination & Dispersal

Dryas flowers are often heliotropic, turning towards the sun as it moves across the horizon. However, the degree of

heliotropism has been found to differ somewhat, depending on location, and often not all flowers of a plant follow the sun. Frequently when the flowers are not heliotropic, they nevertheless tend to be oriented towards the mid-day sun. The bowl or saucer shape of the flowers of *Dryas* and many other arctic plant species is commonly interpreted as a sort of parabolic satellite dish that focuses the rays of the sun at the centre of the flower where the seed develops. This arrangement appears to be an adaptation to collect solar heat, promoting faster development of the seeds in an environment that is quite cold. In fact, in *D. integrifolia* it has been found that flowers oriented directly towards the sun are about 4° C (7° F) warmer than ambient temperatures. Moreover, insects often bask in the concentrated heat generated in the flowers, and it has been found that mountain avens flowers facing the sun are more likely to be visited by pollinators. Although the species can self-pollinate, cross-pollination has been found to produce larger seeds, and plants are dependent on insects for maximum seed set. Several species of flies are important pollinators of mountain avens, but so are workers of the bumble bee *Bombus polaris*.

The fruits are single-seeded, attached to the persisting style of the flower, which is feathery and serves as a sail or parachute for seed distribution by wind. Lemmings are thought to distribute some of the seeds. Seed production is often very irregular. Lateral rooting of branches coupled with fragmentation of mats is a form of vegetative reproduction that assists somewhat in spreading the plant.

USES

Mountain avens is occasionally grown as a rock garden ornamental. First Nations people sometimes obtained a bright green dye from the flowers and seed heads. Several researchers have commented that it seems to be a good candidate for purposes of revegetating northern landscapes.

CULTIVATION

There are a few cultivars (such as 'Greenland Green') of *Dryas integrifolia*, but most cultivated plants are simply identical to the wild plants. Instructions on how to grow mountain avens, from former Central Experimental Farm

horticulturalist and co-worker Larry Sherk, are reproduced in the following, from his popular but out-of-print (1967) guide (cited in #1 of this series) to growing Canada's floral emblems: "If you want to grow the plant in the warmer southern areas, be sure to plant it in a rock garden or among pebbles where there is good drainage but enough moisture to keep the soil from becoming too dry. The plants need shade from the hot afternoon sun, but sun for the rest of the day. Use a well-drained soil with some added peat moss or leaf mold. Large plants usually do not survive transplanting. Because this plant has a taproot, even young seedlings in the wild must be moved carefully. Cuttings taken in August can be rooted in moist sand. To start the plants from seed, sow the seed as soon as it is ripe in seed pans in a well-drained, sandy soil mixture. Sow older seed in the same way, but first stratify it at 40 °F [5 °C] for at least 2 months. Transplant seedlings into individual pots rather than flats to reduce the shock of transplanting them later in the garden. Plants grown from seed take several years to flower."

CONSERVATION STATUS

Dryas integrifolia is a widespread plant, not currently in need of conservation. Climate change is altering the Arctic environment, and this could result in a reduction of the species in some regions.

MYTHS, LEGENDS, TALES, FOLKLORE, AND INTERESTING FACTS

- The "Younger Dryas" (ca. 10,800-9,500 B.C.E.; also called "The Big Freeze") and the "Older Dryas" (occurring about 1,000 years before the Younger Dryas, and lasting only about 3 centuries) are cold geological periods (but not as cold as ice ages) that affected at least the Northern Hemisphere. These periods were named after *Dryas octopetala* plants in Ireland that flourished during those times, and are used as fossil indicators of the periods.
- The Inuit employed the degree of maturity of mountain avens as a seasonal indicator. The untwisting of the tangled styles in the seed head was interpreted as the best time to move inland to hunt caribou. When the seed heads are tightly twisted, caribou skins were considered too thin to make clothing. As the seed heads untwisted, the skins were considered suitable for women's clothing, and when the

Fig. 6. Painting of the official flower of the Northwest Territories, mountain avens (*Dryas integrifolia*), from the Walter Coucill Canadian Centennial official flowers of Canada series (see Coucill 1966 cited in #1 of this series). Reproduced with the permission of the copyright holders, the Coucill family.





