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# The Canadian Botanical Association Bulletin

# Bulletin de l'Association Botanique du Canada

**September/Septembre 2012. Volume 45 No.2/N°2**

**President's Message:**

**L'ABC : une symbiose?**



Frédérique Guinel. Photo: M Costea

Chers membres de l'ABC :
L'été arrive à sa fin, et c'est seulement maintenant que je reconnais qu'il est *la* saison pour les sociétés scientifiques. *Botany 2012* fut une réunion incroyable et riche en gains de connaissances. L'American Bryological and Lichenological Society, l'American Fern Society, l'American Society of Plant Taxonomists, la Botanical Society of America, et l'Association de Botanique du Canada se sont jointes pour célébrer *La Botanique: la génération future*. À cause de la diversité du paysage scientifique, chaque participant a pu y trouver son bonheur: revoir de bons amis, tisser de nouveaux liens professionnels (tout particulièrement pour les étudiants), et parler de science devant un café ou encore mieux une bière locale de Columbus. *Botany 2012* nous a permis de mettre des noms familiers sur des figures jusqu'ici inconnues et nous a offert de nouvelles idées de recherche et d'éducation à implanter dans nos salles de classe.
En y repensant, trois évènements me viennent à l'esprit, bien qu'il y en ait eu beaucoup d'autres auxquels je n'ai malheureusement pas pu assister. En premier, le Symposium organisé par Ann Hirsch, Darlene Southworth, and Hugues Massicotte, intitulé « *Les interactions de la rhizosphère : le microbiome des racines* » nous a démontré que l'avenir se trouve dans l'étude de la racine, sa rhizosphère, et le sol qui l'entoure. Après une introduction inspirante de Dr. Hirsch, Martha Hawes a su nous surprendre en comparant les cellules détachées de la coiffe racinaire aux neutrophiles, leucocytes jouant un rôle très important dans le système immunitaire du corps humain (Hawes *et al*., 2011, Plant Science). En second, pendant le symposium intitulé « *La morphologie expérimentale et la morphogenèse hier et aujourd'hui, à la mémoire d'Elizabeth Cutter* », organisé par Judith Jernstedt, nous avons entendu des présentateurs excellents qui ont peint une image très humaine de Dr. Cutter pour ceux d'entre nous qui ne la connaissions qu'à travers ses deux livres sur l'anatomie des plantes. Dr. Cutter a su partager son amour et enthousiasme pour la structure et le développement des plantes avec ses étudiants et collègues, qui ont maintenant pris le relais. Finalement, histoire, art, science et créativité se sont mélangés dans la présentation offerte par Annals of Botany. Dr. Ned Friedman, dans « *Darwin's "abominable mystery" and the search of the earliest flowering plants* », après nous avoir convaincus que Darwin était avant tout un grand botaniste, nous a offert ses vues sur l'évolution du gamétophyte femelle des

## 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, **45(3)**, must be received **before November 7th 2012**

La date de tombée des textes du prochain numero, le no **45(3)**, est **le 7novembre 2012**

Published in Peterborough, September 1st 2012
Publié à Peterborough, le 1 septembre 2012

SSN 0008-3046 (paper/version papier)
ISSN 1718-8164 (electronic format/version électronic.)


Angiospermes (Friedman and Diggle, 2011, Plant Cell). Se pencher sur un champ de recherche qui n'est pas le sien et stimuler chez les autres assez d'intérêt pour qu'ils aillent ensuite découvrir votre travail sont deux des meilleurs effets d'une conférence.

J'aimerais maintenant remercier Johanne Strogan et David Spooner, qui ont été essentiels à l'organisation et au déroulement de ce merveilleux meeting. Je voudrais aussi reconnaître les efforts de Michele Piercey-Normore qui agissait en tant que vice-présidente pour ce meeting. C'était un travail herculéen et elle a su le réussir – bravo Michele ! Les plans pour le meeting de l'an prochain sont d'ors et déjà bien avancés; sous la direction de Cindy Ross-Friedman, *Thinking Plants* se tiendra à Kamloops, dans l'université de Thompson Rivers du 1er au 5 juin 2013. Notez aussi que le compte à rebours a commencé pour la conférence qui célébrera le 50e anniversaire de notre association à Montréal en 2014. Les dates n'ont pas encore été confirmées, mais gardez vos yeux ouverts car selon moi ce sera un évènement à ne pas manquer.

Présentement, je tiens à accueillir chaleureusement les nouveaux membres du Comité Exécutif : John Markham, président désigné; Santokh Singh, nouveau secrétaire ; Marian Munro et Julian Starr, directeurs de l'Est ; Bruce Ford et Melanie Jones, directeurs de l'Ouest ; et James Jones et Adrian Dauphinee, représentants étudiants. J'aimerais aussi remercier les membres de l'Exécutif qui continuent leur terme, et bien sûr ceux qui l'ont complété. Un merci tout spécial pour Rodger Evans, qui a donné beaucoup de son temps pour promouvoir l'association au-delà de la frontière et a travaillé avec entrain afin d'encourager la participation des membres de l'ABC-CBA. Et je ne peux passer sous silence ma grande estime pour Hugues Massicotte, qui s'est entièrement donné ces deux dernières années dans la fonction de président.

Je souhaiterais maintenant partager avec les adhérents de notre association les deux objectifs que je me suis donnée en tant que présidente.

1. Achever la transition vers la loi des organismes à but non-lucratif (loi BNL). Cela implique l'obtention d'un certificat de prorogation afin d'assurer que nos règlements administratifs soient conformes à la loi BNL. La transition devra être terminée le 17 octobre 2014. Pour le faire, je serai aidé par Rodger Evans, Hugues Massicotte, Marian Munro, Michael Wright, et Jane Young. Le nouveau document sera présenté aux adhérents à la prochaine Assemblée Générale Annuelle, qui aura lieu à Kamloops en 2013.

2.Trouver un emplacement de stockage à long-terme pour les archives de la CBA-ABC (lire l'article ci-joint).

En guise de conclusion, permettez-moi de souligner une heureuse coïncidence : actuellement, l'ancien président, la présidente et le président désigné de la CBA-ABC travaillent sur les symbioses de la racine (mycorhizes, nodules, et actinorhizes, respectivement). Ceci me fait réaliser que notre association peut être comparée à un mutualisme. En y appartenant, ses membres gagnent des connaissances, de l'information, des mentors, des collègues, et des amis. De par leur adhérence, l'association gagne une voix plus puissante qui l'aide lors de discussions sur la recherche au Canada et lors de prises de position sur des sujets environnementaux dans un climat politique hostile à la science. Comme dans toute association mutualiste, les bénéfices viennent à un prix : chaque symbiote doit fournir une partie de l'énergie requise. Du côté du macrosymbiote – l'association – l'énergie se traduit par les finances, mais surtout par une structure qui lui permet de se développer. Pour le microsymbiote – les membres – l'énergie fournie est équivalente à la participation et l'engagement. Pour que l'association persiste de manière durable, les membres doivent contribuer activement à ses réunions et conférences, et s'impliquer dans la gouvernance. Afin d'assurer un flux constant d'énergie, le nombre d'adhérents doit augmenter exponentiellement. Membres anciens et nouveaux doivent trouver le temps de nommer des scientifiques méritoires pour les différents prix offerts par l'association et ne pas craindre d'apporter à la table de nouvelles idées. Chacun de nous a un rôle à jouer dans cette symbiose et j'espère seulement que je puisse jouer le mien de façon à répondre à vos attentes.

Symbiotiquement vôtre,

Frédérique



## President's Message

## CBA: A symbiotic association?

Dear CBA members:

The summer is coming to a close, and I had not previously realized how much it is the season of meetings for societies. *Botany 2012* was an amazing meeting place, rich in learning. The American Bryological and Lichenological Society, the American Fern Society, the American Society of Plant Taxonomists, the Botanical Society of America, and the Canadian Botanical Association all joined in a celebration of Botany: The Next Generation. Because the scientific landscape was so diverse, every attendee found his/her own gem among old friends, new colleagues (especially for the students), and chances to chat about science and research collaborations around a coffee or better a Columbus home-brewed beer. *Botany 2012* offered opportunities to put names to faces and was a great place to get novel scientific information and new ideas on teaching to keep our classroom interested.

For me, three highlights come to mind, though there were of course many interesting sessions which a tight schedule prevented me from attending. First, *Rhizosphere Interactions: the Root Microbiome*, the symposium organized by Ann Hirsch, Darlene Southworth, and Hugues Massicotte, demonstrated to many of us that the future is in the study of the root, its rhizosphere and the surrounding soil. After a thoughtful introduction by Dr. Hirsch, Martha Hawes blew our minds away when she compared root border cells to human neutrophils, a type of white blood cells essential to the innate immute system (Hawes *et al*., 2011, Plant Science). Second, *Experimental Morphology and Morphogenesis Then and Now*, the symposium in memory of Elizabeth Cutter and organized by Judy Jernstedt, hosted excellent speakers who painted a human image of Dr. Cutter to those of us who had only met her through her famous textbooks on Plant Anatomy. She had generously shared her love and enthusiasm for plant structure and development with her students and colleagues, who have now taken up the torch. Finally, history, art, science, and creativity were combined in the Annals of Botany Special Lecture given by Dr. Ned Friedman. In *Darwin's "Abominable Mystery" and the Search for the Earliest Flowering Plants*, Dr. Friedman convinced the audience that Darwin was first and foremost a botanist and presented his insight on the evolution of the Angiosperm female gametophyte (Friedman and Diggle, 2011, Plant Cell). Dipping into things that are not part of your field of research and promoting enough interest in others for them to follow up on your own work are two of the best outcomes of a meeting.

At this point I would like to thank Johanne Stogran and David Spooner, who have been instrumental in organizing this wonderful meeting. I also would like to recognize the efforts of Michele Piercey-Normore who was acting as the CBA-ABC Vice-President for this event. This was an enormous task to achieve and it was very well done. Thank you Michele! Planning for the next meeting, led by Cindy Ross-Friedman (current CBA-ABC Vice-President), is well underway. The 2013 CBA-ABC annual meeting *Thinking Plants* will be held June 1-5 at Thompson Rivers University in Kamloops, BC. The count-down has also begun for the celebration of our 50th Anniversary in Montreal in 2014. The dates have not yet been determined but keep your eyes open as no one should miss this meeting, which will likely be memorable.

I would now like to welcome the new members of the Executive Committee: John Markham, President-Elect; Santokh Singh, new Secretary; Marian Munro and Julian Starr, Directors for the East; Bruce Ford and Melanie Jones, Directors for the West; and James Jones and Adrian Dauphinee, Student Representatives. I also would like to thank those members of the Executive who are continuing their terms, and finally all of those who have completed their term. Special thanks go to Rodger Evans who gave a lot of his time to promote our association beyond the border and worked enthusiastically to increase CBA-ABC member participation. And I cannot continue without expressing my appreciation of Hugues Massicotte, who has worked tirelessly as our President for the past two years.

Before closing, I would like to make two points.

First, I want to share with the membership the two objectives I have for my term of Presidency:

1. To achieve proper transition to the new Canada Not-for-profit Corporations Act (NFP Act). This involves the obtention of a Certificate of Continuance and the assurance that our by-laws comply by the new NFP Act. The deadline for the transition is October 17, 2014. I will be helped by a small *ad hoc* committee composed of Rodger Evans, Hugues Massicotte, Marian Munro, Michael Wright, and Jane Young. The new document will be presented to the membership at the next Annual General Meeting in Kamloops 2013
2. To find a long-term storage place for the CBA-ABC Archives (see inside article).

Second, quite coincidentally, the current CBA-ABC Past-President, President, and President-Elect are all researching different kinds of symbiosis (mycorrhizae, nodulation, and actinorhizae, respectively). This made me realize that our association could be seen as a mutualism. By belonging to it, members gain knowledge, information, mentors, colleagues, and friends. From them the association gains strength and a stronger voice to use when discussing research in Canada or taking a stand for environmental issues, especially in the current political atmosphere, somewhat hostile to science. As in any mutualistic association, the benefits come at a cost. To make it work, the symbionts have to provide different forms of energy. On the macrosymbiont side – the association – the energy is financial, but mostly structural, as it offers a framework in which to expand. On the microsymbiont side – the members – the energy should be seen in terms of participation and engagement. For the association to be vibrant and long-lasting, its members need to participate actively in its meetings and conferences, and engage in its governance by sitting on committees. To ensure a continuous flow of energy, membership should expand exponentially. Long-standing and new members should take the time to nominate worthy scientists for the association's different awards and not fear to bring new ideas to the table. Each of us has a part to play in this symbiotic association, and I can only hope mine will be performed according to your expectations.

Symbiotically yours,
Frédérique



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

*49th Annual Meeting and Conference*

## June 1-5, 2013

***Thompson Rivers University*** *(Kamloops, British Columbia, Canada)*

# *"Thinking Plants"*

**Keynote speaker:**
**Dr. Diana Beresford-Kroeger**
A botanist, medical biochemist and self-defined "renegade scientist" reveals a path toward better stewardship of the natural world.



Photo Credit:
C. H. Kroeger

**Art of Botany Show** How does art support botanical research and learning about plants? The conference will feature a unique juried Art Show showcasing the intersection of art and science!



Dr. Lyn Baldwin, Field Journals

**Platinum sponsors:** University of British Columbia: Department of Botany, Faculty of Science & Office of the Provost

www.tru.ca/cba-abc

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

*49eme réunion annuelle et conférence*

## Du 1er au 5 Juin 2013

***Thompson Rivers University*** *(Kamloops, Colombie Britannique, Canada)*

# *"Pensons Plantes"*

**Conférencière d'honneur:**
**Dre Diana Beresford-Kroeger**
Une botaniste et biochimiste médicale qui se défini comme "scientifique renégate» révèle la voie vers une meilleure gestion du monde naturel.



Crédit photo:
C. H. Kroeger

**L'art et la botanique:**
Comment l'art soutient-il la recherche et l'apprentissage? La conférence comprendra une exposition d'art qui mettra en vedette la rencontre entre l'art et la science!



Dre. Lyn Baldwin, journals de bord

**Commanditaires Platine:**
L'université de la Colombie-Britannique: Département de Botanique, Faculté des Sciences & Bureau du Prévôt

www.tru.ca/cba-abc

## Association News/ Nouvelles de L'association.

### Honorary Degree for Margaret McCully



Margaret McCully receiving her degree from Dr. Max Blouw (left), President of Wilfrid Laurier University, while Dr. Michael Lee-Chin (right), Chancellor of the University, is waiting to congratulate Dr. McCully. Seated is Dr. Deborah MacLatchy.

On June 12, 2012, Dr. Margaret McCully, a previous recipient of the Lawson Medal of the Canadian Botanical Association, received the degree of Doctor of Science, *honoris causa*, from Wilfrid Laurier University, in Waterloo, Ontario. Below is the citation read by Frédérique Guinel on this occasion. Dr. McCully was presented this degree at the Spring convocation of the Faculty of Science.

*Citation for Dr. Margaret McCully*

After receiving a B.Sc. in Agriculture from the Ontario Agricultural College (OAC), Margaret McCully taught Biology for two years in Shelburne, Ontario. She then returned to the OAC to complete her Master's degree in 1960 before teaching Biology at an all-girls school in England. She later obtained a teaching job at Harvard where she completed her PhD in 1966.

On her return to Canada, Dr. McCully settled in Ottawa, at Carleton University, where she taught and did research for approximately 35 years. On her retirement, she began a new life in Australia where she has been working for the Commonwealth Scientific and Industrial Research Organization in close contact with Australian farmers. Since she left Canada, we have not seen her often enough but she comes back regularly to St-Mary's, where she was born. In fact, she grew up on a farm where animals were roaming the hills; corn, pumpkins and other vegetables were harvested; and maple sap was flowing in the spring. Her father, Norman McCully, neither a scientist nor a teacher, taught her to think outside the box; he was knowledgeable in animal husbandry and ahead of others he developed artificial insemination in dairy cattle. He also established the Ontario popular breed of Suffolk sheep.

Margaret McCully has trained many students; in fact, she was my PhD supervisor and I can tell you from experience that she has always taken a genuine interest in “educating” her students in the broadest sense. Working in Dr. McCully's lab, we learnt not only plant biology and microscopy, but also art and literature, classical music, and natural science. She helped many students on their way to success as she encouraged them to attend and participate at conferences and workshops. She was an early advocate of networking and she devoted much time and effort to ensure that her students were introduced to highly-regarded scientists.

Her geographical meanderings, diverse research experience, knowledge of the literature, and her inquisitive mind give her the ability to make connections and ask questions which do not seem to have occurred to many of us. She has a holistic approach to her studies, and she encourages plant scientists to come out of the lab, to see the entire organism and where it lives. In fact she has been doing what we now call integrative biology before it became fashionable. Thus, I like to think that her ideals will motivate the students in our new integrative biology program here at Laurier.

### Collaborative research award for Jane Young and team!

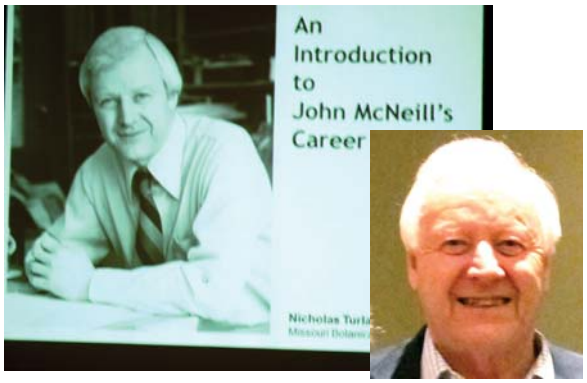


The Collaborative research team. From left to right: Harold Hume (UNBC Research Officer), Bob Redden (EDI President), Jane Young (UNBC), Sam Barnes (UNBC Research Assistant on project; now working at EDI), Angela White (Encana), Brian Wolf (PRFN). Missing: Cathy MacKay (EDI).

At the BC Natural Resources Forum in Prince George in January, 2012, the Business and Technology Collaborative Research Award was presented to Jane Young (UNBC), Prophet River First Nation (PRFN), Encana and Environmental Dynamics Inc. (EDI) for their collaborative work on PRFN knowledge of traditional plants and plant gathering areas. The research, funded by the Science and Community Environmental Knowledge Fund, demonstrates how partners from different backgrounds can work together successfully and develop innovative solutions to difficult problems. Plants, their gathering areas and uses, have been documented in a community booklet, *Communicating Traditional Knowledge: Prophet River First Nation*. Another deliverable of the project is in the form of a Spatial Data Decision-Making Tool (SDDT), which PRFN will use to identify current and future traditional plant gathering sites within their territory. The knowledge base produced from this research will provide a framework allowing PRFN to independently and effectively work with industry to mitigate impacts to traditional plants and plant gathering locations.

This research was highlighted in the Spring 2012 addition of “Update”, a publication of UNBC.

## Two CBA/ABC members honoured at Botany 2012




John McNeill then, at the start of his career in Canada, and now at Botany 2012.

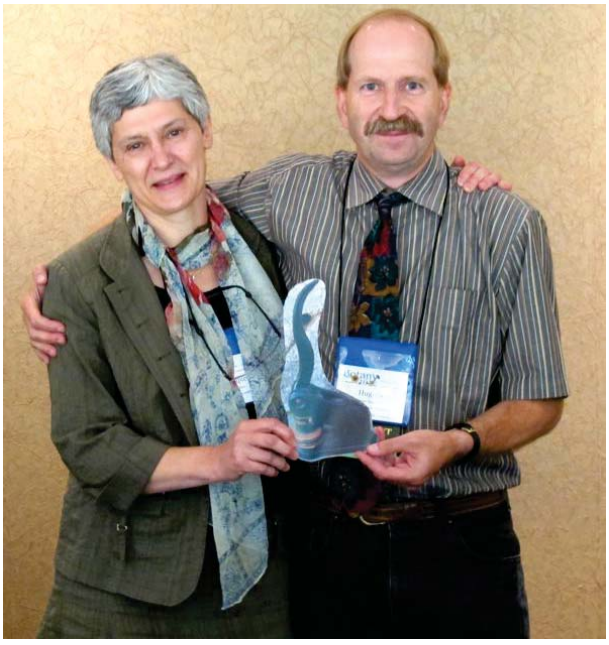
**John McNeill** was honoured with a colloquium at Botany 2012. After a review of his career, a number of papers were given on nomenclature, the Caryophyllaceae and numerical taxonomy.
**Larry Peterson** was invited to give the Kaplan Memorial Lecture at the conference. It was well attended, and appreciated by the large audience, which included many CBA attendees!

## Press release about Programmed Cell Death.

A press release about programmed cell death in the Lace plant appeared on 25 Jul 2012 in BioMedCentral. It details the research of **Arunika Gunawardena** and her students at Dalhousie University.
http://www.biomedcentral.com/presscenter/pressreleases/20120725

# Status of the CBA Archives.

Following is some historical background concerning the present status of the CBA archives. Dr. E. Haber from the Museum of Nature was the last Archivist to have responsibility for sorting and submitting records to the National Archives of Canada. He stepped down as archivist when he lost his job because of cutbacks at the National Museum. One or two years earlier, the National Archives had notified him that they would no longer accept CBA materials because of a reduction of their staff. Since then, archive boxes have existed at several locations. However, this is an unhealthy situation which we agreed to redress at the 2011 AGM in Halifax. At the time, as President-Elect of the Association and now as its new President, I have undertaken the task off consolidating the archives with the goal of finding a secure, long-term storage site.
Since the AGM of July 2011, things have been happening on this front, thanks especially to Dr. Larry Peterson, from the University of Guelph. Larry has gone through many boxes which had been standing for a quite a long time in Drs. Joe and Jean Gerrath's basement at Guelph. He had first to decide what to keep and what to discard. Once this was done, boxes were down to five. Larry has also carefully labeled each box and has made a “where-to-find” list for any future Archivist. The next step is to gather all other scattered documents which may have been kept by previous members of the CBA Executive. For example, Larry reports that there are no records for the year 1969. Once we have ascertained that all materials from all different sources have been obtained, Larry has accepted, with my help, to complete the reviewing task.
While this is being done, I will attempt to find a permanent place for our archives which cover the past 50 years of the Society history. I have asked Dr. Connie Nozzolillo, the Archivist of the Canadian Society of Plant Biologists (CSPB) and Professor Emeritus at the University of Ottawa, what had been done with the archives of that society which is a bit older than ours. The CSPB archives are safely stored, where they have always been since the late Dr. D. Mortimer set them up with the National Research Council of Canada archives on Sussex Drive in Ottawa. Quite ironically, the CSPB archives are at the NRCC because the Public Archives refused to host them as they were already storing the CBA archives and had no room for any other botanical organization! As long as the NRCC does not decide that they need the space for their own records, the CSPB archives are safe at the NRCC. One inconvenience for the CSPB archives location is that the CSPB archives can be accessed only through their archivist.
Once a secure place is found for our archives, several questions will need to be answered. First, should we recall the material from the National Archives and place it with the remaining of the archives in the new location? Should we elect or hire the next Archivist? As long as the archives are not fully digitized, the Archivist will have to live close to the archives' location. When do we move to electronic archiving? In the near future, the Executive will have to discuss access for members to the more recent materials with a clear agreement that confidentiality will not be broken, e.g., 5-10 years old.
I would welcome any ideas, insights, advice from members concerning this issue.
F.C. Guinel



Hugues Massicotte hands over a paper replica of the CBA/ABC seal to incoming President, Frédérique Guinel, at the 2012 AGM.

