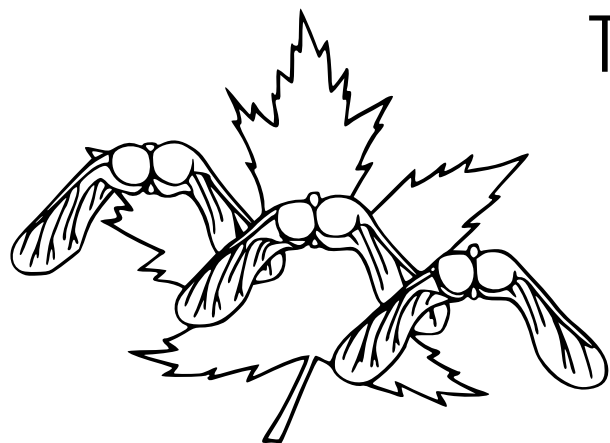




The Canadian Botanical Association Bulletin

Bulletin de l'Association Botanique du Canada

Vol. 49 Number 1, March/mars 2016



Carex grayi ©Tyler Smith

Highlights in this issue:

[Daffodils](#)

page 13

[Invasive Honeysuckle](#)

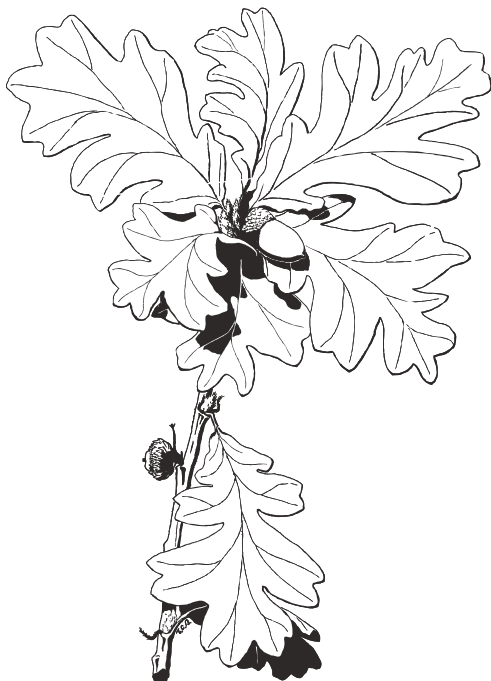
page 21

[The CBA conference](#)

page 5

IN THIS ISSUE:

President's Message	3
Planting Science Mentors	4
Botany on the Edge/Botanique de Pointe	5
Call for New Board Members	6
Student Conferences	7
Mycology Section News	8
La Chaire en Sciences de L'Environnement	9
Janet Ruth Stein Taylor, 10 Oct 1930–16 Jan 2016	10
2015 Lawson Award Winner: Jim Pojar	12
Top Canadian Ornamental Plants. 13. Daffodils	13
Major Invasive Plants of Canada 13. Honeysuckle	21
Plantes du Canada et Leurs Usages	30
Canadian Plants and Their Uses	31
RBG Plant Identification Workshops	32



BOTANY ON THE EDGE BOTANIQUE DE POINTE

Canadian Botanical Association
L'Association Botanique du Canada

Victoria BC
May 15 – 18, 2016

PRESIDENT'S MESSAGE

About 4 years ago I got a phone call from Roger Evans. We had met in the past but never really had much of an opportunity to talk, so I was little surprised. I was even more surprised when he asked me if I could consider being President of the CBA. Indeed, it was an honor but at the same time I didn't know if I had the knowledge or skills to be an effective President. I also had no idea of what my duties would be. After some reassurance from both Roger and Hugues Massicotte I felt the job was something I could commit to. Now, near the end of my term it seems I am just starting to learn the ropes and have a new appreciation of all the work that goes into



an association like ours. I have had the fortune to have the support of many many dedicated CBA members who have offered me advice and done a stellar job in fulfilling their responsibilities. I certainly can't write my last President's address without acknowledging all the help and advice the Past President, Frederique Guinel, has given me. Volunteer organizations like ours rely on many people sacrificing their time to keep the thing running. No organization can effectively run on the work and vision of one person. As I wind down my role as President it is clear that our association draws on the dedication of many individuals. The CBA is also an organization that both honors its traditions but is evolving as an organization. I would like to thank all of you for helping to make this happen.

John Markham

The Canadian Botanical Association Bulletin

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

INFORMATION FOR CONTRIBUTORS

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

EDITOR

Dr. Tyler Smith
K.W. Neatby Building, 960 Carling Avenue
Ottawa ON, K1A 0C6
cba.abc.bulletin@gmail.com

Published in Peterborough, March 1st 2016
ISSN 0008-3046 (paper)
ISSN 1718-8164 (electronic)

NEXT ISSUE

Texts for the next issue, 49(2), must be received by September 1, 2016

Unless otherwise stated, all content is released under the Creative Commons Attribution Share-Alike 4.0 license. Copyright remains with the authors.

Bulletin de l'Association Botanique du Canada

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

SOUMISSION DE TEXTES

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

RÉDACTEUR

Dr. Tyler Smith
K.W. Neatby Building, 960 Carling Avenue
Ottawa ON, K1A 0C6
cba.abc.bulletin@gmail.com

Publié à Peterborough, le 1 mars 2016
ISSN 0008-3046 (papier)
ISSN 1718-8164 (électronique)

PROCHAIN NUMÉRO

La date de tombée des textes du prochain numéro, le no 49(2), est le 1 septembre 2016

Seeking 100 new scientist mentors to work online with middle and high school students on student-led plant biology projects.

"It is a lot of fun interacting with students from an age group I don't have the chance to spend a lot of time with. It is a good reminder of where public knowledge of plant science stands, and a great opportunity for me to practice explaining key concepts in a simple and straightforward way." - PlantingScience mentor

"The thing I liked most was being able to talk to a scientist about what we were doing, and he gave us helpful suggestions on how to do things. Our scientist also asked us questions on what we were doing that helped us keep our minds working." - PlantingScience student

"It was great working with a scientist who took the time to give us meaningful feedback. It really helped me learn and experiment." - PlantingScience student

We're growing!

Help us keep up with all the new student teams we're expecting for our fall session.

*Share your passion for
plants and science
with the next generation!*

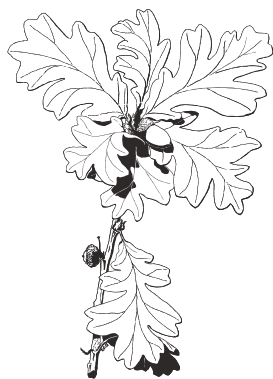
*~1 hour per week
from anywhere with an internet
connection.*

*Scientists at all career stages welcome,
undergraduate – emeritus.*

Learn more and register at:
<http://plantingscience.org/newmentor>



grow with us.



BOTANY ON THE EDGE BOTANIQUE DE POINTE

Canadian Botanical Association
L'Association Botanique du Canada

Victoria BC
May 15 – 18, 2016

Hello CBA/ABC members!

We are looking forward to seeing you in Victoria May 15-18 for the 52nd annual meeting of the CBA/ABC. The conference website and registration page will be live on February 26 (www.uvic.ca/cba2016). Until then, here are some details to help you plan your trip.

The conference will be held at the University of Victoria, situated seven kilometers north of the downtown core. On-campus housing in dormitory style rooms is reasonably priced and very convenient. For those who prefer to stay in hotels, there are regular buses to and from downtown.

Meeting Deadlines

Abstract submission: Wednesday, March 23

Early registration: Thursday, March 31

Highlights of the conference

- Plenary public lecture, Dr. Karl Niklas, Liberty Hyde Bailey Professor of Plant Biology, Cornell University
- Weresub public lecture, Dr. Bryce Kendrick, Distinguished Professor Emeritus, University of Waterloo
- Field trips before and during the conference highlighting the flora of Garry oak ecosystems
- Banquet at the Horticulture Centre of the Pacific
- Spring wildflowers and the rhododendron gardens on campus should be in full bloom!

Stay tuned and visit the website soon to register.

Bonjour aux membres de l'ABC/CBA!

Nous espérons vous voir à Victoria, du 15 au 18 mai prochain, pour la 52e réunion annuelle de l'ABC/CBA. Le site web de la conférence et la page d'inscription seront disponibles le 26 février (www.uvic.ca/cba2016). Pour le moment, voici quelques détails pour vous aider à planifier votre voyage.

La conférence se tiendra à l'Université de Victoria, située à sept kilomètres au nord du centre-ville de Victoria. Le logement sur le campus dans des chambres de style dortoir est disponible à un prix abordable et très pratique. Pour ceux qui préfèrent séjourner dans les hôtels, il y a un service d'autobus régulier vers et depuis le centre-ville.

Délais de soumission

soumission des résumés: mercredi le 23 mars

Inscription précoce: jeudi 31 mars

Faits saillants de la conférence

1. Conférence publique plénière, Dr Karl Niklas, Liberty Hyde Bailey, professeur de botanique, Université Cornell
2. Conférence publique Weresub, Dr Bryce Kendrick, professeur émérite, Université de Waterloo
3. Excursions avant et pendant la conférence spécialement sur la flore des écosystèmes du chêne de Garry
4. Banquet au centre de l'Horticulture du Pacifique
5. Les fleurs printanières et les jardins de rhododendrons sur le campus devraient être en pleine floraison!

Restez aux aguets et visitez le site web sous peu pour vous inscrire.

CALL FOR NEW BOARD MEMBERS

The CBA/ABC runs on the dedicated commitment of volunteers across the country. We are always interested in the participation of new members, bringing ideas, energy, and their own perspective. At this year's Annual General meeting we will be electing new Board members including the following:

President Elect: The President Elect serves two years as President Elect, two years as President and two years as Past President. The President Elect must have served on the Board in the past.

Directors at large for the east and west part of country: Directors at large attend Board meetings at the annual

CBA/ABC meeting and a conference call meeting in January. They represent their region of the country and may be asked to sit on committees. This is an excellent way to see how the CBA/ABC runs, and meet colleagues from across the country. Directors serve a two-year term.

