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The Canadian Botanical Association Bulletin

Bulletin de l'Association Botanique du Canada

December/Décembre 2012. Volume 45 No.3/N°3

President's message



Frédérique Guinel

Another busy year …
The end of the term and of the year are approaching quickly. It will soon be time to mark exams, prepare winter classes and plan the Holiday Season with hopefully a few minutes here and there for rest and relaxation. I have no doubt the fall term has been as busy for all of you as it has been for me: submitting manuscripts and grant applications in the challenging search for research money; attracting new students by presenting at University fairs; teaching undergraduate students and mentoring Honour's thesis students; and participating in many committees.
Your CBA Executive has also been working hard for the Association. Foremost, Cindy Ross Friedman and her colleagues at Thompson Rivers have been steadily planning and designing what they wish to be the best CBA annual meeting ever. The Section Chairs have also been occupied in organizing symposia, which all should be very interesting. Hugues Massicotte, the Past-President, and I have been coordinating a symposium targeting the entire Association which is entitled "New Frontiers in Tree Biology". This event is being co-sponsored by Canadian Science Publishing and its outcome will be a "Special issue", in the journal Botany. The speakers in this symposium will cover a breadth of topics from education to future research, including tree development, tree genetics, and tree associations with mutualistic fungi and parasitic insects. The goal of the presentations is to provide an integrative view of research on Canadian forests. Mark your calendar for our upcoming exciting annual meeting "Thinking Plants" which will be held June 1-5, 2013, at Thompson Rivers University. I, for one, cannot wait to go to Kamloops. Please be aware that deadlines for most student and conference awards are early this year (**March 1st 2013**). I would also encourage you to start thinking about nominations for the Lawson Medal and the Mary E. Elliott Award.
The Executive has also worked on revising the Bylaws of our Association in order to comply with the new Canada Not-for-profit Corporations Act. Its goal is to bring this document to the CBA members at the Annual General Meeting this coming June for a vote. We have also worked with the Plant Canada Directors to determine the location of the 2015 meeting. It was agreed to be held in Edmonton. This meeting should be quite amazing from a Botanical point of view since the Botanical Society of America will be joining Plant Canada. This may be the first time that so many plant biologists convene at a single location in Canada!
Kudos for the Conservation Committee of the Association which is always very active! Because of its hard work, a press release has been made about the designation of Tusket River as an area of special conservation. This is the first location in Canada cited as such by the CBA. It has also spear-headed the writing

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 natureconcernant 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, **46(1)**, must be received **before March 3rd 2013**

La date de tombée des textes du prochain numero, le no **46(1)**, est **le 3 mars 2013**

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of a letter to the Honourable Peter Kent, Minister of the Environment, to offer the services and expertise of the CBA members to ensure that the revisions made to the Species At Risk Act (SARA) are based on the latest conservation science. Some of the societies belonging to Plant Canada joined us in signing this letter. Let us hope that this offer will be put to good use.
Finally, I would like to thank all the colleagues who have guided me throughout the term in my first steps as the CBA President. I wish to them and to all of you a safe and happy Holiday Season, socializing with colleagues, friends and family.

Frédérique

Une année encore bien remplie …
La fin du trimestre ainsi que la fin de l'année 2012 pointent leur nez. Bientôt, il sera temps de corriger les examens, de préparer les cours pour le trimestre prochain, et d'organiser la saison des Fêtes. Espérons que l'on aura un peu de temps pour se reposer et se détendre car l'automne aura sans doute été aussi occupé pour vous que pour moi. Entre la soumission de manuscrits et de demandes de subventions afin de trouver des crédits pour la recherche, la participation à la foire des Universités en quête de nouveaux étudiants, l'enseignement des étudiants de premier cycle et l'encadrement des étudiants de thèse, et le concours à de nombreux comités, on est vite débordé.
Votre exécutif de l'ABC a également travaillé pour l'Association. Tout d'abord, Cindy Ross Friedman et ses collègues de Thompson Rivers n'ont cessé d'œuvrer afin de planifier ce qu'ils souhaitent être la meilleure réunion annuelle de l'ABC. Les présidents de sections ont également été occupés dans l'organisation de colloques, qui devraient tous être très intéressants. Hugues Massicotte, président sortant, et moi-même avons coordonné un symposium qui a pour titre «Nouvelles frontières dans la biologie des arbres". Cet événement est co-parrainé par les Éditions Sciences Canada et aura comme résultat la publication d'un numéro spécial de la revue Botanique. Les invités de ce symposium couvriront une quantité de sujets, de l'éducation à la recherche, y compris le développement des arbres, la génétique des arbres, et les associations des arbres avec des champignons mutualistes et des insectes parasites. Le but de ces présentations est de fournir une vision intégrative de la recherche sur les forêts canadiennes. Marquez votre calendrier (Juin 1-5, 2013) pour notre conférence annuelle qui se tiendra à l'Université Thompson Rivers et qui s'intitule « Thinking Plants ». Pour ma part, j'ai hâte d'aller à Kamloops! Noter que cette année la date-limite pour la plupart des prix d'excellence pour étudiants est Mars 1, 2013. Je vous encourage aussi à penser dès à présent à la nomination de scientifiques méritoires pour la Médaille Lawson et le Prix de service Mary E. Elliott.
Le Comité exécutif a également travaillé sur la révision des statuts de notre association afin de se conformer à la nouvelle loi des organismes à but non-lucratif. Notre objectif est d'apporter ce document aux membres de l'ABC pour un vote lors de l'assemblée générale annuelle de Juin prochain. Nous avons également déterminé avec les directeurs des diverses Sociétés de Plant Canada le lieu de notre prochaine réunion; ce sera Edmonton en 2015. Cette réunion devrait être tout à fait étonnante d'un point de vue botanique puisque la « Botanical Society of America » se joindra à Plant Canada. C'est peut-être la première fois qu'autant de biologistes des plantes se rencontreront en un seul endroit au Canada!
Bravo pour le Comité de Conservation de l'Association qui est toujours très actif! En raison de son travail acharné, un communiqué de presse a été fait à propos de la désignation de la rivière Tusket comme zone de conservation spéciale. C'est le premier endroit au Canada cité comme tel par l'ABC. Il a également rédigé une lettre à l'honorable Peter Kent, ministre de l'Environnement, afin de lui offrir les services et l'expertise des membres de l'ABC de façon à ce que les modifications que le Ministre veut apporter à la loi pour les espèces en péril (LEP) soient conformes à la science de conservation la plus avancée. Certaines des sociétés appartenant à Plant Canada nous ont joint dans cette initiative et ont signé cette lettre. Espérons que cette offre sera utilisée à bon escient.
Enfin, je tiens à remercier tous les collègues qui m'ont guidée dans mes premiers pas comme présidente de l'ABC. Je leur souhaite et à vous aussi une saison des fêtes paisible et heureuse; profitez de ce temps pour passer du bon temps avec collègues, amis et famille.

Frédérique

Association News/Nouvelles de L'association.

Annual meeting in Kamloops, BC.

A report from the Vice President, Cindy Ross Friedman.



Cindy Ross Friedman

The Local Organizing Committee at Thompson Rivers University (TRU) in Kamloops, British Columbia is enthusiastically preparing for your arrival to the 49th Annual Meeting and Conference of CBA/ABC, which will take place June 1-5, 2013. Kamloops, known for its pleasant climate, outdoor recreation, and thriving arts scene, is a small city of about 90,000 people nestled at the confluence of two branches of the Thompson River in the southern BC Interior. TRU is named after these rivers, and is one of Canada's newest universities. There are about 10,000 students on TRU's Kamloops campus, which also lays claim to a quaint botanical garden just waiting for you to come and explore!
The theme for CBA/ABC 2013 is "Thinking Plants". This theme is purposefully broad, and means to highlight the important scientific advances that are made as plant biologists think about plants as well as the role that plants play in sustaining ecosystems. As we come to know more and more about the biology of plants, it is clear that not just scientists - but all of society - should be "Thinking Plants"
CBA/ABC 2013 Registration and Abstract Submission will be open by **December 15, 2012**, accessible through www.tru.ca/cba-abc. Please consider presenting a paper and/or poster at the conference. Presenting students, please do not forget to apply for CBA/ABC travel awards (John Macoun Travel Bursary for Graduate students, Keith Winterhalder Undergraduate Travel Award) as well as the student presentation or poster awards (Lionel Cinq-Mars Award for the best oral presentation, Iain and Sylvia Taylor Award for the best student poster). Please see http://www.cba-abc.ca/awards.htm for more information about the student awards.
We have an exciting line-up of events and symposia in the works. Here is our tentative schedule outlining the major events (in addition to the contributed oral papers and various meetings).
Saturday June 1:
Art of Botany Show and Welcome Mixer: Artists and botanists are invited to submit work that responds to the assertion that "art inhabits the teaching and practice of botany, and conversely botanical subjects and scientific methods have a legitimate place in teaching and practicing art." The deadline for individual submissions is **March 29, 2013**. The submission deadline for project based work involving 10 or more individuals is **January 15, 2013**. Please see www.tru.ca/cba-abc/art.html for more information.
Sunday June 2:
Keynote Speaker: Dr. Diana Beresford-Kroeger, a botanist, medical biochemist and self-defined "renegade scientist" brings together ethnobotany, horticulture, spirituality and alternative medicine to reveal a path toward better stewardship of the natural world.
Evening Poster Session Wine and Cheese
Student Mixer
Monday June 3: Field Trips! Please join us on one of the following botanically-themed Field Trips. Upon return, you will be hosted at a BBQ featuring a live local Latin music trio.
Wells Gray Provincial Park: Experience the stunning vistas of high mountains, deep canyons, volcanic cones, brooding old-growth forests and raging white-water rivers. This is a "must-stop" on any tour of British Columbia, and features the world-famous Helmcken Falls, a waterfall three times the height of Niagara.
Lac du Bois Grasslands Protected Area: Sweeping grassland vistas, spectacular cliffs and canyons, cool, dry forests, secret ponds and small lakes await the visitor to the newest grasslands park in the province. This protected area rises through three distinct grassland communities. Nowhere else in western North America will you find these grassland communities in such close proximity to each other.
Tuesday June 4:
Special Evening Talk: The Luella K. Weresub Memorial Lecture featuring speakers Adolf and Oluna Ceska.
Wednesday June 5:
Closing Banquet in TRU's brand-new Mountain Room featuring local foods, including Pacific wild Sockeye salmon, and a live dance band.

Here are some important dates and costs:

Abstracts due Friday March 15, 2013
Early Bird registration ends Wednesday March 20, 2013
Regular CBA member -$250, Student CBA member -$100
Regular Non-CBA member -$325, Student non-CBA member -$140
Late Bloomer registration ends Tuesday April 30, 2013.
Regular CBA member -$275, Student CBA member -$125
Regular CBA member -$350, Student non-CBA member -$165
Symbiont (spouse etc.) registration is $50
Residence rooms are not guaranteed after April 30, 2013

Confirmed Symposia:

A fantastic set of symposia is being organized by the various sections of CBA/ABC. In addition, Canadian Science Publishing (CSP) is sponsoring a special symposium entitled, "**New Frontiers in Tree Biology".** Sounds great, doesn't it? Here is a list of the confirmed regular section symposia:
Plant Development Section: "New Frontiers in Cell and Developmental Botany"

Conservation and Ecology Section "Seeing the Forests for the Bryophytes: Bryophyte Diversity and Ecosystem Function within Managed Forests"

Teaching Section: "Distilling Plant Science: Botanical Education and Outreach in the 21st Century"

I hope you are as thrilled as I am about our upcoming conference and meeting in Kamloops, 2013! Again, please visit our webpage www.tru.ca/cba-abc for more information. Contact me (cross@tru.ca) or the organizing committee's co-chair, Christine Petersen (cpetersen@tru.ca) for information.
Cynthia Ross Friedman
Vice-President
Canadian Botanical Association
L'Association Botanique du Canada

Le comité d'organisation local à l'Université Thompson Rivers (TRU), à Kamloops en Colombie-Britannique (C-B), se prépare fiévreusement pour votre arrivée à la 49e réunion annuelle de l'ABC/CBA, qui se tiendra du 1-5 juin 2013. Kamloops, reconnue pour son climat agréable, ses activités de plein air variées et sa scène artistique florissante, est une ville de près de 90 000 habitants. Elle se situe à la confluence des rivières North Thompson et South Thompson à l'intérieur de la C-B. TRU, qui tire son nom de ces rivières, est une des plus récentes universités du Canada. Le campus de Kamloops compte près de 10 000 étudiants. En outre, son jardin botanique pittoresque est le vôtre pour explorer.
Le thème de la réunion annuelle de l'ABC/CBA 2013 est "Pensons plantes". Ce thème, délibérément très compréhensif, vise à souligner à la fois les avances scientifiques considérables qui sont réalisées lorsque des chercheurs pensent aux plantes, ainsi que le rôle important qu'elles jouent dans le maintien des écosystèmes. Au gré de l'acroissement des connaissances sur les plantes, il devient de plus en plus évident que ce sont non-seulement les chercheurs qui ont avantage à "Penser aux plantes" mais bien la société entière
L'inscription et la soumission des résumés pour l'ABC/CBA 2013 débuteront le **15 décembre 2012** et se feront par le biais du site web www.tru.ca/cba-abc. Vous êtes invités à donner une présentation orale et/ou présenter une affiche à la conférence. Les étudiant(e)s qui prévoient présenter, sont encouragé(e)s à soumettre une demande pour une bourse de voyage de l'ABC/CBA (Bourse de voyage John Macoun pour étudiants gradués; Bourse de voyage Keith Winterhalder pour étudiants de premier cycle) et aussi de s'inscrire pour le prix de la meilleur présentation orale étudiante (Prix Lionel Cinq-Mars) ou le prix de la meilleur affiche étudiante (Prix Iain et Sylvia Taylor). SVP veuillez consulter le site http://www.cba-abc.ca/awards.htm pour de plus amples informations à cet égard.
Les préparatifs vont bon train et nous prévoyons déjà une série intéressante d'événements et de colloques. Voici donc notre programme provisoire décrivant les événements principaux de la conférence (en plus des présentations orales et réunions diverses).
Samedi 1e juin:
Exposition d'Art Botanique et Réception d'Ouverture: artistes et botanistes sont invités à soumettre des oeuvres qui répondent à l'affirmation que "l'art donne vie à l'enseignement et à la pratique de la botanique, et inversément les sujets de la botanique ainsi que la méthode scientifique ont une place légitime au sein de l'enseignement et de la pratique artistique."". La date limite pour soumettre des oeuvres, impliquant au moins 10 individus, est l**e 15 janvier 2013**. Veuillez consulter **www.tru.ca/cba-abc/art.html** pour plus d'informations.