# Botany 2012 Report, June 2012

*Editor: Dr. Christian Lacroix — University of Prince Edward Island, Charlottetown, Prince Edward Island.*
*This article is part of a full Editorial Board report by Christian Lacroix. Those wishing more information on aspects of the CSP, should contact him at* *lacroix@upei.ca*

## Canadian Science Publishing News

NRC Research has successfully transitioned from a government operation into a not-for-profit company named **Canadian Science Publishing (CSP)**. CSP will continue to provide high-quality, peer-reviewed journals and publishing services and will deliver these services using the same successful format of the NRC Research Press cost-recovery program. CSP is committed to publishing and providing services in English and French and maintaining its mission to support Canadian researchers and their communities in disseminating their research worldwide through the provision of world-class, Canadian-based, advanced scientific and technical scholarly publishing services. In addition, NRC has allowed CSP to continue using its familiar brand name "NRC Research Press" for the publication of its journals.

As a private company, CSP is now able to manage its publishing activities with more flexibility and explore more opportunities to meet the challenges of scholarly publishing worldwide. In an effort to connect and communicate more directly and consistently with its stakeholders from the scholarly publishing community, CSP has added a Board of Governance, which will draw its members from scientific societies, research and librarian communities, granting agencies, and NRC.

The staff and management of CSP look forward to continuing to publish and deliver high-quality, peer-reviewed scientific and technical scholarly journals and thriving as a viable and respected leader in the Canadian and international scientific publishing community

### Accomplishments since privatization

Canadian Science Publishing has successfully established systems and services to support human resources, finance, production, and the website, such as the following:

- a new visual identity program for all of our services featuring a new NRC Research Press logo plus a CSP logo;
- a new very competitive NRC Research Press website hosted by Atypon, an external third party specializing in scholarly journals;
- a new world-class submission and peer review system hosted by ScholarOne (part of the Thomson Reuters Group);
- a new financial system addressing the needs of a private-sector publishing operation;
- an agreement with Canadian Research Knowledge Network (the Canadian universities purchasing consortia) to ensure that all universities with science programs have access to NRC Research Press journals; and
- a new initiative to increase the impact and reputation of our journals, including a review of our exhibits program, promotion of agreements with Canadian societies, and promotion of our journals through sponsorships and awards programs.

### Among the new projects:

***iThenticate***

iThenticate, a well-known plagiarism detection and prevention technology, was purchased and made available to Editors in early 2012.

***RP Mobile***

RP Mobile was launched on 3 April 2012. It enables users to access streamlined NRC Research Press scientific content using their Apple, Android, or Blackberry mobile device. With RP Mobile, users can browse and search all NRC Research Press journal and book content; access all journal content (personal or institutional subscription required); add articles or journal titles to Favorites for quick access; download accessed articles for offline reading; and view and search references .

### Press releases

CSP as a not-for-profit incorporation now has the freedom to publish press releases. If you are handling a paper that you believe is press worthy, please inform the Editorial Assistant and she will let CSP know. If CSP determines that the content is of interest to the general public, a press release will be prepared and distributed to various media contacts. One press release was issued for *Botany* in 2011; it announced the appointment of Christian Lacroix as the new Editor. So far, none have been issued in 2012.

### New website

CSP launched its new website (www.nrcresearchpress.com) on 1 April 2011. Partnering with Atypon, a worldwide leader in the digital content industry, CSP now offers users a website packed with features and functionality. It was designed to appeal to researchers, editors, authors, librarians, students, societies, and anyone with an interest in leading scientific research.

Registered users can create a personalized home page where they can choose from a variety of options to give them the utmost flexibility and ease of use. Users can save and schedule favourite searches, highlight favourite journals and articles, download citations, sign up for e-alerts, and post links on a variety of social networking sites. The website also tracks articles viewed by a user and recommends other articles that might be of interest based on what others have read. To see these and many additional new features, visit www.nrcresearchpress.com

**Partnerships with CBA and CSPB**

Canadian Science Publishing and both the Canadian Botanical Association and the Canadian Society of Plant Biologists have signed a formal partnership in the form of a 3-year Memorandum of Understanding, covering areas such as co-marketing and promotion, discounts to CSP publications (including *Botany*), sponsorship opportunities, and encouraging CBA/CSPB members to publish in *Botany*. Both the CBA and CSPP logos have been placed on the *Botany* cover and homepage. These partnerships are an important step in the continued success of *Botany*.

*(Editors note: At this years AGM members voted unanimously* ***that the CBA/ABC will become a participatory member of the CSP.*** *)*

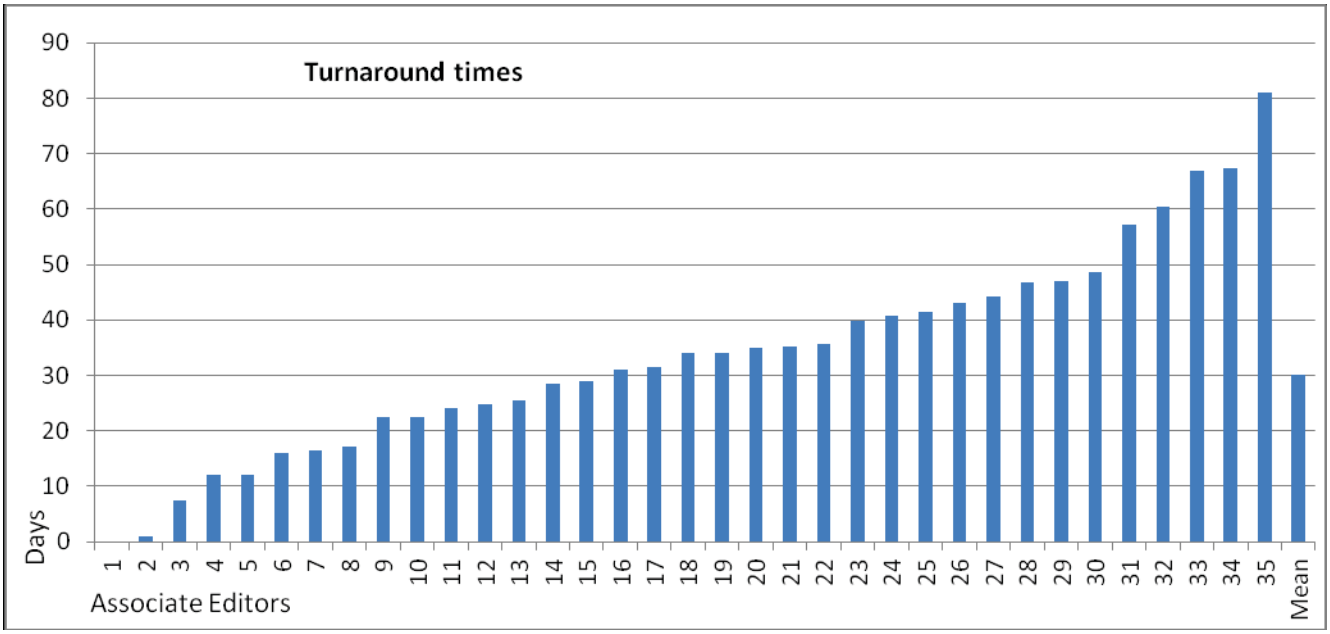
## Botany- Journal Statistics.

**Mean times to first editorial decision for 2011**

For 2011, only the period from 1 April and 31 December 2011 is included because ScholarOne only started collecting this data on 1 April 2011. Earlier data is not available. A total of 256 manuscripts were handled and the overall mean time to first editorial decision was 42.0 days.

| Manuscript decision | No. of manuscripts | Mean time to decision (days) |
|---|---|---|
| Accepted | 5 | 30.2 |
| Major revisions | 39 | 67.3 |
| Minor revisions | 40 | 66.2 |
| Moderate revisions | 1 | 17.0 |
| Reject without review | 97 | 9.5 |
| Rejected | 74 | 59.4 |
| Withdrawn | 0 | – |
| Total | 256 | 42.0 |

**Mean time to first editorial decision for 2011 by Associate Editor**




**Rejection rates 2009-2011**

| No. of manuscripts accepted | | | No. of manuscripts rejected (R) or withdrawn (W) | | | | | | Rejection rates (%) | | | Rejection and withdrawn rates (%) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2009 | 2010 | 2011 | 2009 | | 2010 | | 2011 | | 2009 | 2010 | 2011 | 2009 | 2010 | 2011 |
| | | | Rej | WD | Rej | WD | Rej | WD | | | | | | |
| 113 | 109 | 85* | 207 | 12 | 210 | 7 | 104* | 0* | 62.3 | 64.4 | 55.0** | 66.0 | 67.1 | 55.0** |

*Includes all manuscripts submitted to ScholarOne between 1 April 2011 and 31 December 2011.

**This number is based on manuscripts accepted and rejected between 1 April 2011 and 31 December 2011.

The page allotment for 2012 is 1250, but the journal is currently on track to publish 1600 pages in 2012 because of the large number of manuscripts being received.

| 2008 | | 2009 | | 2010 | | 2011 | | 2012 |
|---|---|---|---|---|---|---|---|---|
| Allotment | Published | Allotment | Published | Allotment | Published | Allotment | Published | Allotment |
| 1700 | 1502 | 1700 | 1254 | 1700 | 1083 | 1500 | 887 | 1500 |

**Time to publication**

| Average time (days) to publish in CJM | | | | | | |
|---|---|---|---|---|---|---|
| Year | Volume | Editorial office | Journal office | | Total time for | |
| | | | Paper | Electronic | Paper | Electronic |
| 2007 | 85 | 146 | 142 | 112 | 287 | 258 |
| 2008 | 86 | 161 | 120 | 99 | 285 | 260 |
| 2009 | 87 | 145 | 132 | 102 | 282 | 247 |
| 2010 | 88 | 138 | 83 | 64 | 220 | 201 |
| 2011 | 89 | 120 | 74 | 58 | 194 | 178 |

**Publication by source (number of manuscripts published and percentage)**

| Canada | | | | | | USA | | | | | | Other | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2009 | | 2010 | | 2011* | | 2009 | | 2010 | | 2011* | | 2009 | | 2010 | | 2011* | |
| No. | % | No. | % | No. | % | No. | % | No. | % | No. | % | No. | % | No. | % | No. | % |
| 59 | 47.2 | 52 | 47.7 | 34 | 45.3 | 25 | 20.0 | 21 | 19.3 | 11 | 14.7 | 96 | 32.8 | 67 | 33.0 | 30 | 40.0 |

*Data for 2011 covers the period from 1 April to 31 December only.

**Impact factor and other metrics**
**Summary of 2010 metrics**

| Total cites | Impact factor | 5-year impact factor | Immediacy index | Citable items | Cited half-life | Eigen-factor | Article influence score | Rank by impact factor | Rank by 5-yr impact factor | Rank by Eigen-factor | Rank by article influence score |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 353 | 1.098 | 1.113 | 0.233 | 103 | 2.4 | 0.00179 | 0.360 | 95/187 | 100/187 | 95/187 | 89/187 |

**A comparison of impact factors from 2007 to 2011**

| Impact Factor (2-year) | | | | |
|---|---|---|---|---|
| 2007 | 2008 | 2009 | 2010 | 2011 |
| 0.985 | 1.078 | 1.397 | 1.098 | 1.251 |

## Web statistics.

**More information is available, such as journal usage, top 15 most-downloaded articles between 1 April 2011 and 31 March 2012 and regional usage. Please contact Christian Lacroix at lacroix@upei.ca if you would like further information.**

## News from the Sections

## Mycology



The symposium “Rhizosphere Interactions: the root microbiome”, partly sponsored by the mycology section and held as part of Botany 2012 in Columbus, was well attended and thought-provoking with 6 energetic speakers (Ann Hirsch, Martha Hawes, Melanie Jones, Luke Moe, Kari Dunfield and Marnie Rout). It is clear that the rhizosphere is an exciting platform that will remain an important frontier of enquiry in the future. We are grateful to our enthusiastic American colleagues, Darlene Southworth and Ann Hirsch, for co-organizing this timely session.

Another highlight for the mycologist was the Weresub lecture “Whitebark Pine Decline in the Greater Yellowstone Ecosystem: Lessons learned from birds, bears and the precious dust of Galadriel”, beautifully delivered this year by Dr. Robert Antibus, from Bluffton University, Ohio. You will have to revisit the *Lord of the Rings* to rediscover what the precious dust can do in the Shire however! The whitebark pine has just been listed as an endangered species in Canada, and it was insightful to see the efforts of Dr. Antibus and colleagues to understand the mycorrhizal ecology of the whitebark south of the border.

We also had co-winners (Joey B. Tanney, Lakehead University, and Luke D. Bainard, University of Guelph) who are sharing the honors for the 2012 Luella K. Weresub Memorial Award this year. Congratulations to both!

During our section meeting, we discussed ideas for future symposia and possible Weresub lecturers for Kamloops next year. 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

## Ecology and Conservation

This was an active year for our section with a new initiative, a symposium organization at Botany 2012, and several nominations for the Stan Rowe award. Many more things are expected in the next year. I invite you to stay informed and get involved!

In the past year, Paul Catling with the help of others has proposed a new initiative to CBA which will involve the Ecology and Conservation section. If this new initiative is considered desirable, it will bring members of CBA together to work with others on the designation of areas of special conservation concern. The concept is to increase awareness of lands that should be better protected against human development or degradation. The designation should generally follow the following outline with these essential elements: (1) An account of species at risk, threats and time period or urgency of threats; (2) References; (3) A map; and a few photographs of the habitat and the plants. In fact, at the AGM during Botany 2012, this proposed initiative was approved as well as the first proposal for the Tusket River, in Nova Scotia (see the article in this Bulletin). We now expect that this process is going to be maintained. To do so, we encourage members (and non-members) to present new proposed new areas of special conservation concern. The process will require members of the CBA-ABC to peer review the proposal and vote for its approval during a subsequent annual general meeting of the association.

At Botany 2012 a symposium was organized jointly CBA with BSA entitled “Transplantations and relocation of species at risk: learning from the past to plan for the future” and involved six speakers from both Canada and the United States. The session finished with a discussion to define the next steps to move forward on this issue. This symposium was the fruit of discussions that we had at the meeting in Ottawa in June 2010. It was very successful and productive and several actions items came out from this session. The first one, which I invite members to let me know if there have a manuscript that they believe can contribute, is a special issue in Botany. This was one of the conclusions that came from the discussion following the symposium. Among the other actions proposed, there was the joint CBA-ABC and BSA preparation of a white paper stating some of the main challenges, especially for plants with continental distribution, and possible solutions regarding reintroduction and other restoration processes for species at risk. It is still at the exploration stage as this would be the first joint paper of the two associations. It was also discussed that we needed to revisit the CBA-ABC position paper on this subject. The discussion will certainly continue at the next annual meeting, especially in light of the review of the Species at Risk Act.

This was a good year for submission for the Stan Rowe award for an excellent contribution made by a student in ecology. We had more nominations than usual and I would like to thank everyone for getting this number up. We had a winner, Caroline Dubé for her paper entitled “Do power line rights-of-way facilitate the spread of non-peatland and invasive plants in bogs and fens?” published in Botany in 2011 with coauthors, Stéphanie Pellerin, and Monique Poulin. I would like to thank David Garbary for helping in judging the papers. It was not a simple task considering the great quality of publications we had to read. I encourage everyone to continue to nominate student's papers and also helping in judging these papers. On that matter, I would like to encourage anyone planning to go to the 2013 CBA-ABC annual meeting to let me know if they would be willing to help judge the Iain and Sylvia Taylor or the Lionel Cinq Mars awards.

Finally, I would like to thank Art Fredeen, from UNBC for being my new co-chair for the past couple of years. He is stepping down for additional duties that he has in his university. I wish you, Art, all the best and thank you for your support!

Liette Vasseur

## Plant Development

Eleven members attended a busy lunchtime meeting of the CBA/ABC Plant Development section held at Botany 2012 in Columbus, Ohio, where they were joined by Bruce Kirchoff, Chair of the BSA Developmental and Structural Section. Later that day, CBA/ABC Plant Development section members, including the incoming and outgoing Chairs (M. Galway and A. Gunawardena), attended the BSA Developmental and Structural Section Mixer and Business meeting. The well-attended joint BSA-CBA/ABC symposium “From canonical to new model systems: The future of plant development” featured seven speakers and an intriguing array of different species, developmental processes and experimental approaches. For the 2013 CBA/ABC meeting at Thompson Rivers University in

Kamloops, a plant development symposium was proposed that would feature younger researchers in the area of plant development with a portfolio of potential speakers to be assembled by the end of August. At Columbus it was announced that Lauren C. Schewe (University of Saskatchewan) was awarded this year's Taylor A. Steeves Award for the best student paper in plant development, structure or morphology published in the previous year. However, next year's deadline to submit applications for the Taylor A. Steeves Award will be earlier (April 1st) so that a winner can be selected and notified before the annual meeting registration deadline so that he/she has the opportunity to attend the meeting and accept the award in person. For the 2013 CBA/ABC meeting in Kamloops, C. Lacroix agreed to serve as the Lionel Cinq-Mars judge from the Plant Development Section, with M. Galway as an alternate.

Moira Galway.

## Teaching.

1. The Joint Teaching Symposium sponsored by CBA/ABC and BSA for the 2012 joint meeting (BOTANY 2012) in Columbus, Ohio. The joint teaching symposium “Are we having a broader impact?” sponsored by the Teaching sections of both CBA/ABC and BSA went well. We had five invited speakers for this symposium, Stokes Baker, Jose Herrera, Kimberly Tanner, Phil Gibson, and Santokh Singh. Dr. Stokes Baker (President, Teaching section of BSA) started the session by introducing the symposium topic and symposium speakers. Dr. Christopher Haufler moderated the discussion session at the end of the symposium talks. See the detailed program of the teaching symposium following:

Introduction: Are We Having A Broader Impact?
Amplifying the ripples: Broadening the effect of your educational projects by Jose Herrera, Beyond Assessing Knowledge: Card Sorting, Superheroes, and Moving Towards Measuring Biological Expertise among Undergraduate Students by Kimberly D. Tanner, Evolution and Assessment: Lessons From A Tree-thinking Curriculum by J. Phil Gibson and Undergraduate Research: Assessing the Opportunities, Challenges, and the Impact on Student Learning, by Santokh Singh.
In addition, the CBA/ABC members also presented at the Teaching section's Contributed paper and Contributed poster sessions at the BOTANY 2012 conference.

2. The Teaching Section Symposium at the 2013 CBA/ABC annual meeting at TRU, Kamloops, B.C. Members of the CBA/ABC teaching section discussed the possibility of having a teaching symposium at the 2013 CBA/ABC annual meeting to be held at TRU in Kamloops, B.C. Please contact Santokh Singh (santokh.singh@botany.ubc.ca) if you have any suggestions for the teaching symposium and potential symposium speakers. More information about the teaching symposium will be provided later.

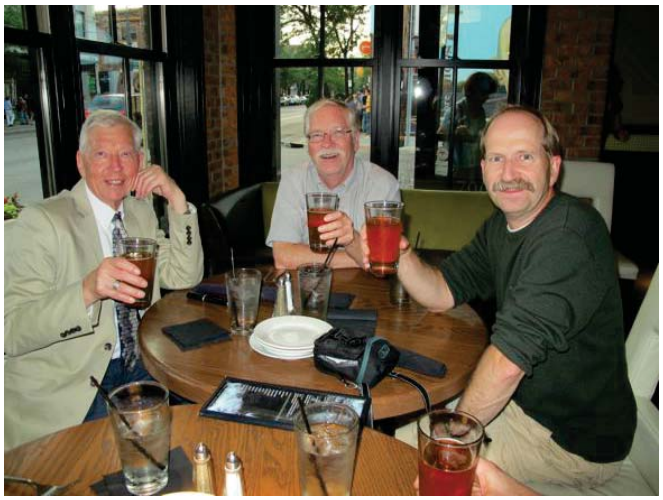
Santokh Singh

## Systematics and Phytogeography.

The section is currently looking for a new chair. We hope to have more news in the next issue of the Bulletin.





Photos from Botany 2012.
Above left: Well attended Teaching Section meeting.
Above right: Larry Peterson (left), Robert Antibus, this years Weresub Lecturer, and Hugues Massicotte, relax with a pint.
Right: Lunch group at the CBA/ABC Luncheon.
Photos by Linda Tackaberry and Hugues Massicotte

## CBA-ABC Designation of the Tusket River, Nova Scotia, as an area of special conservation concern.

At its last Annual General Meeting, the Canadian Botanical Association/Association Botanique du Canada (CBA-ABC) approved a process by which it is possible for members, citizens or organizations to propose an area of special conservation concern. In 2012, the CBA officially endorsed the designation of the Tusket River in Nova Scotia as an area of special conservation concern.

In the past year, the CBA-ABC developed a new initiative that will bring members of CBA-ABC together to work with others on the designation of areas of special conservation concern. The concept is to increase awareness of lands that should be better protected against human development or environmental degradation. The designation generally follows the following outline with these essential elements: (1) An account of species at risk, threats and time period or urgency of threats; (2) References; (3) A map, and a few photographs of the habitat and the plants. The document is submitted to the association for peer review and, if recommended, it is sent for approval at a subsequent annual general meeting. It is then made public through a press release, letter to the appropriate authorities and organizations, and a notice of its website.