Student Directors: As with the Directors at large, student directors attend board meeting and represent the interest of students. Student directors serve a one-year term.

In addition, please feel free to contact me (john.markham@umanitoba.ca), any of the Board members or section members with your ideas of how improve your association.



Canadian Museum of Nature bryologist Jennifer Doubt at work in Ontario's Ring of Fire region ©Tyler Smith

STUDENT CONFERENCES

Science Atlantic Aquaculture & Fisheries and Biology Conference

Science Atlantic is celebrating students working on research in both Biology, as well as Aquaculture & Fisheries. This year, Saint Mary's University is proud to host this annual student conference taking place March 11-13, 2016. This conference, which is attended by faculty and students from institutions throughout the Atlantic Provinces, will feature oral and poster presentations by students, a keynote speaker, and awards for the best student presentations.

For more details, see the conference website: scienceatlantic.ca

Student Research Day and BC Undergraduate Research Conference

University of the Fraser Valley, Thursday April 7. For more details, see the conference website: www.ufv.ca/research.



©Hugues Massicotte

MYCOLOGY SECTION NEWS

The call has just gone out for submissions to the competition for the Luella K Weresub Award for best student paper in fungal biology published in 2015. This year, our review committee (Shannon Berch, Hugues Massicotte, Faye Murrin, Greg Thorn) will benefit from the participation of a volunteer reviewer, Jonathan Cale who is a Post-Doctoral Fellow at the University of Alberta. This is an exciting time for the review committee; we are on pins and needles in anticipation of the array of top-quality and diverse papers we will receive for review.

Plans are in place for a terrific mycological presence at the 2016 CBA/ABC meeting at the University of Victoria this May. Dr. Bryce Kendrick, Emeritus Professor, University of Waterloo, will present our Weresub Lecture on diversity and

function in fungal communities. Dr. Mary Berbee will talk about deep fungal divergence as part of the Opening Symposium at the meeting. We have organized a Mycology Section Symposium with the theme Fungi at the Edge that features four speakers addressing ectomycorrhizal fungi, arbuscular mycorrhizal fungi, lichens, and the fungal-plant interface. Last but not least, we have a half-day field trip in search of spring mushrooms and truffles.

We look forward to seeing many of you in Victoria this May!

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



©Hugues Massicotte

LA CHAIRE DE RECHERCHE K.-C.-IRVING EN SCIENCES DE L'ENVIRONNEMENT ET DÉVELOPPEMENT DURABLE

Fonctions

Information générale : Il s'agit d'un mandat de Chaire d'une durée de 5 ans, possiblement renouvelable, au rang de professeure adjointe ou professeur adjoint à compter du 1^{er} juillet 2016. Ce poste temporaire sera rattaché au Département de biologie ou au Département de chimie et biochimie de la Faculté des sciences (Campus de Moncton).

Dans le cadre de ses fonctions, la personne retenue sera appelée à mener des travaux de recherche d'envergure, à encadrer des étudiantes et des étudiants aux cycles supérieurs et à assumer une charge d'enseignement modérée à la Maîtrise en études de l'environnement ou à l'un des trois cycles universitaires dans le département d'attache. La tâche comprend aussi une participation active aux activités de la Faculté et du programme de Maîtrise en études de l'environnement.

La Chaire a pour mandat de contribuer au développement et à la mobilisation des connaissances, ainsi qu'à la formation de scientifiques bien outillés pour faire face aux grands enjeux environnementaux et du développement durable. Il est attendu que la Chaire favorise une approche à la fois interdisciplinaire et intégrée à l'égard des questions entourant l'environnement, la société et l'économie. Cependant, la titulaire ou le titulaire détiendra une solide expertise en sciences naturelles et développera les collaborations nécessaires à l'intégration de la dimension socio-économique. Consulter le lien suivant pour une description détaillée du mandat : www.umoncton.ca/umcm-sciences/files/sciences/wf/wf/pdf/mandat-kc_irving.pdf

Particularité : L'Université de Moncton, fondée en 1963, est un établissement d'enseignement supérieur de langue française en milieu acadien. Avec ses trois campus situés à Edmundston, à Moncton et à Shippagan, elle offre des programmes d'études universitaires de baccalauréat, de maîtrise et de doctorat dans plusieurs disciplines. Plus de 5000 étudiantes et étudiants provenant de partout au Canada et de l'étranger la fréquentent. Pour de plus amples renseignements sur l'Université et ses programmes d'études, vous êtes invités à consulter le site Internet au www.umoncton.ca.

L'Université de Moncton souscrit à l'exigence d'équité en matière d'emploi et encourage les candidatures de toute personne qualifiée, femme et homme, y compris les autochtones, les personnes handicapées et les membres des minorités visibles. Conformément aux exigences relatives à l'immigration au Canada, ce concours s'adresse en priorité aux citoyennes et citoyens canadiens ainsi qu'aux personnes ayant obtenu le droit d'établissement au Canada.

Formation

Les candidates ou candidats à ce poste détiennent un doctorat dans une discipline des sciences naturelles ou des sciences de l'environnement. Une expertise en écologie végétale, en chimie environnementale ou en biochimie environnementale serait un atout. Une expérience postdoctorale est souhaitable. Les candidates et les candidats auront à leur actif un dossier de réalisations en recherche et démontreront une capacité à développer un programme de recherche axé sur les domaines de l'environnement et du développement durable qui pourra être financé par les grands conseils nationaux. Enfin, la maîtrise de la langue française, tant à l'oral qu'à l'écrit, est essentielle.

Les personnes intéressées à postuler sont priées de faire parvenir un dossier comprenant :

- un curriculum vitae détaillé
- un programme de recherche pour les 5 prochaines années incluant les enjeux environnementaux qu'ils comptent aborder dans une perspective de développement durable
- une description des moyens qui seront adoptés afin de mobiliser les connaissances acquises et de collaborer avec les acteurs non-académiques (communauté, organisations, gouvernement, industrie)
- une description de leur approche pédagogique
- les noms et coordonnées de trois répondantes ou répondants.

Faire parvenir le dossier complet par courriel, par télécopieur ou par la poste à :

M. Francis LeBlanc, Ph.D., doyen, Faculté des sciences
Université de Moncton, Campus de Moncton
18 avenue Antonine-Maillet, Moncton NB E1A 3E9
Téléphone : (506) 858 4301

Télécopieur : (506) 858 4541

Courriel : sciences@umoncton.ca

Salaire : Le traitement annuel est établi selon la formation et l'expérience. Les critères servant à établir le traitement annuel sont régis par la convention collective.

Fermeture du concours : Le 15 mars 2016

Personne-ressource : M. Francis LeBlanc, doyen

JANET RUTH STEIN TAYLOR, 10 OCT 1930–16 JAN 2016

Iain E.P. Taylor¹

Janet Ruth Stein Taylor was born on October 10th 1930 and raised in Denver CO. She graduated with a BA from University of Colorado (1951), and an M.A. from Wellesley College, Wellesley (1953). Her thesis was *A Comparative Study of Brachytic and Normal Zea mays*. Thesis Supervisor: Dr. Rhoda Garrison. Her PhD research in Botany, from University of California, Berkeley (1957) was under the supervision of George F. Pappenfuss. Her dissertation was *A Morphological and Physiological Study of Three Colonial Volvocales*. In 1960 she received the "Dorbaker Award" for the best phycological paper published in North America in 1960.

Between 1957 and 1959, Janet worked as a Technician at Berkeley, and held visiting positions at the University of Minnesota Biological Station, and in the University Teachers Institute at Indiana University. She joined the UBC Department of Botany in 1959 as an Instructor, and after 5 years on the then traditional path for young women she became an Assistant Professor. Her teaching forte was the smallish class with a strong lab requirement. Many students noted her welcoming experience in 2nd year botany as a major influence in their choice of Botany as at least a minor in the BSc programmes. Throughout her career she was an effective mentor for undergraduate and graduate students as well as for newly appointed faculty members. She was probably the last of the 'put-upon' women in the Department, and she was certainly a valuable contributor to the fall of male patronage in both the Department and the Faculty of Science at UBC.

During her career (1959-1985), her research interests were in the Freshwater and Estuarine Algae (especially) of British Columbia. She did extensive fieldwork and identification and data base preparation for what is now part of the *E-Flora of BC: Electronic Atlas of Plants of British Columbia* www.eflora.bc.ca. She established the algal part of the UBC Microbial Culture Collection work that may well have led to her involvement as the Organizing Editor of the 4 volume *Handbook of Phycological Methods*; published by Cambridge University Press between 1973 and 1986.

Janet was an active member of the scientific societies that she joined, particularly of the Canadian Botanical Association/L'Association Botanique du Canada (Director; Editor of *CBA/ABC Bulletin*; Vice-President; President 1970-71) and the Phycological Society of America (Editor of the *News Bulletin and Newsletter*; Editor, *Journal of Phycology*, 1975-1980; Treasurer from 1982-1987; and President 1965).

Over the years Janet taught in the introductory Botany course, brought freshwater algae into the Department, became a stalwart colleague who lead the much respected advising group in the Department, and eventually served as Associate Dean of Science. She was one of the original authors of the textbook, edited by Bob Scagel, *Evolutionary Survey of the Plant Kingdom*, by Scagel, R.F., Bandoni, R.J., Rouse, G.E., Schofield, W.B., Stein, J.R. & Taylor, T.M. 1965 Wadsworth



Janet Stein (left) with Christine Maxwell at the 2014 CBA meeting in Kamloops, BC. ©Hugues Massicotte

Press, Belmont, California.

Janet's graduate students were a diverse and independent minded group. The first was Joseph Gerrath (MSc 1965; PhD 1965) who studied the ecology, culture and taxonomy of Desmids. He married Janet's undergraduate student/technician, Jean Drewry, and they moved to the University of Guelph, where Joe pursued an academic career until retirement. Jean did different technical and teaching jobs in Botany at Guelph and 18 years later she extended her Honours degree in freshwater phycology to a career in higher plant morphology, completed a PhD, and became a professor at the University of Northern Iowa.