Fig. 7. Mountain avens (*Dryas integrifolia*). Source: Canadian Heritage. 2002 (revised edition). Symbols of Canada. Canadian Heritage, Ottawa, ON. Reproduced with permission.

seed heads fully expanded, caribou skins were then believed to be suitable for men's clothing.

- *Dryas octopetala* (which occurs in the highlands of Scotland) is the badge of the Scottish clan MacNeil.
- Patches of mountain avens that are only 0.5 m² (1.5 square feet) in area, formed by vegetative reproduction, can be hundreds of years old, although no existing part of the plant is that age (the oldest recorded age of part of a living plant is 68 years).



Fig. 8. Mountain avens (*Dryas integrifolia*). Source: Department of the Secretary of State of Canada. 1967. The arms, flags and floral emblems of Canada. Reproduced with permission.

SOURCES OF ADDITIONAL INFORMATION

Aiken, S.G., Dallwitz, M.J., Consaul, L.L., McJannet, C.L., Gillespie, L.J., Boles, R.L., Argus, G.W. Gillett, J.M., Scott, P.J., Elven, R., LeBlanc, M.C., Brysting, A.K., and Solstad, H. 1999 onwards. Flora of the Canadian Arctic Archipelago: descriptions, illustrations, identification, and information Retrieval. Version: 29th April 2003.

<http://www.mun.ca/biology/delta/arcticf/>.

Au, R., and Tardif, J.C. 2007. Allometric relationships and dendroecology of the dwarf shrub *Dryas integrifolia* near Churchill, subarctic Manitoba. Can. J. Bot. 85: 585-597.

Hart, G.T., and Svoboda, J. 1994. Autecology of *Dryas integrifolia* in Alexandra Fiord lowland habitats. pp. 145-156 in Ecology of a polar oasis: Alexandra Fiord, Ellesmere Island, Canada. Edited by J. Svoboda and B. Freedman. Captus University Publications, Toronto, ON.

Hultén, E. 1959. Studies in the genus *Dryas*. Svensk Botanisk Tidskrift 53: 507-542.

Kevan, P.G. 1972. Insect pollination of High Arctic flowers. J. Ecol. 60: 831-847.

Krannitz, P.G. 1996. Reproductive ecology of *Dryas integrifolia* in the high Arctic semi-desert. Can. J. Bot. 74: 1451-1460.

Mallory, C., and Aiken, S. 2004. Common plants of Nunavut. Nunavut Dept. Education, Nunavut Wildlife Management Board, Canadian Museum of Nature. National Printers, Nepean, ON. 400 pp. (200 in English, 200 in Inuktituk).

Markham, J.H. 2009. Does *Dryas integrifolia* fix nitrogen? Botany 87: 1106-1109.

Philipp, M., and Siegismund, H.R. 2003. What can morphology and isozymes tell us about the history of the *Dryas integrifolia* complex. Molec. Ecol. 12: 2231-2242.

Porsild, A.E. 1947. The genus *Dryas* in North America. Can. Field-Nat. 61: 175-192.

Rouleau, E. 1956. The genus *Dryas* (Rosaceae) in Newfoundland. Contributions de l'Institut Botanique de l'Université de Montréal 69: 5-23.

Tremblay, N.O., and Schoen, D.J. 1999. Molecular phylogeography of *Dryas integrifolia*: glacial refugia and postglacial recolonization. Molec. Ecol. 8: 1187-1198.

Wada, N. 1998. Sun-tracking flower movement and seed production of mountain avens, *Dryas octopetala* L. in the high arctic NY-Ålesund, Svalbard. Proc. NIPR Symp. Polar Biol. 11: 128-136.