The CBA-ABC has designated as its first case, the Tusket River in Nova Scotia, as an area of special conservation concern.

The Tusket watershed in southwest Nova Scotia is home to a complex of nearly a hundred wetland plants with affinities to the Atlantic Coastal Plain. The Tusket, by virtue of its intact shoreline habitats, climate and great seasonal water level changes, houses 8 of the 14 COSEWIC* listed plant species in Nova Scotia, including three globally rare coastal plain species, two of which are found nowhere else in Canada and are disjunct from wetlands in Massachusetts by more than 300 km. This is Canada's premier coastal plain river and it stands out in the Recovery Strategy and Management Plan for Multiple Species of Atlantic Coastal Plain Flora in Canada (Environment Canada and Parks Canada Agency 2010) as the area of concentration of species at risk. It is however threatened by cottage and other types of development.

Through this designation of the Tusket River and its wetlands as an area of “special conservation concern” for plants in Canada, CBA-ABC affirms the need for conservation efforts and policy relevant actions to be made in order to strengthen the conservation of this area. The CBA-ABC therefore encourages the governments and organizations to work together in this process.

For more information, contact CBA-ABC President, Frédérique Guinel…

*COSEWIC” means the Committee on the Status of Endangered Wildlife in Canada.



## CBA-ABC nomination de la Rivière Tusket en Nouvelle Écosse comme aire de conservation préoccupante.

À sa dernière assemble générale annuelle, l'Association botanique du Canada/Canadian Botanical Association (CBA-ABC) a adopté un processus par lequel il est possible aux membres, aux citoyens ou organisations de nominer une aire de conservation préoccupante. En 2012, l'ABC a officiellement approuvé la nomination de la Rivière Tusket en Nouvelle Écosse comme aire de conservation préoccupante.

La CBA-ABC a élaboré durant la dernière année une nouvelle initiative qui amène les membres de l'association à travailler ensemble et avec d'autres personnes pour nominer des aires de conservation préoccupante. Le but est de sensibiliser les gens aux terres qui devraient être mieux protégées contre le développement humain et la dégradation de l'environnement. La nomination suit généralement les lignes directrices avec les éléments essentiels suivants : (1) un rapport sur les espèces en péril, leurs menaces et les périodes de temps ou le degré d'urgence des menaces; (2) références; (3) une carte avec quelques photographies de l'habitat et des espèces menacées. Le document de nomination est soumis à l'association pour lecture arbitrée et si recommandé, il est envoyé pour approbation à la prochaine assemblée générale annuelle. Cette nomination est alors rendue publique à travers un communiqué de presse, une lettre aux autorités et organisations appropriées et à travers une note sur le site web de l'association.

La CBA-ABC a nominé en 2012 comme premier cas, la Rivière Tusket en Nouvelle Écosse comme aire de conservation préoccupante.

Le basin versant du Tusket dans le sud-ouest de la Nouvelle Écosse est compose d'un écosystème comprenant plus d'une centaine de plantes ayant des affinités avec la Plaine côtière atlantique. La Tusket, en vertu de ses habitats riverains intacts, son climat et ses grandes variations saisonnières des niveaux d'eau, abrite 8 des 14 espèces de plantes listées en Nouvelle Écosse par le COSEPAC*, incluant trois espèces de la plaine côtière globalement rare, deux desquelles ne se trouvent nulle part au Canada et étant disjointes des marais dans le Massachusetts par au moins 300 km. Il s'agit d'une unique plaine riveraine côtière au Canada qui est incluse dans le Programme de rétablissement et plan de gestion plurispécifiques pour la flore de la plaine côtière de l'Atlantique au Canada (Environnement Canada 2010) comme aire de concentration d'espèces en péril. Elle est cependant menacée par les développements de chalets et d'autres types.

À travers cette nomination de la Rivière Tusket et ses marias comme aire de conservation préoccupante pour ses plantes au Canada, la CBA-ABC affirme le besoin des efforts de conservation et des actions en accord avec les politiques publiques afin de renforcer la conservation de cette aire. La CBA-ABC encourage donc les gouvernements et les organisations à travailler ensemble dans ce processus.

Pour plus amples informations, veiullez comminiquer avec Frédérique Guinel, Présidente de la CBA-ABC …

*Le « COSEPAC » veut dire le Comité sur la situation des espèces en péril au Canada.

Liette Vasseur

## A Tribute to Sophie Thomas



***"ne yunk'ut hooghole, 'et si ne yunk 'ut neghde, 'ink'ez ndi yunk'ut 'intawhuts'unilh'en de, whenicho cha 'intats'utet'ilh."***

***"If we look after our earth, it will look after us. If we destroy it, we'll destroy ourselves." ~Sophie Thomas***

"Sophie Thomas (1917-2010) was an incredibly gifted elder who touched the lives of countless people with her vast knowledge, healing ability and caring nature. Her traditional medicines were collected from the natural forest environment and prepared for many ailments including cancer. Sophie was 'Yinka Dene', meaning 'People of the Earth', and born into the Frog Clan. She was raised by her grandmother Hawana, who frequently took Sophie into the bush of Dakelh territory, to teach her about plants and trees that provide food and medicinal cures. Always taught that medicinal plants are a freely given gift from nature, Sophie did not charge for her services or take credit for her success. "The Creator does the healing, I am only a servant," she maintained. It was her refined knowledge of medicinal cures that she desired to pass on and entrust to future generations. Fortunately, she has shared her knowledge and practices with her 15 children and her grandchildren and great grandchildren. Sophie's lifelong message to all people remained unwaveringly, a respect for Mother Earth. In 2002, mindful of posterity and with encouragement from family and friends, Sophie shared her legacy in a book, 'Plants and Medicines of Sophie Thomas', which became a sequel to her 2000 film, 'The Warmth of Love – The Fours Seasons of Sophie Thomas'. In recognition and acknowledgement of her extensive knowledge, work and contribution as a humanitarian for the well being of all people, Sophie received an Honorary Doctor of Law (posthumously) from the University of Northern British Columbia in June, 2010. May we continue in her championing of the honour of Mother Earth."

This paragraph was written by Minnie Thomas, Paul Broda (Health Canada), and I, and with input from other Thomas family members. It will be inscribed on a bronze plaque and placed in a garden, "Sophie's Garden". This garden is a therapeutic garden, with Sophie's plants, and part of the new BC Cancer Agency Centre for the North opening in the fall in Prince George, BC. The garden will provide hope and healing to the patients of the centre.

I had the great honour of working with Sophie Thomas and her daughter, Minnie Thomas, and other members of the Thomas family, along with Alex Hawley (previously at UNBC), to assist in preserving Sophie's wonderful knowledge. I will never forget her wisdom, humour, and grace. Thank you, Sophie. You have enriched my life forever. This summer, with funding from Health Canada, I began working again with Minnie Thomas and her community on a project with the goal to help protect Sophie's plants and gathering areas.

If you would like to learn more about Sophie's life and work, please visit her website:
**http://sophiethomas.org/index.html**

Jane Young

## Ecological Research as Education Network

In the past couple of years, two Canadian universities have been participating in activities organized by a network called the Ecological Research as Education Network (EREN, http://erenweb.org/). This network was funded by the National Science Foundation's Research Coordination Network (RCN) Program. EREN facilitates and develops collaborations among primarily undergraduate institutions (PUI) on ecological research projects at regional and continental scales. Through long-term, coordinated data collection at a network of sites, this project aims to provide insights and tools to identify and analyze broad ecological patterns, thus allowing PUIs with limited resources to enhance their contributions to ecological science and environmental policy. The specific studies within EREN, which currently include topics such as carbon accumulation in tree plots and community composition influenced by invasive plants, will rely on student engagement and collaboration with faculty through standard teaching labs, as part of summer research experiences, and in a continental ecology course module. Data collected are shared extensively and in a transparent manner through an online database for use in teaching, and provide a foundation for multi-authored publications for EREN participants.

During a meeting in Raleigh in June 2012, we discussed the idea that we may want to create a similar network in Canada which can be connected to EREN. While in the United States the network mainly targets primarily undergraduate institutions (PUI), the Canadian network may differ depending on the interest of the members. It may be something that as an association we may want to start working on with projects that can be easily duplicated in our various institutions. For example one of the projects supported by EREN is the establishment of the permanent plant monitoring plots (20 m x 20 m). The protocol used in EREN is quite similar to the standard protocol used by the defunct Ecological Monitoring and Assessment Network of Environment Canada. Already several plots have been established in Canada over the past decade. Anyone interested in this possible network can contact me. We can certainly discuss this possibility more at the next annual meeting.

Liette Vasseur

# Association Awards for 2012

## MAJOR ASSOCIATION AWARDS

Once more, it is my honour this year to recognize those responsible [award-makers] for organizing and designing the 2012 awards. We are privileged to have Dr. Iain Taylor, Professor Emeritus at UBC, and Mr. David Sweet, an artist from Vancouver, who undertook the job to craft the Lawson medal and the Elliott award. I wish to extend to these people our sincere gratitude and appreciation for their time and effort in providing these unique and beautifully made awards.

## The Lawson Medal



Lawson medal winner, Paul Catling, with Marian Munro, the Elliott Award winner

First awarded at the 1969 Annual Meeting, the Lawson Medal, the most prestigious award of the CBA/ABC, was established to provide a collective, formal expression of the admiration and respect of botanists in Canada for excellence in the contribution of individuals to Canadian botany. It is named in honor of Dr. George Lawson, who is generally regarded as Canada's first professional botanist. Lawson Medals may be awarded each year in two categories of eligibility:
(A) Recognition of a single outstanding contribution to botanical knowledge,
(B) Recognition of cumulative, lifetime contributions to Canadian botany.
This year, the CBA/ABC was pleased to award the Lawson Medal - Category B (lifetime contribution) to Dr. Paul Catling, a Research Scientist for the National Program for Environmental Health, at Agriculture and Agri-Food Canada. C'est avec grand honneur que j'ai annoncé que le lauréat 2012 de la Médaille Lawson, Catégorie contributions à vie, est le Dr. Paul Catling, un chercheur pour le programme national de la santé de l'environnement, à Agriculture et Agri-food Canada.
Dr. Catling has traveled a remarkable career path. His scientific accomplishments are truly impressive in terms of quantity, quality, originality, and impact (over 550 publications, about 165 peer-reviewed; several books including: Trees, Shrubs and Flowers to know in Ontario; Rare Vascular Plants of PEI; Audubon: Beyond Birds: Plant Portraits and Conservation Heritage of J.J. Audubon; Official Plant Emblems of Canada: A Biodiversity Treasure).
In addition to his research activities, Paul has made very important contributions to applying science on behalf of Canadian botany and society. These include curation of Canada's largest herbarium, administration within the CBA and government, ongoing participation in some of the most significant conservation initiatives in Canada, participation on numerous important committees nationally and internationally, journal editing, and teaching. Dr. Catling has been employed as a research scientist with Agriculture Canada since 1980, with emphasis on plant classification and ecology. As Adjunct Professor, U. Ottawa (1989–2005), he served on more than 50 student supervisory committees.
In the realm of Canadian plant biodiversity, Paul is one of Canada's most knowledgeable and accomplished experts on the flora of Canada, and on its biogeography and ecology. He has worked in virtually all areas of the country, documented rare plants and endangered ecosystems, and has accumulated a remarkable body of literature. His work includes the first quantitative classification of alvar vegetation and landscapes, their post-glacial history, and factors affecting their diversity. In the realm of Native crops and crop relatives, Paul co-authored the book “Canadian Medicinal Crops”; in the realm of Invasive alien plants, he is one of Canada's leading experts. Paul is an internationally respected expert on orchid classification, evolution and ecology, having discovered many new species. He has influenced orchid taxonomy by promoting the use of the orchid column and breeding systems. With respect to Native forages: grasses, sedges, rushes, Paul is a world expert, particularly respected for his work on hybridization. His activities in Conservation are widely recognized, serving on the Committee on the Status of Endangered Wildlife in Canada (2004–present) and, previously, on the Board of Directors for Nature Conservancy of Canada, to name just two.
In summary, Paul Catling has produced a very impressive body of published work and an equally impressive record of service to science and society, clearly meritorious for recognition for lifetime contributions to Canadian botany. The following excerpts are from the many letters received:
*- I have learned that his passion and determination in his research work have no boundaries, from jumping cliffs in order to get to the other side of deep crevasse, to rummaging with bears and wolves, he is the James Bond of research.*
*- A measure of the breadth of his knowledge and abilities is the fact that I know him as an expert entomologist rather than as a botanist – for many years Paul has been a co-chair of the Arthropods Specialists Subcommittee of COSEWIC…Long may he prosper.*
*- Though knowledge of southern Ontario may have advanced the most from Paul's devotion, there are few regions of Canada that have not benefited. From the Flora of PEI, to range extensions in the Yukon and Northwest territories, Saskatoon taxonomy in Alberta and Saskatchewan, and floristic studies on Sable Island and Newfoundland, Paul has made his mark.*
*- Not only is he one of Canada's foremost botanists who has worked on a wide variety of taxa such as orchids, aquatics, sedges, grasses, rushes, edible plants, and invasive plants, but he is equally respected for his entomological exploits, and has worked on butterflies, tiger beetles, Odonata, and grasshoppers among other groups.*

*- Paul Catling's long and illustrious career in botany certainly makes him a deserving and significant recipient of the Canadian Botanical Association's Lawson Medal. But it is Paul's immense knowledge of Canada's natural heritage and his ability and willingness to share it through his scientific, conservation, and public education efforts that add lustre to his nomination.*
*- Even then, we would joke that it was Paul's goal in life to publish more papers than Merritt Lyndon Fernald…of course Fernald did not enjoy Paul's great diversity of interest!*
*- His kindness, patience and compassion for all living creatures is notable; it brings to mind a field trip where we were going down a road where a turtle was crossing, Dr. Catling stopped the vehicle to help the turtle cross safely to the other side.*
*- Paul's contributions to Canadian natural history is evidenced from the beginning with his working as a Park Ranger in Algonquin where one of his many achievements was to lose a wrestling match with a bear cub.*
A meritorious individual, to be sure! Please join me in congratulating, Dr. Paul Catling, recipient of the 2012 Lawson Medal!!

## Mary E. Elliott Service Award

The Mary Elliott Service Award is given to an individual for meritorious service to CBA/ABC. It was first awarded in 1978 in memory of Mary E. Elliott. Before her untimely death in 1976, she had just completed four consecutive years of service on the Board of Directors (as Secretary, Vice President and President), and was just beginning her term as Past President. Mary Elliott was a plant pathologist and mycologist who spent 28 years with Agriculture Canada at the Central Experimental Farm in Ottawa. She was well known for her work on the taxonomy and biology of the Sclerotiniaceae. In 1975, she became Curator of the National Mycological Herbarium. Mary was also very active in identifying fungi for the public and in contributing to and editing (1970-71) a publication of the Biosystematics Research Institute for public information called Greenhouse-Garden-Grass.
This year, the Canadian Botanical Association was delighted to present the Mary Elliott Service Award to Ms. Marian Munro, Curator of Botany at the Nova Scotia Museum, for her outstanding work as past secretary and past vice-president of the CBA-ABC. Il fut donc mon privilège de vous annoncer que la lauréate 2012 du prix Elliott est Madame Marian Munro, curatrice de botanique au Musée de la Nouvelle-Ecosse, pour son travail acharné et assidu comme ancienne Secrétaire et vice-Présidente de notre association.
Marian is best characterized by her trademark enthusiasm and positive attitude. Of note, she generously shared her energy and time to help organize and provide critical local liaison for the successful Plant Canada 2011 meeting in Halifax. Many times over the past several years, I relied heavily on Marian's expertise, common sense, and excellent organization skills ("get to it, let's get'er done, no nonsense" approach), the same skills that the CBA benefited from when she was secretary of the association. In addition, she is a fabulous botanist, natural historian, curator and painter, and an award-winning citizen! Marian is a generous soul, and the CBA-ABC was absolutely delighted to present The Mary Elliott Award to her. Please accept our most heartfelt congratulations!
**H.B. Massicotte, Past President CBA/ABC**

## STUDENT TRAVEL AWARDS

To begin with, I would very much like to acknowledge our Award Committee members for their time and commitment judging the following competitions: John Markham (U. Manitoba), Arunika Gunawardena (Dalhousie U.), and Lynn Gillespie (Can Museum of Nature and U. Ottawa). As always, they were thoughtful and diligent with respect to the Macoun, Winterhalder, Elliott and Lawson Awards, and we owe them all a great debt of gratitude.

### Travel Awards: John Macoun Travel Bursary

This award was named to honor John Macoun (born in Ireland, 1831-1920), an official botanist on five major Canadian expeditions and, in 1881, appointed Botanist to the Geological and Natural History Survey of Canada. He was also a member of the Botanical Society of Canada (1860-62) and a founding fellow of the Royal Society of Canada in 1882. He had an outstanding career as a traveling scientist. The award was established in 1988 to provide partial financial assistance for travel to the Annual Meeting to students presenting a paper in the Lionel Cinq-Mars competition or a poster in the Taylor competition. Under the impetus of Dr. Jean Gerrath (U. Northern Iowa, now retired), the CBA/ABC 'Auction' was initiated (first in Calgary, 1994); the Macoun fund continues to be replenished by fund raising during the many subsequent botanical auctions, plus additional generous donations.
*This year, travel awards were presented to 4 very deserving students ($500 each):*
*Zoe Panchen, Ph.D. student in Biology at Carleton University (supervisor: Root Gorelick)
*Adrian Dauphinee, M.Sc. student in Biology at Dalhousie University (supervisor: Arunika Gunawardena)
*Katya Boudko, M.Sc. student in Biology at the University of Ottawa (supervisor: Lynn Gillespie)
*Wayne Sawtell, M.Sc. student in Biology at the University of Ottawa (supervisor: Julian Starr)

### Keith Winterhalder Undergraduate Travel Award ($500)

This award was established in 2006 in honor of the late Keith Winterhalder, a long time member and former president of the CBA/ABC, for his outstanding contributions to the Association and for his never-failing interest and encouragement of student members of the CBA/ABC. Keith's area of expertise was in land reclamation. The award provides partial financial assistance for travel to the Annual Meeting to undergraduate students.
*This year, we were pleased to present the Winterhalder award ($500) to a very accomplished candidate:*

James Jones, a 4th year B.Sc. student in Biochemistry and Molecular Biology at UNBC (co-supervisors Drs. Art Fredeen and Hugues Massicotte)



Travel award winners with Hugues Massicotte (far left). Left to right, James Jones, Wayne Sawtel, Katya Boudko, Adrian Dauphinee and Zoe Panchen

## STUDENT AWARDS FOR ORAL AND POSTER PRESENTATIONS

### Iain and Sylvia Taylor Poster Award ($500)

The CBA/ABC gives an award for the best student poster presented at the Annual Meeting. The award is in honor of Iain and Sylvia Taylor, members who, for many years, have actively contributed to the development of the CBA, and continue to be involved to this day. The judges, spearheaded by Christine Maxwell (Bulletin Editor), included Bruce Ford (U. Manitoba), Moira Galway (St Francis-Xavier U.) and Jane Young (UNBC). The 2012 award was presented by Christine Maxwell on behalf of Iain and Sylvia Taylor. The committee's decision was unanimous and the award went to:
*Stephanie Riviere for her poster “To attract or repel? Function, diversity and evolution of infrastaminal scales in *Cuscuta*.” co-authors Courtney Clayson, Kristy Dockstader, Michael Wright and Mihai Costea. Congratulations Stephanie!



Stephanie Riviere receiving her award from Christine Maxwell and Hugues Massicotte

### Lionel Cinq-Mars Award ($500)

This award was established in 1976 for the best oral presentation by a student on his or her own research, as a contributed paper at the Annual Meeting. In 1978, the award was named in memory of Lionel Cinq-Mars, a charter member of CBA/ABC and a member of the first CBA Executive (1965-66). Cinq-Mars (1919-1973) was an expert field botanist, amassing a considerable personal herbarium and considered an expert on the genera *Viola* and *Amelanchier*. Oral presentations were evaluated by: Rodger Evans (Acadia U.), Christian Lacroix (UPEI), Hugues Massicotte (UNBC), and Mihai Costea and Fréderique Guinel (Wilfred Laurier). The award was presented by Fréderique (committee chair) to:
*Christina Lord for her presentation: “Actin microfilaments: key regulators of programmed cell death in the lace plant”, co-authors Adrian Dauphinee and Arunika Gunawardena. Well done, Christina!



Christina Lord receiving her award from Frédérique Guinel and Hugues Massicotte

## AWARDS FOR PAPERS PUBLISHED BY STUDENTS

### J. Stan Rowe Award ($500)

This award was established to celebrate the life and work of an outstanding Canadian Plant Ecologist, Stan Rowe (1918 to 2004). We would like to thank Liette Vasseur and David Garbary for their adjudication - deciding on a winner was difficult as always, with 4 strong nominees this year! As a result, we had an honorable mention and a winner for 2012:

*_Honorable mention_: Zoe Panchen, for her paper “Herbarium specimens, photographs, and field observations show Philadelphia area plants are responding to climate change”, co-authors Richard Primack, Tomasz Anisko and Robert Lyons (U. Delaware).
*_Winner of the Rowe Award_: Caroline Dubé for her paper entitled “Do power line rights-of-way facilitate the spread of non-peatland and invasive plants in bogs and fens?” published in Botany (2011), co-authors Stéphanie Pellerin and Monique Poulin (Institut de recherche en biologie végétale, Jardin botanique de Montréal, U. Montréal). Congratulations to both awardees!



Left:. Caroline Dubé
Right: Liette Vasseur with Zoe Panchen and Hugues Massicotte



## Taylor Steeves Award ($500)

This award was established to honour renowned botanist Taylor Steeves (1926-2011) who made numerous contributions to the CBA/ABC as well as to the botanical sciences in the discipline of plant morphology and development. It is awarded in recognition of the best paper published in the field of plant development by a graduate student. We are grateful to Moira Galway (chief judge) and Cindy Ross-Friedman for the adjudication.
The Taylor Steeves Award goes to Lauren C. Schewe for her work "Ontogeny of floral organs in flax (*Linum usitatissimum*; Lineaceae)" co-authors Sawhney VK, Davis AR, published in the American Journal of Botany 98(7): 1077-1085. Congratulations Lauren!