Dean Blinn (PhD 1969) worked on saline environments and became a career-long faculty member at Northern Arizona University. John Wehr moved to Durham University in the UK for a PhD (1982) and then onto Fordham University, NY, where he is a Professor and Director of the Calder Ecology Center. John, and Robert Sheath, a former visitor with Kay Cole, edited a book on Freshwater Algae of North America: Ecology and Classification that was published in 2003.

Martin Pomeroy, Richard Nordin, Helene Contant and Robert Prange all worked in Government. A post-doctoral husband-wife team, Davis and Diane Findley, from the U S Corps of Engineers, Mobile, AL, contributed much to our knowledge of the ecology of Skaha Lake in the BC Okanagan region during their work with Janet (1969-1971).

Carol-Ann Borden (MSc 1969) did much of the early work on the culture collection, Gary Butler (MSc 1970), Marion McCauley (MSc 1974) and Bob Prange made strong contributions and went along their chosen paths. Robert Prange (MSc 1976) did a PhD and was last heard of in Kentville, Nova Scotia working on apples!

Janet married Roy Taylor, then Director of the UBC

¹Professor Emeritus of Botany, UBC

Botanical Garden and moved with Roy to the Chicago Garden in 1985, and then to the Rancho Santa Ana Garden in Claremont CA. They retired to Nanaimo where both became involved in matters botanical and horticultural and were very active volunteers.

Janet was predeceased by Roy in 2013.

Janet requested no ceremony and only this 'scientific' obituary. However, I thank her friend Heather Fredericks, who visited almost daily, and sent messages that kept us in-

formed as time passed. The care at the Nanaimo Hospital was outstanding. Thanks also to Les Dickason who ensured that Janet's lawyer was able to complete several last legal needs.

I have prepared a more complete biographical commentary in the *History of 100 years of the UBC Botany Department*, which should be available in a few months through the Botany Department's web site.



©Hugues Massicotte

2015 LAWSON AWARD WINNER

JIM POJAR



Jim Pojar (right) receiving the Lawson Award from CBA President John Markham at the 2015 CBA meeting in Edmonton. ©Hugues Massicotte

The Lawson award is the highest honor given by the Canadian Botanical Association. It is given to a Canadian Botanist for either a single major contribution, or for a lifetime contribution to botany. The 2015 year's recipient, Jim Pojar, received the award to his lifetime of contributions to botany in Canada.

Jim completed a B.Sc. in 1969 and a M.Sc. the following year at the University of Minnesota. He then completed a Ph.D. at UBC in 1974. During his graduate student years, Jim worked with Vladimir Krajina and Bristol Foster on land classification. This research led to the establishment of the ecological reserves system in British Columbia, which was a leader in this type of land conservation system in Canada. From 1975 to 1978, Jim worked as a coordinator of the Ecological Reserve Program for British Columbia. Jim then moved to Smithers, BC and assumed a number of roles in the BC Forest Service. There he worked on the study of rare species, plant systematics and ecosystem classification. Jim was instrumental in establishing the ecosystem classification system in BC, which has become the keystone tool for land use management in the province. As one letter of support stated, in BC, Jim's name is synonymous with botany, being instrumental in the co authoring of two widely used field guides (*Plants of the Pacific Northwest Coast* and *Plants of Northern British Columbia*) and a driving force in the Illustrated Flora of BC program. Jim has also been an outspoken advocate for conservation and ecosystem based management.

After leaving the forest service Jim worked as Executive Director CPAWS-Yukon Whitehorse, YT. Jim also helped form the Bulkley Valley Research center in 2002, in order to foster research during a time of dwindling government support. In all, Jim's career shows us how one can make contributions to both the academic aspects of botany and at the same time have major impact on land use management, conservation and botanical education.

TOP CANADIAN ORNAMENTAL PLANTS. 13. DAFFODILS

Ernest Small^{1,2}

DAFFODILS (*narcissi*) are popular spring-flowering herbs grown from bulbs. They are easily grown, reliable, extremely colorful in large display beds, and have become leading cut flowers, houseplants and garden ornamentals.

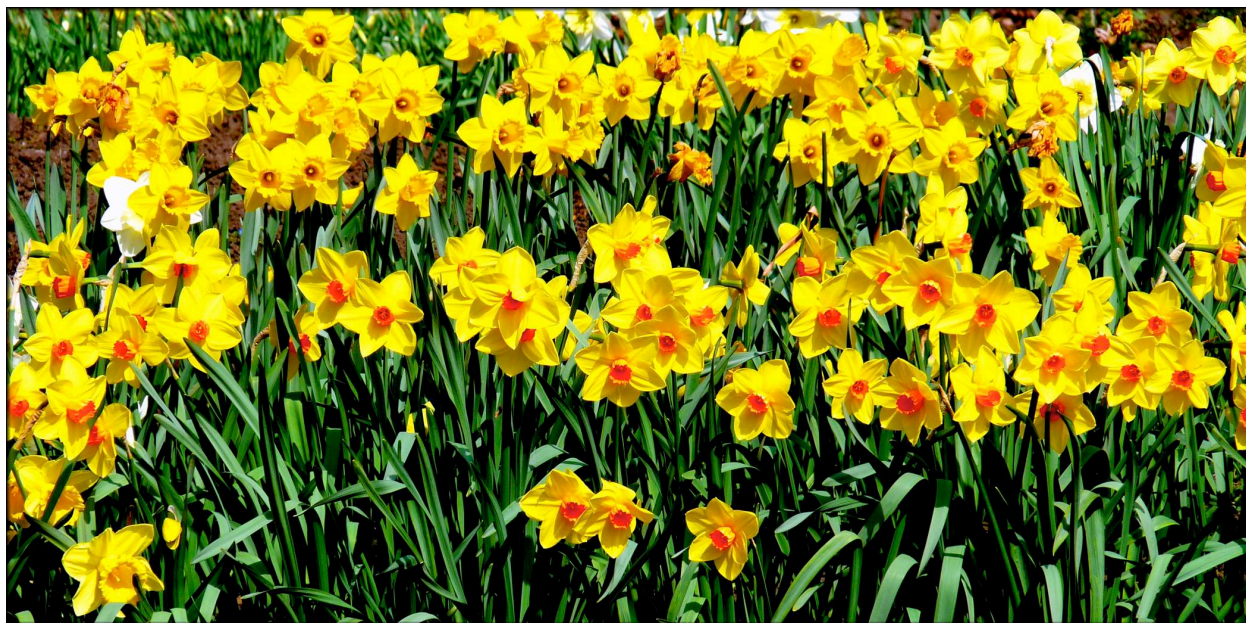


Figure 1: A bed of daffodils. Photo by Les Haines (CC BY 2.0)

Names

Scientific Names: The genus name *Narcissus* is based on an ancient Greek name, possibly *narke*, referring to numbness (daffodils have a reputation for narcotic properties).

English Names: Daffodil, narcissus. The plural of “narcissus” has been debated. *Webster’s Third New International Dictionary* gives plurals in the order “narcissus,” “narcissuses,” and “narcissi.” “Jonquil” is sometimes used to indicate all species of *Narcissus*, but should be reserved for *N. jonquilla* and closely related hybrids.

French Names: Narcisse, jonquille.

Official symbols

The daffodil and the leek are national symbols of Wales; the daffodil is associated with St. David (the patron of Wales), as the flower is said to be the first to bloom on his day (March 1). The daffodil has been interpreted as a national flower of Iran, and in Kurdish culture it is also a national flower symbolising the New Year. In 2007, New York recognized the daffodil as the city’s official flower, after a tradition developed of planting more than a million bulbs producing yellow flowers

(the colour of remembrance) to commemorate the Sept. 11 attack.

Yellow daffodils have been widely adopted throughout the world as symbols of organized efforts to defeat cancer. While many national cancer societies employ the daffodil as their official symbol, the Canadian Cancer Society has become the world’s largest purchaser of daffodils (often grown in British Columbia), which are marketed for fund-raising. April is the Canadian Cancer Society’s Daffodil Month. The 2015 annual “Daffodil Ball,” described as “Canada’s most exclusive gala,” was held in Montreal’s historic Windsor Station, featured 30,000 daffodils, and a blue-chip guest list that raised 2 million dollars for the Canadian Cancer Society.

Wild *Narcissus* species

There is disagreement about the number of species in the genus, estimates varying from less than 20 to well over 100. The taxonomic differences of opinion have been attributed to extensive hybridization both in the wild and in cultivation, and naturalization of many hybrids, making interpretation of species boundaries problematical. Several species are endangered, and some may have become extinct in recent times.

¹Science and Technology Branch, Agriculture and Agri-Food Canada, Saunders Bldg., Central Experimental Farm, Ottawa ON, K1A 0C6

²©Government of Canada. Verbatim redistribution for personal, non-commercial use is permitted.

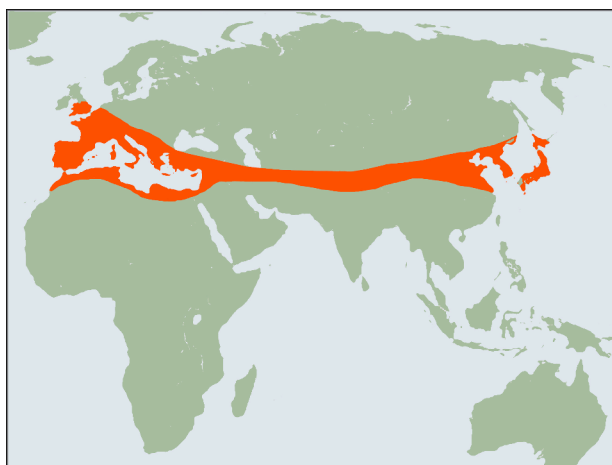


Figure 2: Approximate distribution limits of *Narcissus* species in the Old World. The western range is natural, the eastern range is introduced. Based on Willis (2012), online at daffilibrary.org/wp-content/uploads/Yellow-Fever.pdf.