Zoltai, S.C. 1973. The range of tamarack (*Larix laricina* (Du Roi) K. Koch) in northern Yukon Territory. Can. J. Forest Research 3: 461-464.



TREE: Tamarack



Fig. 9. Silhouette of tamarack (*Larix laricina*). Source: Farrar, J.L. 1995. Trees in Canada. Canadian Forest Service and Fitzhenry and Whiteside, Markham, ON, Canada. Reproduced with permission.

SYMBOLISM

The tamarack is a very suitable choice as the official tree of the Northwest Territories, because: it is exceptionally attractive, noted for its conical shape and striking golden autumn colouration; its hardiness epitomizes the ability of the inhabitants to thrive in a difficult climate; First Nations people used the tree extensively, and so it reflects their contributions and presence; the tree is common in the territory.

LATIN NAMES

Larix laricina (DuRoi) K. Koch

The genus name *Larix* is the classical Latin name for the larch tree (the word has been claimed to translate as “fat”, a reference to the tree’s resin). *Laricina* in the scientific name is Latin for larch-like, the word used because the species was once considered to be a pine, with the name *Pinus larix* L.

ENGLISH NAMES

Tamarack. Also: American larch, black larch, eastern larch, hackmatack, larch, larch hackmatack, red larch, tamarack larch. The inappropriate name “juniper” is sometimes used in the Maritime Provinces.

The name “tamarack” is a French Canadian modification of the Abenaki (of the Algonquian Native American group) name for the species, *akemantak*, meaning “wood used for snowshoes”. “Hackmatack” (which is also occasionally applied to balsam poplar, *Populus balsamifera*), may also trace to the same Abenaki term. The English word “larch” traces back to the Latin *larix*, probably through the German *Lärche*. “Alaska larch” refers to *L. laricina* var. *alaskensis* (Wight) Raup, an isolated central Alaskan variety that most taxonomists have concluded does not merit recognition. The name “red larch” (and the French *épinette rouge*) points out the often reddish colour of the underbark (several *Larix* species frequently have a vivid reddish-purple inner bark).

FRENCH NAMES

Mélèze laricin Also: *épinette rouge*, *fausse épinette rouge*, *mélèze*, *mélèze d’Amérique*, *tamarac*, *violon*.

The French name “mélèze” is probably based on *miel*, honey, a reference to the bittersweet resin secreted by the tree. The French word *épinette* normally means spruce, but its use for the tamarack reflects the practice of the first French settlers in Canada to apply *épinette* to several species of conifers.

HISTORY

a. Canada

In anticipation of the splitting off of Nunavut from the Northwest Territories (which occurred on April 1, 1999), a Special Committee was established in 1998 to examine the continuing status of the official symbols, and it was recommended that tamarack replace jack pine as the official tree of the reduced territory. The tamarack was named as the official tree on Sept. 9, 1999.

b. Foreign

The Northwest Territories is the only large political area that has adopted a species of *Larix* as an official emblem.



Fig. 10. Tamarack (*Larix laricina*) trees in their fall foliage on Oct. 31, 2008 in Barre town, Vermont. Photo by Linda Baird-White, released into the public domain on Wikimedia.



Fig. 11. Young cones of tamarack (*Larix laricina*). Photo courtesy of Steven Katovich (USDA Forest Service) and Bugwood.org.

APPEARANCE

Well-developed tamarack trees are generally 15-23 m (49-76 feet) tall, with a diameter at breast height of 36-51 cm (14-20 inches). However, the trees are often stunted on poor soils, in the far north, and on mountains. The bark is thin, smooth when young and rough and scaly on older trees. The needle-like leaves are soft, flexible, and mostly 1-2.5 cm (0.4-1 inch) long. The ends of the branches bear single, distinctly separated needles. Farther back on the regular branches the needles occur in clusters or tufts of 10-20 on very short, stubby, “spur branches”. The leaves are deciduous, unlike the foliage of most other coniferous plants, turning from light green in summer to yellow before