Lauren Schewe with co-authors Vipen Sawhney (left) and Art Davis.

## Luella K. Weresub Award ($1000)

This award was established in the memory of Dr. Luella Kayla Weresub (1918-1979), a well-known Canadian mycologist who worked at the Biosystematics Research Institute of Agriculture Canada since 1957. Dr. Weresub was a very active member of CBA/ABC, serving as a Director from 1971 to 1973.
We are grateful to Susan Kaminskyj, Greg Thorn and Shannon Berch who judged the submissions this year, and we extend our sincere congratulations to 2 'co-winners' ($500 each)!!
*Joey B. Tanney (Lakehead U.) for his publication “Encapsulation and immobilization of a mycophagous nematode by two Sphaerobolus species”, co-authors Tanney JB & LJ Hutchison, Botany 89: 745-751.
*Luke D. Bainard (U. Guelph) for his publication “Mycorrhizal symbiosis stimulates endoreduplication in angiosperms”, co-authors Bainard LD, JD Bainard, SG Newmaster & JN Klironomos, Plant, Cell and Environment 34: 1577 – 1585.



Joey Tanney



Luke Bainard

## Alf Erling Porsild Award ($500)



Paul Sokoloff on Victoria Island, NWT

This award was established to honor the memory of the eminent Arctic botanist, Alf Erling Porsild. It is awarded in recognition of the best paper published in the field of systematics and phytogeography by a graduate student. One nomination was received this year, put forward by Jeff Saarela (National Herbarium Museum), and the winner of the Alf Erling Porsild Award was:
*P.C. Sokoloff for the paper in Botany entitled "Taxonomy of *Astragalus robbinsii var. fernaldii* (Fabaceae): molecular and morphological analyses support transfer to *Astragalus eucosmus"*, co-authored with LJ Gillespie. Well done!

*H.B. Massicotte, Past President CBA/ABC*

## Regional Undergraduate Awards



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, was held on April 4th 2012.
**Best Oral Presentation in Botany:**
**Lauren Erland**, "Regeneration of *Lavandula pinnata* (Fernleaf lavender) and *Coriandum sativum* (Coriander), and cloning of an essential-oil related gene." Her supervisor was Soheil Mahmoud.

Photo**:** Lauren Erland receiving her award from Dr. Louise Nelson, Associate Dean, Research & Strategic Planning, UBC Okanagan Campus.

**Best Poster Presentation in Botany:**
Joanne Taylor, "Food and Water Security - Sustainably Feeding the World."
Her supervisor was John Wagner. No photo available.

The CBA/ABC sponsored awards at the **UBC Botany Graduate Students' Symposium,** which was a great success this year. The best poster award went to Kathryn Turner and the best oral presentation award went to Jenny McCune. Both winners have profiles which can be seen on page 64 of this issue.

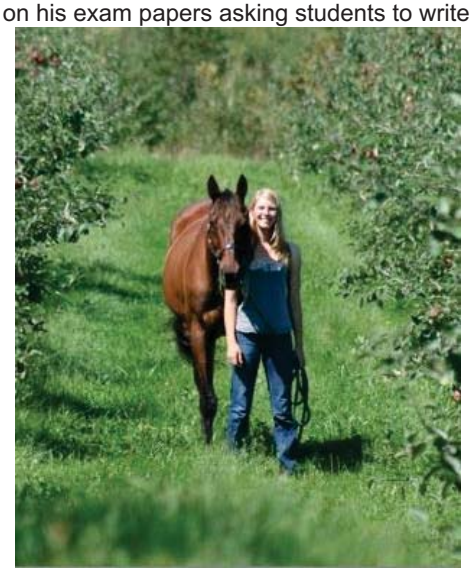
## A Botanical Poem

David Garbary at St Francis Xavier University, regularly has a question on his exam papers asking students to write a botanical poem. Here is the latest contribution from Damita Hansen.

### Reaction Wood

Gravity tugs at gymnosperms' limbs
And angiosperms aren't free of winds.
But reaction wood keeps them strong
When gravity is heavy, and branches are long
Compression wood keeps gymnosperms high
While tension wood is what angiosperms try.
Without reaction wood, branches would fall
But fibers and lignin hold them tall.

Damita Hansen, 2012



Damita with her horse

# Graduate Student Profiles

*We are interested in hearing about the research that Canadian graduate students are involved in! Please send your profiles to the Editor of this newsletter at cba.abc.bulletin@gmail.com. Profiles should be no longer than 250 words, and you should include a photo.*

The first two students profiled below were participants and winners in the UBC Botany Graduate Students' Symposium.

## Jenny McCune, Department of Botany, The University of British Columbia



Jenny McCune

The objective of my research is to fill in some of the holes in our understanding of the long-term dynamics of plant communities on southeastern Vancouver Island, particularly in response to human disturbance. This region is home to Garry oak ecosystems, which have been reduced by more than 90% in area since European settlement in the mid-1800s, and are now one of the most threatened terrestrial ecosystems in Canada.
In particular, I'm working at two time scales. The first is looking at changes in these plant communities over the past 4 decades, a time of great expansion of urban and suburban development. By resurveying 184 vegetation plots originally surveyed in the late 1960s, I've found that plant diversity on the plot level has gone up, as well as the total number of species overall, but across the landscape the diversity between plots (beta diversity) has actually gone down. The second part of my project is using plant microfossils called phytoliths to explore the dynamics of Garry oak savannahs prior to European settlement. We know that savannahs were much greater in extent when Europeans first arrivied, but we know less about how variable they were prior to that.
The talk I gave at the symposium was a summary of a review paper I'm working on that uses the Garry oak savannahs of southeastern Vancouver Island as an example to show how knowledge from multiple disciplines - including ecology, historical ecology, ethnography, history, archaeology and paleoecology - is necessary to really understand the long-term interactions between the plant communities and the human communities that occupy a landscape.

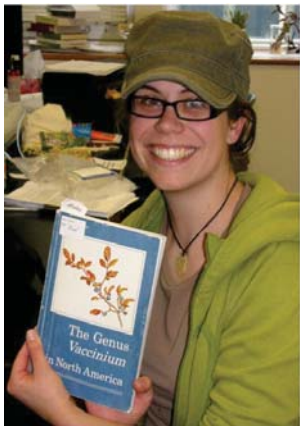
## Kathyrn Turner, Department of Botany, The University of British Columbia



Kathryn Turner

Currently I'm a PhD student at the University of British Columbia, in Vancouver. My focus is the evolution of invasiveness in a problematic weed of the Okanagan Valley, diffuse knapweed (*Centaurea diffusa*, Asteraceae). I have a Bachelor of Science in Plant Biology and a Bachelor of Arts in Asian Studies from the University of Texas at Austin.
Invasive plants are neither a recent nor a trivial problem. But what makes a plant species become invasive? Plant species are constantly being transported to new habitats, largely through human activity, but only some species survive, and only relatively few pose serious threats to their new habitats. My doctoral thesis addresses this fundamental question by examining possible molecular mechanisms underlying the evolution of invasiveness using one of North America's worst weeds, diffuse knapweed, as a model. If we can identify genetic changes associated with invasiveness, then we can better predict which plants pose the most threat, and better target prevention and mitigation efforts.
Support for scientific research in this area from organizations such as the Canadian Botanical Association is invaluable. As a young scientist, I am honored to receive recognition from the CBA for my small contribution to research.

## Danielle T. Stephens, Department of Biology, University of Saskatchewan




Danielle Stephens

Near the end of June, 2012, Danielle T. Stephens defended her M.Sc. thesis entitled "Pollination biology and the floral rewards of *Vaccinium myrtilloides* and *V. vitis-idaea* (Ericaceae)", from the Department of Biology at the University of Saskatchewan. The first paper from her thesis appeared that same month in the special issue of ***Botany*** dedicated to Canadian pollination research, featuring several studies across the country that have received support from CANPOLIN (Canadian Pollination Initiative). Danielle is helping out at her parents' farm in southern Saskatchewan for the rest of this season



# A Tribute to James Herbert Soper, 1916–2012

*ERICH HABER, 60 Baywood Drive, Stittsville, Ontario K2S 2H5 Canada*

Haber, Erich. 201x. A tribute to James Herbert Soper, 1916–2012. Canadian Field-Naturalist 000(0): 000-000.

Figure 1.James Herbert Soper, National Museum of Natural Sciences, Ottawa (now the Canadian Museum of Nature), 24 March 1970. Photo: Used with permission of the Canadian Museum of Nature.

Jim Soper (Figure 1) was born in Hamilton, Ontario, 9 April 1916 to Herbert Armitage Soper (1875–1944) and Anna Eliza Gertrude (née Cooper, 1880–1917). He was the youngest of five children. Jim had three sisters—Dorothy (1903–1910), Phyllis (1906–1936), and Brenda (1908–1947)—and one brother, Robert (1913–2000). Jim's mother died the year after he was born, and, due to family circumstances, he went to live with his father's sister, Florence Anna Callahan (1880–1975), her husband, Charles, and Jim's great-aunt Nancy (his grandmother's sister). Although Jim grew up as the only child in this extended family, there was a lot of visiting between the families. His father subsequently married Nettie Sophia Webb, who had a daughter, Gladys Thompson, from a previous marriage.

The Callahans, Jim, and his great-aunt lived in the house built by Jim's grandfather, Robert Soper, in 1914. Robert Soper was a sailmaker from England who originally immigrated to Quebec, but ultimately settled in Hamilton after purchasing a sailmaking company in 1884. Jim's father was also involved with this company, which later branched out into making tents and awnings. The company, no longer in the family, operates as Soper's Engineered Fabric Solutions. Jim's paternal grandmother was an Armitage with roots in the stone quarries of Leeds, Yorkshire, England. This background led the Armitage family to the Welland Canal area of Ontario. Jim's great-grandfather, Samuel Soper, was a market gardener in the Torbay area of Devon, England, where the Soper farm (Torr Farm) is still located.

Jim attended Hamilton Central Collegiate Institute. He entered McMaster University in 1935, and the yearbook for his freshman year lists his entrance scholarships as the Harold Matthews Memorial Scholarship for First Place Science and the Third Carter Scholarship for Wentworth. Jim completed his undergraduate degree in Honours Chemistry (1938) and his M.A. in Biology (1939). His supervisor arranged to have Jim serve as a field assistant to Hugh M. Raup on his botanical exploration of the Brintnell Lake area (now known as Glacier Lake) in the Mackenzie Mountains in the Northwest Territories (Raup 1939). On this trip, Jim joined the entire Raup family, including Lucy Raup and their two young boys, Karl and David. Jim was greatly influenced by his association with the Raups, who treated him as a member of the family. He learned from Lucy how to bake bread, a skill that he later expanded to include a variety of baked goods loved by his own family. Jim completed his Ph.D. at Harvard (1943) under Raup and M. L. Fernald, specializing in plant taxonomy and phytogeography. His thesis was a study of the flora of the Lake Erie region of southern Ontario.

Following his studies at Harvard, Jim served with the Operational Research Section of the Royal Canadian Air Force, and he was on loan to Royal Air Force Headquarters, Coastal Command, in Britain, for eight months. He subsequently joined the same section of the RCAF at Eastern Air Command, Halifax. With the end of World War II in 1945, Jim took a position as an Agricultural Scientist in what is now the old herbarium building in the Arboretum of the Central Experimental Farm, Ottawa. Here he met Jean Morgan of Montreal, the botany librarian, who that winter introduced him to cross-country skiing.

Jim and Jean married in August 1946 and moved in the fall to Toronto, where Jim took up his new teaching position in botany as Special Lecturer and Curator of the Vascular Plant Herbarium at the University of Toronto. Jean resumed library work, becoming secretary-treasurer of the Ontario Library Association. The following years were busy times for Jim and Jean, with Jim preparing botany lectures for the first time and the Sopers settling into a new house they had bought in the Leaside area of Toronto and starting a family.

Shortly after they moved into their new house, their daughter Nancy was born (1948), followed by Mary (1950), and twins Daphne and Ian (1952). Over the years at their Leaside home, Jim enjoyed cultivating a sizeable vegetable garden and planting trees and shrubs. Perhaps gardening was in Jim's genes, his great-grandfather having been a market gardener.

Over the course of the following 21 years, from 1946 to 1967, Jim combined a teaching career with active botanical research on the flora of Ontario. He taught General Botany, Taxonomy, Economic Botany, and Plant Geography. Jim had a special interest in documenting the Carolinian flora of southwestern Ontario and in the shrubs of Ontario. The latter was perhaps fostered through his association with Dr. W. Sherwood Fox, former president of the University of Western Ontario, with whom he collaborated on a number of projects. His fieldwork also took Jim to northern Ellesmere Island, where he participated in a study of the Lake Hazen flora as part of International Geophysical Year projects in 1958. With the completion of the Lake Superior portion of the TransCanada Highway in1960, Jim undertook field excursions along the newly accessible shoreline of the lake. Subsequently, he published or co-published papers dealing with arctic–alpine elements found along the eastern shore of Lake Superior. He also conducted fieldwork on Vancouver Island, in Revelstoke National Park, and in Glacier National Park. When he was on holidays in the Jeep station wagon (known in the neighbourhood as the Soper's truck), much of his Ontario fieldwork was done with the family in tow. They camped or rented a cottage, and while the kids played, Jim kept busy conducting fieldwork.

To facilitate making herbarium labels and mapping the

mapping the distribution of Ontario plants, Jim undertook to learn FORTRAN, the computer language then being used to run the university's computers. Having a great facility in math and problem-solving, Jim developed a program for mapping plant records. He was one of the first in North America to promote computer mapping of phytogeographic data (Soper 1964, 1966). He set up a punch-card machine for data entry and a card reader in a small room opposite the herbarium on the third floor of the Botany Building. Herbarium assistants would punch in data that were subsequently mapped using the university plotters.

During Jim's tenure at the University of Toronto herbarium, it grew substantially through an active program of plant collecting by Jim, student projects, and colleagues' work and through an exchange program. The vascular plant collection grew from 60 545 to 156 831, with his personal collections totalling more than 10 000. Jim documented his sight records with preprinted checklist cards that he used in the field. He also compiled a card catalogue of collections and localities.

In his years as professor and curator, Jim mentored graduate students in taxonomy and biogeography and was the primary supervisor of my M.Sc. thesis on Enchanter's Nightshade in Ontario (genus *Circaea*) and of Ph.D. student Gary R. Thaler, who studied the limits of the Carolinian floristic zone using, in part, Jim's biogeographical data.

In 1967, Jim took up the position of Chief Botanist at the National Museum of Natural Sciences, National Museums of Canada in Ottawa. There he continued his efforts to promote the computerization of collections at the Botany Division of the Museum (now the Canadian Museum of Nature). Jim became an avid student of French, developing a working facility in the language that even extended to reading French novels.

In 1981, Jim followed up his early work on the arctic–alpine flora on the shoreline of Lake Superior with post-doctoral fellow David Given (Given and Soper 1981). Work on the shrubs of Ontario, initiated with Margaret Heimburger in 1961, culminated 20 years later in a major publication by the Royal Ontario Museum (Soper and Heimburger 1982). On retirement in 1981, Jim continued his research on the flora of Ontario as Curator Emeritus and assisted me in compiling my georeferenced database on the rare vascular plants of Canada.

Jim is the author or co-author of 3 books and over 60 botanical papers. A sedge (*Carex soperi* Raup) and two varieties of plants (*Celtis tenuifolia* Nutt. var. *soperi* Boivin and *Houstonia longifolia* Gaertn. var. *soperi* Boivin) were named after him. The sedge is now synonomized under the geographically widespread Thick-headed Sedge (*Carex macloviana* d'Urv.), and the two varieties are currently also included with the normal range of variation of their respective species, Dwarf Hackberry (*Celtis tenuifolia*) and Long-leaved Bluet (*Houstonia longifolia*). In 1977, Jim was awarded the Queen's Silver Jubilee Medal honouring Canadians who were considered to have made a significant contribution in important fields of endeavour.

In his early years at Toronto, Jim served as Chairman of the Checklist Committee of the Federation of Ontario Naturalists, along with members W. Sherwood Fox, Monroe Landon, Fred H. Montgomery, and Edmund M. Walker (Cruise 1982). A preliminary checklist of vascular plants of the portion of southern Ontario south of the Canadian Shield and west of Kingston was completed in 1949. Jim was a member of a number of societies and associations, including the National and Provincial Parks Association of Canada (now the Canadian Parks and Wilderness Society), the Royal Canadian Institute (President, 1962-1963), the Canadian Botanical Association (Treasurer, 1968-1969, and President, 1982-1983), the Federation of Ontario Naturalists, the Royal Botanical Gardens (Hamilton), the Arctic Institute of North America, the Bruce Trail Association, the Ottawa Field-Naturalists' Club, the American Fern Society, the Australia-New Zealand Association, and the Harvard University Club of Ottawa.

The McMaster yearbook for 1938, the year of his graduation, provides insight into some of the young man's talents and interests:

Starting from Central Collegiate on the matriculation scholarship in Science and advancing to win the City of Hamilton scholarship in second year, Jim mixed Chemistry and Botany to get a fine grounding for graduate work. He combined badminton, music and flower collecting for diversions. Weakness—drawing everything he could see and then some.

Women in the family, especially Aunt Flo, played an important role in Jim's early life. During his years in Hamilton, Jim developed considerable skill in playing the piano, especially classical music, and he made a recording in 1940. It was a love that he maintained all his life. His interest in drawing, and later watercolours, was likely fostered initially by his aunt Flo, who had been Assistant Principal of the Hamilton Art School (1905–1909). She possessed a variety of skills in the arts and crafts of the time, including painting on porcelain, but concentrated on painting landscapes in oils. Jim's love of sketching, already noted in the account from the yearbook from his graduating year at McMaster, is also highlighted in a photograph he took of himself sketching the mountains around Brintnell Lake while sitting on a packing box. (Harris and Lougheed 2002). During his years in Toronto, Jim was also a keen photographer of wildflowers.

To improve his skills in painting and drawing, Jim attended classes at the Ontario College of Art in Toronto in 1965-1966. In retirement, Jim began to specialize more seriously in painting watercolours of botanical subjects, including dried flower bouquets (Figure 2). He took instruction at the Ottawa School of Art (1981–1983) with Morton Baslaw and Leonard Gerbrandt; at Sunbury Shores Arts and Crafts Centre, Saint Andrews, New Brunswick (1982), doing landscapes with Henry Purdy; at the Ottawa Board of Education (1986), doing watercolours with Cécile Loubert; and botanical illustration in watercolour with Dorothy Bovey at the Royal Botanical Gardens, Hamilton (1988 and 1990).

Overall, Jim was a quiet and reserved individual, and always a gentleman. He was tender-hearted when it came to small creatures. He was a highly organized and tidy person, and he loved his Dymo labeller. He was very much disciplined about his health. An early riser, he would take a brief nap after lunch each day, even at work, swim regularly at the YMCA, and do 5BX exercises (Five Basic Exercises, developed for the Royal Canadian Air Force—stretching, sit-ups, back extension, push-ups, and running on the spot). He was creative in building or repairing things, and his fine motor skills are quite evident in his neat handwriting and artistic abilities, as reflected in his beautifully executed artwork. Apparently, needing to keep his hands busy, Jim learned crocheting and made baby jackets for the kids and afghans out of “granny squares”. Jim also liked to do string figures for the kids.

Jim had a dry sense of humour and loved play on words. He and Jean enjoyed bridge, and Jim loved crosswords and

even made some up, in retirement, with his computer. In later years, Jim spent much time reading and was still driving up until a year before his death to get groceries and do banking. After Jean had a fall in November 2011, they moved into a retirement home for a respite visit. Jim was not happy being away from their home overlooking the canal in Ottawa. However, as long as Jim got three meals a day on time, he never complained.

Jim died peacefully after a short illness on 16 February 2012 in his 96th year. He is survived by his loving wife, Jean, his daughters, Nancy (Richard Stoneman), Mary (David Gladwin), and Daphne (James Boyce), his son, Ian (Nicole Ratté), his grandchildren, Kathryn and John Stoneman, and his nieces and nephews. Jim's beautifully rendered watercolours, in the homes of family and friends, remain as a testament to his love for plants and their beauty.



Figure 2.Jim Soper, after retirement, in his office at the Botany Division, Canadian Museum of Nature, with one of his watercolour paintings depicting a winter bouquet of dried plants. Photo: E. Haber.

**Acknowledgments**

I am indebted, in particular, to Jean, daughter Mary, and niece Sharon for providing insights into Jim's family history and family life. Jennifer Doubt, Botany Collection Manager, Canadian Museum of Nature (CMN), helped to initiate searches for information at the CMN. CMN archivist, Chantal Dussault, provided leads to information stored by the Museum and at Library and Archives Canada. Deb Metsger and Royal Ontario Museum (ROM) volunteer Marilynn Murphy were most helpful in compiling data on the herbarium collections of vascular plants at the University of Toronto, now held by the ROM. Paul Catling and Gisèle Mitrow, at Agriculture and Agri-Food Canada, provided a bibliographic compilation of Jim's publications that were on file at the Central Experimental Farm. George Argus, Charles Bird, Irwin Brodo, Daniel Brunton, Paul Catling, and Charles Gruchy read an earlier draft.

**Literature Cited**

**Cruise, J. E.** 1982. Foreword. *In* Shrubs of Ontario. *By* J. H. Soper and M. L. Heimburger. Royal Ontario Museum, Toronto. 495 pp.

**Given, D. R.,** and **J. H. Soper**. 1981. The arctic-alpine element of the vascular flora at Lake Superior. Publications in Botany 10. National Museum of Natural Sciences, National Museums of Canada, Ottawa, Ontario. 7 pages.

**Harris, J.,** and **V. Lougheed.** *Editors.* 2002. Diary of a Lake: An Intimate Description of the Natural History of Glacier Lake and the Cirque of the Unclimbables, in the Words of Scientists who were among the Area's First Pioneers. Repository Press, Prince George, B.C. 214 pages.

**Raup, H. M.** 1939. Botanical exploration of the Mackenzie Mountains. Bulletin of Popular Information. Arnold Arboretum, Harvard University. Series 4 7(13): 69-72.

**Soper, J. H.** 1964. Mapping the distribution of plants by machine. Canadian Journal of Botany 42: 1087-1110.

**Soper, J. H.** 1966. Machine-plotting of phytogeographical data. Canadian Geographer 10: 15-26.

**Soper, J. H.,** and **M. L. Heimburger.** 1982. Shrubs of Ontario. Life Sciences Miscellaneous Publication. Royal Ontario Museum, Toronto. 495 pages.