Narcissus species occur mostly in southwestern Europe, especially in Spain and Portugal (the Iberian Peninsula), and in North Africa. Most species have quite restricted ranges. Several extend into France and Italy, and a few grow east to the Balkans (*N. poeticus*, *N. serotinus* and *N. tazetta*) and the eastern Mediterranean (*N. serotinus*) including Israel (*N. tazetta*). In ancient times, some species were transported eastward, establishing a naturalized distribution in a narrow band across Eurasia all the way to Japan. Six species and several hybrids have also been naturalized in North America. In Canada introduced species include *N. papyraceus*, *N. poeticus*, and *N. pseudonarcissus*.

The wild species occur in a variety of habitats, including grassland, river banks, rocky crevices, scrub, woods and mountains. Most flower in the spring (a few in the autumn), usually producing a flowering stem with a single flower, occasionally an umbel with as many as 20 flowers. In most species, a “corona” (floral tube) arises near the base of the perianth segments and the stamens, and is trumpet-shaped or cup-shaped in the most popular cultivars. The flowers produce nectar, and are insect-pollinated (by bees, butterflies, flies and hawkmoths). The shape and size of the corona limits access to the nectary to appropriate pollinators. The foliage consists of several strap- or awl-shaped leaves, which senesce after flowering, the plants surviving much of the summer and autumn by underground bulbs. The bulbs are onion-like, with a bud in the centre surrounded by white, fleshy scales which store energy for the bulb to flower. A thin outer skin (“tunic”) covers the bulb. A “basal plate” at the bottom of the bulb produces roots. A cold (vernalization) period is required for most species (not for *N. tazetta*) for growth to resume in the spring (professional growers often force bulbs to flower by providing a chilling period at 9°C, for 2–10 weeks depending on cultivar). Alkaloids protect the plants from predation.

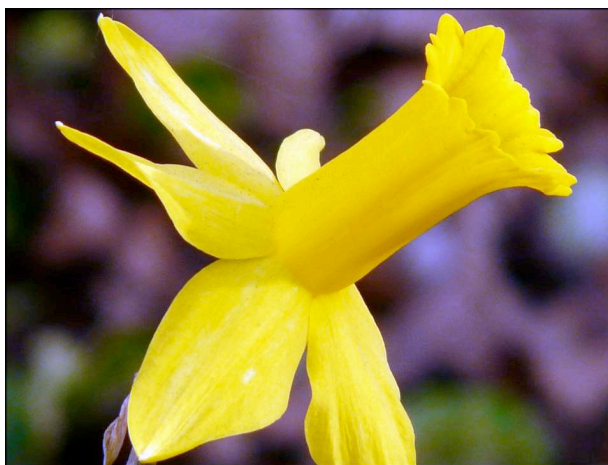


Figure 3: *Narcissus* flower with a trumpet-shaped corona (floral tube, “trumpet”). Photo source: Pixabay (public domain; CC0).

The evolution of cultivated daffodils

Most garden daffodils are of hybrid origin, and there are numerous cultivars. The Royal Horticultural Society of Great Britain is the international registration organization for daffodil cultivars, and has recognized over 30,000. Commercial cultivars are usually larger and more robust than their wild parents. The corona’s size, shape and colour have been principal characteristics selected by breeders. Cultivars with flowers developing trumpet-shaped coronas usually originated at least in part from *N. pseudonarcissus* (trumpet narcissus, lent lily). Crosses between *N. pseudonarcissus* and *N. poeticus* (poet’s narcissus, pheasants-eye narcissus), have produced a variety of cultivars with cup-like flowers. Many of the multi-headed cultivars arose as hybrids of *N. poeticus* and *N. tazetta* (bunch-flowered narcissus, polyanthus narcissus). Other species important in breeding of cultivars include *N. bulbocodium* (hoop petticoat daffodil, petticoat daffodil), *N. cyclamineus*, *N. jonquilla* (jonquil), *N. serotinus*, *N. tazetta* and *N. triandrus* (angel’s tears). Flowers are predominantly white or, yellow (green in the night-flowering *N. viridiflorus*), sometimes (especially in cultivation) partly pink or salmon, and many cultivars are “bicolors” (the perianth differing in color from the corona). Some cultivars have doubled flowers (with either or both the perianth segments and the corona doubled).

Daffodils have been arbitrarily assigned horticulturally to one of 13 standard categories based mostly on flower and plant form or species ancestry, although hybridization has obscured the differences. Daffodils with trumpet-shaped or cup-shaped coronas are the most popular. “Miniature species” (as distinguished from “dwarf species”) have been defined as having flowers no more than 5 cm or 2 inches in diameter.

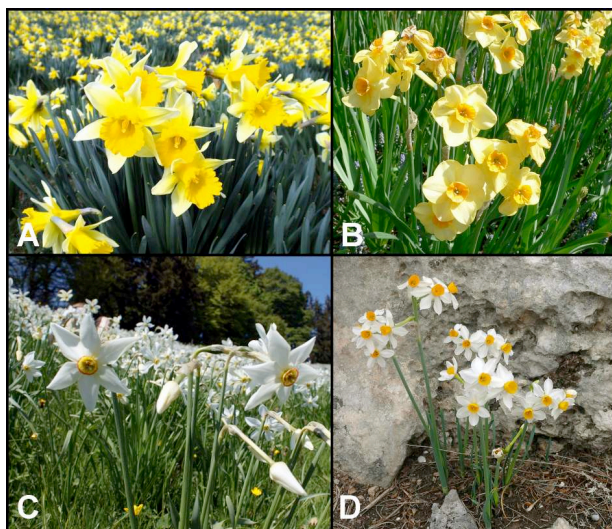


Figure 4: The most important parental species of modern garden daffodils. **A.** *Narcissus pseudonarcissus*. Photo by Amanda Slater (CC BY SA 2.0). **B.** *Narcissus jonquilla*. Photo by Mark Pellegrini (CC BY SA 2.5). **C.** *Narcissus poeticus*. Photo by Katso Käyttöehdot (released into the public domain). **D.** *Narcissus tazetta*. Photo by Zachi Evenor (CC BY 3.0).

Paperwhites

Several white-flowered, usually fragrant, species of *Narcissus* are called “paperwhites,” and the bulbs are commonly forced to flower indoors (these are usually too tender to grow outdoors as perennials in most of Canada). Some cultivars of *N. tazetta* are particularly used for the purpose. Unlike most other *Narcissus* species, they do not require chilling to flower. These produce tight clusters of four to eight or more small, usually intensely fragrant flowers. The bulbs are typically potted close together, in a well-drained but quite moist soil. Alternatively, the bulbs are often simply placed in gravel or stones, or just in water (keeping the water level somewhat above the bases of the bulbs to allow roots to develop in the water). The plants are best kept in a cool room with diffused light, and sometimes the stems grow tall and flop over unless staked.

Economic status

Daffodils have been grown commercially in Europe since the sixteenth century, and have become one of the major ornamental bulb crops grown in temperate regions. The plants are produced as field crops providing both bulbs and flowers for the cut-flower trade. Forcing of bulbs in glasshouses

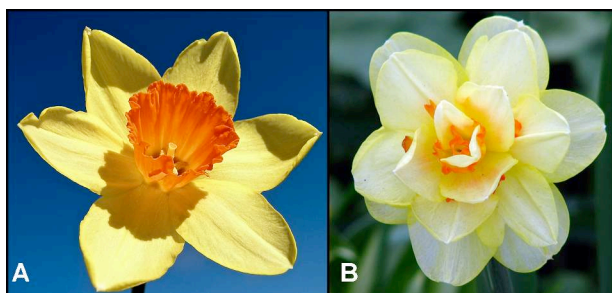


Figure 5: Examples of floral features selected under domestication. **A.** Corona differently coloured than the perianth. Photo by Jassmit at English Wikipedia (public domain). **B.** Doubled flower. Photo by Kor! (CC BY SA 3.0).

furnishes flowers and pot-plants throughout the year. The Netherlands is the larger producer. Other areas of Europe (notably the U.K.), Australia, Canada (British Columbia), the U.S. and other countries produce significant crops.

Medicinal use

Daffodils were harvested from the wild or cultivation in ancient Europe and Asia for at least 2,000 years, mostly as medicinal herbs. Most of the old applications are obsolete, and indeed rather dangerous given the content of toxic alkaloids present. However, one of the alkaloids, galanthamine, which is reminiscent of morphine, is under examination as a possible therapeutic agent in Alzheimer’s disease. It is found in various species of Amaryllidaceae, particularly in *Narcissus*, as well as in some closely related families (Agavaceae, Haemodoraceae and Hypoxidaceae).

Toxicity

Occasionally daffodil bulbs are mistaken for small onions and ingested (raw or cooked) by people, usually resulting in acute vomiting from the toxic alkaloids. Livestock (cattle, goats and pigs) have also been poisoned, sometimes fatally. Food shortages in the Netherlands during the Second World War led to attempts to feed the bulbs to cattle, which sometimes died. Domestic pets – notably cats, also dogs, horses, and rabbits, have been poisoned, and so have children who consumed leaves or sucked on the stalks. Wild animals (except insects) usually avoid daffodils, which are quite resistant to deer, rabbit, squirrel and other rodent damage (although the bulbs may be dug up).

“Daffodil itch” or “lily rash” is a dermatitis associated with picking or handling daffodils. Because of this, workers handling daffodils minimise contact between daffodils and their skin. Gardeners concerned about the possibility of an allergic reaction from handling the bulbs should wear gloves.

The presence of daffodils in a vase with other cut-flowers (especially tulips) has a deleterious effect on them. The cause is uncertain, but does not seem attributable to the alkaloids of the daffodils.