Dimanche 2 juin:
Conférencière d'honneur: Dr. Diana Beresford-Kroeger, une botaniste et biochimiste médicale qui se définit elle-même comme "scientifique rénégate", traitera d' ethnobotanique d'horticulture, de spiritualité et de médecine alternative afin de révéler une voie menant à une meilleur gestion du monde naturel. Soirée de présentation des affiches, comprenant vin et fromage. Activité sociales pour les étudiant(e)s

Lundi 3 juin:
Sorties sur le terrain! SVP joignez-vous à nous lors des sorties suivantes, toutes sous le thème de la botanique. À votre retour, un repas BBQ vous attend, avec comme divertissement un trio de musique latine.
Parc Provincial Wells Gray: Faites l'expérience des panoramas saisissants de hautes montagnes, canyons profonds, sombres forêts anciennes et rivières aux eaux impétueuses. Le parc, un site à voir absolument pour tout ceux qui visitent la C.-B., comprend également les chutes Helmcken, de renommée mondiale et dont la hauteur est trois fois celle des chutes Niagara.
Zone protégée Lac du Bois Des prairies: Des pairies à vues panoramiques, à falaises et canyons spectaculaires, incluant une forêt tempérée semi-aride et parsemés d'étangs secrets et de petits lacs, attendent les visiteurs du plus nouveau parc à pairie de la province. Cette zone protégée comprend trois communautés écologiques de prairie distinctes; nulle part ailleurs en Amérique du Nord ne trouverez-vous ces communautés de prairies si différentes.

Mardi 4 juin:
Présentation spéciale en soirée: Conférence commémorative Luella K. Weresub par Adolf et Oluna Ceska.

Mercredi 5 juin:
Banquet de clôture dans la toute nouvelle salle Mountain Room avec mets régionaux, incluant du saumon Sockeye, et comme divertissement, un groupe de musique dansante 'live'.

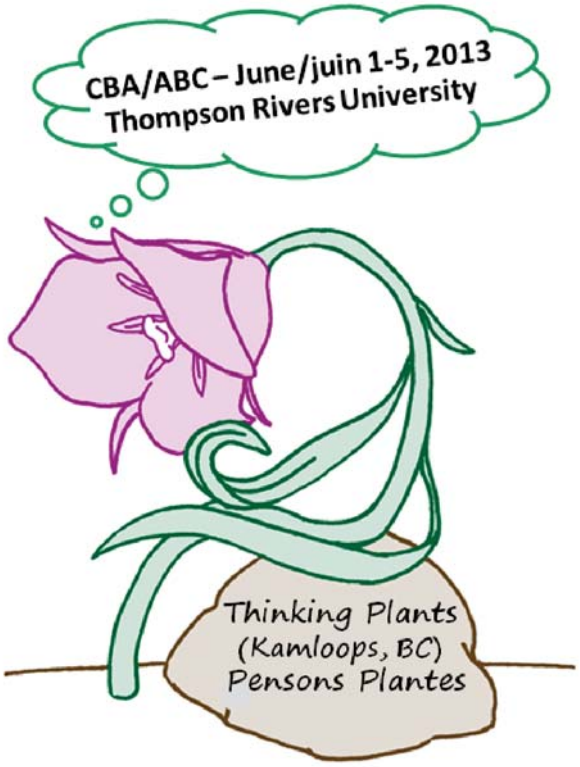
Voici quelques dates importantes et coûts à prévoire:
Date limite de soumission des résumés: vendredi 15 mars 2013
L'inscription 'lève-tôt' se termine mercredi le 20 mars 2013
Membres réguliers de l'ABC - $250; Étudiants membres de l'ABC - $100, Non-membres, réguliers - $325; Étudiants non-membres - $140
L'inscription après le délai officiel se termine mardi le 30 avril 2013
Membres réguliers de l'ABC - $275; Étudiants membres de l'ABC - $125
Non-membres, réguliers - $350; Étudiants non-membres - $165
Inscription des conjoint(e)s - $50
La disponibilité des chambres dans la résidence de TRU ne peut pas être assurée après le 30 avril 2013.

Colloques confirmés:

Une série formidable de colloques est en cours de préparation par les diverses sections de l'ABC/CBA. De plus, les Éditions Sciences Canada parraineront le colloque spécial « **Nouvelles Frontières dans la Biologie des Arbres»**. En résumé, un programme qui plaira. Voici une liste des colloques réguliers qui sont déjà confirmés:
Section Développement des Plantes: « Nouvelles Frontières en Botanique Cellulaire et en Développement »
Section Conservation et Écologie: « Lever le voile sur les bryophytes forestiers: diversité et fonction des bryophytes dans les forêts aménagées
Section Enseignement: « Distillation de la Science des Plantes: Éducation Botanique et Sensibilisation Sociale au 21e Siècle »

Je suis convaincue que le programme de la prochaine réunion annuelle à Kamloops en 2013 saura vous ravir! Veuillez consulter notre site web www.tru.ca/cba-abc pour de plus amples informations. Vous pouvez également me contacter (cross@tru.ca) ou encore la co-présidente du comité d'organisation, Christine Petersen (cpetersen@tru.ca), pour plus de détails.

Cynthia Ross Friedman
Vice-Présidente
Association Botanique du Canada
Canadian Botanical Association
(Traduit en français par le Dr Louis Gosselin; merci, Louis!).



Please see the posters for the conference on the following pages

Letter of Thanks from Award Winner

The following letter was received from the winner of the Winterhalder travel award for 2012

Dear members of the CBA
I am writing to express my gratitude at receiving the Keith Winterhalder undergraduate travel award from the Canadian Botanical Association. As an undergraduate, it would have been highly unlikely that I would have been able to experience my first Botany conference without this award. Many students may think that conferences are the realm of more experienced scientists, a view I before shared, but they can be a truly enlightening experience for those interested in pursuing a career in science. Even at the undergraduate level, the knowledge one can gain isn't limited to that presented in the poster sessions or seminars. The most valuable element is the human one, and the connections forged at meetings like this can last a lifetime. Because of this, I strongly encourage all students interested in research careers to become involved in the scientific community as early as possible.
I would like to give my thanks to the Winterhalder family, and the CBA.
-James Jones

Apologies!

This photo should have been included in the September issue of the Bulletin.
Best Poster Presentation in Botany at the Annual Regional Undergraduate Research Day at UBC-O in Kelowna (at the 7th Annual Irving K. Barber School of Arts and Sciences Undergraduate Research Conference).
Joanne Taylor, University of British Columbia (Okanagan Campus). Her poster was titled "Food and Water Security - Sustainably Feeding the World." Supervisor: John Wagner.
Photo: Joanne with her poster.



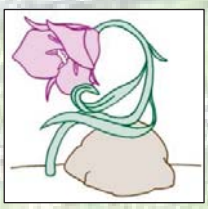
Canadian Botanical Association/ L'Association Botanique du Canada (CBA/ABC)

49th Annual Meeting & Conference

June 1-5, 2013

Thompson Rivers University *(Kamloops, BC)*

"Thinking Plants"



Call for Oral Papers & Posters

Abstracts Due: March 15, 2013

Registration (before March 20, 2013):

$250 (regular members of CBA/ABC); $100 student members of CBA/ABC)

Keynote speaker: Dr. Diana Beresford-Kroeger Botanist, medical biochemist & self-defined "renegade scientist".

Art of Botany Show A unique juried **Art** Show showcasing the intersection of art and science!

Field Trips to Wells Gray Park & Lac du Bois Grasslands!

BBQ, live entertainment, & local foods!

Confirmed Symposia

- Canadian Science Publishing: *New Frontiers in Tree Biology*
- *Seeing the Forests for the Bryophytes*
- *New Frontiers in Cell & Developmental Botany*
- *Distilling Plant Science: Botanical Education & Outreach in the 21st Century*

visit www.tru.ca/cba-abc

Canadian Botanical Association/
L'Association Botanique du Canada (CBA/ABC)

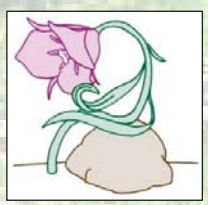
49e réunion annuelle et conférence

Du 1er au 5ième juin 2013

Thompson Rivers University *(Kamloops, Colombie Britannique)*

«Pensons Plantes»

Appel pour les présentations orales et les affiches



Soumission des résumés avant: le 15 mars, 2013

Inscriptions (avant le 20 mars 2013):

$250 (membres réguliers du CBA/ABC); $100 membres étudiant du CBA/ABC)

Conférencière d'honneur: Dre Diana Beresford-Kroeger Botaniste, biochimiste médicale, qui se défini comme une "scientifique renégate "

Exposition de l'art botanique, une exposition d'art jurée unique qui démontre l'intersection de l'art et la science!

Excursions au parc Wells Gray, et les prairies au Lac Du Bois

BBQ, spectacles, et nourriture locale!

Colloques confirmé

- Colloque Special (Éditions Sciences Canada): *Nouvelles Frontières dans la Biologie des Arbres*
- *Nouvelles Frontières en Botanique Cellulaire et en Développement*
- *Forêts de Bryophytes: Diversité des Bryophytes et Fonction des Écosystèmes au sein de Forêts Aménagées*
- *Distillation de la Science des Plantes: Éducation Botanique et Sensibilisation Sociale au 21e Siècle*

visitez www.tru.ca/cba-abc

Make a difference: get involved with your CBA!













The CBA executive always welcomes new energy to be a vibrant part of our administrative team. We know great talents (possibly yet undiscovered!) abound out there and we hope to hear from you. The CBA is a wonderful venue to promote and to explore numerous areas within the botanical sciences with like-minded folks, and to discover new regions within Canada during the process. Please contact me (hugues@unbc.ca) or Frédérique (fguinel@wlu.ca) if you are interested and willing to put your name forward, volunteer your time, or perhaps just want to know more about what is involved with some of the executive positions.

At the 49th CBA annual meeting in Kamloops (June 1-5, 2013), we will be looking for:

Nominations for one Eastern Director and one Western Director (Dr Art Fredeen and Dr Moira Galway are finishing their mandate). A director is an important liaison role, ensuring that information about Botany is disseminated to Canadian universities of your region, and that students in botany are aware of opportunities available to them.

Nominations for two student representatives (James Jones, western region, and Adrian Dauphinee, eastern region, are finishing their mandate). A student representative helps with liaison with other students in the CBA, before and during the annual meeting.

Nominations for section chair of Systematics & Phytogeography. This vacant position has recently been filled by Dr. Julian Starr (thanks Julian!), who has agreed to be the interim chair until Kamloops.

Nominations for the position of archivist. If you feel you can contribute in any aspect to help with the CBC/ABC archives in any capacity, we would love to hear from you. Your support to the association is always greatly appreciated!

Hugues Massicotte, CBA/ABC Past President

Impliquez-vous… Et découvrez votre ABC!

Regional Undergraduate Conferences for 2013

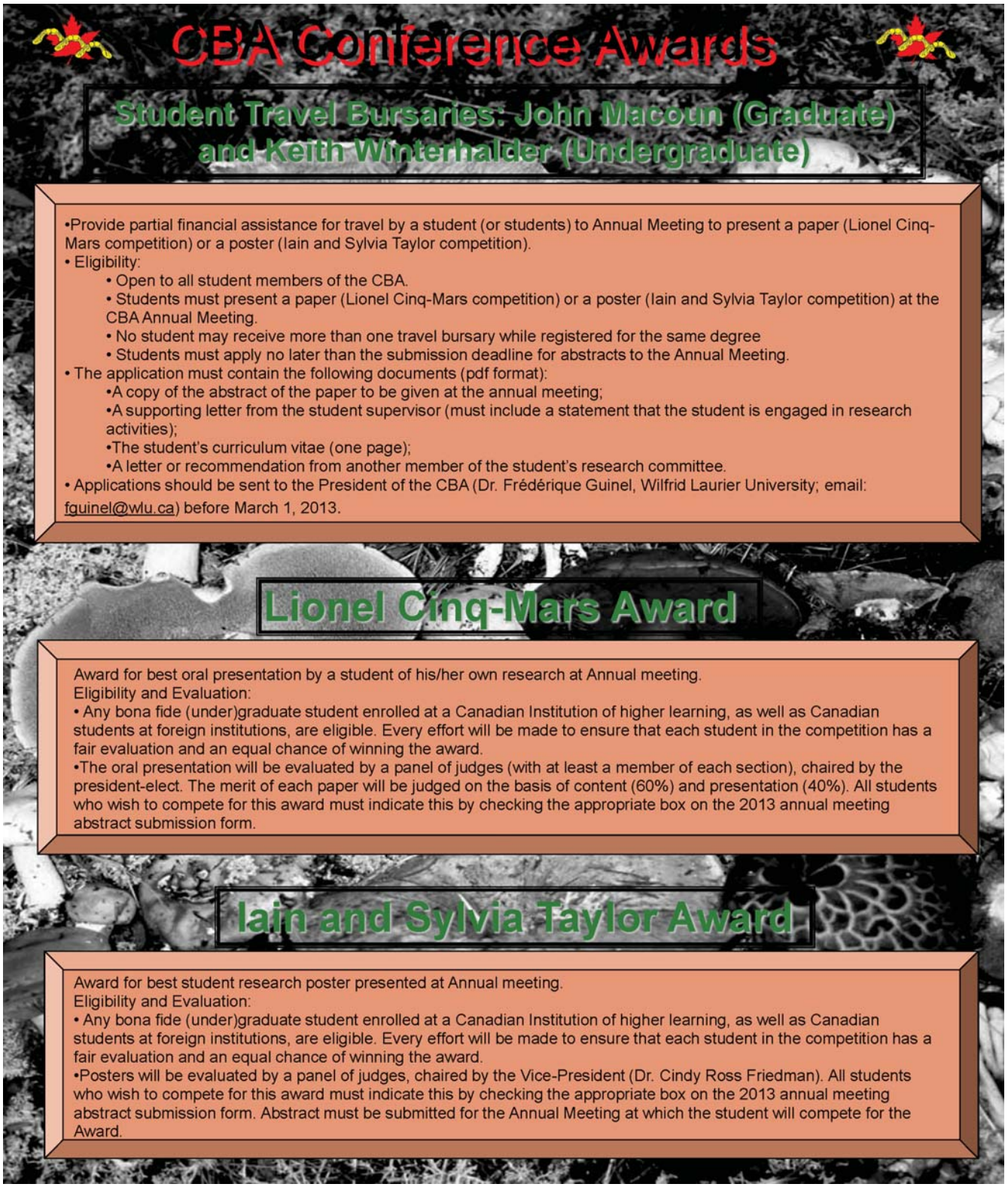
The CBA/ABC presents awards at these conferences for the best oral and the best poster presentations. Please plan to attend!

1. **Science Atlantic Undergraduate Biology Conference (AUBC)**
   Since 1970, the Biology Committee has organized the AUBC for undergraduate biology students in Atlantic Canada. Since 1990, we have held the event in conjunction with the Aquaculture & Fisheries Conference. Up to 150 students and faculty gather each March at one of the region's post secondary institutions for two days of student presentations and keynote speakers. Awards are presented to the top oral and poster presenters for outstanding research and science communication. You can learn more about the Biology student awards on the Biology Awards page.
   2013 Conference will be held March 15-17, 2013, at Acadia University.
   Visit the Science Atlantic Site at: www.scienceatlantic.ca
2. **Ontario Biology Day (OBD)**
   The next OBD will be hosted by McMaster University, in Hamilton, on the week-end of the 16th and 17th of March 2013
3. **Multidisciplinary Undergraduate Research Conference (MURC)**
   MURC 2013 is taking place on Saturday, March 16th 2013 in the Irving K. Barber Learning Centre in the University of British Columbia, Vancouver. More information is available at http://murc.ubc.ca/attend-murc-2013/. The top presenters from this year's Conference will be invited to submit papers for possible publication in the conference proceedings. They may also be asked to compete to represent UBC at the U21 Undergraduate Research Conference next July.



Thanks to Hugues Massicotte for the most recent version of our awards posters.