A full bibliography of James Soper will be published in the December issue of the Bulletin.

## Canadian Botanical Association/l'Association Botanique du Canada 49th Annual Meeting and Conference Art Exhibition June 1-5, 2013 Call for Entry

The 49th annual meeting and conference of the Canadian Botanical Association will be meeting at Thompson Rivers University in Kamloops, British Columbia, Canada from June 1-5, 2013. 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 exhibition, Art and Science: Drawing and Botany, will present an array of work that facilitates discussion about integrating art with science and science with art. Specifically this exhibit will include work that explores questions about the perceived boundaries between art and science, and will add to a growing synergy between art and botany. Many scientists, and specifically botanists, incorporate art practices as part of their own research, and many artists explore the realm of botany in their practice. The idea for this exhibition grew out of a collaborative relationship between an art instructor and a botany instructor at Thompson Rivers University.

Traditionally, botanical art endeavoured to make life sized visually accurate renditions of the botanical subject. A blind contour drawing is no less an authentic study of a plant than an intensely accurate drawing of the same plant. The process of making the work advances knowledge about the botanical subject. Submissions are not restricted to traditional media or styles associated with botanical art.

In addition to individual submissions, collaborative projects between artists and scientists are encouraged as are group projects, such as might arise from classroom/studio/lab settings. Group and collaborative projects might consider keeping journals of the process, especially in classroom settings, to be displayed with the artwork.

The deadline for individual submissions is **March 29, 2013.** Early submission is strongly recommended especially for project based work. The submission deadline for project based work involving 10 or more individuals is **January 15, 2013**

**Check the website for details: www.tru.ca/cba-abc**

# Book Reviews




## Spring Wildflowers of the Northeast: A Natural History

Gracie, C.
*2012. Princeton (NJ): Princeton University Press. 290pp. ISBN 978-0691144665*

***Daniel Mosquin, Research Manager, UBC Botanical Garden***

On rare occasions, one encounters a book that sets itself above and beyond its peers. Carol Gracie's Spring Wildflowers of the Northeast: A Natural History meets that lofty standard with its rich information, strong photography and audience-friendly writing.

It must first be noted that this is not a field guide, a type of book Gracie has already co-authored with Steven Clemants in the 2005 Wildflowers in the Field and Forest: A Field Guide to the Northeastern United States. Unlike the field guide with its hundreds of species and brief descriptions, the author of Spring Wildflowers of the Northeast opts for far fewer species or groups (30) with each explored in depth. With six to ten pages dedicated to each species or group (two exceptions: fire-pink with four pages and violets with sixteen(!)), the author is able to share a comprehensive natural history. As an example, the chapter on skunk cabbage (*Symplocarpus foetidus*) begins with a small information box that has a small blurb about the species, its habitat and its range (what one might see in field guide). The written accompaniment then explores phenology, inflorescence morphology and colour, scientific name etymology, use by wildlife, calcium oxalate crystals within its plant family and their effects, flower morphology, pollination biology including the production of heat by the spadix, leaf morphology and senescence, fruit biology, taxonomy, related species, and phytogeography.

Accompanying the text for the skunk cabbage entry are 28 figures, illustrating the species in habitat, inflorescences, flowers, fruits, plants through their annual cycles including leaf emergence and enlargement, roots (one is captioned: “A partially excavated skunk cabbage plant with its long contractile roots splayed out over the muddy soil. It took three hours to fully excavate the plant.”) and related plants. All photographs are in focus and the accompanying captions often point out exactly what concept or feature is being illustrated.

This outstanding level of detail is also peppered with historical observations (Peter Kalm's complaint about its fragrance), the author's observations and references to scientific studies. Gracie cites twenty references (listed at the back of the book) used to write the account for skunk cabbage, with papers from journals such as Journal of Mammalogy, Annals of the Missouri Botanical Garden, Journal of the New York Entomological Society, Molecular Phylogenetics and Evolution, Annals of Botany, and Biochemical Systematics and Ecology.

The depth of information and excellent photography is repeated twenty-nine more times throughout the book, and it is clear that the author has a passion for the subject. The enthusiasm and detail will often delight the reader. As an example, instead of merely stating that splash-cup mechanisms occur across multiple groups of organisms, photographs of the seeds of *Mitella* (miterwort) in their boat-shaped capsules, the peridioles of bird's nest fungi in cups and the gemmae in the gemma cups of liverworts (*Marchantia polymorpha*) are all present.

It is difficult to find any criticisms with the book, though there are perhaps two small areas for improvement. The first is a matter of design. Each species or group of plants leads with a near-full page photograph of the species or group and concludes with text that reaches the end of the page (thanks to clever editing of the photographs). When casually flipping through the book, though, it would be handy if there was a better visual cue that a new species group was being encountered, as one page “bleeds” into the other across sections, since each page is full. This could have been accomplished by changing the background colour of these lead pages from white to a shade of grey, using the full page for the photograph rather than bounding it with the same-sized white borders of the rest of the book, or differently-coloured bands at the top of the pages for each species or group.

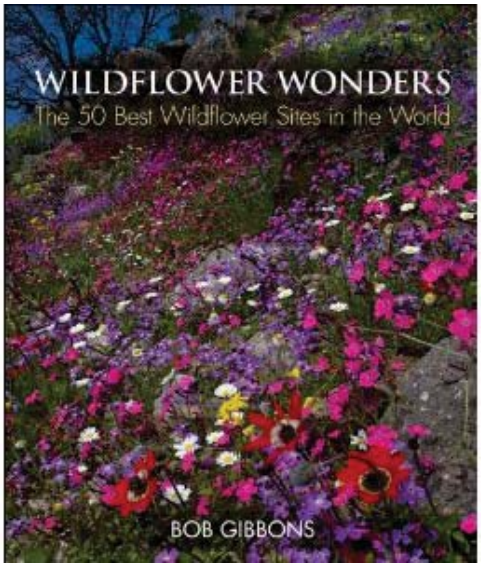
Secondly, I'm not a fan of organizing the species or groups by common name, particularly when adjectives are used to sort the sections alphabetically, e.g., Celandines, Columbines, Dutchman's Breeches, Early Meadow-Rue,… Lesser Celandine,… It isn't a fatal flaw, since only 30 species or groups are featured in the book, and one should become familiar with their placement quickly. As mentioned earlier, it is not a field guide, so the organization doesn't need to be taxonomically or morphologically delineated. That said, I would have preferred a different approach for the first few times using the book, perhaps something that would have added easily to the depth of information in the book like “sequenced by approximate flowering phenology” or “alphabetical by plant families”.

Minor criticisms aside, this is an excellent book. Even if you are not a resident in the region it covers, you should find a way to get this book into your library both to delight in its quality and to discover the new standard to which other books of its ilk need to be measured against.

( Continued)



**Future Meetings.**
**2013 Kamloops BC**
**2014 Montreal. 50th Anniversary meeting.**
**2015 Edmonton. Plant Canada, BSA.**




## Wildflower Wonders: The 50 Best Wildflower Sites in the World

*Gibbons, B. 2011. Princeton (NJ): Princeton University Press. 192pp. ISBN 978-0691152295*
*US$27.95*

***Daniel Mosquin, Research Manager, UBC Botanical Garden***

As an avid collector of regional books about where and when to go to see wildflowers, I was delighted to hear that someone tackled the subject on a worldwide scope. Dr. Bob Gibbons' effort does not fail to impress. Having traveled to a number of the western North American sites featured in the book, I am aware of the energy, planning skills and luck required to visit just one or two sites per year at peak flowering. To have witnessed the forty-four sites as seen by Dr. Gibbons (the remaining six are contributed by others) is obviously a passion, revealed both in his writing and photographs.

Each wildflower site receives two to three pages of text shared with two or more photographs. Most sites have a full-page photograph that expertly represents the wildflower landscape being highlighted. The rest of the photographs for each site may include additional wildflower landscapes, habit or macro shots, and/or the occasional wildlife image. A sidebar for each entry features a small map of where the site is on its continent, short text about the location, reasons to go, timing and protected status.

The book also includes a brief essay on why some places are so flowery, a list of other sites excluded, a couple pages of useful contacts (which I would have called useful resources, as it is mostly a list of web sites containing more information about visiting the sites and their host countries), a bibliography, a common name to scientific name species list, and an index.

Photographs are the strongest element to the book. Supplemented by a clean design and typeface, the presentation is overall sharp and pleasing. The photographs are generally taken from standard or wide-angle perspectives, permitting the reader to be transported to the site in her/his imagination. These image perspectives also often provide a sense of the surrounding landscape or flower abundance—perfect for the book.

The writing is strong, but tends toward the overuse of superlatives. Each site is described with a mix of historical, geological, climatic and ecological information, with occasional additional commentary on threats to the landscape. The bulk of most entries details information specific to the flowers: where to see them, when to see them, what can be seen, and what is present. Some entries read like brief travelogues for specific areas, detailing what will be encountered as one proceeds up higher elevations or transitions from wet-to-dry zones.

One inconsistency which I personally find annoying is the treatment of plant names. Scientific names are occasionally used, and when present only sometimes accompanied by a corresponding common name. Far more frequent is the use of common names. Unfortunately, these are inconsistent in style in that lower case initial letters are sometimes employed but more often upper case initial letters are used. This creates a bit of a visual hodgepodge, e.g., "…masses of sainfoin, yellow rattles, rampions, orchids, campions, clovers, pink Bistort, Viper's Bugloss, Ox-eye Daisy, bellflowers and even occasional Orange Lilies". The editor should have reviewed this and employed the generally-accepted standard: lower case initial letters except when the word is a geographical or personal name. To point out when a common name is directly referable to a species in the common name to scientific name species list at the back of the book (which is what I think is intended by the use of upper case initial letters), other books of this ilk have employed a bold typeface for these instances.

Another sore point with the names is the indexing (again, an issue of editing). Using the page index to find species of Parnassia, commonly known as grass of Parnassus one finds: "Parnassia, Fringed: 174" and "Grass of Parnassus: 37, 42". Or, for species of Helleborus, also known as Christmas rose or hellebore: "Christmas Rose: 79" and "hellebores: 69". In other words, the indexing is not comprehensive to someone looking for specific plants or specific plant groups.

Lastly, I do take some issue with the title of the book, which I suppose was given for marketing purposes. The fifty best wildflower sites in the world when a continent like South America isn't represented (e.g., the Atacama Desert) and Europe receives 28 of 50 sites? It does seem a bit curious. Why not "Wildflower Wonders: 42 Exceptional Wildflower Sites of the Northern Hemisphere" and add additional photographs (or additional North American and Asian sites, like the ephemeral wildflowers of the Carolinian forests)? All that said, it is a worthwhile addition to the library of anyone interested in wildflowers and plant abundance. For those who are able to travel for their botanizing, it provides an excellent starting point for deciding "Where to next?".



**SAD NEWS**

**Don Britton passed away on May 18th 2012. A tribute will be published in the next issue of the Bulletin**

# MAJOR INVASIVE ALIEN PLANTS OF NATURAL HABITATS IN CANADA

Paul M. Catling and Gisèle Mitrow

## 4. Glossy Buckthorn, Alder Buckthorn, neprun bourdaine.

*Frangula alnus* P. Mill.
Synonym: *Rhamnus frangula* L.

Infrataxa that have been recognized include: subsp. *baetica* (Reverchon and Willk.) Rivas, Goday *ex* Devesa, subsp. *columnaris* Hort., subsp. *elliptica* (Meinth.) R. Knapp, subsp. *saxatilis* Gancev, subsp. *sphagnicola* A.P. Khokhr, var. *angustifolia* Loud., var. *prostrata* Sell., and f. *angustifolia* W.R. Franz
The genus name *Frangula* is said to refer to the brittle wood or to the chemical frangulin first isolated from this plant. The specific name *alnus* is most likely a reference to its resemblance to species of Alder. The common name "Glossy Buckthorn" is derived from an earlier classification with the buckthorns and the fact that some of the leaves are often glossy. It is also called Alder Buckthorn (a name better reserved for *Rhamnus alnifolia*, a native shrub of fens and swamps), Columnar Buckthorn, European Alder and Fen Buckthorn.

## Identification and Classification

The genus *Frangula* belongs to the buckthorn family (Rhamnaceae) and consists of about 50 species that are predominantly American and subtropical. Glossy Buckthorn was first formally described by Linnaeus in 1753 as *Rhamnus frangula*. Subsequently (1758) it was separated by Philip Miller into the genus *Frangula* on the basis of its hermaphrodite (both male and female parts) flowers with a five-parted corolla instead of either male or female flowers and four-parted corolla as in *Rhamnus*. The separation of *Frangula* from *Rhamnus* is now widely accepted and supported by recent genetic data.
There are 3 genera in the Buckthorn Family found in Canada which can be distinguished as follows:

**1a.** Leaf blades with the prominent veins arising from the base; flowers numerous in dense, white inflorescences; fruit dry ……..... ***Ceanothus***
**1b.** Leaf blades with prominent veins arising from the central vein; flowers creamy or yellow-green, solitary or several; fruit fleshy ……..... **2**

**2a.** Leaves smooth-margined; flowers bisexual (plants monoecious); sepals and petals 5; true bud scales lacking, replaced by the reduced leaves of naked buds which are hairy ……..... ***Frangula***
**2b.** Leaves with marginal teeth; flowers unisexual or bisexual (plants dioecious or polygamo-dioecious); sepals and petals 4, or sepals 5 and petals none; bud scales present and smooth except for the hairy margins ……***Rhamnus***

In Canada there are only two species of *Frangula*, distinguished as follows:
**1a.** Pedicels of flowers (and fruiting peduncles) glabrous or nearly so: leaf blades 2.5-8 cm long; In Canada naturalized from Manitoba eastward and cultivated in Saskatchewan and Alberta ..... ***Frangula alnus***
**1b.** Pedicels of flowers and fruiting peduncules pubescent; leaf blades ca. 8-12 cm long; in Canada known only in British Columbia or possibly a very rare escape elsewhere ……..... ***Frangula purshiana***

Glossy Buckthorn is most often confused with European Buckthorn (*Rhamnus cathartica)* but the latter differs in its sub-opposite branching, leaves with serrated margins (Figure 1), and some twigs are tipped with a sharp stout thorn. *Rhamnus alnifolia*, *R. davurica* and *R. utilis* also occur in North America. The latter has glossy leaves like *Frangula alnus*, but all may be distinguished from the latter using the key above. Glossy Buckthorn may also be confused with various dogwoods but most these have opposite leaves and fresh dogwood leaves often show white latex strings between the veins when torn. Such strings are not present in Glossy Buckthorn.

The native relative Cascara (*Frangula purshiana*) is found in southern British Columbia and the Rocky Mountains southward. The bark of this shrub or tree has been collected for its medicinal value leading to substantial declines in populations The overall retail value of Cascara bark is of the order of $100 million. For more information see CBA Bulletin vol. 29(4): 58-59. 1996 (Oct.) or http://www4.agr.gc.ca/AAFC-AAC/display-afficher.do?id=1301435968306&lang=eng ). The various species of *Frangula* are sometimes confused in trade but can be distinguished by anatomical features of the wood. *Frangula alnus* lacks sclereids for example but *F. purshiana* has them.

## Description (See Figures 1, 2, 3, 4, 5, 6 and 11)

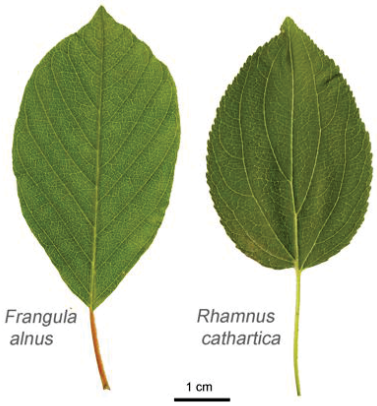



Figure 1. Comparison of the leaves of Glossy Buckthorn and European Buckthorn. [Photo by P.M. Catling, S side of Ottawa, June 2012.]

Deciduous multi-stemmed shrub or small tree to 9 m tall (mostly less than 6-7 m) with glossy, rounded to ovate, smooth-margined, mostly alternate and prominently-veined leaves which turn yellow or red in autumn. Bark is grey or brownish grey with prominent whitish lenticels. Small, young twigs are reddish or brownish grey and densely hairy. Bud scales are lacking but young hairy leaves can be mistaken for scales. Leaves have 6-10 pairs of lateral veins and the

blades are dark-green, 2-11 cm long and 1.5-6 cm wide with petioles 1-2 cm. Flowers are hermaphroditic (having both male and female parts), solitary, or 2-6 in leaf axils, 3-5 mm in diameter, and star-shaped with five greenish-white acute triangular petals. Pedicels are 5-10 mm long. Sepals are keeled and slightly beaked. Petals orbicular with the tips slightly emarginate. Ovary is globose, with 2 or 3 compartments. The style is undivided but the stigma is slightly 2 or 3-lobed. The fruiting pedicel is 7-10 mm. Smooth fleshy fruits 6–8 mm diameter are at first green, then red, ripening to black. They contain 2 or 3 pale brown seeds 5 mm long. The chromosome number is 2n = 20.



Figure 2. Flowers of Glossy Buckthorn. [Photo by P.M. Catling, S side of Ottawa, June 2012.]



Figure 3. Illustrations of *Frangula alnus* from Köhler's Medizinal-Pflanzen (Franz Eugen Köhler) published in 1897.

Flowering occurs in June and continues into July (in Canada). New flowers open continuously over a period of several weeks. Fruit ripens in July and August. Leaf fall is later than in native trees and shrubs making Glossy Buckthorn conspicuous in the fall.




Figure 4. Illustrations of *Frangula alnus* from Atlas des plantes de France by A. Masclef published in 1891.




Figure 5. Variation in leaf shape of *Frangula alnus* in eastern Canada. a, normal leaves, Montreal, *G. and P.H. Du Boulay 4203* (CAN 313634); b, unusual leaves resembling those of a willow, High Park, Toronto, Ontario, *L.T. Owens s.n.* (TRT 114234); c, long acuminate leaves of f. *asplenifolia,* Springhill Bog, 2 miles W of Springhill Cemetary, Osgoode Township, Ottawa-Carleton, Ontario, *A.W. Dugal 2823* (CAN 536407); d, very unusual linear leaves, 5 miles E of Osgoode, Ottawa-Carleton, Ontario, *M.J. Shchepanek 4340b & A. Dugal* (CAN 467143). [Photo by P.M. Catling.]



Figure 6. Seeds of *Frangula alnus*. [Used with permission of Steve Hurst @ USDA-NRCS PLANTS Database.]

## Distribution and History

Glossy Buckthorn is native to Europe (north to 68°N in Scandinavia), western Asia (east to Siberia and western China) and North Africa. It may have been introduced to North America in the 1800s because of its value in medicine and gunpowder manufacture. It only became widespread in the American Northeast in the late 1800s, as a result of escape from plantings largely due to its popularity as a hedge plant and a source of medicine. There were likely multiple introductions. Glossy Buckthorn was planted in hedgerows in Wisconsin as early as 1849. Currently it is found in the following states: Colorado, Connecticut, Iowa, Idaho, Illinois, Indiana, Kentucky, Massachusetts, Maine, Maryland, Michigan, Minnesota, New Jersey, Nebraska, New York, Ohio, New Hampshire, Pennsylvania, Rhode Island, Tennessee, Vermont, Wisconsin, West Virginia, and Wyoming. It is one of many serious North American invasives that were introduced partly as a result of ornamental horticulture.

We have borrowed and databased the specimens from the following herbaria: ACAD, ALTA, CAN, DAO, LKHD, MT, MTMG, NFLD, NSPM, OAC, QFA, QK, QUE, SASK, TRT, TRTE, UBC, UNB, UWO, V, WAT and WIN. MMMN and UPEI did not have specimens of Glossy Buckthorn in their collection. In Canada it was first collected in 1897 in Ottawa (MT) with subsequent Ottawa records in 1899 (TRT), 1909 and 1910 (CAN, DAO). The second Canadian specimen originated from London, Ontario in 1898 (CAN, DAO) with another in 1903 (DAO, MT). It then appeared in Guelph, Ontario in 1906 (TRT). In the 1940's it had become well established in Ottawa, London and Guelph. In 1913, the plant was found for the first time in Nova Scotia (CAN), for the first time in New Bruswick in 1939 (DAO) and for the first time in Prince Edward Island in 1856 (ACAD). The first record for Quebec was in 1918 (DAO) and it is now widespread in the southwestern part of that province. In the west, it appeared in Manitoba in 1958. It was cultivated in Saskatchewan at the University of Saskatchewan in 1984 and in at the experimental station in Lethbridge, Alberta in 1944. Glossy Buckthorn is now widespread in eastern Canada (Figure 7.).

A rapid spread and increase in Glossy Buckthorn over the past two decades has been overlooked by many people. The shrubs are interpreted as just part of the greenery. It is not like the very conspicuous Purple Loosestrife (*Lythrum salicaria*) in the 1980s which was so obviously changing Canadian wetlands, that it demanded attention, and was subsequently reduced to acceptable levels in local areas as a result of the release of biocontrol agents.

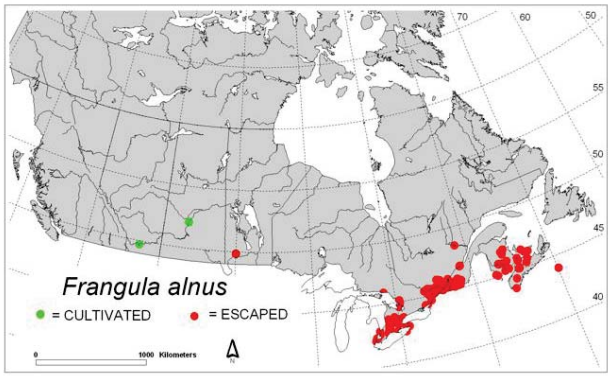



Figure 7. Distribution of Glossy Buckthorn in Canada based on specimens in Canadian herbaria.