Cultivation

PURCHASING AND PROPAGATING

Wild species and non-hybrid cultivars can be grown from seed, but it usually requires up to 5 years to produce flowering plants of reasonable size, so most gardeners buy bulbs from commercial sources (especially from catalogue sales), or acquire them from other gardeners, or divide their own

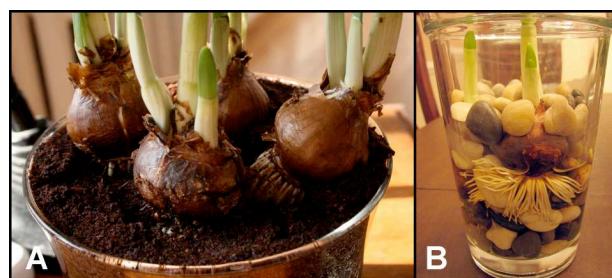


Figure 6: Bulbs planted in soil. Photo by thebittenword.com (CC BY 2.0). **B.** Bulbs planted in a glass of water. Photo by terren in Virginia (CC BY 2.0).



Figure 7: Potted daffodils for sale. Photo by Zákupák (released into the public domain).

plants (i.e. use the daughter bulbs or offsets produced by their plants as new planting stock). If bulbs are not planted immediately on receipt, they should be stored in a cool, airy place (not a refrigerator).

Commercial growers employ a technique called “twin scaling,” in which bulbs are sliced vertically into numerous segments, each with a pair of adjoining bulb scales and accompanying tissue, culturing these on growth media to produce new plants. Some ambitious gardeners sometimes slice bulbs to produce many new plants, although this is labour-intensive and slow to produce flowering plants (up to 4 years). True micropropagation, as currently utilized for many crops, has not been commercially successful yet for daffodils.

PLANTING

Bulbs are ideally planted in early fall, allowing time for the plants to establish before freeze-up (although bulbs planted late nevertheless usually survive). Daffodils are tolerant of many substrate types and conditions, but grow best in well-drained, deep, fertile, slightly acidic soil (pH 6.0 to 6.5, although a pH as high as 7.5 has been recommended). Daffodils have been grown in soils with considerable organic matter, although commercial daffodils are mostly raised in silty or loamy-sandy soils. A low-nitrogen commercial fertilizer with a N:P:K ratio of 1:3:3 is recommended, and it should be worked well into the soil before planting. Excessive nitrogen promotes leaf rather than floral growth and can stimulate production of too many small bulbs. Bonemeal (which is very low in nitrogen) was once recommended, but many daffodil specialists today dislike its use. The bulbs should be planted with the flattened base pointed downward, packing soil firmly around the bulb. In general, the tops (pointed ends) of the bulbs should be planted at about twice their largest diameter in medium to heavy soils, and about three times their depth in sandy soils, if instructions on planting depth are not provided. The soil should be worked deeply (25–30 cm or 10–12 inches) to facilitate root development. Daffodils have contractile roots, which shorten with age, pulling the bulb deeper into the soil. Small bulbs should be spaced about 7.5 cm (3 inches) apart, the largest bulbs about 15 cm (6 inches) apart. Closer planting can speed up the development of a good display of flowers (excessive closeness suppresses good plant development) but requires replanting

of the bulbs sooner. Wider spacing (up to 30 cm or 12 inches) eventually produces dense stands, and has the advantage of not requiring replanting for up to 10 years. Bulbs of the same type should be planted in groups (at least three to twelve) for best effect.

LOCATION

Daffodils are well-suited to many situations, particularly in formal landscape beds. They require a sunny location, but will do well in light shade. They display nicely near deciduous shrubs and trees (flowering occurring in the spring before the woody plants produce significant shade). They are also suitable in rock and perennial gardens, and beside buildings (but not too close to foundations or under extended eaves, which can be excessively dry). Daffodils are also frequently deliberately planted in lawns and groundcovers. They are frequently placed in woodlands and meadows (contributing to their naturalization in foreign floras).

MAINTENANCE

After bulbs are planted, a 5 cm (2 inch) protective winter mulch is helpful, especially for bulbs planted late in the season or in a southern exposure where early spring soil warming could result in damage. A light fertilization each spring as the leaves are sprouting is helpful. Daffodils planted near trees or shrubs, or in lawns, may need additional water and fertilizer to keep them healthy. Faded flowers should be removed to prevent seed and fruit development, which lowers bulb production. After several years when the floral display has lessened because of crowding, the bulbs may be dug up after the tops have started to die back, and replanted immediately, or stored in a cool, shady, airy, dry location. Bulbs are typically stored commercially at 17–18°C (63–64°F) at a relative humidity below 75%.



Figure 8: Cut daffodils in a vase. Photo by Kathryn Yengel (CC BY ND 2.0).



Figure 9: A commercial daffodil field in the Netherlands. Photo by Antony Antony (CC BY 2.0).



Figure 10: Daffodil picking. As noted in the text, daffodils can produce dermatitis, and harvesters are protectively clothed to prevent this from developing. Photo by Anne Burgess (CC BY SA 2.0).

Curiosities of Science and Technology

- According to Greek mythology, a young man named Narcissus fell in love with his image reflected in a pool of water. For rejecting the nymph Echo, Narcissus was punished by the goddess Nemesis, who turned him into a flower. Narcissus' fascination with himself is debatably the basis of the term narcissism, descriptive of people with an exaggerated, grandiose view of their own greatness (as noted earlier, the genus name *Narcissus* has been claimed to trace to the Greek *narke*, meaning narcotic or capable of producing stupor).
- Another ancient Greek tale concerns the goddess Persephone, who was kidnapped by the god Hades (god of the underworld) while she was distracted by the beauty of the flowers. Accordingly, the ancient Greeks considered daffodils to be the flower of death (since it was the last flower that Persephone picked). To this day, some people consider daffodils to be unlucky, and will not allow the flower to be brought into their houses. In some areas of Great Britain, it was thought that if daffodils were brought into a farmer's residence, his chickens would not lay eggs.
- The Prince of Wales is traditionally owed a symbolic rent of one daffodil for untenanted lands of the British isles of Scilly. Recently, the Prince demanded a similar payment of one daffodil for a property in Cornwall. Such nominal compensation to British royalty is more common in the form of "peppercorn rent." In English law as well as in the legal systems of some other countries, a legal contract is not binding unless each party receives something of value, even if one party receives something of much greater value than the other.
- Only well-known flowering ornamentals with characteristic flower colours have contributed their names to colours. Examples include buttercup, carnation, fuchsia, hyacinth, lavender, lilac, marigold, rose and violet. Daffodil is a member of this elite club: "daffodil yellow" is a bright yellow, and "paperwhite" is an off-white resembling paper.
- In the early 1990s, the Rockefeller Foundation sponsored research to genetically engineer increased provitamin A (beta-carotene) production into rice, in order to improve the diet of many in the Third World who relied excessively on the crop. The pathway for such biosynthesis is present in green parts of rice, but not in the endosperm (the starchy part of the grain). Genes ("transgenes," notably one from daffodil) were introduced into rice which resulted in a form with relatively high beta-carotene. High-provitamin A rice became known as 'golden rice' because of the yellowish colour visible after milling and polishing, due to the presence of beta-carotene in the endosperm. Golden rice has had limited success, and there are more sensible ways of improving the diets of people suffering from vitamin deficiencies (Small 2014).



Figure 11: Daffodils growing under a deciduous tree. As noted in the text, although daffodils are often planted beside trees, extra water and fertilizer are often required to compensate for competition from tree roots. Photo by Evelyn Simak (CC BY SA 2.0).



Figure 12: Painting of Narcissus ("Narcisse changé en fleurcolas") by Bernard Lépicier (1735–1784). This depiction is based on a version of the legend which holds that Narcissus, fond of looking at his own mirrored reflection, attempted to kiss his image on the surface of a pool, fell in, and drowned. The gods then transformed him into a scented flower which blossoms in the mountains in spring. Public domain, photo credits: Wikipedia & le Château de Versailles (CC BY SA 3.0).

Key Information Sources

- Barrett, S.C.H., and Harder, L.D. 2005. The evolution of polymorphic sexual systems in daffodils (*Narcissus*). *New Phytol.* 165: 45–53.
- Barnes, D. 1987. *Daffodils for home, garden and show*. Portland, OR: Timber Press. 176 pp.
- Caldwell, J. and Wallace, T.J. 1955. *Narcissus pseudonarcissus* L. *J. Ecol.* 43: 331–341.
- Fernandes, A. 1968. Keys to the identification of native and naturalized taxa of the genus *Narcissus* L. *Daffodil Tulip Year Book* 1968: 37–66.
- Fernandes, A. 1968. Improvements in the classification of the genus *Narcissus* L. *Plant Life* 24: 51–57.
- Fernandes, A. 1975. L'évolution chez le genre *Narcissus* L. *Anales Inst. Bot. A.J. Cavanilles*. 32: 843–87.
- Graham, S.W., and Barrett, S.C.H. 2004. Phylogenetic reconstruction of the evolution of stylar polymorphisms in *Narcissus* (Amaryllidaceae). *Am. J. Bot.* 91: 1007–1021.
- Hanks, G.R. (ed.). 2002. *Narcissus and daffodils*. New York, NY: Taylor & Francis. 428 pp.
- Hanks, G.R., and Rees, A.R. 1979. Twin-scale propagation of narcissus: a review. *Scientia Horticulturae* 10: 1–14.
- Heath, B., and Heath, B. 2001. *Daffodils for North American gardens*. Albany, TX: Bright Sky Press. 144 pp.
- Jefferson-Brown, M.J. 1969. *Daffodils and narcissi: a complete guide to the narcissus family*. London, U.K.: Faber. 224 pp. + 49 plates.
- Kamenetsky, R. and Hiroshi Okubo. H. (eds.) 2012. *Ornamental geophytes: from basic science to sustainable production*. Boca Raton, FL: CRC Press. 553 pp.
- Kingsbury, N. 2013. *Daffodil: the remarkable story of the world's most popular spring flower*. Portland, OR: Timber Press. 220 pp.
- Mather, J.C. 1961. *Commercial production of tulips and daffodils*. London, U.K.: W.H. & L. Collingridge. 212 pp.
- Pérez-Barrales, R., Simón-Porcar, V.I., Santos-Gally, R., and Arroyo, J. 2014. Phenotypic integration in style dimorphic daffodils (*Narcissus*, Amaryllidaceae) with different pollinators. *Phil. Trans. R. Soc. B* 369: 20130258. <http://dx.doi.org/10.1098/rstb.2013.0258>.