they are shed in the autumn. (Bald cypresses, *Taxodium* species, are other examples of the very few conifers that are deciduous.) After the leaves have fallen, a knob is left on the regular branch (the remnants of the spur branch), and the knobby regular branches of tamarack are very characteristic of the species. Both male and female cones occur on the same tree, the female cones maturing their seed within the season they are produced. The male cones have the appearance of small mounds (less than 5 mm or 0.2 inch wide), and are made up of brown to yellowish pollen sacs with papery scales at their base. They occur along the branches, especially in the lower part of the crown. The male cones develop in early spring, shed their pollen, and wither. The seed cones are 1-2.3 cm (0.4-0.9 inch) long, bright red or green when young but turning brown with maturity; they contain 12-25 seed scales, each bearing two seeds. After shedding their seeds in late summer and fall, the cones often remain on the tree for 2 to 5 years. The seeds are 2-3 mm (about 0.1 inch) long, excluding their wings. The trees rarely live as long as 200 years.

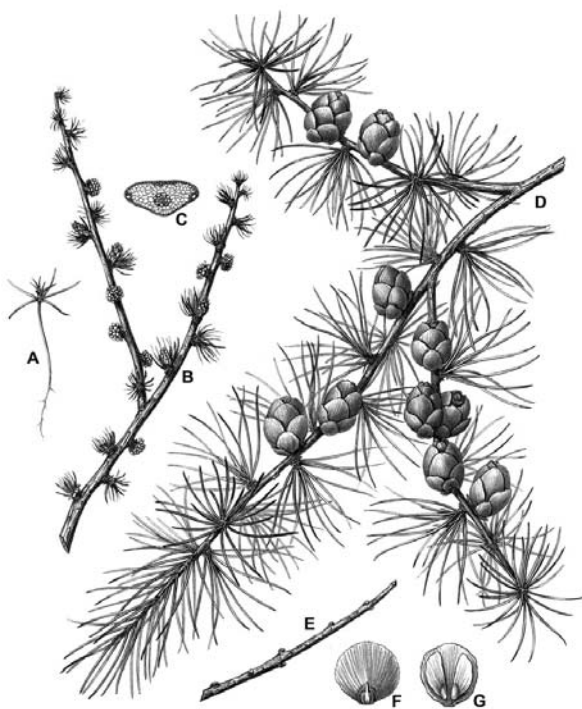


Fig. 12. Tamarack (*Larix laricina*). A, Seedling. B, Flowering branch. C, cross section of a leaf. D, Fruiting branch. E, Branchlet in winter. F, Lower side of cone scale. G, Upper side of cone scale with its two seeds. Source: Sargent, C.S. 1898. The silva of North America. Houghton, Mifflin and Company, Boston, MA. Vol. 12, plate 593.

CLASSIFICATION

Family: Pinaceae (pine family).

Larix is a genus of about 10 species of the northern hemisphere, three occurring in North America. In addition to *L. laricina*, *L. occidentalis* (western larch) and *L. lyallii* (alpine larch) occur in southern British Columbia and southern Alberta; both of the latter species also are native to the northwestern United States. The following key identifies

the larches commonly found in Canada.

- 1A. Scales of fruiting cone pubescent on the out*L. decidua* (introduced)
- 1B. Scales of fruiting cone smooth on the outside.....2
- 2A. Twigs smooth; seed cones 1-2 cm long, with bracts shorter than the scales.....*L. laricina*
- 2B. Twigs hairy, at least when young; seed cones 2-5 cm long, with bracts longer than the scales.....3
- 3A. Twigs densely hairy; scale margins with rough, irregular edges.....*L. lyallii*
- 3B. Twigs sparsely hairy; becoming smooth; scale margins with straight edges.....*L. occidentalis*