Glossy Buckthorn is also an interesting case of an invasive that first became well established in urban areas, perhaps because of the plantings for hedges and attractiveness to European Starlings which were concentrated in urban areas and served as local dispersal agents (although Glossy Buckthorn was not brought to Canada by Starlings since they were not recorded breeding in Ontario until 1922). It clearly demonstrated the geographic pattern of passing through the lag phase in an urban setting and then also undergoing the initial expansion and increase in abundance in an urban setting. At meetings in the Ottawa area in the 1990s a few well informed landscape managers suggested that it would be more profitable to devote the limited management resources available to areas outside the city as a result of dominance of Glossy Buckthorn in the city.

## Ecology

Glossy Buckthorn has a broad ecological niche in Canada. It can do well in a great variety of soils (mineral, organic, acid, alkaline, wet, dry) and is capable of growing both in full sun and in moderately shaded habitats. It has invaded wetlands as varied as acidic bogs, calcareous fens, sedge meadows and various kinds of swamps and marshes as well as drier open habitats such as alvars, prairies and granite barrens. It also invades old fields rapidly so that the rich old field diversity of our southeastern countryside is now at risk as is the diversity of fencerows and powerlines. An old field can become a dense stand of Glossy Buckthorn 5 m high within 10 years. It can be dominant on shorelines and riparian woodlands. It is less likely to invade densely shaded and/or periodically dry woodland, but does invade successional transition hardwood forests. It may die in late successional woodland as a result of increasing shade.

In Canada, the flowers are attractive to wasps and bees (Honey Bees and Bumble Bees mostly based on our numerous observations) which probably transport pollen. One herbarium specimen notes Honey Bees visiting the flowers (CAN 455218).There is a single study of reproductive biology that took place in Spain.

**Alternatives to Planting Glossy Buckthorn**

For gardens and to attract wildlife many native shrubs and trees are available from local nurseries such as American Elder (*Sambucus canadensis*), Black Chokeberry (*Aronia melanocarpa*) and Saskatoon (*Amelanchier alnifolia*).

The incompletely protandrous (male first) flowers last for 8-10 days. There were 21 pollinators (mainly Diptera but also Hymenoptera and Mecoptera) reported, attracted by a weak odour as well as nectar and pollen. The flowers are largely self-incompatible and insects are necessary for seed production.
The fruit is consumed and the seeds dispersed by European Starlings, various blackbirds, Rose-Breasted Grosbeaks, Wood Ducks, Cedar Waxwings, Bohemiam Waxwings, American Robins and Blue Jays. Among mammals, elk and mice eat the berries and are presumably dispersal agents. Starlings were suggested to have played a major role in spread in Ohio where both the birds and the shrubs arrived and spread at about the same time. Since the berries fall soon after they are ripe, rodents are likely important seed predators and dispersal agents. Seedlings often germinate from abandoned rodent caches.
Anthraquinones (emodin) are concentrated in the immature fruit making it unattractive and preventing premature dispersal. The fresh fruit is said to float for 19 days and dry seeds float for a week so that some dispersal by water may be possible. Fresh fruit from shrubs in Ottawa sank immediately so it is difficult to attach much significance to this mode of dispersal without additional study. Seeds remain viable in the soil for at least two or three years. Germination is promoted by high light and exposed soil and the plant is twice as likely to colonize recently ploughed sites as other situations.
See under biocontrol for other information on interaction with native species.

## In Canada

As well as being listed as the 7th most serious invasive in Canada, Glossy Buckthorn been listed as among the top most problematic species in wetlands. The situation has become much more critical since these listings because it has expanded outside urban areas and has now begun to dominate natural areas far-removed from cities where it was entirely absent only a few decades ago. Buckthorns are prohibited from entry into Canada under the Plant Protection Act and Regulations. Some provincial Invasive Species Councils have produced useful brochures on Glossy Buckthorn. Problems with the shrub are well documented in Ontario and Quebec. In Manitoba Glossy Buckthorn is listed under the Noxious Weeds Act which requires that plants be destroyed by landowner's, etc. In Nova Scotia, it has been reported as a current pest of natural habitats that is rapidly expanding.
**Damage** (significance is suggested by the number of asterisks to 5 for highly significant)

**Biodiversity**
(1) It out-competes native plants for nutrients, light and moisture resulting in dense stands with no other species. Its ability to dominate and alter natural habitats may be partly due to release of poisonous compounds (allelopathy) but this requires further study. There are hundreds of examples of loss of diverse natural habitats to Glossy Buckthorn. For example, it has dominated the Leitrim Fen south of Ottawa, the Hunt Club swamplands and sandy woods on the south side of Ottawa, and the Sifton Bog, a benchmark site near London, Ontario, and has substantially reduced biodiversity on Mont Royal, Quebec. Changes may be exacerbated by loss of groundwater or drying in general but their rate in some areas so far suggests that changes due to Glossy Buckthorn will occur regardless of climate warming. *****
(2) The loss of plant diversity in invaded areas results in a loss of animal diversity and a resulting loss of wildlife habitat which has economic value. Although Glossy Buckthorn produces a lot of fruit (and flowers and leaves) it is less useful to biodiversity than a diverse native flora. A Wisconsin study found that Glossy Buckthorn supported fewer arthropods than 11 species of native trees and shrubs. Another researcher noted that while a diversity of native species produce timely, high quality food for birds, Glossy Buckthorn produces easily accessible junk food with a laxative effect that leads to a net energy loss. *****
(3) It changes the structure of plant communities from open woodlands or marshlands and open bogs to dense thickets. *****
(4) Management and control to protect valuable biodiversity is expensive in time and money. *****

### The new question

The co-efficient of conservatism is an index of floristic quality based on an assigned number between 0 and 10 that reflects the fidelity of a native species to a natural pre-settlement habitat within a particular region. An average value from a list of species present indicates the floristic quality of an area. Another method of evaluating natural areas is to consider their ecological integrity. This includes the “characteristic composition and abundance of native species”, “the full complement of native species”, or the idea that “the ecosystem's biodiversity is ensured”. These are very useful methods for selecting areas for protection, but as a result of invasives, the situation is far from static, and not much can be ensured. Valuable methods of determining the highest priority natural area can seem like a wasted effort only five years later because of an invasive. Several studies have shown that conservatism and integrity decline sharply and steeply when Glossy Buckthorn enters the scene. **Now, equally important as these measures is the question of whether money will be needed and available for management in the near future.** No invasive brings this observation more to the forefront than Glossy Buckthorn that is spreading so rapidly into high priority and high diversity habitats.

**Agriculture**
(5) Glossy Buckthorn is an alternate host for alfalfa mosaic virus and also for crown rust fungus that infects oats and barley. These rusts can cause significant yield losses and lowered grades of cereal grains. Losses are greatest with early season infections. *****
(6) It is an alternate host of the introduced Soybean Aphid. *****
(7) It has been collected on the edges of Blueberry fields in Nova Scotia but the extent to which it may become a pest of Blueberry crops is not yet clear. *
(8) There are references to death of cattle following ingestion of all parts of Glossy Buckthorn (but they are few and horses, goats and sheep are said to browse on it without difficulty). *

**Industry**
(9) It may have a negative economic impact on the white pine timber industry in North America. **
(10) It may delay or prevent gap filling in forests. **

**Evidence, Proof, and Differences**

An extensive study of Ontario wetlands found no evidence that introduced species, including Glossy Buckthorn, excluded native species. This lack of evidence was based on a single year of study and did not evaluate change over time. Of course "the currency of science is evidence, not proof," but that evidence deserves to be questioned. When long-lasting and rich native habitats are replaced by monospecific stands of Glossy Buckthorn, the evidence for displacement seems strong. In fact numerous studies have documented negative effects of Glossy Buckthorn on native herbaceous cover.

**Health**

(11) Plant parts may be poisonous to humans (but have not been featured as a poisonous plant of major significance). **

## Beneficial Aspects

(1) It has been used (mostly the bark) medicinally from the Middle Ages to the present, particularly as a laxative, but also as tonic, to treat abdominal bloating, hepatitis, cirrhosis, jaundice, liver and bladder complaints, gum disease, scalp infestations, skin irritations and to eliminate parasitic worms. The bark also contains anthrones and antranols which induce vomiting. It also contains anthraquinone deriviatives, flavonoids, peptide alkaloids and tannins. It can be dangerous if taken in excess. There are many products still on the market including various teas and tablets all of which are much safer than home made preparations. **

(2) It is a potential source of drugs for the treatment of cancer. **

(3) It is a food source for native (and introduced) Canadian birds such as the European Starling, blackbirds, wood ducks, elk, mice, cedar waxwings, robins and blue jays, although it may not be a preferred food of any of these. In fact it has been suggested that replacement of native species has resulted in a reduction in food quality available to native birds. Also used by Canadian insects as a food source (leaves, berries and floral nectar). It has been recommended in Europe (where not invasive and where fauna is adapted to it) for wildlife habitat. In Acadia National Park (Maine) managers have concluded that in order "to benefit native bee populations by providing additional needed food resources … their (*Berberis thunbergii* and *Frangula alnus*) removal at present need not be a high priority." Part of the reason for this was to protect plant-pollinator mutualisms. Glossy Buckthorn is on the "Perfect for Pollinators" list of the Royal Horticultural Society. **

(4) It is used for hedges extensively in the past (the cultivar "Tallhedge"). A variegated form called "Variegata" and narrow-leaved form called "Asplenifolia" as well as columnar forms are still sold in North America. *

(5) It is recommended in Europe (where not invasive) for certain kinds of reforestation. *

(6) The bark used for skin and hair conditioning products. *

(7) It is used as a natural dye (yellow, from wood and bark) in Russia and Ukraine. *

(8) It is the source of high quality charcoal used by artists. *

## Outside Canada

In the United States it is being managed in Illinois, Indiana, Iowa, Ohio, Michigan, and Wisconsin. The contacts of many management research programs are given in http://wiki.bugwood.org/Frangula_alnus

Sale, transport or import of Glossy Buckthorn is illegal in Minnesota. It "overran" the 1,000 hectare Cedarburg Bog in Wisconsin within 20 years. It is a "serious pest" of bogs and fens in Michigan. Since the arrival of Glossy Buckthorn in Gavin Bog, Illinois, the endangered Highbush Bluberries have declined. There are many other examples that suggest that the situation with this invasive is as serious in the adjacent U.S. as in Canada. It has been given an invasive significance rank of high/medium by NatureServe's U.S. Invasive Species Assessment Protocol.

## Management

As with all invasive species, buckthorns in natural areas are most effectively controlled by recognizing their arrival early and removing isolated plants before they begin to produce seed. With large infestations, the largest seed-producing plants should be removed first. There are a large number of articles on best management practices available on the Web. Combined methods may increase control. Most methods have produced at least some positive results, however, all methods require follow-up treatment.

**Biological Control:**

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 – see above). Since our two introduced buckthorns (*Frangula alnus* and *Rhamnus cathartica*) are quite different it might be assumed that any Eurasian insect that feeds only on one of them might be host-specific and not feed on native North American species. Such a potentially host-specific insect would be a good one to begin biocontrol research on. Unfortunately one recent study found that most of the Eurasian insects that feed on one, also feed on the other, the one exception being a species of leafhopper. An insect feeding on both of these species of buckthorns does not necessarily prevent its use in biocontrol, it just makes it less likely. Other factors such as habitat may protect native buckthorns. For example the use of the Eurasian Brimstone butterfly (*Gonepteryx rhamni*), which is said to feed only on our two introduced buckthorns, may not be a problem for the native *Rhamnus alnifolia* which often occurs in swamps, whereas the butterfly occurs in open habitats. The Brimstone (Figure 8) is one of the longest-lived butterflies. It hides for several months resembling a leaf with the wings, which are green beneath, closed over the back. This potential biocontrol agent may be limited in Canada however, by the lack of broad-leaf evergreens to hibernate in. 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*. Remarkably some North American insects feed on the introduced populations of Glossy Buckthorn. One of the most interesting is the Henry's Elfin butterfly (*Callophrys henrici,* Figure 9), which was generally rare but which suddenly became locally common in the Ottawa district as Glossy Buckthorn increased in abundance everywhere on the landscape. Another interesting case of a native insect feeding on the plant involves the Cecropia Moth (*Hyalophora*

*cecropia*, Figure 10), but these spectacular moths with a wingspan of 16 cm, but neither these large moths nor the small elfins are sufficiently common to be useful in control.



Figure 8. Common Brimstone Butterfly (*Gonepteryx rhamni*). [From Wikipedia, by Sarefo, Cologne Zoo, 17 Sept. 2007.]



Figure 9. Henry's Elfin Butterfly (*Callophrys henrici*). [From Wikipedia, by Megan McCarty, 9 March 2009.]



Figure 10. Caterpillar of the Cecropia Moth (*Hyalophora cecropia*) feeding on Glossy Buckthorn. [Photo by Bev Wigney on Snake Island Road, Osgoode, Ontario, taken on August 2, 2004. Used with permission.]

In England, Glossy Buckthorn declined when attacked by *Fusarium* and *Nectria* fungi. An attempt to simulate this decline was initiated in Wisconsin by inoculation of *Triocothecum roseum*, a fungus potentially causing root rot. It is also an alternate host for the Oak Rust fungus, *Puccinia coronata* which has caused significant die-back in Buckthorn and has been used as a biocontrol agent in Europe. Two specimens collected near Ottawa (DAO) were infected with the fungus, *Puccinia graminis.* The potential for control using fungi has not been evaluated in North America. See also notes under "**Agriculture"** below.

## Manual and Mechanical Methods:

**Burning:** Prescribed burns in early spring and fall may kill seedlings, but are less effective for plants with a well developed root system. Regrowth after fire, as with cutting can be very rapid. Sprouts were 1-1.5 m tall after a minor fire in woodland dominated by White Cedar and Quaking Aspen near Ottawa, Ontario. In a calcareous fen in Michigan, stem density of Glossy Buckthorn was twice as dense in the summer following a fall burn and the sprouts were 1/3 the height of the pre-burn stems. Burning is preferable for communities that would routinely experience fire, but adverse effects on the fauna should be considered. Possibly burning in a mosaic pattern can help to address this problem or cutting, instead of burning, in areas of the foodplant of a rare insect. Burning once or twice a year to control buckthorns may have to be continued for several years.

**Manual cutting and pulling**: Small shrubs can be hand-pulled or removed with garden equipment. A weed wrench is needed for larger plants to 5 cm in diameter. Still larger plants can be cut with a handsaw or chainsaw. Removal of sucker growth within a few weeks is desirable. Shrubs that have been removed should be burned or hauled away (as waste refuse) to prevent any effect of poisonous compounds on other plants or germination of seeds. One study noted that most evaluations of cutting have focussed on the extent to which the buckthorn was killed, but the study in question examined the extent to which native species can be preserved by cutting. Overall native species cover was significantly greater ($p=0.0084$) within cut plots (despite 20-38 new Glossy Buckthorn shoots/$m^2$ averaging 16-34 cm long).

**Girdling:** Cutting a 3 cm strip around the base of the trunk (removing the bark) is a useful option because it does not disrupt nearby soil and it may not cause the shrub to re-sprout as vigorously as cutting. Girdling tools are available or can be made by attaching handles to a section of the cutting chain from a chainsaw.

**Water Level Adjustments**: In wetlands with lowered water tables, restoring the water to a historical level, or simply flooding, will often kill Glossy Buckthorn.

**Chemical Control:**

Chemical control methods can be employed in the fall when most native plants are dormant, yet buckthorns are still growing. This lessens the risk of effect on non-target plants. The persistently green leaves will provide easy recognition and allow a thorough treatment. Winter application of chemicals has also proven successful and also lessens the risk of damage to non-target species.

During the growing season, stems may be cut off near ground level and treated with glyphosate which curbs sprouting. Immediately after cutting, a 20%-25% active ingredient (a.i.) glyphosate can be applied to the cuts. Resprouts can be cut and treated again, or sprayed with a hand sprayer of 1.5% a.i. glyphosate (which is approved for use over water). Foliar applications over non-water sites can also use 2% triclopyr solution or other chemical solutions. For severely disturbed sites, a 25-50% a.i. triclopyr solution diluted in water can be sprayed with a low pressure hand sprayer, a spray bottle, or sponge applicator to freshly cut stumps. A 12.5% a.i. tricolopyr (with oil dilution) solution is also effective on cut surfaces. Basal bark application of 6% a.i. triclopyr (with oil dilution) solution

or 2-4-D (12.5% a.i.) in bark oil also effectively controls buckthorns.
Fosamine, a non-selective bud inhibitor for woody species, can be applied as a basal bark treatment in the fall at 3% a.i. concentration in winter. Much additional information on this chemical control is available online: e.g. http://wiki.bugwood.org/Frangula_alnus , http://www.discoverlife.org/mp/20q?search=Frangula+alnus&guide+North_American_Inv .

A number of studies have suggested that chemical control, along with other methods is the most effective option on a local scale. On a broader scale, biocontrol may be the only answer.

## Prospects

In 1994 it was suggested that Glossy Buckthorn would spread throughout much of southern Ontario over the next 10-20 years and become abundant in open and semi-open wetlands over most of the southern part of the province. It does now occur throughout much of southern Ontario and is dominant in a variety of habitats. It has only begun to be a serious problem over the past three decades, but its growth as a problem of native habitats has been exponential and that trend may continue. It is especially destructive to unusual habitats with rare and endangered species. Its impact on agriculture is likely to increase as it continues to become more common in agricultural landscapes. Within the next two decades it may affect many southern Ontario fens, change the structure of many bogs invading all but the wettest parts, reduce the native vegetation of mesic prairies, alvars and mesic to periodically dry sandy habitats. It will result in many species of flora and fauna becoming at risk. We can hope that pathogens will catch up with it and bring it to a lower level of occurrence and that biocontrol will be successfully implemented before the damage is extremely serious. Highest priority habitats should be protected to the extent possible with all appropriate management tools. The entire range of Glossy Buckthorn in North America may move north as a result of climate warming and since that range includes an area substantially south of the Canadian border the problems are likely to increase in geographic extent in Canada.

## Believe It or Not.

- Galen, a Greek physician of the 2nd century A.D., was familiar with Glossy Buckthorn and its relatives. They were said to have the power to protect against witchcraft, demons, poisons, and headaches.
- Glossy Buckthorn was of major military importance in the 15th to 19th centuries, as its wood provided the best quality charcoal for gunpowder manufacture. It was particularly valuable for time fuses because of its even burn rate. Gunpowder is a combination of sulphur, charcoal and potassium nitrate
- 60,000 plants of Glossy Buckthorn were once sold from wholesale nurseries each year in Minnesota and Wisconsin prior to the ban on sale which was implemented to protect oats from crown rust.
- Wood of Glossy Buckthorn was used to make nails, shoes and veneer.
- A Glossy Buckthorn with a stem 8 cm in diameter can produce 50 sprouts after cutting with the longest 2 m in length and some may produce fruit in the first year.
- The city of Charlottetown recently removed 125 half ton truck loads of Glossy Buckthorn from Victoria Park.
- Millions of dollars are being spent today because someone imported Glossy Buckthorn a long time ago.

### Monsters in the Marsh

A volunteer program has been organized to control Glossy Buckthorn in Annapolis Royal Marsh, Nova Scotia. It is funded by Wal-Mart, Shell Oil, Nova Scotia Dept. of Natural Resources, and a federal career focus program. A useful guide is available as a result of this effort (Tardif-Woolgar 2009).

### Purple Milkwort – going

Purple Milkwort (*Polygala sanguinea*) is a species restricted to southwestern Quebec, and extreme southeastern and extreme southwestern Ontario. It is found in open sandy habitats that are periodically dry. These habitats may be successional, meaning that they change to more wooded conditions over a period of several decades. In pre-settlement times they were likely part of sand barrens ecosystems that were created and maintained by a combination of fire and periodic drought. Now the open sand is only being created by human activities that expose sand along roads or in old sandy pasture and it is more short-lived as a consequence of Glossy Buckthorn which invades forming dense thickets within a few years. There is less time for Purple Milkwort to disperse to a new habitat and there is less new habitat to disperse to. Populations are short-lived and do not have time or opportunity to colonize other sites. As a result it is becoming much harder to find Purple Milkwort. It may soon be impossible over most of the Canadian range, largely as a result of Glossy Buckthorn.



## References


**Bolmgren, K. and B. Oxelman**. 2004. Generic limits in *Rhamnus* L. s.l. (Rhamnaceae) inferred from nuclear and chloroplast DNA sequence phylogenies. Taxon 53(2): 383-390.

**Canadian Food Inspection Agency**. 2008. Invasive Alien Plants in Canada. Published by Canadian Food Inspection Agency, Camelot Drive, Ottawa, ON K1A 0Y9. http://www.agrireseau.qc.ca/argeneral/documents/SIPC%20Report%20-%20Summary%20Report%20-%20English%20Printed%20Version.pdf

**Catling, P.M. and Z. Sue Porebski.** 1994. The history of invasion and current status of Glossy Buckthorn, *Rhamnus frangula*, in southern Ontario. Canadian Field-Naturalist 108(3): 305-310.

**Catling, P.M., R.A. Layberry, J.P. Crolla and P.W. Hall.** 1998. Increase in populations of Henry's Elfin, *Callophrys henrici*, (Lepidoptera: Lycaenidae) in Ottawa-Carleton, Ontario, associated with man-made habitats and Glossy Buckthorn, *Rhamnus frangula*, thickets. Canadian Field-Naturalist 112(2): 335-337.

**Cunard, C. and T.D. Lee.** 2009. Is patience a virtue? Succession, light, and the death of invasive glossy buckthorn (*Frangula alnus*). Biological Invasions 11(3): 577-586.

**Converse C.K.** 2012. *Frangula alnus*. Global Invasive Species Team, The Nature Conservancy. http://wiki.bugwood.org/Frangula_alnus .

**Fiedler, A.K. and D.A. Landis.** 2012. Biotic and abiotic conditions in Michigan Prairie Fen invaded by Glossy Buckthorn (*Frangula alnus*). Natural Areas J. 32: 41-53.

**Forest Invasive Plants Resource Center**. 2012. *Frangula alnus*. FINPRC, Minnesota. http://www.na.fs.fed.us/spfo/invasiveplants/

**Frappier, B., R.T. Eckert, and T.D. Lee.** 2003. Potential impacts of the invasive exotic shrub *Rhamnus frangula* L. (glossy buckthorn) on forests of southern New Hampshire. Northeast. Nat. 10(3): 277-296.

**Frappier, B., T.D. Lee, K.F. Olson and R.T. Eckert.** 2003. Small-scale invasion pattern, spread rate, and lag-phase behavior of *Rhamnus frangula* L. For. Ecol. Manag. 186(1-3): 1-6.