- Quinn, C.E. 1959. *Daffodils, outdoors and in*. New York, NY: Hearthsides Press. 204 pp.
- Rivera Nuñez, D., Obón De Castro, C., Ríos Ruiz, S., and Alcaraz Ariza, F. 2003. The origin of cultivation and wild ancestors of daffodils (*Narcissus* subgenus *Ajax*) (Amaryllidaceae) from an analysis of early illustrations. *Scientia Horticulturae* 98: 307–330.
- Shepherd, F.W. 1987. *Daffodils*. London, U.K.: Cassell and the Royal Horticultural Society. 64 pp.
- Small, E. 2014. Blossoming treasures of biodiversity – 46. Golden rice – a food fight to enhance the unsustainable monarch of mega-crops. *Biodiversity* 15: 269–289.
- Wells, J.S. 1989. *Modern miniature daffodils: species and hybrids*. Portland, OR: Timber Press. 170 pp.
- Willis, D. 2012. 'Yellow fever' a prospect of the history and culture of daffodils. Sherriff Hutton, York, U.K.: published by the author. 426 pp.



Figure 13: The mythical ancient Greek goddess Persephone, picking wild daffodils. Public domain photo of painting by John William Waterhouse (1849–1917). Photo credit: www.jwwaterhouse.com.



Figure 14: Canadian daffodil postage stamps issued in 2005.

Key websites

AMERICAN DAFFODIL SOCIETY

daffodilusa.org.

FORCING GUIDE – NARCISSUS (FOR PROFESSIONALS)

www.flowerbulbs.ca/ibc-jsp/binaries/pdf-bestanden/narcissus_forcing-guide.pdf.

GREAT BRITAIN DAFFODIL SOCIETY

thedaffodilsociety.com.

ROYAL HORTICULTURAL SOCIETY DAFFODIL CULTIVAR REGISTRATION

www.rhs.org.uk/plants/plantsmanship/plant-registration/daffodil-cultivar-registration

ROYAL HORTICULTURAL SOCIETY GUIDE TO BOTANICAL NAMES IN THE GENUS *NARCISSUS*

www.rhs.org.uk/plants/pdfs/plant-registration-forms/daffalpha

Acknowledgements

Brenda Brookes skillfully assembled and enhanced the illustrations for publication. Creative Commons Licenses employed in this article:

- [CC BY 2.0 \(Attribution 2.0 Generic\)](#)
- [CC BY 3.0 \(Attribution 3.0 Unported\)](#)
- [CC BY ND 2.0 \(Attribution NoDerivs 2.0 Generic\)](#)
- [CC BY SA 2.0 \(Attribution ShareAlike 2.0 Generic\)](#)
- [CC BY SA 3.0 \(Attribution ShareAlike 3.0 Unported\)](#)
- [CC0 1.0 \(Universal Public Domain Dedication\)](#)



Figure 15: Daffodil fairy ("Narcisse"). Source: Grandville, J.J. 1847. Les Fleurs Animées. Paris: Gabriel de Gonet.



Daffodil section ©Tyler Smith

MAJOR INVASIVE ALIEN PLANTS OF NATURAL HABITATS IN CANADA. 13. HONEYSUCKLE, CHÈVREFEUILLE, *LONICERA* SPP.

13a. Tatarian Honeysuckle, chèvrefeuille de Tartarie, *Lonicera tatarica* L.; 13b. Morrow's Honeysuckle, chèvrefeuille de Morrow, *Lonicera morrowii* A., Gray; 13c. Bell's Honeysuckle, chèvrefeuille joli, *Lonicera × bella* Zabel; 13d. Maack's Honeysuckle, chèvrefeuille de Maack, *Lonicera maackii* (Rupr.) Herder; 13e Dwarf Honeysuckle, chèvrefeuille à balais, *Lonicera xylosteum* L.

Paul M. Catling^{1,2}, Gisèle Mitrow¹ and Amanda Ward¹

THE Tatarian Honeysuckle group is notable for: (1) identification challenges which are probably related to hybridization; (2) domination of some native habitats leading to serious decline of many native species; and (3) attractive cultivated shrubs that provide certain ecosystem services. Overall the plants are considered detrimental. One recent article about these honeysuckles is entitled "Beautiful species to hate". Their success is based on: high biomass and seed production; effective long-distance seed dispersal by birds; an extended growing season with leaf emergence 1-2 weeks prior to native species; and leaf senescence 2-3 weeks later. Local control is possible to protect specific biodiversity features and address human health issues. There will be continued loss of biodiversity to this group of invasives. Problems with Maack's Honeysuckle are likely to increase due to more extensive occurrence in southern Canada due to climate warming.

Classification and Identification

DESCRIPTION OF SHRUB HONEYSUCKLES

Honeysuckles belong to the family Caprifoliaceae. They may grow as vines or bushes and have fragrant, attractive flowers making them popular in cultivation. These flowers may be almost radially symmetric (regular), drooping and bell-like or erect and radially asymmetric (irregular). We are concerned here with the latter type. The leaves are opposite, straight-edged, mostly deciduous, and the shrubs are up to 5 m tall. The introduced species of interest have a distinctive brown pith in the young branches 2-3 mm wide, which later becomes hollow (instead of white and continuous as in native species). Flowers are in axillary stalked (peduncled) pairs each subtended by two bracts and four bractlets (or flowers in whorls at ends of branches in other groups of *Lonicera*). The corolla is 2-lipped or equally 5-lobed. There are five stamens. The fruit is a few to many-seeded red or orange berry.

The genus is named after German physician and naturalist, Adam Lonicer (1528-1586). The name "tatarica" means from central Asia (but see also text box below).

The most useful recent work on identification of the introduced bush honeysuckles may have been that published by Swink & Wilhelm (1994). Their work is summarized in the accompanying diagram showing species and hybrids. We have not been confident of an ability to recognize and discriminate all of these taxa. Consequently we have settled with a smaller group (in red on the diagram). More taxonomic work is required on what some taxonomists have called "the very messy hybrid shrub honeysuckle complex". It has been suggested that "certain identification of many specimens is more of an art than a science". We believe that the extensive hybridization in North America has created a complex where taxa formerly distinguishable morphologically and

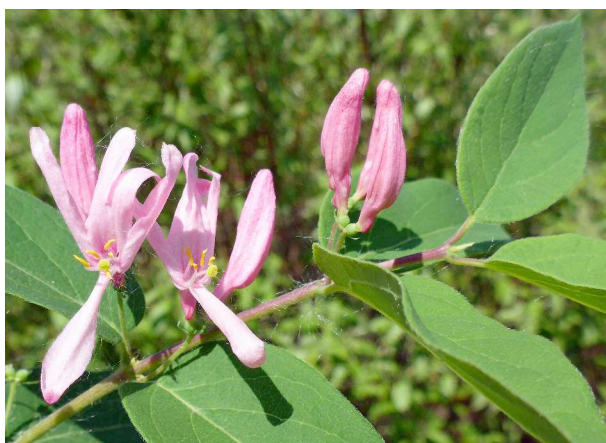


Figure 1: Bell's Honeysuckle, Picton, Ontario, Canada. Photo by P.M. Catling on 20 May 2015.

geographically in their European ranges are now obscure. Our examination of many hundreds (actually 1500) of Canadian specimens has suggested that the following key and taxa will be most useful in working with this group pending a more detailed study.

Identification tips: Any hairless or almost hairless (some hair on leaf margins) plant is *L. tatarica*. Both *L. xylosteum* and *L. maackii* may have stalked glands on the ovary but the acuminate leaves and short flower stalks of *L. maackii* are distinctive (see photo of leaves). Pollen and glands may be confused but the latter are stalked.

¹Science and Technology Branch, Agriculture and Agri-Food Canada, Saunders Bldg., Central Experimental Farm, Ottawa ON, K1A 0C6

²©Government of Canada. Verbatim redistribution for personal, non-commercial use is permitted.

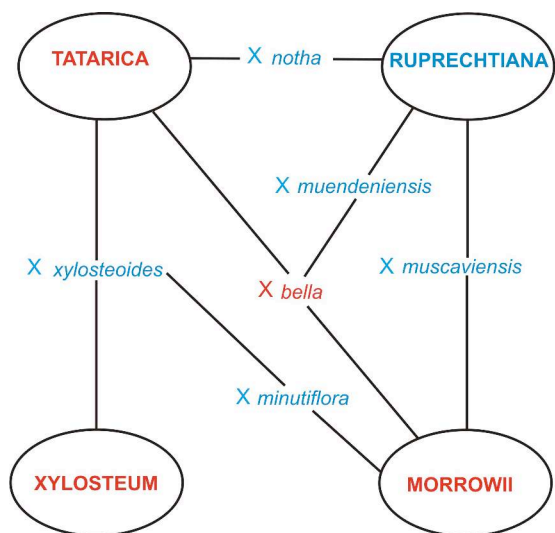


Figure 2: Relationships of introduced bush honeysuckle taxa. Redrawn from Swink & Wilhelm (1994).