GEOGRAPHY

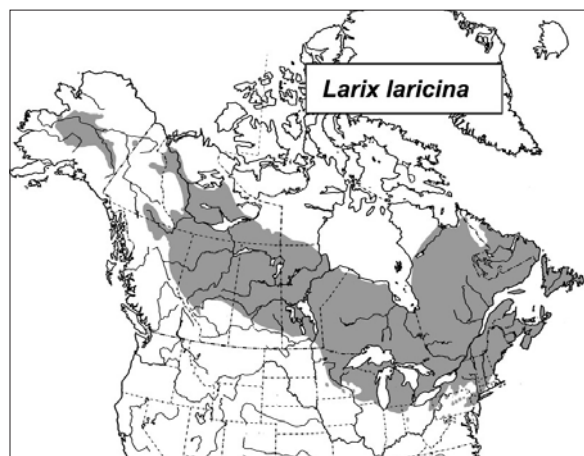


Fig. 13. Distribution of tamarack (*Larix laricina*) in North America and Greenland.

Larix laricina is distributed widely through the boreal forest of North America from Alaska to Newfoundland, extending from the tree line in the north slightly into the deciduous forest to the south. The southern limit includes northeastern British Columbia and central Alberta, southern Minnesota, Wisconsin, northeastern Illinois, and New England, with isolated populations in western Ohio, Pennsylvania, West Virginia, western Maryland, Long Island, and Rhode Island. *Larix laricina* occurs in every province and territory of Canada.

A number of maps fail to show the distribution correctly in northern Yukon, where tamarack occurs west of the Richardson Mountains. and north to the Porcupine River. The ranges of western larch, alpine larch and tamarack come close to each other in southwestern Alberta but may not overlap. It appears that tamarack does not occur south to the Bow Valley and Kananaskis regions where western larch is well established. Alpine larch does occur in the Kananaskis country but at higher elevations than western larch. The occurrence of western larch in Alberta is completely omitted from some recent maps.

Genetic studies have revealed a general east to west pattern of variation in tamarack, although the trees are not known to differ morphologically. Similarly, the trees of the

Great Lakes region are distinctive genetically, but have not been shown to differ externally. On the other hand, trees from Alaska differ slightly in morphology from the trees of the northern Yukon, and this is thought to have resulted from different origins.

ECOLOGY

Larix laricina is mostly a species of cold climates, found in northern forest stands bordering the tundra. It has the widest range of any North American coniferous tree, growing farther north than white and black spruce, both of which become shrub-like in areas where tamarack is still able to grow as a tree. *Larix laricina* is a pioneering species, often the first tree to invade open bogs and swamps, and burned peatlands. Tamarack is frequently associated with black spruce (*Picea mariana*). In much of Canada the tree forms extensive pure stands, but in most of the U.S. this is uncommon.

Habitat

Tamarack usually occurs in cold, wet, poorly drained sphagnum bogs and muskegs, and in these conditions it is often stunted. The soils are usually acidic. In addition to these organic soils, the species is also found on moist but well-drained upland mineral soils, and then it often grows extremely well, often better than all other northern conifers. Tamarack is also found in swamps, and on the margins of streams and lakes. It is very shade-intolerant.

Inter-species Relationships

Tamarack cones provide seeds for some birds (including pine siskin and crossbills), and small mammals (such as squirrels, mice, voles, and shrews). The twigs are browsed to a small extent by snowshoe hares and grouse, but deer, moose, and caribou avoid tamarack or consume very small amounts. Porcupines fed on the inner bark. Because tamarack sheds its leaves, it does not provide good winter cover for most animals. The larch sawfly (*Pristiphora erichsonii*) is the most destructive pest of tamarack, periodically defoliating stands and killing many trees. On the positive side, outbreaks of this insect provide food for other species of insects, as well as birds and mammals. The sawfly was first recorded in North America in 1880, and is believed to be an invasive alien which originated in Europe.



Fig. 14. Tamarack (*Larix laricina*) branch with larvae of the larch sawfly, *Pristiphora erichsonii*. Photo courtesy of Steven Katovich (USDA Forest Service) and Bugwood.org.