Prix Étudiants ABC
Prix pour les articles publiés par les étudiants durant 2012
Le Prix Commémoratif Alf Erling Porsild
Prix honorant la mémoire de l'éminent botaniste de l'arctique Alf Erling Porsild (1901-1977). La mise en candidature d'étudiant(e)s ayant publié (comme auteur principal) un article en systématique et/ou phytogéographie durant l'année précédente, devrait être envoyée au président de la Section Systématique et Phytogéographie des plantes (Dr. Julian Starr, Dept of Biology, University of Ottawa, ON: jstarr@uottawa.ca) avant le 1er mars 2013.
Le Prix Commémoratif J. Stan Rowe
Prix établi pour célébrer la vie et le travail de J. Stan Rowe (1918-2004), un éminent écologiste des plantes et écrivain. La mise en candidature d'étudiant(e)s ayant publié (comme auteur principal) un article en écologie durant l'année précédente, devrait être envoyée au président de la Section Ecologie des plantes (Dr. Liette Vasseur, Brock University, ON: lvasseur@brocku.ca) avant le 1er mars 2013.
Le Prix Commémoratif Taylor A. Steeves
Prix établi pour honorer les nombreuses contributions de Taylor Steeves (1926-2011) à la botanique et l'ABC. La mise en candidature d'étudiant(e)s ayant publié (comme auteur principal) un article en développement, structure ou morphologie végétale durant l'année précédente, devrait être envoyée à la présidente de la Section Développement végétal (Dr. Moira Galway, St. Francis Xavier University, NS: mgalway@stfx.ca) avant le 1er mars 2013.
Le Prix Commémoratif Luella K. Weresub
Prix établi en mémoire de Luella Kayla Weresub (1918-1979), une mycologue canadienne reconnue qui travailla à l'institut de recherche en biosystématique d'Agriculture Canada. La mise en candidature d'étudiant(e)s ayant publié (comme auteur principal) un article en mycologie ou lichenologie durant l'année précédente, devrait être envoyée à un des co-présidents de la Section Mycologie: Shannon Berch, BC Min of Environment (Shannon.Berch@gov.bc.ca) ou Hugues Massicotte, UNBC (hugues@unbc.ca) avant le 31 janvier 2013.


CBA Conference Awards
Student Travel Bursaries: John Macoun (Graduate) and Keith Winterhalder (Undergraduate)
•Provide partial financial assistance for travel by a student (or students) to Annual Meeting to present a paper (Lionel Cinq-Mars competition) or a poster (Iain and Sylvia Taylor competition).
• Eligibility:
• Open to all student members of the CBA.
• Students must present a paper (Lionel Cinq-Mars competition) or a poster (Iain and Sylvia Taylor competition) at the CBA Annual Meeting.
• No student may receive more than one travel bursary while registered for the same degree
• Students must apply no later than the submission deadline for abstracts to the Annual Meeting.
• The application must contain the following documents (pdf format):
•A copy of the abstract of the paper to be given at the annual meeting;
•A supporting letter from the student supervisor (must include a statement that the student is engaged in research activities);
•The student's curriculum vitae (one page);
•A letter or recommendation from another member of the student's research committee.
• Applications should be sent to the President of the CBA (Dr. Frédérique Guinel, Wilfrid Laurier University; email: fguinel@wlu.ca) before March 1, 2013.
Lionel Cinq-Mars Award
Award for best oral presentation by a student of his/her own research at Annual meeting.
Eligibility and Evaluation:
• Any bona fide (under)graduate student enrolled at a Canadian Institution of higher learning, as well as Canadian students at foreign institutions, are eligible. Every effort will be made to ensure that each student in the competition has a fair evaluation and an equal chance of winning the award.
•The oral presentation will be evaluated by a panel of judges (with at least a member of each section), chaired by the president-elect. The merit of each paper will be judged on the basis of content (60%) and presentation (40%). All students who wish to compete for this award must indicate this by checking the appropriate box on the 2013 annual meeting abstract submission form.
Iain and Sylvia Taylor Award
Award for best student research poster presented at Annual meeting.
Eligibility and Evaluation:
• Any bona fide (under)graduate student enrolled at a Canadian Institution of higher learning, as well as Canadian students at foreign institutions, are eligible. Every effort will be made to ensure that each student in the competition has a fair evaluation and an equal chance of winning the award.
•Posters will be evaluated by a panel of judges, chaired by the Vice-President (Dr. Cindy Ross Friedman). All students who wish to compete for this award must indicate this by checking the appropriate box on the 2013 annual meeting abstract submission form. Abstract must be submitted for the Annual Meeting at which the student will compete for the Award.

ABC Prix de Conférence

Bourses de Voyage John Macoun (étudiant gradué) et Keith Winterhalder (étudiant de premier cycle)

•Les bourses ont été établies pour aider à défrayer une partie des coûts de déplacement à la réunion annuelle pour un(e) étudiant(e) (ou des étudiants) qui présentent une communication orale dans la compétition Cinq-Mars ou une affiche dans la compétition Taylor.

• Eligibilité:
  - Ouvert à tous les membres étudiants de l'ABC.
  - Les étudiants doivent présenter une communication orale (compétition Cinq-Mars) ou une affiche (compétition Taylor) à la réunion annuelle de l'ABC.
  - Aucun(e) étudiant(e) ne peut recevoir plus d'une bourse de voyage lorsque inscrit(e) au même programme d'étude.
  - Les étudiants doivent soumettre leur candidature avant la date limite de soumission des résumés à la réunion annuelle.
• L'application doit contenir les documents suivants (format pdf):
  - Une copie du résumé de la communication prévue à la réunion annuelle;
  - Une lettre de support du directeur de thèse de l'étudiant(e) qui inclue aussi une déclaration que l'étudiant(e) est impliqué dans sa recherche;
  - Le curriculum vitae de l'étudiant(e): une page;
  - Une lettre de support d'un membre du comité de direction de l'étudiant(e), autre que le directeur;
• Les demandes doivent être envoyées à la Présidente de l'ABC (Dr. Frédérique Guinel, Wilfrid Laurier University; courriel: fguinel@wlu.ca) avant le 1er Mars 2013.

Le prix Lionel Cinq-Mars

Prix décerné à un(e) étudiant(e) pour la meilleure présentation orale de son propre projet de recherche, présenté à la réunion annuelle.

Eligibilité et évaluation:

• Tout membre étudiant(e) de premier, deuxième ou troisième cycle inscrit(e) dans une institution canadienne, ou membre étudiant(e) canadien(ne) d'une institution à l'extérieur du Canada, est éligible. Tous les moyens nécessaires seront utilisés afin d'assurer que chaque étudiant(e) participant à la compétition reçoive une évaluation juste et une chance égale de gagner la compétition.

• La présentation orale sera évaluée par un comité de juges (avec au moins un représentant de chaque section de l'ABC) sous la direction du Président Elu. Le mérite de chaque communication sera jugé sur le contenu (60%) et la présentation (40%).

Tous les étudiants qui souhaitent participer à cette compétition doivent indiquer leur intention en cochant la case appropriée sur le formulaire de soumission du résumé. Les résumés doivent être soumis pour la réunion annuelle 2013 à laquelle l'étudiant(e) participera à la compétition.

Le prix Iain et Sylvia Taylor

Prix décerné à un(e) étudiant(e) pour la meilleure affiche présentée à la réunion annuelle.

Eligibilité et évaluation:

• Tout membre étudiant(e) de premier, deuxième ou troisième cycle inscrit(e) dans une institution canadienne, ou membre étudiant(e) canadien(ne) d'une institution à l'extérieur du Canada, est éligible. Tous les moyens nécessaires seront utilisés afin d'assurer que chaque étudiant(e) participant à la compétition reçoive une évaluation juste et une chance égale de gagner la compétition.

• Les affiches seront évaluées par un comité de juges sous la direction de la Vice-Présidente (Dr. Cindy Ross Friedman).

Tous les étudiants qui souhaitent participer à cette compétition doivent indiquer leur intention en cochant la case appropriée sur le formulaire de soumission du résumé. Les résumés doivent être soumis pour la réunion annuelle 2013 à laquelle l'étudiant(e) participera à la compétition.

News from the Sections/ Nouvelles des sections

Systematics and Phytogeography.

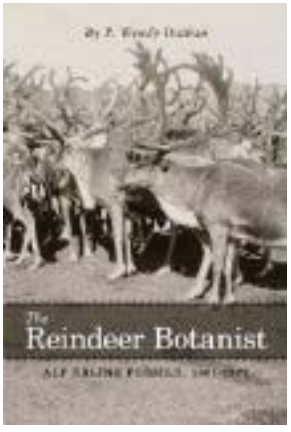
Dear members of the CBA Systematics and Phytogeography section,

it is with great pleasure that I take on the role of acting Chair of the section till Kamloops, and I would like to encourage you to send me any news that is of interest to our section. As I have only just taken on my new role within the last few days I do not have much to relate to you for this Bulletin, but in the future I would like this to be your opportunity to relate to the community any important or interesting news that you feel needs to get out.

Probably the most important role I have as Chair of our section is to be actively involved in the promotion and awarding of the A.E. Porsild Award for the best paper by a student in Systematics and Phytogeography. I was the proud recipient of this award in the 1990s and I know of at least three other former recipients that are currently working as professional systematists. In other words, the award has meaning! Please encourage your students to apply for the Award or nominate yourself, if necessary. The award is open to any graduate student who publishes a work as first author from research conducted at a Canadian university or research conducted by a Canadian student at a foreign university. The work should be published while the author is still a graduate student or be based on work done while a graduate student and published within two years of graduating.

The deadline for the receipt of applications is the 1st of March 2013, and they should be sent to me, Julian Starr, acting chair of the Systematics and Phytogeography Section via email (jstarr@uottawa.ca). A PDF of the publication accompanied by a cover letter explaining the role of the principal author and the significance of the work would be greatly appreciated.

For those of you interested in knowing more about A.E. Porsild, a fascinating botanist, a biography of his life has just been written by Wendy Dathan and published by the University of Calgary Press under the title **"The Reindeer Botanist: Alf Erling Porsild, 1901-1977"** (October 2012). Maybe someone in the section would like to write a review.



Herbarium news – Dr. Bruce Ford has informed me that the herbarium of the University of Manitoba (WIN) has reached an important milestone: the collection now consists of over 75,000 specimens of which 15,000 have been digitised for Canadensys, the database of Canadian university-based biological collections hosted by the Centre sur la biodiversité de l'Université de Montréal. A wine and cheese is in the works to celebrate! Way to go Bruce! In other news, the last 2000 specimens from the Carleton University herbarium (CCO), consisting entirely of vascular plants, were recently transferred to the University of Ottawa herbarium (OTT), but remain separate for the time being. The algal (CANA), fungal (DAOM), lichen (CANL) and bryophyte (CANM) collections of CCO have already been transferred to other herbaria. You will be happy to know that those CCO specimens now residing at OTT are being used to teach the next generation of botanists the vascular flora of eastern Canada in a course offered by me at the University of Ottawa (BIO3310, English; BIO3710, French).

Julian Starr, Chair of the Section.

Ecology and Conservation.

Since the meeting in Columbus, OH, we have been busy. First, the proposal to have a special issue in Botany on rare species reintroduction has been approved and we are now receiving and reviewing the papers. There is still an interest to also prepare a book on the topic. Anyone with ideas can contact me.

At the section meeting, it was decided that we would write a letter to Minister Peter Kent to offer the expertise of our association for the review of SARA. Other organizations have also agreed to sign the letter. It should be sent very soon. There will be a few more letters to be sent as other issues have come up such as the decision to not list some species at risk. Stay tuned on some of these issues.

There is also some interest in preparing a white paper on the challenge and importance of maintaining populations of species that are rare in their northern range in Canada but might be common in the United States. This is an activity that we will be starting over the next few months, we hope with the participation of other associations and societies. The goal is to have a strong paper reviewing all the various reasons and research knowledge that exists in this regard.

I am very happy to also confirm that there will be an Ecology symposium at the 2013 CBA annual meeting in Kamloops. I would like to acknowledge the contribution of Nicole Fenton and Lyn Baldwin who are currently organizing this symposium entitled "Seeing the forests for the bryophytes: bryophyte diversity and ecosystem function within managed forests". This should be a very interesting symposium presenting new cutting edge research in this field.

For the designation of areas of special conservation concerns, there is a possibility that is currently being examined. More information about this process will be found in the next Bulletin. As you remember, the Tusket River system in Nova Scotia was out first approved designation. The press release was sent earlier this year.

Finally anyone interested in helping with the judging of oral presentations or posters at the 2013 CBA annual meeting in Kamloops, please let me know. I will also encourage you to contact me if you are interested in evaluating papers for the Rowe Award which will be evaluated in March (we hope). This also means to not forget to send nominations! They may be from your own lab or from another lab where you are aware of the student's publication.

With all these activities in these sections, please feel free to join

of you!

Best wishes,
Liette Vasseur, Section Chair.

Écologie et Conservation

Depuis la conférence à Columbus, OH en juillet, les sections sont restées occupées. Premièrement, la demande de préparer un numéro spécial sur la réintroduction d'espèces en péril a été accepté par Botanique et nous recevons maintenant les manuscrits qui sont aussi évalués par les pairs. Il y a aussi un intérêt à la production d'un livre. Si certaines personnes sont intéressées et ont des idées n'hésitez pas à me contacter.
À la réunion de la section, on avait décidé de préparer une lettre pour le ministre Peter Kent pour lui offrir l'expertise de notre association pour la révision de la Loi pour les espèces en péril. D'autres organisations ont aussi accepté de signer la lettre. Celle-ci partira très bientôt. Il y aura d'autres lettres qui seront préparées dans les prochains mois sur d'autres sujets qui nous sont venus comme celui de la décision de ne pas lister certaines espèces en péril. Nous allons continuer à vous informer à ce sujet.
Cela m'amène à un autre intérêt de préparer un document blanc sur les défis et l'importance de maintenir les populations d'espèces rares qui se trouvent à leurs limites nord de distribution au Canada mais qui sont communes aux États-Unis. Cette activité commencera dans les prochains mois et nous espérons la participation d'autres organisations et sociétés. Le but est de préparer un manuscrit exhaustif faisant une revue des connaissances dans ce domaine et des différentes raisons pour leur protection.
Je suis heureuse de vous confirmer qu'il y aura un symposium en écologie à la conférence annuelle de 2013 à Kamloops. Je veux particulièrement remercier Nicole Fenton et Lyn Baldwin qui présentement organisent ce symposium qui s'intitule « Lever le voile sur les bryophytes forestiers: diversité et fonction des bryophytes dans les forêts aménagées ». Celui-ci devrait être très intéressant car il présentera les nouvelles recherches dans ce domaine.
Pour la nomination d'aire de conservation préoccupante, il y a en ce moment une possibilité qui reste à examiner. Cela sera confirmé dans le prochain bulletin. Comme vous vous rappelle, la Rivière Tusket en Nouvelle Écosse a été notre première nomination approuvée par l'association. Le communiqué de presse a été envoyé plus tôt cet été.
Finalement, si vous êtes intéressés à être juges pour les présentations orales ou les affiches à la réunion annuelle de Kamloops, n'hésitez pas à me contacter. Je vous encourage aussi à me contacter si vous êtes prêts à aider pour juger les articles pour le Prix Rowe qui devrait êtes faits en mars (j'espère). Cela veut aussi dire que je vous encourage à envoyer des nominations. Les articles peuvent provenir de votre labo ou d'un autre labo où vous savez qu'il y a une publication faite par un(e) étudiant(e).
Avec toutes ces activités dans nos sections, n'hésitez pas à joindre le groupe et à contribuer. Il y a beaucoup d'occasions pour tout le monde !