KEYS TO MAJOR TAXA

1. Plants trailing or climbing (branches bent); fruit purple-black; flowers 3-5 cm long ***L. japonica***
1. Plants erect (branches straight); fruit variously coloured; flowers less than 2.5 cm long
 2. Pith of twigs white and continuous
 native species not included here
 2. Pith of twigs brown and hollow between nodes ... introduced species
 3. Leaves acuminate; peduncles (flower stalks) shorter than petioles (leaf stalks) ***L. maackii***
 3. Leaves acute or obtuse; peduncles (flower stalks) longer than petioles (leaf stalks)
 4. Plants completely or almost completely smooth
L. tatarica
 4. Plants more or less hairy
 5. Leaves large, 6-10 cm long, and acuminate; bractlets $\frac{1}{4}$ - $\frac{1}{3}$ as long as the ovary
 [***L. ruprechtiana***]
 5. Leaves smaller, 3-6 cm long, acute; bractlets $\frac{1}{2}$ to as long as the ovary
 6. Ovary glandular; bractlets $\frac{1}{2}$ as long as the ovary ***L. xylosteum***
 6. Ovary not glandular
 7. Bractlets as long as the ovary
L. morrowii
 7. Bractlets half as long as the ovary
L. x bella

The plants treated here are relatively distinct and rarely confused with other species which also have opposite leaves. The native Northern Bush Honeysuckle (*Diervilla lonicera*) differs in having leaves with serrated edges. The Dogbanes (*Apocynum* spp.) are not woody and have milky sap and radially symmetric, non-tubular flowers. The white spongy berries on Thin-leaved Snowberry (*Symphoricarpos albus*) distinguish that species but in the absence of berries, the short pedicelled, bell-shaped flowers are distinctive.

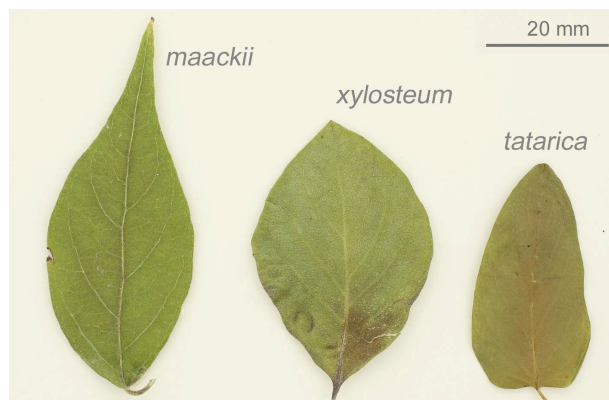


Figure 3: Leaves of bush honeysuckles, from left to right *L. maackii* (Rupr.) Herder (DAO 867998 [01-01000593947]), *L. xylosteum* L. (DAO 867603 [01-01000588551]) and *L. tatarica* L. (DAO 323444 [01-01000588649]).

Young plants of Dog-strangling Vine (*Cynanchrum* spp.) resemble *L. maackii*, but have less acuminate (long-pointed) leaf tips and eventually develop into vines.

13A. TATARIAN HONEYSUCKLE, CHÈVREFEUILLE DE TARTARIE, *LONICERA TATARICA* L.

Corolla rosy pink to red, sometimes white, but not changing to yellow with age. Bracteoles are very short, $\frac{1}{3}$ - $\frac{1}{2}$ as long as the ovary. Short bracteoles are a characteristic of hybrids involving this species. Most recently any hairless or nearly hairless shrub in this group has been called *L. tatarica*. It is native to Eurasia and was cultivated in Ottawa as early as 1898 (DAO). It now occurs wild across Canada and throughout much of the midwestern U.S. It is an occasional escaped introduction as far north as Fort Simpson in the Northwest Territories (DAO) where it was apparently planted on the Anglican Mission grounds prior to 1955. This species is reported to have been introduced to North America in 1752.

13B. MORROW'S HONEYSUCKLE, CHÈVREFEUILLE DE MORROW, *LONICERA MORROWII* A. GRAY

This species is a very hairy plant, but with smooth ovaries and bractlets as long as the ovaries and hairy but also mostly without glands. The corolla is white changing with age to yellow. It is introduced to North America from Japan in 1875 and now it is widespread in the U.S. and in southern Canada.

13C. BELL'S HONEYSUCKLE, CHÈVREFEUILLE JOLI, *LONICERA x BELLA* ZABEL

The combination of pubescence and short, more or less smooth bracteoles, helps to define this hybrid. The flowers may be deep pink to white but fade to dull yellow. Much of what has been called *L. tatarica* in Canada is referable to this hybrid taxon, which may have become more abundant than *L. tatarica*. It occurs throughout an extensive area of northeastern North America and may still be spreading and increasing in abundance.

13D. MAACK'S HONEYSUCKLE, CHÈVREFEUILLE DE MAACK, *LONICERA MAACKII* (RUPR.) HERDER.

The distinctive features of this species are the short flower stalks (peduncles), which are shorter than the leaf stalks (petioles), and the relatively large (5-8 cm), acuminate leaves. Both petioles and peduncles are glandular-pubescent. The corolla reaches 2 cm long and is white, turning yellowish.

Tatarian or Tartarian (don't ask!)



Figure 4: Berries of Tatarian Honeysuckle, photo by J. O'Brien. With permission, USDA Forest Service.

"Tataricus" is a Latin word that refers to the Tatar people from Mongolia and Manchuria who invaded western Asia and Europe in the Middle Ages (led initially by Genghis Khan). "Tartarian" is a widespread variant of the spelling of "tatarian". Based on the brutality of the Mongol invasions the word "tatar" can refer to a harsh, fierce or intractable person. Although this is an appropriate name for a troublesome invasive, it was not the original intent. The former spelling may be a little more common in English but the latter is more common in Latin scientific names where it may be translated as "from central Asia". Many other plants have the same epithet; *Acer tataricum*, *Silene tatarica*, *Aster tataricus*, to name a few, and some animals also bear the same epithet such as the Saiga Antelope called *Saiga tatarica*. This Antelope occurred recently (most recent fossil 13,400 years old), in the Yukon and Northwest Territories of Canada, presumably in an environment that resembled the Mongolian steppe where it originated and to which it is confined today.

Var. *podocarpa* Franch. has the ovary raised on a very short stalk and the flower is pubescent on the outside. Some plants belonging to the latter var. may have the flowers flushed with pink and may be referred to as the form *erubescens* Rehder. This species is native to central and northeastern China, Korea and Japan. Although herbarium records indicate that Maack's Honeysuckle has been cultivated at Ottawa and at Morden, Manitoba, and produced mature berries at both locations, it apparently has not been able to spread to the wild outside of the Carolinian region of extreme southwestern Ontario. It was first reported growing wild in Canada in 1973 based on specimens collected near Hamilton as early as 1955. Although it is said to have been first brought to North America in 1896 to the Dominion Arboretum in Ottawa, its inability to grow in the wild around Ottawa after that suggests that it did not escape from cultivation here. Earlier dates of introduction, such as 1855 and 1860, have been reported in the U.S. Maack's Honeysuckle is widespread in the eastern and central US, and is known in Canada only from southwestern Ontario. This species is also called "Amur Honeysuckle" after the Amur River, which is the world's eighth longest river. It forms the border between the Russian Far East and Manchuria in China. The remarkable story of the changing attitudes toward Maack's Honeysuckle in North America have been well documented.

13E. DWARF HONEYSUCKLE, CHÈVREFEUILLE À BALAIS, *LONICERA XYLOSTEUM* L.

This pubescent species has leaves that are 3-6 cm, often round or obovate and acute. The corolla is white or yellowish-white, often tinged with red, changing to yellow with age, approx. 1 cm long, and pubescent outside. It has glandular-pubescent ovaries and bractlets (bracteoles). Varieties of this species vary in pubescence (var. *mollis* Reg. is densely pubescent, var. *glabrescens* Zabel has the leaves

glabrous or nearly so). The fruits are usually dark red, but yellow in var. *lutea* Loisel. It is native to Eurasia, and widely naturalized in northeastern North America including southern Canada.

[13F. *LONICERA* × *NOTHA* ZABEL, (*L. RUPRECHTIANA* × *TATARICA*)]

This hybrid has been reported from northeastern British Columbia. It is difficult to circumscribe and requires more study.

[13G. MANCHURIAN HONEYSUCKLE, (*LONICERA RUPRECHTIANA* REGEL)]

Perhaps distinctive in its long (6-10 cm), acuminate leaves. The plant is pubescent and the leaves oblong-obovate or lanceolate and acuminate. The corolla is white, changing to yellow, smooth outside, 1.5-1.8 mm long. Bractlets smooth or glandular. Presumably hybrids may have either smooth or glandular and pubescent bracteoles. This species requires more study but having examined hundreds of specimens one cannot help but think that it would be conveniently placed in synonymy with *L. ×bella*, this also eliminating problems with recognition of *L. ×notha*, *L. ×muendeniensis* and *L. ×muscaviensis*.

[13H. *LONICERA* × *MUSCAVIENSIS* REHDER (*L. MORROWII* × *RUPRECHTIANA*)]

This hybrid is said to differ from *L. morrowii* in the acuminate leaves and from *L. ruprechtiana* in the longer bractlets. Its delimitation requires more study.

[13I. COMMON EUROPEAN FLY HONEYSUCKLE, *LONICERA* × *MUENDENIENSIS* REHDER (*L. ×BELLA* × *RUPRECHTIANA*)]

Small corollas less than 12 mm long and obovate and/or somewhat acuminate leaves may help to distinguish this hybrid which otherwise resembles *L. ×bella*. It requires more

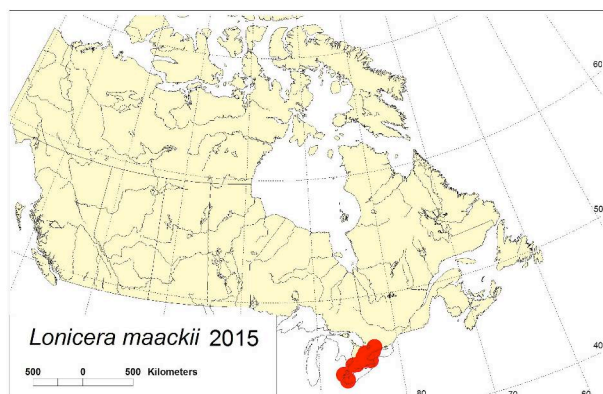


Figure 5: Distribution of Maack's Honeysuckle in Canada based on specimens examined.