Pollination & Dispersal

Tamarack is wind-pollinated. Like numerous other tree species, good crops are produced in cycles, usually once every 3 to 6 years in *L. laricina*. A large tree can produce 20,000 cones with 300,000 seeds in a good season. Squirrels distribute some of the seeds, but most are dispersed by the wind. The majority of the seeds fall within a distance of two to three times the height of the tree. At the northern limit of the species range seed production is very limited, but the lower branches of the dwarfed trees occasionally take root and produce new trees.

USES

Because tamarack is adapted to short-season, cold, wet habitats, it has potential for reforestation in such situations, although it currently is not extensively planted. Wild stands are managed for forestry purposes, but *L. laricina* is not a leading commercial tree. Tamarack wood is heavy, durable, and decay-resistant, and is employed to a limited extent for railway ties, pilings, posts, poles, mine timbers, rough lumber, boxes, crates, and fuelwood. However, the lumber is of limited commercial value because of insect (especially larch sawfly) and disease problems. The wood is used for pulp, mainly in the United States, but has poor pulping properties because of the high resin content. In the past, tannin extracted from the tree was employed for tanning leather. Indigenous Peoples used tamarack for a very wide range of tools and medicinal uses, and a few food uses. Northern First Nations craftspeople, especially the Cree (the largest group of First Nations people in Canada, with over 200,000 people), are highly respected for fashioning bundles of tamarack twigs into sculptures of geese, and elegant, lifelike goose hunting decoys.

Arabinogalactan, a carbohydrate (polysaccharide) extracted from the resin of *Larix* species (including *L. laricina*), is approved in some jurisdictions as a food additive or dietary fibre for use in digestive health products. Advantages alleged (but requiring verification) are that it stimulates the immune system, fights cancer, and helps grow beneficial bacteria in the digestive tract.



Fig. 15. "Tamarack geese" prepared by Cree in the James Bay area, and sold as collector's items at prices ranging up to \$500.00. Photo courtesy of Chichester Inc.

TOXICITY

Sawdust from the wood has caused dermatitis in some sensitive people, but tamarack is not considered to be a toxic plant.

CULTIVATION

Larch species, especially the European larch (*L. decidua*), are often planted for forestry purposes, but *L. laricina* is infrequently planted in this regard. As noted above, however, it has potential for cold, wet, northern habitats. *Larix laricina* is grown occasionally as an ornamental tree, especially in cold climates, but the European larch is usually cultivated in preference to it. There are several ornamental cultivars of *L. laricina*, mostly selected for dwarf form and/or for foliage colour. Cultivars include 'Beehive', 'Blue Sparkler', 'Craftbury Flats', 'Diane', 'Deborah Waxman', 'Eidelweiss WB', 'Lanark', 'Nana', 'Newport Beauty', 'Steuben', 'Stubby', and 'Therandt'. *Larix laricina* is very popular as bonsai.



Fig. 16. Tamarack (*Larix laricina*) trained for 26 years as bonsai. Photo by Nick Lenz, released into the public domain on Wikimedia.

CONSERVATION STATUS

Tamarack is a very widespread species, not considered in need of special conservation measures. For forestry purposes, the widespread damage inflicted by the larch sawfly is of concern, since this has greatly limited the commercial value of the species.

MYTHS, LEGENDS, TALES, FOLKLORE, AND INTERESTING FACTS

- The natural crooks in the stumps and roots of large tamarack trees were used by 18th and 19th century boatwrights in constructing small ships because they are naturally curved as much as 90°, and so could be used to join ribs to deck timbers. A section of trunk attached to a lateral root was termed a "knee", one part used to support the deck, the other to tie beams to the boat's hull.
- Early American settlers employed tamarack needles for stuffing pillows and mattresses, but the fragrant needles of balsam fir may have been more popular for this purpose.