Meilleurs vœux,
Liette Vasseur

Teaching

The CBA/ABC teaching section will organize a teaching symposium at the Canadian Botanical Association's 49th Meeting and conference to be held in Kamloops. The theme is **"Distilling Plant Science: Botanical Education and Outreach in the 21st Century".** I have four speakers confirmed for our symposium: 1.David Pearson, Laurentian University 2. George Haughn, University of British Columbia . 3. Michael Runtz, Carlton University 4.Jean Becker, Wilfrid Laurier University.

Santokh Singh, Section Chair

Mycology



Photo: H Massicotte

The mycology section is taking a pause by not sponsoring a mycology symposium at the 2013 annual meeting in Kamloops, BC. There will, however, be some mycology as part of the symposium on Frontiers in Tree Biology, as Dr. Marty Kranabetter will speak on ectomycorrhizas, climate change and assisted migration.
We are also delighted to announce that Adolf and Oluna Ceska have kindly accepted to be our "Weresub lecturers" in Kamloops, where they will deliver a joint presentation not to be missed!
We have recently had a conference call with the Weresub Award judges in preparation for the next competition, to streamline and revise the judging process and criteria. As early notification, please be aware that nominations for the Weresub Award for best student paper in mycology published in 2012 must be received by **January 31st, 2013.** More details will soon follow.
We continue to build a database of mycology-inclined folks in Canada and Canadian mycologists abroad that we can contact directly with reminders and deadlines.
As always, we welcome all who might be interested in participating to the Section Meeting (Kamloops next summer!) as well as all mycology comments for the Bulletin!

Respectfully submitted,
Hugues Massicotte and Shannon Berch
Co-Chairs of the Mycology Section

Plant Development

Organization of a Plant Development Section symposium for next year's the CBA/ABC Annual Meeting is in underway. The theme of the symposium is “New Frontiers in Cell and Developmental Botany”. This symposium is intended to showcase current and future research in plant cell and developmental biology and to encourage collaboration and discussion between researchers through presentations by early to mid-career researchers based in Canada or with a Canadian connection or interest. The symposium will include presentations by invited speakers, plus an additional few selected from submitted abstracts. Following the model of this year's successful symposium at Botany 2012 on canonical and new model systems, the symposium will end with a short discussion on the state of plant cell and developmental biology in Canada.

Please remember to nominate deserving students for the Taylor Steeves Award. Nominations, sent to Moira Galway, mgalway@stfx.ca should be received by **March 1st 2013.**

What is MITACS?

Funding for botanical research projects in partnership between academia & industry

Botanists looking to collaborate with their counterparts in industry or academia can take advantage of the MITACS Accelerate program which co-funds short and medium-term research projects between companies and universities.

Under Accelerate, the conduit between a company is a graduate student or post-doctoral fellow – an intern – who spends approximately half of her/his time over the duration of the project onsite with the company, collecting data and interacting with staff; the balance of her/his time is spent at the university, developing innovative approaches to solve the research challenge which is of interest to all parties.

While the partner company involved in an internship contributes $7,500 for each four-month period of the project, this funding is matched dollar-for-dollar by MITACS through the support of the federal and provincial governments. This results in $15,000 in funding for a four-month project, $10,000 of which goes to the intern as a stipend.

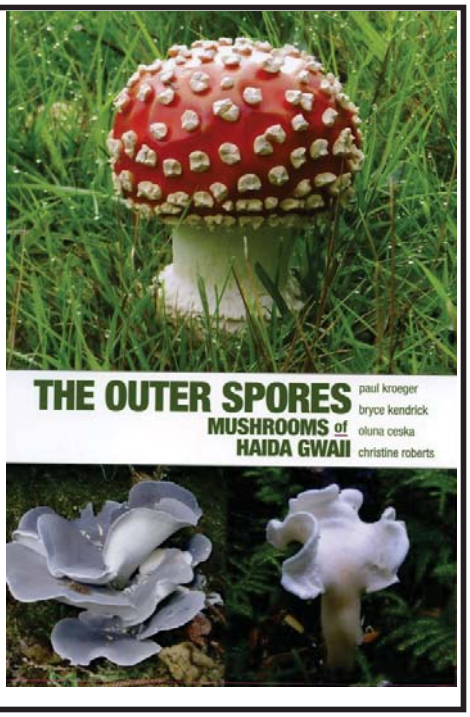
Project eligibility is very broad. In last two years, Accelerate has funded projects focused on controlling the biennial bearing of apple trees, investigating new ways to control the Canola flea beetle, understanding the importance of timing in pesticide application and researching the effect of plant condition on bumble bee pollination in greenhouse tomatoes. Interested companies or individuals are encouraged to contact Alison Ewart at 416.650.8439 or visit www.mitacsaccelerate.ca.

Accelerate is administered by MITACS, a national, not-for-profit research corporation which connects academia and industry through collaborative research projects. For more information, visit www.mitacs.ca

Mycologue Publications has just published

“The Outer Spores - Mushrooms of Haida Gwaii"

A 200-page book detailing the results of a 5-year study of fungi in Haida Gwaii.
With approachable text covering the nature of fungi, their ecological roles as saprobes, parasites and symbionts, and about 300 colour pictures, this book is a good introduction to fungi of the archipelago and the west coast of Canada.
It can be obtained from Mycologue Publications by printing and mailing the order form to be found at the website (www.mycolog.com) The cost is $30 including mailing and tax.



A Tribute for Donald Britton (1923- 2012)
A wonderful botanist!

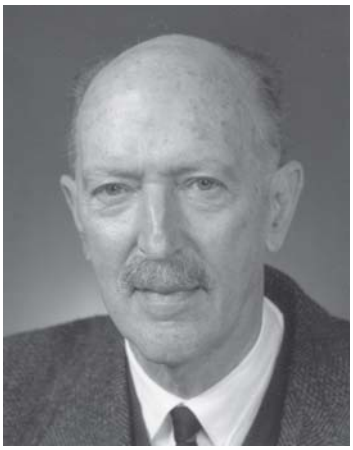
Daniel F. Brunton and Paul M. Catling

Don passed away in Guelph on 18 May 2012. He is known to most CBA members as “the fern guy” and an internationally known cytogeneticist who won the CBA Lawson Medal in 1991 recognizing his outstanding contribution to botany in Canada (see CBA/ABC Bulletin 24(4): 66-67. 1991). Although he worked in a number of research institutions in Canada and the United States, Don Britton will be forever remembered for his 50 year affiliation with the University of Guelph in southern Ontario. Arriving at the Department of Botany in 1958, Don subsequently developed a solid international reputation as a important investigator of the classification, identification and distribution of ferns and fern allies in North America and beyond. He was unquestionably Canadas foremost pteridologist.

An early appreciation of the pioneering work of British cytologist and electron microscopist Irene Manton (1904-1988) inspired Don to initiate such investigations in North America. In doing so he and his students made important headway in clarifying perennially perplexing classification issues in taxonomically important pteridophyte groups such as *Dryopteris, Asplenium, Gymnocarpium*, *Polypodium* and most recently, *Isoetes*. Throughout a half century of important lab-based scientific research, however, he never lost sight of the importance of knowing the whole organism and understanding how it worked in the natural environment. He worked diligently to reconcile what the lab results told him with what he observed the plants to be doing out there in the real world.

An especially important and long-lasting contribution was Britton’s accumulation of massive amounts of carefully authenticated information on the distribution, abundance and site ecology of ferns across Canada. In doing this he built the University of Guelph herbarium (OAC) into the premier collection of pteridophyte specimens in Canada. The value of these carefully preserved and irreplaceable specimens increases with each passing year as new applications are found to extract new taxonomic, chemical, molecular and conservation management information from that material. Don assembled a huge, country-wide army of enthusiastic collectors and correspondents who fed him information and material. While his own research work was benefiting from this field-based regional information, in return he was also contributing significantly to our knowledge of the regional distribution and status of pteridophytes across Canada. That accumulated knowledge was fully exploited in *The Ferns of Canada* which he co-authored with William J. Cody (1922-2009). These contributions also resulted in successful habitat and species conservation initiatives across the country as well as inspiring a extensive research.

At the memorial service held in his honour in Guelph on 28 July 2012, Duke University professor and former Britton student, Dr. Kathleen Pryer, spoke of him as an outstanding research supervisor and mentor. She underscored how DMB (her label for him) quietly inspired his students to *move beyond their comfort zones*. He encouraged them not to *stew about things*, not to be concerned if outcomes were not so certain, to enjoy the ride as it were, wherever it led.



Donald Britton in 1996

Discovery was the thing that he enjoyed most. Don was a classical scholar. Although comfortable enough with scanning electron microscopes and other contemporary technological tools, he relied most fundamentally on his acute observational skills, superior ground-truthed intuition, incredibly thorough research and a dogged determination to get to the bottom of things.

It was an amazing experience to work with Don. First there was his famous (infamous?) typewritten communications to interpret (always characterized by a misaligned letter e!), then there was the sheer avalanche of literature, reports, photos, specimens and questions he was sure to send your way. It was exhilarating and it was exhausting. He was amongst the most democratic of senior scientists as well. It did not matter who you were, what research position (if any) you held, or what your professional qualifications might be. If you were serious and reasonably skilled and willing to work, that was all the qualification and seniority you needed. That remarkably accepting attitude and collaboration was the inspiration for many productive careers. And it kept him going too. He co-authored, for example, over 30 scientific papers on *Isoetes*, describing 15 new species, hybrids and subspecies for science, the majority of these studies being produced after he retired!

Never flashy and downright cryptic at times (most times, truth be told!), Don Britton was nonetheless an inspiration to those of us privileged to share the path with him - literally or figuratively. Generous with his time, perceptive, respectful of all associates, patient to a fault and also, perhaps a bit surprisingly, not just a little competitive. He would positively chuckle over figuring out some problem or finding some missing link ahead of another associate, the more prominent the better. And then, he would promptly share all his data with them! He profoundly influenced many students over decades at the University of Guelph, and many that never went to Guelph except to visit him.

Don received many tributes in his day, including the aforementioned CBA Lawson Medal in 1991 which he valued greatly. In 2000 he was awarded a lifetime achievement Honorary Membership in the Ottawa Field-Naturalists Club, the same tribute by the American Fern Society in 2001 and the John Goldie Award by the Ontario Field Botanists in 2007. He was a co-recipient (with Dan Brunton and Tom Weiboldt) of the Windler Prize in 1996 for the best paper published in Castanea that year. His contributions to our understanding and appreciation of ferns is also acknowledged by the naming of three pteridophytes in his honour, *Gymnocarpium* × *brittonianum* (Sarvela) Pryer & Haufler, *Isoetes* x *brittonii* Brunton & Taylor and *Dryopteris*

filix-mas *spp. brittonii* Fraser-Jenkins & Widen. As he turned 80 a series of tributes were published to acknowledge his exceptional contribution to Canadian botany (Botanical Electronic News #304 and #305 in 2003, and in 2012). An extensive discussion of his achievement will appear in a future issue of the Canadian Field-Naturalist.
It is easy enough to appreciate historical figures in a particular field after lots has been written and said of them, but its much harder to appreciate when you are actually working with someone like that in real time. Don was just such a figure and he had a huge influence on Canadian botany. We were fortunate to know him well.



Photo: Dryopteris filix-mas spp. brittonii. Taken by Dan Brunton (Lone Sheiling, Cape Breton Highlands NP 27 Aug 05)

Tribute to Jim Soper (Part 2- Bibliography) by Erich Haber

(Part 1 Appeared in the Bulletin 45(2)65-67



FIGURE 3. Jim Soper several years after retirement in his office at the Botany Division, Canadian Museum of Nature, in front of a map of southern Ontario with pins and labels indicating his numerous collection localities. Photo: E. Haber



FIGURE 4. Jim Soper sketching at Brintnell Lake (now Glacier Lake), 10 August 1939. Photo: J. H. Soper.

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Accolades for other botanists and mycologists

Dr David Richardson was pleased to see that Dr Margaret McCully received an Honorary degree at Wilfrid Laurier last spring. He noted that Dr George Barron had received one from St Marys University in 1993 and Dr Margaret McCully in 2004. Here are the abbreviated convocation citations.

George L. Barron Doctor of Science

Born in Grangemouth, Scotland, in 1928, George Barron earned a Bachelor of Science degree with First Class Honors in Botany at the University of Glasgow followed by a Master of Science in Plant Pathology from the University of Toronto and two doctoral degrees, a Ph.D. in Mycology from the Iowa State University in 1958 and a Doctor of Science in Mycology from the University of Glasgow in 1984. He is a retired Professor of Environmental Biology at the University of Guelph.

Regarded as one of the most prominent scientists in Canada, his reputation for exceptional work in mycology is world-wide and has resulted in him being regarded as Canada's leading mycologist. He has published on almost every group of fungi, including three notable books, the last of which was Mushrooms of Ontario and Eastern Canada, 1999. In completing this latter book, he visited Saint Mary's University, gave an outstanding seminar, and went on field exercises with Saint Mary's University mycology students and local naturalists. The specimens and records he collected from Nova Scotia provided valuable data that aided in the completion of his book. He is known internationally not only as a mycologist but also as a photographer of fungi and his illustrations are to be found not only on his website and in numerous publications of other authors, but even on calendars.

Dr. Doug Strongman, Professor of Biology at Saint Mary's University, and a former student of Dr. Barron, remarked that his reputation as an educator is no less renowned that his recognition as a world-class mycologist. Unlike other professors at large institutions, he focused his attention on undergraduate students to the extent that students who passed through his course in mycology 20 years ago still mark the experience as one of the most memorable in their careers.

It is not surprising that Dr. Barron has been the recipient of a significant number of awards and honors. These include Goldsmiths Company of London Travel Fellowship; Nuffield Foundation Travel Fellowship; George Lawson Medal from the Canadian Botanical Association; and in 1998 the Distinguished Mycologist Award. In addition, he has published widely and been a source of significant inspirations to decades of students.

Now retired from the University of Guelph, he has been married to Mae Thomson since October 1953 and they have four children, two girls, Lesley and Laurie and two sons, Scott and Stuart together with seven grandchildren.

Dr. Margaret E. McCully Doctor of Science

The distinguished plant biologist, Dr. Margaret McCully is Director of the Carleton Cryoanalytical Microscopy Facility at Carleton University. She received her B.Sc. and an M.Sc. from the University of Toronto. Her early employment included being Research Associate for the Park Davis Company in Detroit, U.S.A., teaching science at an Ontario high school, and teaching biology at a girl's school in England. In 1962, she became a Teaching Fellow at Harvard University and obtained her Ph.D. there in 1966. She then joined Carleton University as an Assistant Professor, being promoted to Full Professor in 1977. She was appointed to her present position in 1990. Dr. McCully has been widely honoured for her work. She has been invited as Visiting Fellow to universities in England and Australia and was Honorary Vice-President of the XIII International Botanical Congress held in Sydney, Australia, in 1981. In 1987, she received the Carleton University Scholarly Achievement Award, and in the same year was elected a Fellow of the Royal Society of Canada. Her research has aimed at understanding how plant roots exploit the soil environment in search of nutrients, a factor of key importance in agriculture and horticulture. For these studies, Dr. McCully has developed new approaches and techniques using the latest developments in light and electron microscopy. She has published numerous scholarly papers and presented her work internationally in the form of outstanding lectures and workshops.