**Gassmann A, I. Tosevski and L.Skinner.** 2007. Use of native range surveys to determine the potential host range of arthropod herbivores for biological control of two related weed species, *Rhamnus cathartica* and *Frangula alnus*. Biological Control 45(1): 11-20. http://www.sciencedirect.com/science/article/pii/S1049964407003222

**Grubov, V.I.** 1949. Monography of *Rhamnus* L. s.l. Pp. 14-425 in Schischkin, B.K. (ed.). Flora et Systematica Plantae Vasculares. Academiae Scientiarum USSR , Leningrad.

**Grubov, V.I.** 1974. Rhamnaceae. Pp. 486-516 in Schischkin, B.K. (ed.). Flora of the U.S.S.R. Israel Program for Scientific Translations. Jerusalem.

**Gucker, C.L.** 2008. *Frangula alnus*. In: Fire Effects Information System, [online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory. http://www.fs.fed.us/database/feis [2012 July 23]

**Kupchan, S.M. and A. Karim.** 1976. Tumor inhibitors. 114. Aloe emodin: antileukimic principle from *Rhamnus frangula*. Lloydia 39(4): 223-224.

**Medan, D.** 1994. Reproductive biology of *Frangula alnus* (Rhamnaceae) in southern Spain. Pl. Syst. Evol. 193: 173-186.

**Miller, R.O.** Regenerating Quaking Aspen on a site dominated by buckthorn in Upper Michigan: a case study. Michigan State University, Upper Peninsula Tree Improvement Center Research Report 2-11-05: 9 pp. http://agbioresearch.msu.edu/fbic/pubs/aspen.pdf

**Nagel, L.M., R.G. Corace III and A.J. Storer.** 2008. An experimental approach to testing the efficacy of management treatments for Glossy Buckthorn at Seney National Wildlife Refuge, Upper Michigan. Ecological Rest. 26(2): 136-142.

**Quaderi, M.M., D.R. Clements and P.B. Cavers**. 2009. The biology of Canadian weeds. 139. *Rhamnus cathartica* L. Can. J. Plant Sci. 89: 169-188.

**Ragsdale, D.W., D.J. Voegtlin, and R.J. O'Neil.** 2004. Soybean aphid biology in North America. Ann. Entomol. Soc. Am. 97(2): 204-208.

**Sinclair, A. and P.M. Catling. 1999.** The value of cutting in the management of Glossy Buckthorn (*Rhamnus frangula* L.). Wetlands J. 11(2): 25-27.

**Tardif-Woolgar M.** 2009. Monsters in the Marsh! Project Report,Removing Glossy Buckthorn (*Rhamnus frangula*) from the Annapolis Royal Marsh. 2009. http://www.gov.ns.ca/natr/wildlife/habfund/final08/NSHCF08_blackthorn.pdf

**United States Department of Agriculture.** *Frangula alnus* Mill., Glossy Buckthorn. 2012. Natural Resources Conservation Service. Plants Database: http://plants.usda.gov/java/nameSearch?keywordquery=Frangula+alnus&mode=sciname


### Speaking of Invasives.....

BC government makes "Report-a-weed" app!

Anyone with a smartphone can now help stop the spread of invasive plants in BC, thanks to an innovative application developed by Hipwood Digital, the Invasive Species Council of British Columbia and the Ministry of Forests, Lands and Natural Resource Operations.The "Report-a-Weed BC" app is free to download and is available for both iPhones and Android phones. The easy-to-use interface allows users to submit reports on invasive plant sightings anywhere in BC, upload photos of plants they find, and view previously logged sightings on a Google map. Invasive plants are plants that are not native to a particular ecosystem.

http://www.vancouverobserver.com/life/technology/bc-government-makes-report-weed-app

# TOP CANADIAN ORNAMENTAL PLANTS. 2. Roses

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Figure 1. An attractive rose bush. Photo by Huhu Uet, available online at Wikimedia under the Creative Commons Attribution 3.0 Unported license.

Over 2,500 years ago the Greek poetess Sappho referred to the rose as “the Queen of Flowers”. Today, rose species collectively are the most popular flowering ornamental plants not just in Canada but indeed in the world. From an economic perspective, roses rival the most valuable crops. From aesthetic and sentimental perspectives, however, roses are unrivalled – no other plants are so universally grown for their beauty, and none has equally inspired writers, artists, and lovers.

## Wild Species

The genus *Rosa* consists of about 190 species of mostly deciduous (rarely evergreen) shrubs (occasionally with scrambling or trailing stems) distributed throughout the temperate and subtropical areas of the northern hemisphere. About 95 species occur in China. In North America there are 15–20 native species, and perhaps 12–15 that are introduced. Fourteen native and 11 introduced roses grow wild in Canada. The plants grow in a variety of habitats throughout North America, usually in open situations. Some species are fairly widespread, others have narrow distributions and indeed are considered endangered. Depending on species, a range of soil types and tolerance of dry and wet soils is found.

Although commonly called “thorny” or “spiny”, anatomically roses have prickles or bristles. Thorns are modified branches or stems, developing from buds; spines are modified leaves, stipules, or parts of leaves, developing at nodes. Both spines and thorns have vascular tissue. Prickles and bristles merely develop from the epidermis and perhaps also the underlying cortex. Bristles are flexible, weaker forms of prickles.

Rose fruits are commonly called hips. These are accessory or false fruits, not true fruits. The fleshy, outer portion that surrounds the “seeds” is a “hypanthium”, developed from the top of the flower stalk; in contrast, the flesh of true fleshy fruits is developed from one or more ovary walls. The “seeds” of a rose are in fact the true fruits; these are “achenes”, defined as single-seeded, dry, indehiscent fruits in which the seed coat is separate from the fruit wall (sunflower “seeds” are another example of achenes). Rose fruits are often not produced in cultivars with flowers composed of densely packed petals, because the sexual organs are simply inaccessible for pollination.



Figure 2. Rose stem armoured with prickles. Photo by J.J. Harrison, available online at Wikipedia under the Creative Commons Attribution-Share Alike 3.0 Unported license.



Figure 3. Rose hips. Photo by Morn the Gorn, available online at Wikipedia under the Creative Commons Attribution-Share Alike 3.0 Unported license.

## Ancestors of Cultivated Roses

The following six wild species, substantially of Asian origin, are the most important forerunners of modern cultivated roses:

*R. chinensis* Jacq. (China rose, Bengal rose; native to China)
*R. foetida* Herrm. (Austrian yellow rose, Persian yellow rose; Asia)
*R. gallica* L. (Gallic rose, French rose, apothecary rose; Eurasia)
*R. moschata* Herrm. (musk rose; known only in cultivation)
*R. multiflora* Thunb. (Japanese rose, multiflora rose; Asia)
*R. rugosa* Thunb. (Japanese rose, Turkestan rose; Asia)

There are numerous other rose species that are cultivated or have contributed to the breeding of domesticated varieties. Significant wild ancestors of some rose cultivars include:

- *R. arkansana* Porter (prairie rose; North America)
- *R. arvensis* Huds. (field rose; Eurasia)
- *R. banksiae* W.T. Aiton (Banksian rose; Asia)
- *R. bracteata* J.C. Wendl. (Macartney rose; Asia)
- *R. canina* L. (dog rose; Eurasia)
- *R. fedtschenkoana* Regal (no English name; Asia)
- *R. luciae* Franch. & Rochebr. ex Crép. (*R. wichuraiana* Crép.) (memorial rose, Wichura's rose; Asia)
- *R. moyesii* Hemsl. & E.H. Wilson (Mandarin rose; China)
- *R. pendulina* L. (Alpine rose; Europe)
- *R. phoenicia* Boiss. (fenicierros, Middle East)
- *R. rubiginosa* L. (eglantine, sweetbriar; Eurasia)
- *R. sempervirens* L. (evergreen rose; Eurasia, Africa)
- *R. setigera* Michx. (prairie rose; North America)
- *R. spinosissima* L. (*R. pimpinellifolia* L.) (Scotch rose, burnet rose; Eurasia)

Many hybrids of garden origin have been used to generate additional hybrids. The following have been particularly important:

- *R.* ×*alba* L. (white rose, white rose of York; parentage unclear, perhaps *R. gallica* and other species)
- *R.* ×*centifolia* L. (cabbage rose; a complex hybrid of *R. gallica*, *R. moschata*, *R. canina*, and *R.* ×*damascena*)
- *R.* ×*damascena* Mill. (Damask rose; *R. gallica* × *R. moschata*; Turkish origin)
- *R.* ×*gigantea* Collett ex Crép. (*R* ×*odorata* nothovar. *gigantea* (Collett ex Crép.) Rehder & E. H. Wilson [a nothovariety is an intervarietal hybrid]; Asian origin)
- *R.* ×*odorata* (Andrews) Sweet (tea rose; *R. chinensis* × *R.* ×*gigantea*; Chinese origin)

## History of the Ornamental Species

Rose cultivation traces back thousands of years in temperate regions of Eurasia, notably China, Mesopotamia, Persia, Egypt, Greece, and Rome. The plants were often used in ancient times predominantly for medicine and fragrance, but also for ornament. Today, ornamental roses are sometimes planted for their decorative fruit or as hedging and ground cover, but are grown mostly for floral display. Some species have flowers with 200 or more stamens; selection of mutations in which stamens have been converted to petals is the basis of so-called “doubling” of flowers, producing globes of tightly interleaved petals, which humans find much more attractive than the usual whorl of five petals in wild species.

Until about 2 centuries ago, European and Chinese domesticated roses were selected independently. In the 18th century, roses from China were imported in substantial numbers to Europe. As discussed later, the Chinese roses have a much longer blooming period and other desirable characteristics lacking in roses that were cultivated in Europe, but require a warmer climate. The introduction of Chinese roses strongly stimulating the cultivation of roses as ornamental plants, and the creation of new cultivars. France's Empress Josephine (1763-1814), wife of Napoleon Bonaparte, adored roses and financed the collecting and planting of over 250 varieties in her garden at Malmaison (a manor house 12 km west of central Paris, where Josephine also imported and maintained hundreds of exotic plants and animals). Although “rosariums” (rose gardens) have been known for millennia, Josephine is considered to have developed the first modern display rose garden. Pierre Joseph Redouté (1759-1840), the great Belgian flower portraitist, was commissioned by Josephine to paint her roses and many believe that his book of engravings, *Les Roses,* is the best known rose book in the world. Rose cultivation and the development of new cultivars subsequently expanded greatly. It is claimed that 30,000 to as many as 100,000 cultivars have been recorded, and perhaps as many as 18,000 are commercially available. Most cultivars have been bred during the last 2 centuries, and hundreds of new varieties are being introduced annually.



Figure 4. Marie Antoinette, Empress of France, posing with a rose. As noted in the text, she greatly stimulated the development of roses. Public domain photo available online at Wikipedia.

## The Importance of Artificial Hybridization

Aside from selection for floral features (petal doubling, size, colour, longevity, etc.), hybridization by gardeners has been the most important consideration in the evolution of modern roses. Most garden roses are hybrids, and in many cases their ancestry is uncertain. In addition to professional plant breeders, many amateurs conduct rose hybridization as

Virtually every rose sold today originated as a cutting, and represents a clone of identical plants tracing back to a single seed which developed into a superior floral display. In turn, that foundational seed is usually the hybrid of two seeds that similarly once produced superior roses. This process of continual improvement of roses traces back thousands of years. When you look at a garden rose, you see the cumulative artistry of the finest gardeners in history, and the judgment of millions.



Figure 5. Pierre Joseph Redouté, considered to be the greatest rose artist, and two of his paintings of *Rosa gallica*. Public domain images.

a hobby. Hybridization is the key to understanding why roses turned into the world's leading floral ornamental in recent centuries. The development of transportation and commerce provided access to the world's wild and cultivated species, and hence facilitated the extensive hybridization which is the basis of the numerous cultivars that have been bred. The huge natural gene pool of the genus *Rosa* (many species are very variable, with forms adapted to various ecological stresses) and the natural ability of the species to hybridize (barriers to interbreeding are frequently weak) have allowed mankind to generate almost endless variations that meet the needs of different climates and indeed the changing tastes of fashion.

## Classification of Rose Cultivars

There is no universal system of classification of rose cultivars. There are various horticultural classifications, in some cases somewhat based on ancestry, but centuries of undocumented hybridization has made determination of genetic relationships very difficult. Moreover, hybridization has also obscured or eliminated differences among some categories that were formally recognized, and new cultivars can be impossible to assign to categories based only on their appearance. In addition to phylogeny, rose horticultural classifications are usually based on growth habit (size, whether a shrub or vine-like), and number, form, and disposition (display structure) of flowers. The two most influential rose organizations adopted different classifications. In 1979 the World Federation of Rose Societies (WFRS) adopted a new system, but this was not adopted by the American Rose Society (ARS), which has its own system. The British Association of Rose Breeders recently recognized 30 categories, WFRS 39, and ARS 56. However, the categories are often problematical. For example, climbing roses or miniature roses can often fit into several categories. The ARS system is the most widely adopted. It categorizes garden roses into three groups: “Species Roses”, “Old Garden Roses” and “Modern Roses”, discussed in the following. Species roses are the ancestors of old garden roses, which are in turn the ancestors of modern roses.

Most wild roses produce flowers only or predominantly at a particular time in the season. Domesticated roses have usually been selected to produce flowers for longer periods. The term “remontant” (French for blooming again) refers to roses that bloom repeatedly during the season. Many early rose cultivars bloomed at different, distinctive times of the season, but recent rose cultivars have been selected to be “everblooming”, producing large floral displays more or less continuously. Most Old Garden Roses bloom once, most Modern Roses produce a continuous flowering display for much of the season.

## Species Roses

So-called “species roses” (often referred to as “wild roses”) are more or less wild rose species that are cultivated. Typically their flowers only have five petals, but frequently there has been some selection (especially for colour and doubling of flowers). It has been said that species roses, unlike the majority of garden roses, will reproduce true from seed, but this is not entirely accurate, since many cultivars referred to as species roses are in fact hybrids, and these (and indeed some non-hybrid forms) are propagated vegetatively as clones. Although species roses are usually somewhat domesticated and frequently exist as named cultivars, they are much closer to natural wild species than are most cultivated roses, and accordingly are hardier, often tolerating poor soil, some shade, diseases, and insects, and accordingly they require relatively limited care. Most originated from northern Europe, and are fairly tolerant of cold climates. Many have interesting or large fruits (hips) that often persist into winter, attracting wildlife. They also tend to have pleasant odours. However, their flowers are smaller and not as attractive as most garden roses, and they usually bloom only once during the season. Commonly grown species roses include Austrian yellow rose, Banksian rose, dog rose, Gallic rose, musk rose, Scotch rose, and sweetbriar (scientific names are given in the preceding).

## Old Garden Roses

In 1867, J.B. Guillot of France hybridized a “hybrid perpetual” and a “tea” rose to produce what is considered to be the first “hybrid tea” cultivar, 'Madame Bravy'. The ARS and indeed many rose horticulturists now widely categorize garden roses produced prior to 1867 (as well as roses produced after 1867 but using only old cultivars as parents) as “Old Garden Roses” (sometimes called “antique roses”) and new hybrids produced after 1867 as “Modern Roses”. Old garden roses usually bloom just once. The flowers are typically white, mauve, pink, or red-purple (in the past, crimson red and yellow were not available) and are often sweetly scented. Like species roses, many are tolerant of stresses including cold, and are relatively undemanding and easy to care for (compared to modern roses).

Common groupings of old garden roses include:

A. Old European roses (cold-hardy, usually blooming only once): (1) Alba roses (likely the progeny of dog and Damask roses); (2) Centifolia roses (cabbage roses; based on *R.* ×*centifolia*); (3) Gallica roses (French roses, Provence roses; the oldest garden roses, tracing to classical Greek and Roman times; extremely cold-hardy; derived from *R. gallica*) (4) Moss roses (with moss-like glandular hairs on stems and buds; these are mostly mutations of Centifolia and Damask); (5) Damask (summer Damask roses flower once, like groups 1–4, autumn Damasks have a limited repeat blooming in the fall; derived from *R.* ×*damascena*).

B. Chinese Roses (imported into Europe about the middle

of the 18th century; repeat-bloomers, not cold-hardy): (6) China rose (*R. chinensis*); (7) tea rose (*R.* ×*odorata*).

C. Hybrids of European and Chinese roses

(8) Portland possibly a China × Gallica hybrid).
(9) Noisette (an old class of largely climbing roses with long slender canes that thrive in warm to hot climates; these originated around 1800 in Charleston, South Carolina, derived from *R. moschata* and *R. chinensis* 'Old Blush').
(10) Bourbon (a cross of China rose and Damask autumn rose).
(11) Hybrid perpetual (an old class dominant during the late Victorian and Edwardian eras, with over 1,000 cultivars; derived from recrossing Bourbons and Portlands with China rose).

## Modern Roses

Modern roses include the most attractive of roses, producing richly coloured flowers. They are in fact hybrids of European and Chinese roses, like the last-mentioned group, but produced after 1867. Common groupings are noted in the following (but it needs to be emphasized that contemporary cultivars are frequently not clearly assignable to just one class):

(12) Hybrid tea: by far, the most popular of roses, characterized by large solitary flowers on long stems, and high-centred flower shape (long inner petals forming a central cone); used mostly as garden roses and cut flowers. The French hybridizer Joseph Pernet-Ducher introduced brilliant yellow and copper tones by crossing with *R. foetida* in the late 19th and early 20th centuries.

(13) Polyantha: a class of roses created by the French breeder Jean Baptiste Guillot in the early 1970s, from crosses between climbing varieties of *R. multiflora* Thunb. (an Asian rose, then identified as *R. polyantha* Thunb.) and *R. chinensis*), these present delicate flowers in sprays well above their foliage.

(14) Floribunda (hybrid polyanthas) derived from crossing polyanthas and hybrid teas); (floribunda literally means “abundant flowers”); these produce clusters of smaller flowers (compared to hybrid teas) on relatively low-growing, compact plants.

(15) Grandiflora: similar to hybrid teas and floribundas (and derived as a cross between them), but producing more flowers per stem than hybrid teas, and fewer and larger flowers than floribundas; mostly tall-growing; these are currently uncommon.

(16) Shrub (All roses are shrubs, and this inaccurately named category has been applied in different ways, including any modern bushy roses that do not fit into other categories, or more specifically David Austin roses (also known by the inaccurate name English roses): roses originated by the contemporary British hybridizer David Austin, in which the repeat blooming of modern roses has been combined with the form and fragrance of old garden roses



Figure 6. Climbing roses on an arbour in the Bagatelle Rose Garden, Paris. Photo by Georges Seguin, available online at Wikimedia under the Creative Commons Attribution-Share Alike 3.0 Unported license.

## Rose Classes Based on Habit

In addition to the above, the following classes based substantially or only on habit are also commonly recognized:

Climbers (ramblers, trailers): forms with long canes that are appropriately trained on trellises or other supports.

“Cut rose” varieties: these have been bred for long stems (peduncles) for use in bouquets and vases. This makes them susceptible to wind, so they are unsuitable as garden plants, and are often raised in greenhouses and protected locations.

Miniatures: typically less than 30 cm (1 foot) and rarely higher than 45 cm (18”) in height, these (genetically) dwarf plants are ideal for containers. (About 1920, the dwarf cultivar *R. chinensis* 'Pompon de Paris' became the basis of breeding many additional dwarf roses, facilitated by dwarfness being determined by one dominant gene.) A very wide range of cultivars is now available.

Patio roses (dwarf, cluster-flowered roses): small rose bushes that are larger than miniature roses.

Tree roses (standards): a graft of one or more (usually hybrid tea roses) on top of an elongated, bare stem (“trunk”, generally 90–120 cm or 3–4 feet tall) of a vigorous rose (which is often grafted onto a basal rootstock).

Many rose cultivars grow considerably more vigorously when the stems are grafted onto the base (“rootstock”) of other species, and this practice is very common. Species roses are not grafted onto hardy rootstocks, nor are most Old Garden Roses, climbers, and miniature roses. Most modern roses (including most of the popular hybrid teas) require hardy rootstocks, but there is a movement to grow some on their own roots.

## Canadian Roses

Unfortunately, most modern roses are not well adapted to cold environments (many roses can be grown as annuals in very cold areas, a practice that doesn't allow most cultivars to develop good displays). In most regions of Canada, the




Figure 7. 'George Vancouver' rose, growing in the Felicitas Svejda Explorer Rose Garden in Ottawa. Photo by E. Small.

dominant challenge to roses is winter hardiness, and native species have often been employed as breeding sources of cold-tolerant genes. Over the last century, perhaps about 100 Canadian rose hybridizers have produced more than 600 rose cultivars. Felicitas Svejda of Agriculture Canada, the most distinguished rose breeder of Canada, beginning in 1961 selected a series of 13 cold-hardy cultivars that she named after Canadian explorers ('Champlain', 'Frontenac', 'Henry Hudson', 'John Cabot', etc.). 12 additional Explorer roses were bred at Agriculture Canada in l'Assomption PQ by I. Ogilvie and N. Arnold (rose research was recently discontinued by Agriculture Canada). The Explorer rose series is widely considered to be the world's most successful breeding program for winter-hardy roses. Several of these were bred with "*R.* ×*kordesii* H. Wulff", an invalid name associated with *R. rugosa* × *R. wichuraiana*). 'John Cabot' utilized the Eurasian *R. laxa* Retz., which is hardy enough to survive in Siberia.
The Morden station of AAFC (in southern Manitoba), beginning in the 1940s, released a number of cultivars bred for Canadian prairie conditions, especially the "Prairie Series". More recently (in the 2000s), the "Parkland Series", also bred specifically for the Canadian prairies, was released by Morden. *Rosa arkansana* was employed to breed most of the Morden cultivars. The Explorer and Morden roses perform well on their own roots, and do not require grafting. Roses that regenerate in the spring from their own roots rather than as buds from a grafted rootstock are advantageous in severe winter areas, because the roots are relatively protected from the cold.
"Canadian Artists roses" is a new series of Canadian-bred roses, using the materials from the above discontinued AAFC programs. These now include 'Emily Carr', 'Felix Leclerc', and 'Bill Reid'.