- Before 1917 in Alberta, surveyors used tamarack posts as markers of the northeast corner of Sections of Townships, because the wood is very rot resistant and readily available. (A township measures 6 miles × 6 miles, and contains 36 sections, each 1 mile square.)
- The Gwich'in First Nation people (of Alaska, Yukon, and the Northwest Territories) so respect the tamarack that tradition calls for leaving an offering, such as tea or sugar, each time part of a tree is collected.
- The northernmost tree in the world, extending into Eastern Siberia, is Dahurian larch (*L. gmelinii*). It is considered to be the most cold-hardy tree on Earth (reaching 72° 31' N), and can tolerate temperatures of -70 °C (-94 °F). According to Encyclopedia Britannica, the northernmost tree in North America is said to be white spruce (*Picea glauca*) growing along the Mackenzie River delta, near the shore of the Arctic Ocean. However, tree-sized feltleaf willow (*Salix alaxensis*), which are up to 2.4 m (8 feet) tall and 81 years old, exist in sheltered ravines at the head of Minto Inlet (71° 34' N), in western Victoria Island, NWT. Here they are disjunct from more continuous occurrence along near-treeline floodplains several hundred kilometres to the south. These may be interpreted as the northernmost trees in North America. (See "What is a tree?" in #14 of this series.)

SOURCES OF ADDITIONAL INFORMATION

- Brunton, D.F. 1984. The status of western larch, *Larix occidentalis*, in Alberta. Can. Field-Nat. 98: 167-170.
- Edlund, S.A., and Egginton, P.A. 1984. Morphology and description of an outlier population of tree-sized willows on Western Victoria Island, District of Franklin. Current Research, Part A. Geological Survey of Canada Paper 84-1A: 279-285.
- Graham, C.M., Farintosh, H.L., and Linhart, Y.B. (Editors). 1983. Larch symposium. Potential for the future. (Nov. 9, 1982). Fac. Forestry, Univ. Toronto and Ont. Min. Nat. Res., Toronto, ON. 175 pp.
- Johnston, W.F. 1990. *Larix laricina*. pp. 141-151 in Silvics of North America, Vol. 1. Agric. Handbook 654, R.M. Burns and B.H. Honkala (Technical Coordinators). USDA For. Serv., Washington, D.C.
- Johnston, W.F., and Carpenter, E.M. 1985. Tamarack. USDA Forest Service, Washington, D.C. 7 pp.
- MacGillivray, H.G. 1969. Larches for reforestation and tree improvement in Eastern Canada. For. Chron. 45: 440-444.
- Parker, W.H. 1993. *Larix*. pp. 366-368 in Flora of North America, vol. 2. Edited by Flora of North America Editorial Committee. Oxford University Press, Oxford, U.K.
- Parker, W.H., and Dickinson, T.A. 1990. Range-wide morphological and anatomical variation in *Larix laricina*. Can. J. Bot. 68: 832-840.
- Roe, E.I. 1957. Silvical characteristics of tamarack, *Larix laricina*. United States Dept. of Agriculture, Forest Service No. 52LS. Lake States Forest Experiment Station, St. Paul, MN. 22 pp.
- Schmidt, W.C., and McDonald, K.J. (Compilers) 1995. Ecology and management of *Larix* forests: a look ahead. Proceedings of an International Symposium, Whitefish, Montana, October, 5-9, 1992. GTR-INT-319. USDA For. Serv., Intermountain Research Station, Ogden, UT. 521 pp.
- Semerikov, V.L., and Lascoux, M. 1999. Genetic relationship among Eurasian and American *Larix* species based on allozymes. Heredity 83: 62-70.

(Continued)



Fig. 17. Tamarack (*Larix laricina*) in fall colour in Blaine, Minnesota. Photo courtesy of Steven Katovich (USDA Forest Service) and Bugwood.org

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Hugues Massicotte reacts to receiving the CBA/ABC seal of office from Rodger Evans

Ottawa Banquet scenes



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