Note from the Editor.

I am planning to step down as the editor of the Bulletin in the spring of 2014, so I am hoping that there is someone out there who is willing to take it on after that! If you are interested, please contact Hugues Massicotte, hugues@unbc.ca
Christine D. Maxwell.

Graduate Student Profiles

We are interested in hearing about your research! Please send us a brief article (250 words) and photo, telling us about your project.

Gaolathe Rantong. Dalhousie University.



Gaolathe Rantong

Gaolathe is a PhD student in Dr Arunika Gunawardena's programmed cell death lab at Dalhousie University, in Halifax, Nova Scotia. Gaolathe is studying the genetic regulation of programmed cell death (PCD) in lace plant, an aquatic monocot which forms perforations on its leaves resulting in a lace-like structure of the leaves. The perforations are formed through developmentally regulated PCD, as part of normal development. They form at highly predictable areas between transverse and longitudinal veins, stopping 4-5 cells from the vascular tissue. It is not known how PCD is regulated in lace plant and Gaolathe's research is based on identifying genes that play a role in regulation of lace plant PCD. Ethylene has been implicated as one of the regulators of lace plant PCD through inhibitor experiments and an observed climacteric-like pattern of ethylene production by lace plant leaves during morphogenesis. Gaolathe isolated three lace plant ethylene receptor genes and is studying their transcript levels in lace plant leaf cells predetermined to undergo PCD (PCD cells) versus the control non-dying cells (non-PCD cells) and in leaves at different stages of development. Caspase-1 inhibitors have been shown to stop perforation formation in lace plant. Gaolathe isolated genes encoding two lace plant vacuolar processing enzymes (which display caspase-1 like activity) and is studying their transcript levels in different cells (PCD cells versus non-PCD cells) and leaves at various stages of development. Future work will include studying the interaction between ethylene, ethylene receptors and vacuolar processing enzymes in regulation of lace plant PCD.

Zoe Panchen. Carleton University.



Zoe in the Lham Chu Valley, Kailash Kora

My research is looking at plant responses to climate change; in particular Arctic plant phenological, demographic and floristic responses. Phenological responses are changes in seasonal events such as time of leafing out, flowering and fruiting. Demographic responses are the movement of plants to new locations such as the advancement of the range distribution of a species to more northern latitudes or higher altitudes. Floristic responses are the change in plant composition of a plant community. In the Arctic climate change is happening very rapidly and the pattern of warming is quite different from temperate regions where we know that spring flowering plants in particular are flowering earlier due to rising temperatures. Herbarium specimens, photographic and satellite images and field surveys provide a historic record of the date of flowering, fruiting and/or the presence of a plant at a particular location in a particular year. Repeated records provide a series that can be correlated with climate variables to measure response rates. Through analysing herbarium specimens I am assessing the change in timing of flowering and fruiting over time and with temperature changes. I plan to use satellite image vegetation index techniques and repeat photography techniques to assess changes in vegetation cover in relation to climate change. I also plan to repeat vegetation surveys to assess changes in floristic composition of snow bed plant communities. I am a PhD student in Root Gorlick's lab in the Department of Biology at Carleton University.

Saikat Kumar Basu. University of Lethbridge.

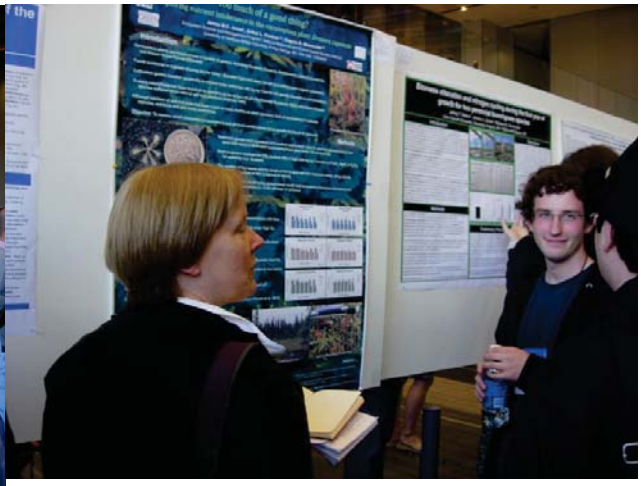


Saikat Kumar Basu

Saikat Kumar Basu did his double masters in Botany (Major: Microbiology) from the Calcutta University (India) and in Agricultural Studies from University of the Lethbridge (Canada). Currently he is currently finishing his doctoral degree in Biomolecular Sciences at the Department of Biological Sciences, University of Lethbridge specializing in Cereal Biotechnology and is supervised by Professor James E. Thomas.
Saikat enjoys traveling, soccer, cricket and photography during his leisure.
His project deals in studying the influence of RecA and RAD51 proteins on the integration pattern of a reporter gene in mature somatic cells and germ-line microspores through the use of biolistics and cell penetrating peptide mediated transfection in wheat.

More Scenes from Botany 2012







Above: Poster session in progress.
Left: Some of the Executive at the Outgoing Executive Meeting. L to R. Jane Young, Moira Galway, Liette Vasseur, Frédérique Guinel, Christine Maxwell, Arunika Gunawardena, Santokh Singh,Hugues Massicotte and Rodger Evans.
Photo: Linda Tackaberry and Hugues Massicotte.



Hamming it up with a Mona Lisa mural in Columbus.
Photo by Liette Vasseur

MAJOR INVASIVE ALIEN PLANTS OF NATURAL HABITATS IN CANADA

Paul M. Catling and Gisèle Mitrow

5. Common Buckthorn, European Buckthorn, nerprun cathartique, nerprun pergatif.

Rhamnus cathartica L.

Synonyms: no common synonyms

Infrataxa: A number of infrataxa, mostly varieties, have been described based mostly on varying amounts of hair on the leaves (e.g. *caucasica, densepubescens, pubescens, pumila, villarsii*). These are listed in Asian floras. They have some geographic correlation, those with more hairy leaves being in more arid regions. The densely hairy extreme, not found in Canada, is var. *caucasica* Kusn. Canadian plants have leaves ranging from those with a sparse covering of hairs between the more densely hairy veins to leaves that are entirely smooth. The former might be called var. *pubescens* Bean. Here we define var. *pubescens* as plants like the former but these grade into other plants with just hairy veined leaves, to those with sparsely hairy veined leaves, to plants with smooth leaves, without a clear point of separation. We are reluctant to recognize var. *pubescens* but have included it in the key pending a detailed study. There may be a more correct name for var. *pubescens* in the extensive European and Asian literature. The f. *longipetiolata* Grub. has coarse and long petiolate leaves.



Figure 1. Common Buckthorn from Köhler's Medizinal-Pflanzen (Franz Eugen Köhler) published in 1897

The genus name *Rhamnus* is said to be derived from the Greek “rhamnos” meaning “buckthorn” or the Celtic “rham” which refers to a group of branches. The specific name “cathartica” is Latin for “purging”, derived from the Greek “katharo” meaning “to cleanse”, a reference to the widespread former use of the berries as a cathartic (a laxative). Common Buckthorn is common and widely established in much of North America and is of European origin, hence the appropriate common names.

Identification and Classification

The genus *Rhamnus* belongs to the buckthorn family (Rhamnaceae) and consists of about 150 species, mainly in east Asia. *Rhamnus* differs from *Frangula* by its either male or female flowers and four-parted corolla instead of flowers with both male and female parts and a five-parted corolla. The leaves of *Frangula* have 8-9 pairs of lateral veins whereas those of *Rhamnus* have 3-6 pairs. For more information, see number 4 (Glossy Buckthorn, CBA Bulletin 45(2)) in this series.

In Canada there is one species of *Rhamnus.* Two additional species (*R. utilis* and *R. davurica*) occur in adjacent US states and are to be expected. They can be distinguished as follows:

1a. Leaves shiny above (when fresh), with more than 5-6 pairs of lateral veins, mostly narrowly elliptic or oblong, acute at the base and more than twice as long as wide, more than 8-12 cm long; leaf petioles 5-15 mm; drupes with 2 pits (leaves may be golden yellow pubescent on the veins beneath) ..... ***R. utilis*** Decne.
1b. Leaves shiny or not (when fresh), with 3-5(6) pairs of lateral veins, mostly ovate or ovate elliptic , acute, rounded or flat at the base and less than twice as long as wide and less than 6 cm long; leaf petioles 15-30 mm; drupes with 2-4 pits (leaves are smooth or hairy on the veins beneath)... …**2**

2a. Leaves with 3(4) lateral veins, shiny or dull above, broadly ovate to elliptic, oval, suborbicular, mostly 25-70(85) mm long ..... ***R. cathartica*** L. **– 3**
2b. Leaves with 4-5(6) lateral veins, shiny above, narrowly elliptic to elliptic oblong or narrowly obovate, mostly 60-100 mm long .....***R. davurica*** Pall**. –4**

3a. Leaves hairy between the veins beneath … .....var. ***pubescens*** Bean
3b. Leaves not hairy between the veins beneath ..... var. ***cathartica***

4a. Leaves 4-10 cm long, elliptic-obovate to oblong, narrow-oblong, grayish-green beneath ..... subsp. ***davurica***
4b. Leaves 5-15 cm long, narrow-oblong, green beneath (said to have a more vigorous spreading habit and more lustrous leaves) ..... subsp. ***nipponica*** (Mak.) Kartesz & Gandhi

Although only 3 introduced species of *Rhamnus* are reported from the northern US, it is possible that others occur which differ only slightly (particularly Chinese species). The round or flat-based and completely smooth leaves, with mostly 3 pairs of lateral veins are distinctive for Common Buckthorn. Other distinctive features include twigs ending in short thorns, opposite leaves and inconspicuous greenish-yellow flowers in the leaf axils.

There is some taxonomic difficulty in this group. For

example the var. *pubescens* Bean of *R. cathartica* has pubescent leaves, like *R. davurica* and *R. utilis,* casting some doubt on the value of this character in separating taxa, despite its use in the past. Whether or not the branches end in a spine or a bud also appears to be of limited use in separating *R. davurica* and *R. cathartica*, because the latter is sometimes quite spineless despite possessing all the other characters of *R. cathartica*. The occurrence of a well documented hybrid of *R. cathartica* and *R. utilis* in Michigan suggests that, without critical study, situations where hybrids are present may lead to incorrect identifications. The statement that *R. cathartica* is variable and polymorphic may be a result of hybridization involving the European *R. cathartica* and the Asian *R. davurica* and/or other species that are now in contact as a result of introduction. Here, when examining the Canadian herbarium specimens, *R. davurica* was defined as having relatively large narrowly elliptic and shiny leaves with 4 or more veins. No non-cultivated specimens from Canada definitely referable to *R. davurica* or *R. utilis* were seen. Common Buckthorn is most often confused with Glossy Buckthorn (*Frangula alnus,* see number 4 in this series). In species of New Jersey Tea (*Ceanothus* spp.) the inflorescences are terminal or long-pedunculate and the leaves are not folded or recurved at the tip and have straighter veins, and the twigs of these low shrubs, to 1 m tall, are without thorns.

Description (See Figures 1, 2, 3, 4, 5, 6, 7, 8)



Figure 2. Leaf of Common Buckthorn. Photo by P.M. Catling. Ottawa. November 2012

Deciduous multi-stemmed shrub or small tree to 9 m tall (mostly less than 4-7 m) with dull or occasionally somewhat shiny, rounded to ovate or elliptic, crenate-margined (with rounded teeth), mostly opposite or subopposite **leaves** with 3 or occasionally 4 prominent veins that curve toward the apex. The leaves are smooth on both surfaces or pubescent below (in var. *pubescens*) and sometimes also above, dark green or pale green above and a paler green below, and may be papery or leathery. The leaf tips are rounded, acute or flattened overall, but also pointed and slightly folded or recurved at the very tip. The leaf bases are subcordate, rounded, tapered or flat. The leaves are (2)2.5-6(10) cm long and 0.9-4(7) cm wide with more or less grooved and smooth or hairy petioles 0.4-3 cm long. They turn yellow in the late autumn but often persist as green foliage well into November after most native trees and shrubs have lost their foliage.



Figure 3. Bark of Common Buckthorn. Left, young bark with prominent lenticels. Middle, Young bark being replaced by flaky bark. Right, older scaly bark. Photos by P.M. Catling. Ottawa. November 2012.

The stout **branchlets** are grey-brown and either smooth or densely hairy. Long shoots are smooth and slightly angled whereas the short shoots are rough with crowded leaf scars. Some of the branches end in a sharp thorn 0.5-2.2 cm long between the buds or the branches. Young **bark** is grey or grey-brown with prominent horizontal lenticels (pores which allow gas exchange). Older bark is grey and scaly or fissured. Buds are scaly and the **bud scales** are dark brown or chestnut brown with white hairy margins. The heartwood is yellowish-orange and the sapwood is pale off-white. The roots are generally less than 1 m deep and the ratio of root length to tree height is 1.2.



Figure 4. Thorns of common Buckthorn. Photo by P.M. Catling. Ottawa. November 2012

Flowering occurs from mid-May with expanding leaves, or later, and may last until late June or early July. **Flowers** are green or greenish-yellow, less than 6 mm in diameter, unisexual, and the plants are dioecious (different sexes of flowers on different plants), rarely polygamous (both sexes of flowers on the same plant) and/or polygamodioecius (with male flowers and flowers with both male and female parts, or with female flowers as well as flowers with both male and female parts on the same plant), mostly 4-parted, in dense clusters (cymose inflorescences) from the axils of the lower



Figure 5. Flowers of Common Buckthorn. Left, male flowers. Right, female flowers. Both Ellis Hollow Creek Road, Ithaca, New York. Photos from Plantsystematics.org. Copyright Kevin Nixon. Used with permission.

leaves. Female flower clusters have approx. 30 flowers whereas those of males tend to be larger with about 40 flowers. Pedicels are approx. 6 mm long. Sepals form a four lobed tube and the erect petals are inserted on this tube. **Female flowers** have petals approx. 0.6 mm long, stigma approx. 1 mm long and style approx. 1.5 mm long. **Male flowers** have petals 1-2 mm long, 4 stamens with filaments 1.5 mm long and oblong whitish anthers 0.5 mm long. The fruiting pedicel is 5-10 mm. The **fruit** is a smooth, fleshy, globose, berry-like drupe 5–10 mm in diameter, at first green in June and July, red in August and purplish black when ripe in September. Unlike the fruits of Glossy Buckthorn, many of those of Common Buckthorn are retained over winter. The fruits contain 1-5 but mostly 3 or 4 **seeds** (pits) approx. 5 mm long and 3 mm wide, and with a narrow dorsal groove that is furrowed and open near the base. The chromosome number is 2n = 21.



Figure 6 . Fruit of Common Buckthorn. Photo by P.M. Catling. Ottawa. November 2012.

Distribution and History

Common Buckthorn is native to most of Europe (north to 61.75°N in Sweden), but absent from the extreme south, although it occurs in Morocco and Algeria, and extends east throughout middle Asia to Russia, Iran and Afghanistan. It was introduced to North America in the 1800s because of its value in medicine and use as a hedge plant.