Figure 8. Notable rose cultivars on stamps, issued in 2001 as a set by Canada Post. Upper left: 'Morden Centennial', from the Agriculture Canada "Parkland series". Upper right: 'Agnes', Canada's first hybrid rose variety, bred by William Saunders of Agriculture Canada (named for his wife). Lower left: 'Champlain', from the Agriculture Canada "Explorer series". Lower right: 'Canadian White Star', a recent rose produced by the private sector.

**Rose Colours**

Natural rose colours include apricot, mauve, orange, pink, red, russet, white, and yellow. These colours vary in intensity, and there are cultivars with flowers that are variegated (segments of the petals differing in colour). Naturally blue roses do not exist in nature, but are sometimes produced by dying white roses. There have been partially successful attempts to produce blue-flowered roses by genetic engineering. Naturally black roses also do




Figure 9. Rose cultivars illustrating common colours. A. 'Rose Dot' (a hybrid tea rose; photo by Stan Shebs). B. 'Golden Celebration' (a David Austin rose; photo by Hamachidori). C. 'Mme. Caroline Testout' (an early (1890) hybrid tea rose; photo by A. Barra). D. 'Doris Tysterman' (a hybrid tea rose; photo by Anna Reg). E. 'Rosa Mundi' (a striped Gallica rose said to date to the 12th century; photo by Libby Norman). F. 'Mrs. Herbert Stevens' (a hybrid tea rose; photo by Laitchie). (All photos are online at Wikipedia; E is public domain, the others are available under the Creative Commons Attribution-Share Alike 3.0 Unported license.)

not exist, but some so-called black roses are dark shades of red, purple, or maroon. The colour of harvested "black roses" is sometimes accentuated with dye or by adding ink to the water of harvested flowers. A "rainbow rose" is created by splitting the stem base of a harvested rose and dipping each segment in differently dyed water; the dyes are drawn into the petals, which become differently coloured. Rose flowers still attached to the plants have also sometimes been differentially coloured by using hypodermic needles to inject dyes into the stems during flower development.



Figure 10. A rainbow rose, produced by injecting dyes into sectors of the peduncle (see text). Photo by Lucy Robers, available online at Wikipedia under the Creative Commons Attribution 2.0 Generic license.

## Cultivation

Information on all aspects of growing roses is so widely available that it need not be presented here (see information resources cited).

## Non-ornamental Uses

PERFUME: A few roses yield important essential oils used in perfumery To make 1 kg of costly rose essence for use in fragrances and perfumes, thousands of kilograms of rose flowers are required. The perfumery agent attar of roses is an oil which rises to the surface of rose water left to stand and kept cool. Damask rose is the main source. It is grown commercially mainly in Bulgaria and Turkey. Cabbage rose is grown for rose oil in North Africa and France.

MEDICINE: Roses were important medicinal plants during the Middle Ages, used to reduce fever, inflammation, pain, and to stop any kind of excessive flow, be it tears, diarrhea, or hemorrhage. The popularity of the rose eventually resulted in its elevation to the status of a wonder drug, employed even for epilepsy, tuberculosis, goitre, and gout; during plagues, rose fragrance was used to purify the air in public places. Apothecaries even used rose galls, employing them to induce urination. Rose hips still have significant market value as sources of medicinal preparations. Rose hip oil, which is pressed from rose hips of some species, is employed medicinally. It is high in essential fatty acids, which contribute to skin health, and so is incorporated into skin care products. Extracts from rose hips have been shown to alleviate rheumatoid arthritis. Rose hips also have health values for pets and livestock. They are fed to pet guinea pigs—rodents which (like humans) can not synthesize their own vitamin C (they are also fed to chinchillas in the mistaken belief that they also must have supplemental vitamin C). Rose hips are fed to horses in the form of a dried powder, with the intention of improving coat condition and stimulating hoof growth.

FOOD: The use of rose fruits as food is minor, but nevertheless has a long history. Neolithic Old World archaeological sites dating back to 5000 BP show evidence of humans intentionally collecting rose fruits for food, and they were also consumed by indigenous people of North America. Rose hips are often covered with hooked, hairy outgrowths which should be removed before the fruits are cooked. In most species, the hairs on the outside are less troublesome than the fuzz on the inside. De-seeding the hips and removing the fuzz and hairs are tedious tasks. The principal species used for rose hips are dog rose and Turkestan rose. Rose flowers have limited, but interesting culinary uses. Drinks have been perfumed with roses, and rose petal wines have been made since classical times. Rose water, used for flavouring sweet dishes, is the result of distilling rose flowers with a little water. The Damask rose, mentioned in the preceding, is the main source. It is also used to produce rose petal jam. The French rose provides flower petals that are often crystallized, preserved in syrup, or dried and used to flavour teas, beverages, cakes, honey, and liqueurs. Rose water, rose petal jam, rose petal-flavoured honey, rose-flavoured candy, and rose-flavoured vinegar are still marketed, albeit on a very limited scale. To a minor extent, the food industry uses rose extracts to flavour beverages, candy, ice cream, bakery goods, gelatin desserts, and jelly.

## Invasive, Weedy Roses

Some roses have escaped from cultivation and become quite invasive. World-wide, the most troublesome species are *R. canina*, R. multiflora, *R. rubiginosa*, and *R. rugosa*. In North America, the most invasive species include *R. bracteata* J.C. Wendl., *R. laevigata* Michx. (Cherokee rose), R. *multiflora*, and *R. rugosa*.



Figure 11. Heart-shaped floral arrangement composed of roses. Photo by 4028mdk09, available online at Wikimedia under the Creative Commons Commons Attribution-Share Alike 3.0 Unported license.

## Symbolism

- The symbolism of the rose surpasses all other flowers. The perfect blossom represents love, beauty, youth, perfection, and immortality; withering of the flower reflects the ephemeral nature of beauty and youth; the thorns epitomize the pain of love and guilt; the white rose portrays purity and innocence, and is often associated with the Virgin Mary; the red rose is the embodiment on the one hand of sensual desire, passion, and shame, and blood and sacrifice on the other hand; the yellow rose reflects perfect achievement or sometimes jealousy, and can also mean joy and friendship (it meant infidelity and jealousy in Roman times, but today often means friendship); a dark crimson rose signifies mourning; a dark pink rose stands for thankfulness; a lavender rose means enchantment; an orange rose suggests fascination; a pale pink rose stands for grace and joy; a white and red rose together stands for unity; red and yellow roses mixed together says congratulations!; yellow and orange roses together imply passionate thoughts; two roses of any colour taped or wired together implies a commitment or forthcoming marriage; a rosebud signifies beauty and youth, and a heart innocent of love; a thornless rose means love at first sight; a single bloom of red rose can mean I have just fallen in love or I still love you. ("Signature rose" is a florist's term for a single perfect red rose framed with baby's breath (*Gypsophila*); this is often a preferred gift for many on Valentine's Day, anniversaries, and birthdays.)
- Roses have been a heraldic emblem on the shields of soldiers since the time of the Romans. The War of the Roses was a series of battles (1455–1487) between two branches of the Royal Family Plantagenet in England. The House of Lancaster, represented by the red rose, defeated the House of York, represented by the white rose. The white rose is reputed to have been a form of *R. canina* (also said to be *R.* ×*alba* L., a hybrid involving *R. canina*). The two houses combined with the marriage of Henry VII of Lancaster to Elizabeth of York, Henry becoming the first Tudor king. He adopted a red and white Tudor rose as his symbol, and this is now the national flower of England. A rose cultivar called 'York and Lancaster' which develops both red and white flowers is currently marketed. This has been identified as a cultivar (named in 1551) of the briar rose, *R. rubiginosa*.
- Roses are the most popular of gravestone-inscribed flowers. In Victorian cemeteries where a husband and wife were buried next to each other, the gravestone of the wife often showed a hand holding a lily (symbolic of innocence and purity) while that of the husband showed a hand with a rose. Children's gravestones often showed rose buds as symbols of innocence, and sometimes the stem of the rosebud was carved as broken, suggesting their short lives.
- The Cherokee rose (*R. laevigata*) is a native of China that was imported into the United States, and now grows wild in the south. According to legend it acquired its name when a Cherokee maiden carried one of these roses to her lover, a soldier who was wounded and convalescing in a tent. The white-flowered Cherokee rose has long been used as a peace symbol following fighting. During the American civil war it was often planted as a memorial on the graves of the fallen.
- Roses have been very popular choices as floral symbols of political regions, although often a particular species is not identified. Alberta and Iowa chose a "wild rose" as its emblem. The rose is the New York state flower. Georgia adopted the white Cherokee rose (which was once also the state flower of North Carolina). The District of Columbia is associated with the American beauty rose. North Dakota chose the prairie rose. Roses have national significance in Bulgaria, England, Iran, Luxembourg, and the Maldive Islands in the Indian Ocean. The rose served as the national flower of Honduras from 1946 to 1969, but an orchid was adopted as the national flower in 1946. In 1986, the rose became the "national floral emblem" of the United States, when President Reagan signed the proclamation in the White House Rose Garden; according to one newspaper report, the president "rose to the occasion".
- The rose is extremely significant in Islam. According to legend, the rose arose from perspiration that fell from the brow of the prophet Mohammed. When he later saw a rose, he kissed it, pressed it to his eyes, and declared that it was part of God's glory. In the Koran, the king of Babylon, Nimrod, cast Abraham into a burning pyre. Abraham declined help from the angel Gabriel, relying on his faith, and as a result Allah turned the fire into a bed of roses. Rose water was used to purify mosques profaned by infidels.
- The rose is the principal flower associated with the Virgin Mary, a transfer from its association with the Roman goddess Venus. The Virgin Mary was called "the rose without thorns". Rosaries are used to count prayers to Our Lady. The first "rosaries" were made out of pounded rose petals, moulded into beads and threaded (the word rosary is derived from the Latin *rosarium*, rose garden). Rosaries were later made out of rose hips, and eventually out of various materials. The scent of the beads was supposed to remind one of the roses in Mary's garden. However, early Christian Europe suppressed the rose as a symbol associated with Christianity, because of previous associations with sensuality. In those early times, prostitutes were forced to wear roses as a sign of disgrace.



Figure 12. Aramaki rose park in Itami, Japan. Photo by 663Highland, available online at Wikipedia under the Creative Commons Commons Attribution-Share Alike 3.0 Unported license.

## Literary Gems

- "The rose has thorns only for those who would gather it." Chinese Proverb
- "Whats in a name? That which we call a rose By any other name would smell as sweet".WilliamShakespeare (1564-1616), English dramatist and poet; in *Romeo and Juliet*)
- "We can complain because rose bushes have thorns, Or rejoice because thorn bushes have roses." Abraham Lincoln (1809–1865, 16th president of the United States)
- "The question of common sense is 'what is it good for?' A question which would abolish the rose and be answered triumphantly by the cabbage." James Russell Lowell (1819-1891, American poet, critic, and editor)
- An idealist is one who, on noticing that a rose smells better than a cabbage, concludes that it will also make better soup." Henry Lewis Mencken (1880-1956, American journalist and critic)
- Treaties are like roses and young girls. They last while they last." Charles De Gaulle (1890-1970), President of France, in an interview in the July 12, 1963 issue of Time magazine
- "Roses are red, violets are blue, I'm schizophrenic, and so am I." Oscar Levant (19061972, American pianist and actor)
- "A revolution is not a bed of roses. A revolution is a struggle between the future and the past." Fidel Castro (1927 , Cuban revolutionary and ruler)
- "'I want some red roses for a blue lady', crooned Raoul, stopping at the florist's on his way to the morgue." David Hirsch (Seattle Washington; Dishonorable Mention in the 19th (2000) annual Bulwer-Lytton Fiction Contest for Horrible Writing, which seeks the worst beginning to an imaginary novel; named for Edward George Earl Bulwer-Lytton (1803-1873), a British writer whose 1830 book *Paul Clifford* begins with the oft-mocked cliché that was plagiarized for years by Peanuts beagle Snoopy, "It was a dark and stormy night...")

## Curiosities of Science and Technology

- Western North American Indians thought wild roses repelled ghosts and evil spirits. Rose branches were scattered around the house and yard of recently deceased persons to prevent the return of the ghost, and relatives and friends drank a tea made from rose branches to protect them from it. A rose branch was used to sweep out the grave before burial to prevent the living from being drawn down.
- During World War II, rose hips were eaten for their content of vitamin C while supplies of foreign fruit were limited. The British Ministry of Health distributed "National Hip Syrup". Similarly, German submarines and ships were supplied with rosehip syrup.
- In England, it was found that the vitamin C content of rose hips increases towards the north, with four times as much in plants grown in Scotland compared to those in southern England.
- In 1939 Frances Meilland, a rose specialist in France, found a rose with magnificent pale gold blossoms growing from one seed he had nurtured. He sent cuttings to a Pennsylvania rose grower, which were transported on the last American plane that got out of France in November 1940, a step ahead of the invading Nazis. The cuttings were used to propagate the Peace rose, which many experts consider the best ever developed. It blooms on more than 30 million bushes throughout the world.
- The rose is associated with numerous old beliefs concerning brides and marriage. In old England girls picked a moss rose (various species with sepals of "mossy" appearance, particularly the moss rose, also known as the cabbage rose, *R. centifolia*), wrapped it in white paper, and hid it. If it was still fresh in a month, she would wear it to church with the expectation that her future husband would appear and take it from her. Another Middle Ages European belief was that if a young unmarried woman dreamed of red roses she would marry a handsome man. In Normandy (France), the headdress of white roses worn by a bride was laid out on the honeymoon bed following the wedding; the fading of the roses was symbolic of the fading of the life of the bride as a maiden. An old belief in France was that a maiden would develop rosy cheeks if she pricked her finger with a thorn from a red rose bush and buried a drop of her blood beneath it. In Switzerland, the bridal wreath, generally made with roses, was set on fire by the mistress of ceremonies at the wedding feast. If the wreath burned briskly, it was taken as a sign of good fortune, and vice-versa.
- It has been claimed that the world's largest rosebush is in Tombstone, Arizona. This was planted in the late 18th century, produces more than 200,000 blossoms in full bloom, and spreads over an arbour under which more than 150 people can be seated comfortably. According to the 2001 Guinness book of world records, the species is *Rosa banksiae*, has a trunk circumference of 4.1 m (13 feet 6 inches), stands 2.7 m (9 feet) high, and covers an area of 743 square meters (8,000 square feet).
- The naming of roses has become a commercial venture. Some companies offer clients the possibility of having new rose varieties named for them, for a price sometimes ranging up to $75,000.00. New rose varieties are being named for corporations ('Barbie' for the doll; 'Weight Watcher's Success' rose), causes ('Arthritis' rose, 'Veterans' Honor' rose), and of course famous personalities (including 'Billie Graham', 'Céline Dion', 'Chris Evert', 'Vidal Sassoon', 'Rosie O'Donnell', 'Barbra Streisand', and 'George Burns').
- 'Dr. Huey' is a rose cultivar bred in 1914, that is the most widely used rootstock for grafted roses. It is a cold hardy hybrid tea, capable of surviving in the warmer parts of Canada, with rambling stems and red flowers. 'Dr. Huey' has become the most widely observed rose in North America, because roses grafted on it frequently die, and the rootstock sends up shoots that replace the more attractive rose that once grew on it.

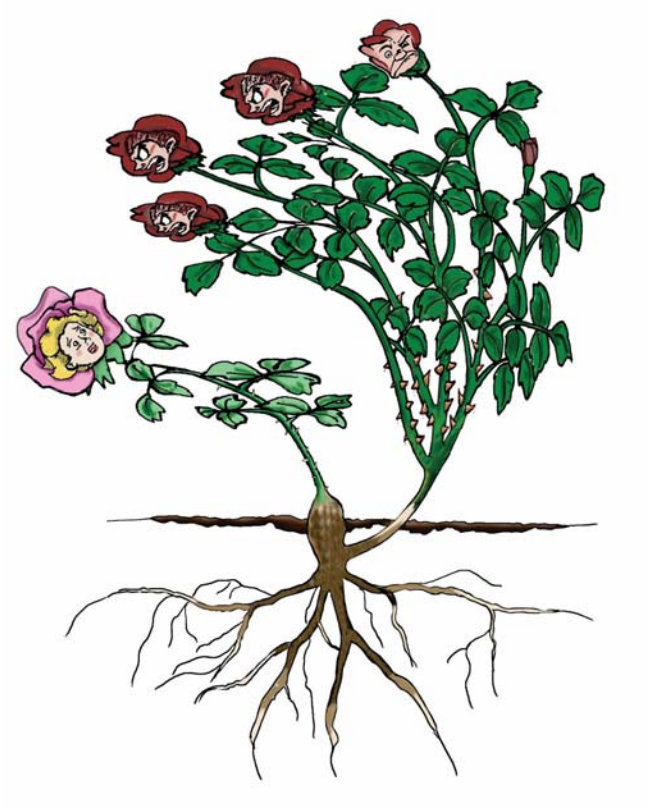


Figure 13. A beautiful rose cultivar grafted to a vigorous rootstock (note swelling, indicating the location of the graft) being suppressed by a sucker from the rootstock. Prepared by B. Brookes.

## Key Information Sources


American Rose Society. 2000. Ultimate rose. Dorlin Kindersley, New York, NY. 160 pp.

Beales, P. 1985. Classic roses: an illustrated encyclopaedia and grower's manual of old roses, shrub roses, and climbers. Holt, Rinehart, and Winston, New York, NY. 432 pp.

Bruneau, A., Starr, J.R., and Joly, S. 2007. Phylogenetic relationship in the genus *Rosa*: new evidence from chloroplast DNA sequences and an appraisal of current knowledge. Syst. Bot. 32: 366–378.

Cairns, T. 2000. Modern roses XI. The world encyclopedia of roses. Academic Press, San Diego, CA. 638 pp. + CD-ROM.

Crockett, J.U. 1978. Roses. Time-Life Books, Alexandria, VA 160 pp.

Dobson, B., and Schneider, P. 2002. Combined rose list, 2002: roses in commerce, rose registrations update, hard-to-find roses & where to find them. Peter Schneider, Mantua, OH. 240 pp.

Hessayon, D.G. 1996. The new rose expert. Revised edition. Transworld Publishers, London, U.K. 144 pp.

Krüssman, G. 1981. The complete book of roses. Timber Press, Portland, OR. 436 pp.

Macoboy, S. 1993. The ultimate rose book: 1,500 roses antique, modern (including miniature), and wild all shown in color and selected for their beauty, fragrance, and enduring popularity. H.N. Abrams, New York, NY. 472 pp.

MacPhail, V.J., and Kevan, P.G. 2009. Review of the breeding systems of wild roses (*Rosa* spp.). Flor. Ornament. Biotech. 3(Special issue 1): 1–13.

McCann, S. 1993. The rose: an encyclopedia of American roses, rosarians, and rose lore. Stackpole Books, Harrisburg, PA. 198 pp.

McKeon, J.C. 1995. The encyclopedia of roses: an organic guide to growing and enjoying America's favorite flower. Rodale Press, Emmaus, PA. 192 pp.

Moody, M., and Harkness, P. 1992. The illustrated encyclopedia of roses. Timber Press, Portland, OR. 304 pp.

Phillips, R., and Rix, M. 1988. Roses. Random House, New York, NY. 224 pp.

Quest-Ritson, C., and Quest-Ritson, B. 2003. American Rose Society Encyclopedia of roses. DK, New York, NY. 448 pp.

Richer, C., and Davidson, C.G. 2004. Winter-hardy roses: Explorer, Parkland and Prairie series. Revised edition. Agriculture and Agri-Food Canada, Ottawa, ON. 56 pp.

Roberts, A.V., Debener, T., and Gudin, S. 2003. Encyclopedia of rose science. Elsevier Academic Press, Amsterdam, The Netherlands. 3 vols.

Scanniello, S., and Bayard, T. 1990. Roses of America: the Brooklyn Botanic Garden's guide to our national flower. H. Holt, New York, NY. 224 pp.

Schneider, P. 1995. Taylor's guide to roses. Revised edition. Houghton Mifflin Co., Boston, MA. 451 pp.

Shanley, P., and Kukielski, P. 2010. The sustainable rose garden: a reader in rose culture. Newbury Books, Havertown, PA. 271 pp.

Svejda, F. 1984. New winter-hardy roses and other flowering shrubs. Revised edition. Agriculture Canada, Ottawa, ON. 36 pp.

Svejda, F. 2008. The Canadian explorer roses. National Roses Canada, London, ON. 58 pp.

Wylie, A.P. 1954. The history of garden roses. Part 1. J. Roy. Hort. Soc. 79: 555–571.

Wylie, A.P. 1955. The history of garden roses. Part 2. J. Roy. Hort. Soc. 80: 8–24.

Wylie, A.P. 1955. The history of garden roses. Part 3. J. Roy. Hort. Soc. 80: 77–87.


## Key Websites

American Rose Society – http://www.ars.org/ [The largest and most important organization dedicated to roses; requires subscription for most articles.]

Canadian Rose Society – http://www.canadianrosesociety.org/ [An excellent source of information on roses for Canada; requires subscription for most articles.]

Galetta Rose Nurseries – http://www3.sympatico.ca/galetta/ [A commercial source of hardy roses; sales restricted to the Ottawa area; a very good source of information on roses for Canada.]

John Cabot Rose Society of Newfoundland and Labrador http://nfldhort.dhs.org/page41.htm [A source of information on roses for the most difficult province to cultivate them.]

Rose Magazine – http://www.rosemagazine.com/pages/rose

Rose Magazine – http://www.rosemagazine.com/pages/rosesocieties.asp [Has links for Canadian sites.]

Santa Clarita Valley Rose Society – http://scvrs.homestead.com/ [Provides excellent articles.]

Vancouver Rose Society – http://www.vancouverrosesociety.org/ [Requires membership for access to most articles; the Southwest Coast of B.C. is the most hospitable area of Canada for cold-intolerant roses, and this organization is particularly useful for cultivar selection.]

Wikipedia, category: roses – http://en.wikipedia.org/wiki/Category:Roses [Information on numerous cultivars and topics related to roses.]

World Federation of Rose Societies – http://www.worldrose.org/aboutwfrs/about.asp [Provides information on contacts and activities of rose societies worldwide.]



Figure 14. Bouquet of roses. Photo by Arnoldius, available online at Wikipedia under the Creative Commons



Sampling the local brew!



Hugues Massicotte with Ian Sussex



Banquet reception

# The CBA Board of Directors 2012-2013
# Le bureau de direction de l'ABC 2012-2013

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