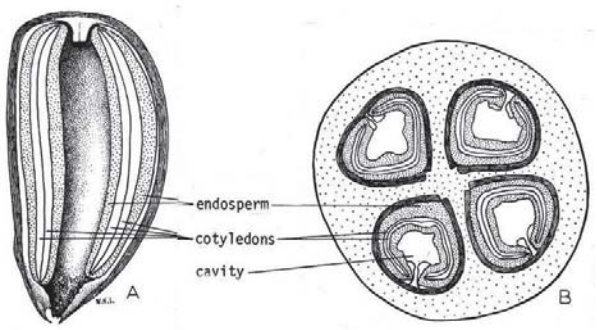


Figure 7. Cross-section of a berry showing the 4 seeds and their parts. USDA-NRCS PLANTS Database. Used with permission.



Figure 8. Seeds of *Rhamnus cathartica* from Tbilisi, Georgia, United States. Photo by Steve Hurst for USDA-NRCS PLANTS Database. Used with permission.

The accompanying map (Figure 9) is based on 673 specimens from the following herbaria: ACAD, ALTA, CAN, DAO, LKHD, MMMN, MT, MTMG, NFLD, NSPM, OAC, QFA, QK, QUE, SASK, TRT, TRTE, UBC, UNB, UWO, V, WAT and WIN. By 1877 Common Buckthorn had escaped from cultivation at Castleton and Belleville in Ontario. In the 1890s there were many collections from southern Ontario from localities such as Toronto, Queenston Heights and Ottawa. The oldest Canadian specimen (TRT) was collected by M Wilkes on Spadina Ave. in Toronto in 1894 (perhaps only a few blocks from where the tragic University College fire had consumed 33,000 books 4 years earlier). The first specimen from Quebec (QFA) was collected at Montreal in 1915 with many others from Montreal in the 1920s. Common

Buckthorn established a little later as a common local introduction in the maritimes and the prairies with the first specimen from Nova Scotia (ACAD) in 1938, the first from Saskatchewan (SASK) in 1923 and the first from Alberta (ALTA) in 1942. It is said to have been introduced to Saskatchewan in the 1930s at the Dominion Tree Nursery in Saskatoon for use as shelterbelts. It had apparently already escaped locally by the time its role as an alternate host of Oat Crown Rust was realized and experimental plots were promptly destroyed.

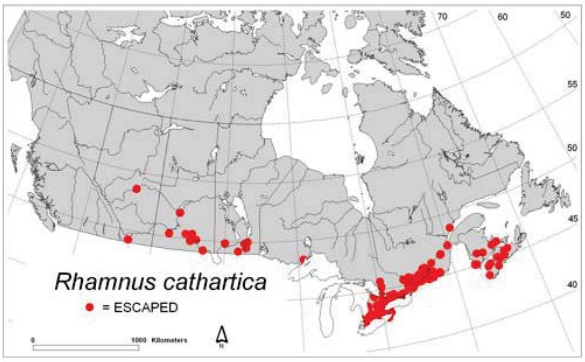


Figure 9. Distribution of Common Buckthorn in Canada based on specimens in Canadian herbaria.

Ecology

Common Buckthorn grows in wet to dry substrates, particularly those that are alkaline. The Ontario distribution maps that have been made for it suggest an absence from the acid substrates of the Canadian Shield. It grows with grasses in open habitats such as old fields and with other shrubs and trees in fence rows and along roads, or in semi-shaded woodlands and woodland edges.
The flowers are reported to be pollinated by bees and flies (*Eristalis, Bombus, Andrena*). The styles of the female flowers may be different lengths on different trees. The pollination system requires more study.
In its native range in England it was written in 1918 that "it is not beloved of birds except when hunger of long-continued rough weather drives them to its berries."
Although the fruits are said to be generally avoided by birds, but used as a last resort in late winter or early spring, dispersal by birds by regurgitation and defecation and by mammals must be relatively effective since the plant has become widespread and abundant over North America in the short period of a little more than 100 years. Starlings, American Robins, thrushes and Blue Jays feed on the fruit in fall, and/or winter and spring in various parts of the northeast. Cedar Waxwings and Bohemian Waxwings are reported to feed on the berries in winter in Saskatchewan. It has been assumed that the fruit has a laxative effect on birds (as well as people) and that this improves the possibilities of dispersal, but this idea also requires further study.
Mice, particularly Meadow Voles and Deer Mice, feed on the seedlings and seeds, and may contribute to dispersal over short distances. Other rodents, especially those creating food caches, and deer may also disperse seeds. Since fresh seeds and fruits can float for at least several days, dispersal by water is also a possibility. Dispersal by humans can result from seeds becoming lodged in mud on vehicles and in the past resulted from the use of the plant in hedges.
There is variation between trees and between years with regard to when the fruit is dropped, but many fruits are retained until late winter or early spring or longer. One of the advantages of seeds falling late with the dried flesh of the fruit around them is that their viability may be increased. Seed banks beneath trees may contain up to 5000 seeds m^2. Seeds remain viable for 2 years and possibly as long as six years.

Some Invasive Advantages possessed by Common Buckthorn

Light exclusion – can grow taller than native shrubs forming a dense canopy that excludes light.
Allelopathy – produces chemicals that are deleterious to the plants growing around it (conflicting studies).
Bird dispersal – permits dispersal over long distances**.**
Thorny – may deter some browsing mammals.
Longer photosynthetic period – leaves remain green after native trees and shrubs have dropped their leaves in fall. The extent to which this is a benefit is unclear. Bud break in the spring may be earlier or at the same time as native species.
Hydridization – of races and closely related species leading to genetic diversity and the development of more aggressive plants.
Invisibility – not easy to see the impact and abundance of Common Buckthorn. To most people it is just another inconspicuous shrub. This makes it difficult to control. To an experienced field botanist however, it is clearly one of the most abundant shrubs in many parts of southern Canada and has already had a huge impact by displacing native species.
Relationship with other successful invasives – It has been suggested that Common Buckthorn may be promoted by invasive alien earthworms (there are no native soil dwelling earthworms in most of Canada). A primary dispersal agent may be the introduced European Starling and unprecedented increases in White-tailed Deer in southern Canada may also have played a role.
Rapid Growth – seed to a seed-producing plant in 5 years.
Broad Niche – wet or dry and open or shaded conditions
High fecundity and germination – large amount of seed produced with high germination success.

In Canada

Provincial Invasive Species Councils have produced information about Common Buckthorn on the web and in brochures. Ontario in particular has a very informative Best Management Practices document http://www.invadingspecies.com/resources/publications/ .
Common Buckthorn is listed as a noxious weed in the weed control acts of Alberta, Ontario and Saskatchewan.

Damage (significance is suggested by the number of asterisks to 5 for highly significant)

This species was number 26 on a prioritized list of invasive alien plants of natural habitats in Canada published in 2005 (CBA/ABC Bulletin 38(4): 55-57. 2005). It is now considered to be within the top 20. It has an invasive species assessment protocol of High/Medium for the United States and is a "very high" impact species in the state of New York (http://www.dec.ny.gov/animals/65408.html)

Biodiversity

(1) Invades both open areas and semi-open woodlands where it out-competes native plants for nutrients, light and moisture resulting in dense stands with no other species. For example it has invaded open Oak-Hickory woods in Prince Edward County, Ontario, resulting in the decline or disappearance of native shrubs such *Rhus aromatica, Ceanothus americanus, Amelanchier sanguinea,* and *Shepherdia canadensis*. Woodland edges and semi-open woods are soon dominated by Common Buckthorn. It rapidly invades gaps in woodlands resulting from the death of overstory trees. It has contributed to the decline of tallgrass savanna in the Great Lakes region and the upper Midwest. Once savanna is converted to Buckthorn woodland, burning can no longer be used as a management tool. It has dominated both the shrub and herb layers of forests with sapling densities of 34,600 stems/ha and dense covers of seedlings.*****

(2) Alters forest structure by increasing the density of woody stems.*****

(3) Changes soil chemistry and composition, perhaps with the help of introduced earthworms, in ways that are unlikely to benefit native species and it may also be allelopathic.*****

(4) Replacement of native species that provide valuable food for wildlife with a species of lesser food value. In much of southern Ontario it has become the dominant plant of edges of woodlands and hedge rows where it has displaced numerous native shrubs including viburnums, juneberries, hawthorns, cherries, plums, and others, all of which were of great value to wildlife.*****

(5) Management and control to protect valuable biodiversity is costly.*****

(6) Chemical control of Common Buckthorn in natural habitats to protect nearby crops may have a have a deleterious effect on native flora and fauna.*****

(7) It has displaced native species such as Roses and Hawthorns which have more and stronger and sharper "thorns" and provide more protection for nesting native birds thus potentially increasing predation.*

Agriculture

(8) It is also the alternate host of the pathogenic fungus, *Puccinia coronata* (Figure 10), causing crown rust and leaf rust of Oats. This pathogen reduces the yield, quality, weight and protein content of the oat grains. It was reported that most severe infections of oats throughout Ontario were associated with host populations of Common Buckthorn. A variant of *P.coronata* called var. *hordei*, commonly called Crown Rust of Barley, has been reported on Barley and forage grasses in the adjacent US states of Minnesota and North Dakota.*****

(9) Common Buckthorn is an alternate host for the introduced Soybean Aphid (*Aphanes glycines*). The aphids overwinter primarily on Common Buckthorn (Figures 11, 12).*****

(10) Poisoning in cattle has been reported, but may not occur often, even though Common Buckthorn appears to be excluded by browsing from heavily grazed pastures. It is also said to reduce quality and quantity of milk and affect the meat. Effects on horses have also been reported but are not well documented.*



Figure 10 Crown rust of oat (*Puccinia coronata*) on a leaves of alternate buckthorn hosts. Left, upper surface of a leaf. Photo by Howard F. Schwartz, Colorado State University, Bugwood.org. Right, lower surface of a leaf. Photo by Rob Routledge, invasive.org.

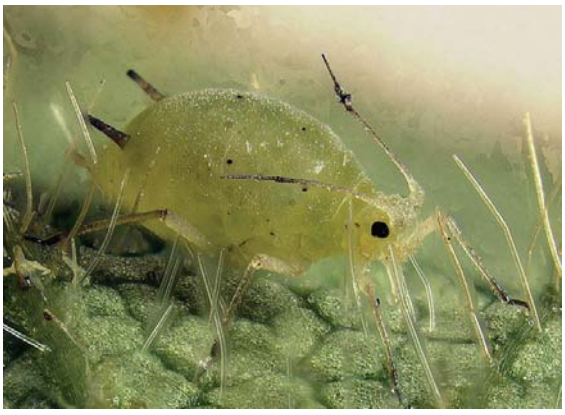


Figure 11. Soybean Aphid (*Aphis glycines*). Wikipedia Commons, photo by Ho Jung Yoo. Purdue University.

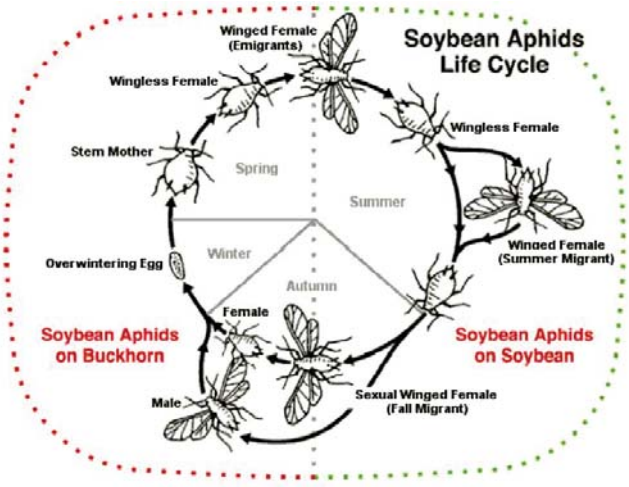


Figure 12. Soybean Aphid life cycle is complex. The wingless adult females later develop wings that allow them to migrate in the spring and fall. The complete soybean aphid life cycle includes 15 to 18 generations annually. They overwinter in the egg stage on buckthorns. Wikipedia Commons, courtesy of David Voegtlin, University of Illinois at Urbana-Champaign.

Health
(11) Contains glycosides yielding anthraquinones such as emodin. Poisonings mostly involve young children. They often eat only a few berries because of the unpleasant taste. This is followed by stomach pain, vomiting and diarrhea. Comsumption of twenty berries or more may also lead to nausea, stomach cramps, muscular convulsions, kidney damage, and irritation and bleeding of the digestive system.**

Beneficial Aspects

(1) It has been used (bark and berries) medicinally from the Middle Ages to the present, as a laxative. Both the bark and the berries have been used to treat skin disease, dropsy, rheumatism and gout. Some compounds in the fruit have proven to be antibacterial.*
(2) Yellow and green dies of good quality can be made from the bark and berries.*
(3) The flowers are a source of nectar for honey production but comparisons with other species and studies of particular situations are not available to evaluate this suggestion. *
(4) It is used for hedges extensively in the past and to a lesser extent as an ornamental.*
(5) The wood with reddish veins and a marble-like grain is used in woodwork and carpentry.*
(6) The bark is rich in tannins and has been used as a tanning agent.*

Management

Biological Control:
As with Glossy Buckthorn, a potential problem with introduction of biocontrol agents is the possibility of them feeding on native species of buckthorns (both *Rhamnus* species and *Frangula* species, including the economically important Cascara). Most of the Eurasian insects that feed on one, also feed on the other, so it would be helpful to consider biocontrol of both at the same time. More recent studies have suggested that the two genera have a different insect fauna. A 1964 study aimed specifically at Canada revealed a number of potential biocontrol agents including gall midges living in the berries and leaf-feeding Lepidoptera.
The Minnesota invasive species program has selected a geometrid moth (*Philereme vetulata*), a leafhopper (*Trichochermes walkeri*) and a fly (*Wachtiella krumbholzi*) for further study as control agents for both *Frangula alnus* and *Rhamnus cathartica*. One recent study found little biotic resistance to the establishment of biocontrol agents but predators and parasitoids required more research.
The impact of the accidentally introduced Soybean Aphid (*Aphis glycines*) on Common Buckthorn has not been evaluated but interest in controlling this insect to protect crops will limit its biocontrol potential.
Among the native Canadian insects that have been observed to feed on Common Buckthorn is the Green Stink Bug (*Acrosternum hilare*), Say's Stink Bug (*Chlorochroa sayi*) and the Eastern Tent Caterpillar (*Malacosoma americana*).

Manual and Mechanical Methods:
Burning: Prescribed burns in early spring and fall, when leaf litter is dry, may kill seedlings and have been useful in control in some situations. However, the seedlings and saplings often occur where leaf litter is insufficient for a useful fire and *Rhamnus* litter does not persist. Resprouting of trees and shrubs of Common Buckthorn may occur after fire so the beneficial effect may be short lived. As usual the effects of fire on the local flora and fauna should be taken into account. Repeated prescribed burns for a period of 5-6 years have been found necessary for control but improved control occurs during this period with higher diversity of herbaceous vegetation gradually developing. The improvement occurs because fuel availability from herbaceous species increases over time and energy available in root reserves of the buckthorn decreases.
Manual cutting and pulling: As with Glossy Buckthorn, small shrubs can be hand-pulled or removed with garden equipment. A weed wrench (Figure 13) is very useful for larger plants to 5 cm in diameter. Still larger plants can be cut with a handsaw or chainsaw. However cut stumps send up vigorous shoots. In applying any mechanical control, it is important to remember that disturbance to the soil may encourage an enormous seed bank to germinate so that follow-up actions are necessary.



Figure 13. A weed wrench is a manually operated all-steel tool designed to uproot woody plants. Courtesy of Weed Wrench Company, Grants Pass, Oregon. http://www.weedwrench.com/weedwrench/

Does Common Buckthorn have real thorns?

In the broad sense, thorns are hard, sharp structures that plants have evolved for protection. In fact, real thorns are modified branches while spines are developed from leaves (and bracts, stipules, etc.) and prickles are developed as an extension of the outer covering (epidermis, cortex). Barberry shrubs and cacti have spines, roses have prickles and yes, Common Buckthorn has thorns (sort of), but if you want to see real thorns check the Honey Locust (*Gleditsia triacanthos*), … or ask Crocodile Dundee for an Australian example and he can show you a real knife at the same time!

Girdling: Cutting a 3 cm or wider strip around the base of the trunk (removing the bark) is effective. Girdling tools are available. Two parallel bands a few cm deep may be cut on the trunk several cm apart and the bark can be removed between them.

Water Level Adjustments: Since Common Buckthorn, unlike Glossy Buckthorn, is mostly a plant of drier situations, flooding is usually not a control option.

Chemical Control: It is recommended that those applying chemical methods contact a local ministry of natural resources to obtain information on rules and procedures. Herbicides have been found to effectively control Common Buckthorn in many situations and the literature is extensive. Use of triclopyr herbicide at the rate of 1:4 herbicide:water with dye on cut stumps during the growing season (from late May to October) is often used. Use of 1 part glyphosate herbicide to 5 parts water mixture applied immediately to cut stumps with a hand sprayer also proved useful. There have been some studies that have compared various combinations of cutting and girdling with different combinations of herbicides. One of these found that cutting or girdling with applications of glyphosate or picloran/2,4-D were the most effective treatments.

General Considerations: Treatment late in the season to avoid damage to native plants is desirable. Permits are often required for application of herbicides. It is sensible to remove fruit-bearing trees first. It is also sensible to concentrate on high-priority areas since resources will always be limiting.
Until an effective biocontrol program has been established or until local pests have caught up with the infestation, which may be too late to protect much native biodiversity, this invasive will only be effectively controlled on a very local basis. Where significant economic or natural features exist, including soybeans, barley and oats, or rare and endangered species, a variety of labour intensive control methods are available.

Prospects

Over the next few decades there will be increased impact on agriculture and substantial loss of native biodiversity as a result of Common Buckthorn. Many native plants including trees, shrubs and herbs will decline. Common Buckthorn will continue to exploit disturbed situations, and new problems, possibly including the loss of ash trees as a result of Emerald Ash Borer. It is likely to continue to increase in abundance.

Believe it or not

- To some, *Rhamnus cathartica*, as well as being the scientific name of a plant, also refers to the act of shoving or ramming something up someone's rectum, in a theoretical sense, in attempt to get even with someone or gain revenge. It was popularized because of the limited understanding of the meaning which enabled its use to be increased, and the fact that it is less rude and demonstrative, even when understood. Used in this way the name appears on mugs and t-shirts.

- The fact that Common Buckthorn remains green longer than other species in the fall has been used to assist in mapping infestations using satellite imagery and aerial photographs.

- The introduced Soybean Aphid which depends largely on Common Buckthorn may have facilitated increase in populations of the exotic Multi-coloured Asian Lady Beetle (*Harmonia axyridas*) which is implicated in the decline (or complete disappearance) of some North American Lady Beetles that feed on crop pests.

- A pamphlet produced by the Ontario Department of Agriculture in 1954 (re-issued in 1961) was entitled “Rid Ontario of the Common Barberry and the European Buckthorn.” It was already much too late as clearly indicated by a survey done by the federal Dept. of Agriculture in eastern Ontario in 1952.

- “Only a few decades ago people thought that loss of habitat to agriculture was the primary cause of threat to native species. They looked to government parks and protective agencies to remedy the situation. Now in southern Canada we have two species of buckthorns affecting some of the most important natural areas that are left. People are now looking to invasive species councils and volunteer programs, but they know that the battle is being and will be lost without a much more aggressive biocontrol program.”

- Common Buckthorn has been called a “keystone invader” of agricultural landscapes (one with disproportional impact) because of significant effect as an alternative host for pests of Soybean and Oats.

- Oaks will lose their historical dominance in the Midwest over the next few decades due to invasion of Common Buckthorn.

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Figure 14. Common Buckthorn leaves and berries. From www.discoverlife.org. Used with permission



Figure 15. Remarkably large Common Buckthorn at Ehner, Luxembourg. Wikimedia Commons.

TOP CANADIAN ORNAMENTAL PLANTS.

3. Poinsettia

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Figure 1. Red poinsettias. Photo (public domain) by Scott Bauer, U.S. Department of Agriculture.

Except for Christmas trees, poinsettias have become the most popular winter season plant. Almost unknown 150 years ago, they are now ubiquitous in homes and offices, not just in Canada, but in much of the Americas, Europe, and other areas. There is something very special about the way poinsettias produce their vivid red bracts in mid-winter, just in time to celebrate Christmas. Although sales are virtually confined to the Christmas period, the poinsettia is nevertheless the leading potted plant in many areas of the world.

Names

SCIENTIFIC NAME: *Euphorbia pulcherrima* Willd. ex Klotzsch (*E. poinsettia* Raf.; *E. pulcherrima* (Willd. ex Klotzsch) Graham). *Euphorbia*, named for Euphorbus, a first century Greek physician of an ancient African kingdom that was located in what is now modern Algeria, is a huge genus of 2,000 or so species. The epithet *pulcherrima* is Latin for “very beautiful”.

ENGLISH NAMES: (common) poinsettia, poinsetta (a widespread misspelling, associated with the mispronunciation poin-SET-uh). Also: Ataturk's flower (in Turkey; poinsettia was the favourite flower of Atakurk, the founder of modern Turkey), Christmas flower, Christmas plant, Christmas star, eastern flower, lobster flower, lobster plant, (Mexican) flame leaf, painted leaf, points (a nickname encountered in the greenhouse trade), winter rose. The English name poinsettia commemorates Joel Roberts Poinsett (1799–1851) the first United States Minister to Mexico (ambassadors were not appointed until 1896), and an amateur botanist.

FRENCH NAMES: poinsettia, étoile de noël; also: euphorbe superbe, euphorbe écarlate, rose de noël.



Figure 2. Joel Roberts Poinsett (1799–1851), prominent United States politician, who introduced poinsettia to the U.S. in 1828. Public domain photo of an oil painting in the possession of the U.S. Department of Defense.

The Wild Ancestor

Euphorbia pulcherrima is indigenous to tropical and subtropical regions from western Mexico to Guatemala (the range now extending south to Costa Rica), occurring in deciduous forests at moderate elevations as well as in hot, seasonally dry forests. The species is commonly cultivated in subtropical and tropical regions, and has become naturalized in many areas. It is sometimes classified as an invasive alien. In North America, it occasionally has been found growing outside of cultivation in some of the southern U.S. states. This shrub or small tree develops several erect stems 0.6–4 m (2–13 feet) high. Depending on climate, the foliage is evergreen or deciduous. The normal leaves are dark green and dentate, but the upper ones are modified (as “bracts”), becoming red at maturity. The flowers are tiny, unisexual, lack petals and sepals, and occur in a cyathium – a greenish, cup-shaped cluster of flowers surrounded by very tiny bracts. Cyathia occur on the ends of branches, surrounded by 10 to 20 leaf-like large coloured bracts. Male flowers consist of a single red stamen, and several of these surround the solitary pistil in each cyathium. The female flower is exserted from the cyathium on a pedicel. Fused to one side of the cyathium is a nectar gland, appearing like yellow lips, this serving to reward pollinators (reportedly birds, especially hummingbirds, as well as various insects). The fertilized ovaries developed into fruits (schizocarps) which explosively scatter the seeds. Poinsettia flowering and associated bract colouration are photoperiodic, occurring in response to shortening day length. In its native area of Central America, the plant flowers in winter (hence the association with Christmas) when days are short (i.e. nights are long). The inconspicuous flowers fade after fertilization, but the bracts can remain colourful for weeks. The substantial red display of the bracts compensates for the inconspicuous flowers, and indeed non-botanists frequently refer to the bracts as petals.

History of the Ornamental Forms

Euphorbia pulcherrima was cultivated and indeed likely .

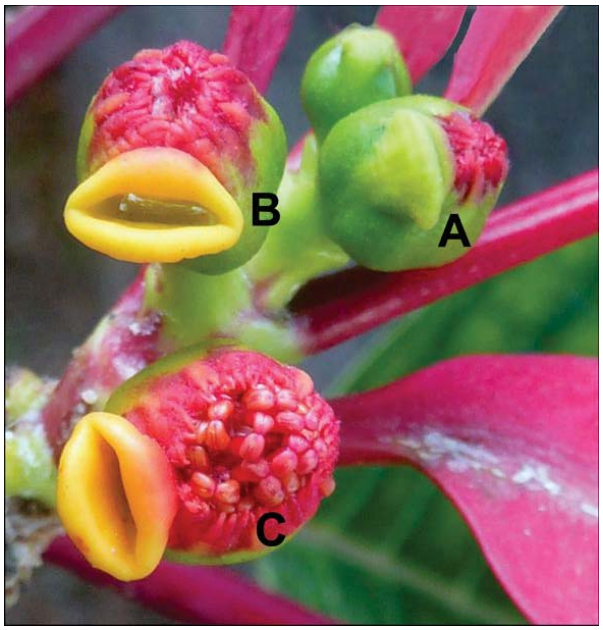


Figure 3. Close-up of young poinsettia cyathia (inflorescences); A is unopened, B is opening, C is recently opened. The single nectar gland associated with each cyathium has the appearance of yellow lips of an open mouth. The female flowers have not yet emerged (see Figure 4). Photo by Philstone, Creative Commons 3.0 license.

domesticated to some extent by the Aztecs in Mexico in pre-Columbian times. With Christianization of indigenous people in Mexico, the Aztec tradition of using the plant in religious ceremonies was taken up in churches. In the early 1800s the species was brought to both Europe and the U.S., where its ornamental value was realized; by the middle of the 19th century, poinsettia was widely cultivated in both the New and Old Worlds, but primarily as a landscape shrub in subtropical climates. Northern Guerero, Mexico, has been identified as the principal area from which modern poinsettia cultivars have been derived. In 1923, a poinsettia seedling grown by a Mrs. Enteman in Jersey City, New Jersey became the basis of the cultivar 'Oak Leaf'. This plant proved to have excellent bract retention and to be exceptionally suitable for pot culture; it formed the basis of the potted poinsettia trade for 40 years. Selection of over 100 cultivars occurred during the 20th century, with emphasis on bract display. Depending on the cultivar, periods of uninterrupted darkness of 12 to 14 hours are needed daily for 7 to 10 weeks for bract colouration to develop. Bracts in cultivars are larger and more numerous than in most wild plants, and colour variants have been selected. Today, in additional to the traditional red bract colour, cultivars are available with bracts that are burgundy, pink, coral, orange, white, cream, yellow, pale green; marbled, mottled, or variegated; and even with wavy margins.

In the poinsettia trade, tall, top-heavy plants are awkward to handle and are therefore very undesirable. Compared to the original wild ancestor, store-bought plants purchased for Christmas are compact and dwarfed, usually forced into bloom at a height of 0.3–0.6 m (1–2 feet), and the stems have been pinched to promote branching. (In the past, it was common practice to place several cuttings in a pot to give the impression that one well-branched plant was present.) Commercial growers have probably selected low-growing forms, but height is also often limited by applying growth retardants. Some store-bought plants are capable of growing into tall shrubs if transferred to an appropriate environment.

The Remarkable Use of a Disease Organism to Produce Attractive Poinsettias

It may seem counterintuitive, but humans sometimes find diseased plants to be very attractive. Several dwarfed trees and shrubs in commerce are simply virus-infected plants maintained by cuttings. Foliage chimeras (i.e. with leaves variegated with white) of various species are also sometimes similarly diseased plants. Many of the early tulip cultivars with variegated petal colours were simply the result of viral infections; eventually these were banned because they weakened the tulips and indeed threatened the tulip trade. However, as noted below, most modern poinsettias are in fact diseased plants, but the disease is highly beneficial for the industry.

In the 1980s, poinsettia breeder Gregor Gutbier grafted a poinsettia plant that was naturally poorly branched on top of a poinsettia plant that was highly branched. Very curiously, when he took cuttings from the poorly branched plant, they grew into highly branched plants. Apparently others in the poinsettia trade have also utilized plants with the natural ability to produce highly desirable branching dwarfs. Later, Lee et al. (1997) discovered that the highly branched dwarf poinsettias which have come to dominate the poinsettia trade were infected with a phytoplasma (a bacterium, notable for lack of cell walls), and that this disease is transmissible and *causes* the dwarfing and branching. (More

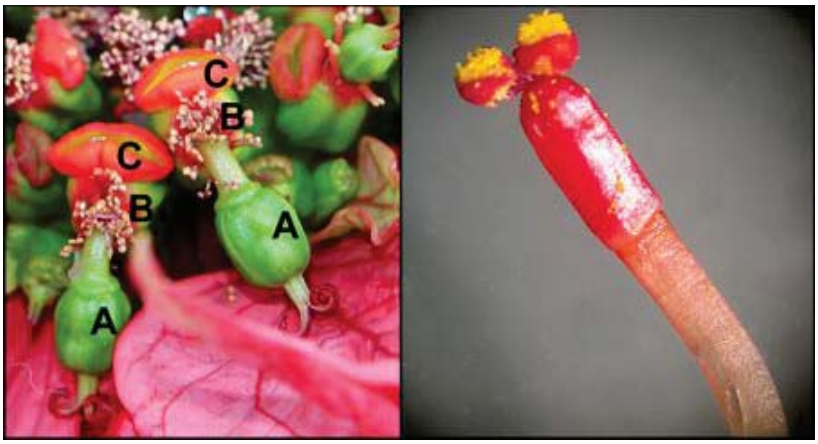


Figure 4. Left: Poinsettia cyathia. A = ovary of the single female flower of each cyathium. B = Male flowers (stamens) surrounding the female flower. C = nectar gland. Photo (public domain) by “Hardyplants at the Wikipedia project”. Right: Male flower (reduced to a single stamen with a bi-lobed anther) shedding pollen. As discussed in the text, plants shedding pollen are overmature and should not be purchased. Photo by Aelwyn, Creative Commons 3.0 license.

precisely, it causes much-increased branching from a single pinching off of a terminal stem.) The infectious agent has been shown to be related to some other diseases (including peach x and spiraea stunt), but is relatively benign in poinsettia. Today, the phytoplasma is deliberately introduced to poinsettia cultivars by grafting in order to stimulate the desired highly branched, compact habit.



Figure 5. Huge poinsettia plants growing in a courtyard in Mexico. Photo by Thelmadatter, Creative Commons 3.0 license.



Figure 6. A commercial greenhouse of red poinsettias. Photo by Rachael Kramer (Flickr; Creative Commons attribution required).

Commercial Aspects

Until the middle of the 20th century, the poinsettia was not well known. Paul Ecke Jr. (1925–2002) is widely credited with transforming the species into the top-selling potted plant in the U.S., and an indispensable associate of Christmas. His father, Paul Ecke Sr., developed the first poinsettia that could be successfully grown as an indoor potted plant, and was instrumental in founding the Paul Ecke Ranch, which to this day is the world's largest producer of poinsettias. Paul Ecke Jr. sent thousands of free plants to the major television stations to use as scenic backdrops for Christmas. During the Christmas season, television viewers were treated to backgrounds of hundreds of poinsettias on their favourite shows. Ecke also recognized that women are the chief purchasers of flowers, and he provided free plants to women's magazines. This inspired product placement hooked the public, and by 1986 poinsettias displaced chrysanthemums as the leading potted plant in the U.S. The poinsettia is an outstanding example of commercial interests establishing a “tradition” of purchasing a commodity for a seasonal event.

“Stock plants” are simply rooted cuttings that can be used by garden centre retailers for direct sales and for growing potted plants of many floricultural and some vegetable crops. Because of economic considerations (especially costs for labour, heating, and construction of greenhouses), and climate advantages, the production of stock plants has migrated “offshore” to a very large degree. Central America has become the centre of growing and breeding of new poinsettia cultivars, and of shipping small, rooted plants (“plugs”) to commercial greenhouses all over North America and Europe. The greenhouses use these plugs to grow the plants in pots, pinching most cultivars to promote branching, and using huge shade curtains to block off light, to provide the necessary induction of bract colouration.

Today, world production of poinsettias is controlled by a handful of firms. The Paul Ecke Ranch, the world's largest poinsettia producer, once grew all of its plants outdoors in Encinitas, southern California, but now specializes in the production of poinsettia plugs in Guatemalan greenhouses. Growing poinsettias is a precise science, and numerous problems can arise (these are detailed in the references provided).

Marketing poinsettias has become a very competitive business. Big box stores and supermarkets have come to dominate poinsettia sales, in some cases selling the plants at retail prices that are actually less than the wholesale prices that many producers can afford. Sometimes plants are spray-painted (!) or cleverly interwoven with colourful foil, both rather deplorable trends that detract from the intrinsic beauty of the plants. Selling “designer” plants (those with unusual bract colours or colour combinations), placing plants in unusual containers, and combining poinsettias with other plants are ways that some specialty flower shops are trying to remain viable. However, the mass-marketing of poinsettia and indeed other ornamental plants is a very serious challenge for many independents today, some of whom are considering switching to alternative holiday plants.

Europe accounts for almost two-thirds of poinsettia world sales, and the U.S. for about one-third. In the U.S., poinsettia is the leading produced potted plant (followed by orchids collectively and chrysanthemums collectively), accounting for about a third of sales of all flowering potted plants. California is the leading grower, accounting for about a quarter of U.S. production, but some plants are grown commercially in all U.S. states. U.S. production in 2011 (based on the 15 top-producing states, which dominate the industry) amounted to 35 million pots valued at $140 million (a decrease from previous years).

The leading class of potted plant produced in Canada is geraniums, followed by poinsettias and chrysanthemums. Over the last decade about 10 million pots of poinsettia have been sold annually in Canada, with a trend of decreasing sales (down to 8.6 million in 2011). About half of domestic production is in Ontario, and a third in British Columbia. Six inch pots have been popular in recent years, but demand is increasing for larger plants in 8 inch pots. In addition to Canadian production of potted poinsettias from plugs, potted poinsettias are also imported into Canada; however, trade statistics are not available to indicate the size of poinsettia importation.



Figure 7. An excellent commercial specimen of poinsettia. Note the several branches in flower, a key criterion of quality. Public domain photo by Petr Kratochvil.

Consumer Tips

Poinsettias remain attractive in the home for 2 to 4 weeks, but the beautiful display can be extended with excellent care to 8 weeks, or even longer with some varieties.

- Buy from a reputable source. If before you bought it a plant has been stored in cold conditions or with inadequate attention to moisture, it will probably deteriorate rapidly.
- Look for aesthetic quality: dark green foliage down to the soil line, bracts that are completely coloured, a habit that is balanced and symmetrical.
- Check for maturity: ideally, the flower buds should be closed (i.e. unopened); the true flowers in the cyathia should be green or red-tipped and fresh looking, and pollen should not be covering the bracts (indicative of over-maturity).
- Check for obvious health problems: fallen or yellowed leaves, drooping or wilted habit, and insects; ties or stakes should not be necessary.
- Check for poor display and storage conditions: plants kept in sleeves tend to deteriorate; plants crowded together tend to drop their bracts; wet soil promotes fungal problems.
- Transporting plants from the shop to your home in the cold of winter (less than 10 °C or 50 °F) can be very damaging; insist on completely wrapping the plant, preferably in plastic.
- Light: bright but not direct sunlight is best, preferably at least 6 hours. Low light stimulates the loss of leaves. If a shady location is desired for best display while visitors are present, return the plant to its holding area afterwards.
- Moisture: poinsettia is very intolerant of overly moist soil, but requires continuous moderate moisture. Check soil moisture daily, water sparingly (but enough so that water flows from the bottom of the pot) and only when the surface of the compost begins to dry out (and is dry to the touch). This might require watering two or three times weekly. If the usual foil wrapping extends over the base of the pot, punch a hole through the bottom for drainage; discard water draining into the supporting dish (do not allow the pot to sit in water). Setting the container in a gravel-filled pan with water, or near other plants, can help maintain the humidity of the surrounding air. Alternatively, mist the foliage
- Heat: poinsettia is very intolerant of cold and drafty locations (such as near heat vents, radiators, exterior doors, and open windows). Do not allow plants to touch cold windows. Minimum required temperature is 13–15 °C (55–59 °F). Ideal daytime temperatures are 15.5–21 °C (60–70 °F). Preferably, the plant should be moved to a cooler room (around 13–18 °C (55–65 °F) at night.
- Poinsettias purchased for Christmas do not normally require fertilization. However, if kept for more than a month, to maintain the green foliage and promote growth, apply a low nitrogen, high potassium, soluble fertilizer, monthly.



Figure 8. Poinsettias with white bracts, the second most popular colour after red. Public domain photo by David Wagner.

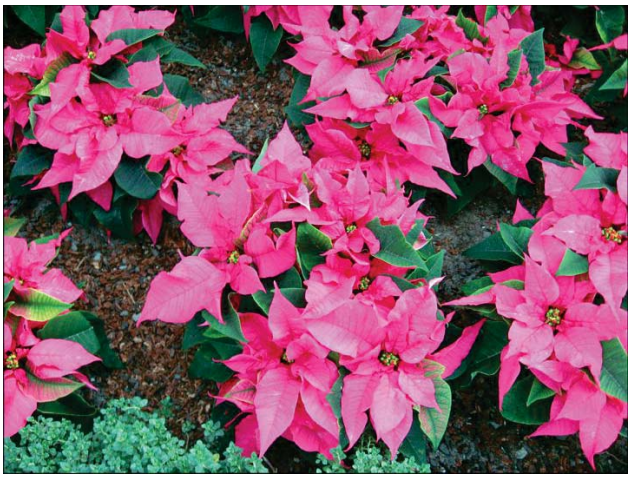


Figure 9. Poinsettias with pink bracts, the third most popular colour after red and white. Photo by Susan Reimer (Flickr; Creative Commons attribution required).

The Poinsettia Challenge

Very few who receive a gift of poinsettia have the knowledge or patience to maintain the plant and stimulate it to reproduce its attractive colouration for another season, so the plants are regularly discarded. Accordingly, poinsettias are ideal for retailers, as consumers are quite willing to buy new ones annually. For most people, buying a new plant for Christmas is much easier than trying to resurrect the attractive bract display for next year. It is very unlikely that the attempt will result in a poinsettia of the original flower shop quality. Perhaps epitomizing the difficulties is the defunct rock band *Dead Poinsettia* of St. Paul, Minnesota. Do you really want to resurrect that sad-looking poinsettia, probably still in its colourful aluminum sleeve, after Christmas? Commercial poinsettias were grown under optimal light, humidity, fertilization, and sprayed multiple times with growth regulators. They have been carefully protected from numerous diseases and insects (poinsettias are whitefly magnets). And are you really going to be able to rotate the plants from the dark to the light at 7 a.m and back to the dark at 5 p.m. every day for many weeks? Nevertheless, some readers will be attracted by the challenge. The steps shown below are some useful guidlines.

● After most of the leaves have fallen off, reduce watering (to keep plants on the dry side) and store the pot(s) in a cool (10–15 °C, 50–60 °F), well-ventillated area (possibly a garage).
● In April, prune plants back to 10–15 cm (4 –6 inches).
● Repot in a larger-sized container (2.5–5 cm or 2–5 inches larger in diameter than the previous pot), into quality potting soil, preferably pasteurized (a recommended mixture: 2 parts peat moss, 1 part potting soil, and 1 part sand or perlite).
● Grow in a semi-shady, cool place over the summer, ideally at 15–18 °C (60–65 °F). The plant can be moved outdoors, once the temperature is consistently above 15 °C (60 °F).
● Some people sink their pots into the soil outdoors to maintain them during the summer. This makes bringing the plants indoors in the fall more difficult, as they will extend their roots outside the pots (unless the pots are turned regularly).
● Fertilize regularly when new growth resumes, following the rate recommended on the brand of fertilizer being used. Reduce fertilization in December by half.
● To prevent the plant from growing too high, and to make it bushy, “pinch” growing tips every 4 to 6 weeks during the summer (much better: use a sharp knife to remove about 2.5 cm or 1 inch; wash away the secreted milky sap and minimize exposure to skin). Do not prune after mid-August.
● If grown outside, bring plants indoors before the threat of cool weathe (ensure insects are removed).
● For bracts to develop and color up, the plants should be kept in complete darkness (uninterrupted by occasional light) for a period of 12 to 14 hours daily for 8–10 weeks. For bracts to colour up well, provide a constant temperature of about 13 °C (55 °F). A light-tight closet, box, or bag is normally used for the purpose by amateur horticulturists. Suggested schedule: begin Oct. 1, providing the dark period from 5 p.m. to 7 a.m. Once bract colour develops in the top leaves, this strict schedule is no longer necessary; however, many horticulturists recommend maintaining the procedure until the bracts are almost fully expanded and coloured. Of course, light must be provided for growth for part of each day; uninformed people have killed their plants by leaving them in a dark closet for a month or more. In theory in most of Canada, the plant could be left in a window in a room that is not illuminated, but probably stray illumination at night coming through the window would interrupt the development of bract colouration.

Using Cuttings to Produce New Plants

Instead of discarding the stems removed when the poinsettia is cut back in spring, the attempt may be made to root these in moist perlite or sand. However, better than using these relatively exhausted branches, take vigorously growing cuttings in early summer, as follows. Using new shoots 20–25 cm (8–10 inches) long, cut off the terminal 10–15 cm (4–6 inches) end with a sharp knife. Remove the lower leaves and apply a rooting hormone to the bases. Place these in a moist rooting medium (clean, coarse sand, or a mix of sand and peat moss). Cover with glass or plastic to conserve moisture, and place in shade. Cuttings should produce roots in 3 to 4 weeks; transfer these to small pots (note that roots are brittle).

Toxicity

For most of the last century, poinsettia was regarded as very toxic if consumed by people or pets, but in recent decades this viewpoint has almost completely been abandoned. Nevertheless it is recommended that the plant not be ingested as substantial quantities of leaves could result in gastrointestinal upset. (In any event, there is no good reason to eat poinsettia.) Many species of *Euphorbia* contain a toxic, milky latex, and the latex of poinsettia has caused rashes and asthma-like symptoms in isolated cases. It should be kept in mind that several chemicals are employed in the commercial production of poinsettia, and these are potentially toxic.

Symbolism

● The ancient Aztecs were the first to ascribe religious significance to the poinsettia. The red colour of the bracts served as a reminder of the need for blood sacrifices to the gods. The Aztecs also considered the poinsettia to symbolize purity (its name, *cuetlaxochitl*, signified “flower that withers, mortal flower that perishes like all that is pure”). Considered a gift from the gods, poinsettias adorned the palace of Montezuma (1466–1520, the last of the Aztec kings).
● In Christianity, poinsettia symbolizes the two main colours of Christmas: red, representing the blood of Jesus, and green, indicating the rebirth of life after winter. The star-like pattern of the bracts viewed from the tip of a branch is said to symbolize the Star of Bethlehem (hence the name “Christmas star”).

Curiosities of Science and Technology

- Moralistic stories are often associated with plants that have acquired religious significance. The most famous poinsettia story concerns a peasant girl in Mexico, too poor to contribute a significant gift to the Christ Child ceremony at the church. Trying her best, she picked a bouquet of weeds as her offering. Miraculously, her sincere effort was rewarded when the weeds were transformed into attractive poinsettias.
- Joel Roberts Poinsett, after whom poinsettia is named, was a co-founder of the National Institute for the Promotion of Science and the Useful Arts, one of the early efforts to initiate a U.S. national history museum that led to the establishment of the Smithsonian Institution (based in Washington, D.C.), the world's largest complex of museums.
- While he was the U.S. Minister to Mexico (1825–1830), Poinsett acquired a reputation for meddling in Mexico's internal affairs. The word *poinsettisimo* has persisted to the present in Mexico to express arrogance and high handedness.
- A “bract” usually denotes a kind of leaf (typically smaller than the normal leaves) associated with flowers (the rare term “hysophyll” has the same meaning) or fruits. Brightly coloured bracts that compensate for a lack of attractive petals occur in species other than *Euphorbia*; for examples: *Bougainvillea*, *Cornus*, plants with spathes (especially members of the Araceae), and bromeliads.
- The city of Ventura in southern California is nicknamed the Poinsettia City, reflecting the past importance of the crop in the area.
- The Poinsettia Bowl is a NCCA (National Collegiate Athletic Association, encompassing the U.S. and Canada) post-season football game held in San Diego (in southern California) since 2005.
- A poinsettia cocktail is a mixture of dry sparking white wine, vodka (alternatively Cointreau or Triple Sec) and cranberry juice, the latter providing the red colour for which the plant is famous.
- Red remains the most popular poinsettia colour, accounting for about 75% of North American sales; white (about 8%) and pink (about 6%) are next in popularity.
- December 12 is National Poinsettia Day in the U.S., a holiday that that was established in the mid-1800s to commemorate the death of Joel Roberts Poinsett.
- Eighty percent of poinsettias are purchased by women.

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Figure 11. A lady in a poinsettia costume. Photo by Dave Walker (Flickr; Creative Commons attribution required).

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Key Websites

Avoiding top problems of poinsettias – http://www.gpnmag.com/avoiding-top-problems-poinsettias [A brief review of significant problems encountered by

professional poinsettia producers.]
Ecke Ranch website – http://www.ecke.com/ecke/ [Website of the largest commercial grower of poinsettias; provides considerable growing information and a sales catalogue.]
Syngenta Flowers 2012 poinsettia catalogue + 2013 supplement – http://www.syngentaflowersinc.com/default.aspx?TabID=24 [Poinsettia offerings of one of the large commercial floral firms; a catalogue of more than a dozen cultivars and information for commercial growers.]
The poinsettia pages – http://urbanext.illinois.edu/poinsettia/index.cfm [General information presented in several categories.]
The Texas poinsettia producers guide – http://aggie-horticulture.tamu.edu/ornamental/the-texas-poinsettia-producers-guide/ [Provides extensive information for commercial production.]



Figure 12. A bridge in Brisbane, Australia, painted in a poinsettia motif. The red poinsettia is the official flower of Brisbane. Photo by Brisbane City Council (Flickr; Creative Commons attribution required)



Photo: Hugues Massicotte