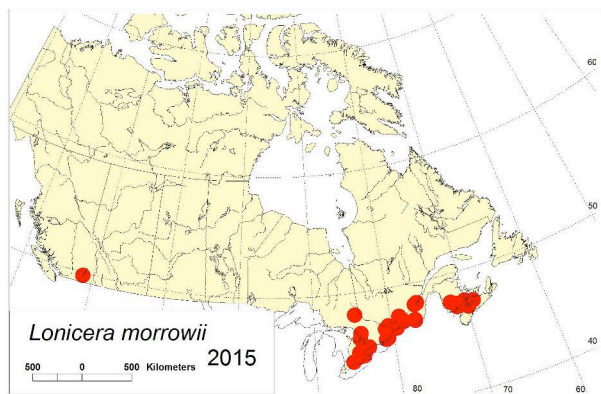


Figure 6: Distribution of Morrow's Honeysuckle in Canada based on specimens examined.

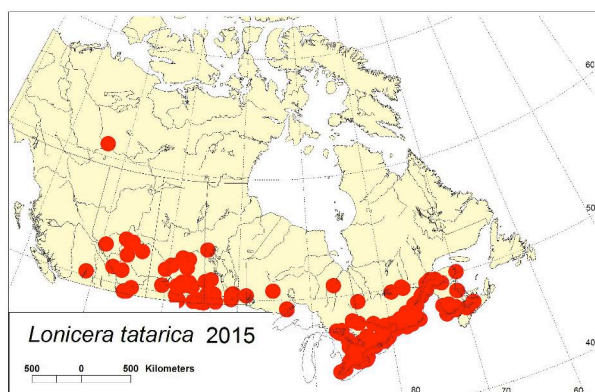


Figure 7: Distribution of Tatarian Honeysuckle in Canada based on specimens examined.

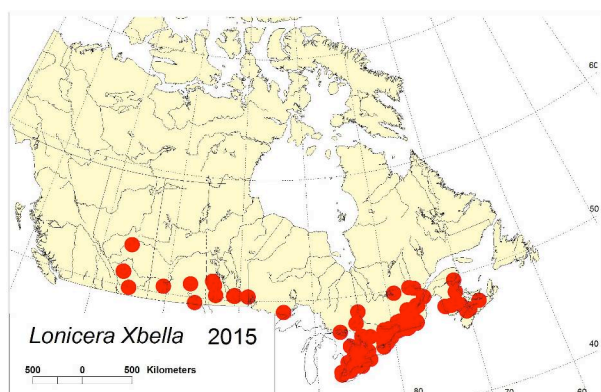


Figure 8: Distribution of Bell's Honeysuckle in Canada based on specimens examined.

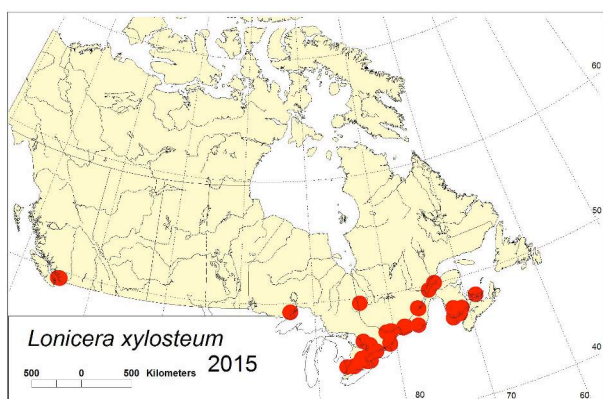


Figure 9: Distribution of Dwarf Honeysuckle in Canada based on specimens examined.

study and we have not been comfortable accepting it partly because of difficulty accepting the *L. ruprechtiana* parent.

[13J. SMALL-FLOWERED HONEYSUCKLE, *LONICERA MINUTIFLORA* ZAB. (*L. MORROWII* × *XYLOSTEOIDES*)]

Leaves are oblong, relatively small (less than 3 cm long), nearly glabrous, and flowers are small (less than 1.5 cm long). The bractlets are more than half as long as the ovary. Few of

the specimens we have seen are definitely referable to this hybrid.

[13K. *LONICERA* × *XYLOSTEOIDES* TAUSCH.]

Leaves mostly rhombic-ovate, broad-cuneate at base, and bluish-green, and slightly pubescent. Flowers small and pinkish. The putatively distinctive characteristics of this hybrid require more study.

Distribution

Worldwide there are more than 150 species of *Lonicera*. Those considered here originate in Europe and Asia. Accompanying maps showing distribution in Canada are based on collections from ACAD, ALTA, CAN, DAO, HAM, LKHD, MMMN, MT, MTMG, NBM, NSPM, OAC, PMAE, QFA, QK, QUE, SASK, TRT, TRTE, UAC, UNB, UWO and V. The distributions of individual taxa are discussed above.

Ecology

POLLINATION

Although the flowers are perfect (having both male and female parts), they are functionally unisexual by being male first (protandrous). After the flower first opens the stamens become uppermost and shed pollen. After pollen release, style curves upward bringing the newly receptive stigma into an upper and/or accessible position and creating a fe-

Invasive Changes Bird Colours

A diet of Honeysuckle berries can change the colour of native birds. Cedar Waxwings (*Bombus cedrorum*) develop orange (instead of the normal yellow) tail bands as a result of feeding on the fruits of *Lonicera morrowii* over an extended period from June to October. The yellow being orange or red on other birds such as White-throated Sparrows, Kentucky Warblers, Yellow Warblers, Yellow-breasted Chats and a Baltimore Oriole, has also been linked to feeding on Honeysuckle fruit.

Although this changed colour does not seem to be too serious, it raises the question of what other less obvious effects on native birds result from a diet of invasive Honeysuckle berries.



Figure 10: An unusually orange tail, with small waxy tips also developing on some rectrices. Orange instead of yellow tails in Cedar Waxwings are believed to result from eating non-native honeysuckle berries. Photo by M. Gahbauer. By permission, McGill Bird Observatory (QC), April 2006

male flower. At this point the stamens are empty and curve downward. (out of the way) The process often takes 2-3 days. Pollination of the invasive species covered here is by bees, butterflies, moths and flies.

DISPERSAL

Over 20 species of birds have been reported as dispersal agents in this group of shrubs. In central New York State, White-tailed Deer have been found to be major dispersal agents of *Lonicera tatarica*, *L. morrowii*, and *L. x bella*. Mice feed on and disperse seeds over shorter distances. Plants that have naturalized in North America produce more seeds compared to those in the native ranges in Europe and Asia

OTHER INTERACTIONS

A frequently asked question is: what is the disease causing the proliferation of short internodes with short leaves in the introduced honeysuckles? These dense masses of small leaves are called "witches' brooms". In the introduced honeysuckles, they are usually the result of feeding by the introduced Honeysuckle Aphid (*Hyadaphis tataricae*), of Asian origin, and probably introduced with the Asian honeysuckles. This accidentally introduced aphid is not yet widespread enough to serve as an effective control. Susceptibility varies between and within species. Maack's Honeysuckle is tolerant but Bell's and Tatarian are susceptible. Witches' Brooms are seen on a number of different woody plants. They may be best known to botanists on spruce trees (and some pines) as the result of another vascular plant, Dwarf Mistletoe (*Arceuthobium pusillum*).

Apart from the introduced aphid, these introduced honeysuckles do not suffer from extensive insect damage. Parasites of both Lepidoptera and sawflies feeding on honeysuckle have been reported from Ottawa and two of the parasites were described as new species.

Introduced honeysuckles are present in a great variety

of habitats (dry to wet, open to closed) and soil types (acid to alkaline), but they are particularly common along woodland edges and in woodlands with a history of disturbance (fragmentation, forestry, grazing).

Detrimental Aspects

Significance is suggested by the number of asterisks, 5 indicating highest significance.

(1) NEGATIVE EFFECTS ON NATIVE FLORA *****

Maack's Honeysuckle (*Lonicera maackii*) creates a dense shrub layer in deciduous forests in eastern North America that negatively impacts native shrubs, herbs and tree seedlings. In one recent study "tree seedling survival was reduced up to 70%, and herb growth and reproduction rates plunged by up to 80%, primarily because of the shade cast by honeysuckle."

In many sites invaded by *L. maackii*, habitats are experiencing wholesale alterations in species composition, structure, and successional trajectory. The invasion may also change competitive interactions in forest understories as well as alter between-layer species linkages. The same is true of the other introduced bush honeysuckles, but there are fewer studies of their specific impacts. Recent studies have shown that chemicals in *Lonicera maackii* are capable of inhibiting germination of other plants. In addition the invasive bush honeysuckles may compete with native plants for pollinators reducing seed set of native species.

(2) AGRICULTURAL PEST ***

Lonicera tatarica is reported to be an alternate host of the Spotted Wing Drosophila (Fruit Fly - *Drosophila suzukii*) which is a serious new pest of soft fruit in southern B.C. [Only males have the black wing spots.]



Figure 11: Male cardinal feeding in Honeysuckle. It remains unclear how important honeysuckle is to native birds. Photo by M. Paynes (CC BY-NC-SA 2.0).

(3) FACILITATION OF HUMAN HEALTH PESTS ***

In one of the first studies to investigate the potential facilitative effect of *Lonicera maackii* on an insect vector, it was found that leachate from *L. maackii* was significantly more beneficial to the development of the disease-carrying mosquito, *Culex pipiens*, than some native woody plants. See also text box concerning ehrlichiosis.

(4) NEGATIVE IMPACTS ON NATIVE FAUNA ***

Robins nesting in Maack's Honeysuckle experience higher predation rates than in native shrubs. This may be related to earlier production of cover but lower height and absence of thorns. As a result of this phenomenon the introduced shrub honeysuckles have been referred to as "ecological traps". However, a recent study advised caution in this categorization and suggests that effects can be null or positive on native birds in certain localities. It has also been suggested that a number of fruit-eating birds including Cardinals, Robins and Catbirds have tripled during the past three decades in parts of North America due to the spread of non-native honeysuckles.

Other fauna has been reported to be reduced by honeysuckle invasion due to reduced insect populations. This may lead to declines in some small birds which require 4,800

Manage invasion - improve human health

Management of biological invasions may help ameliorate the burden of vector-borne disease on human health. Maack's Honeysuckle (*Lonicera maackii*), increases human risk of exposure to ehrlichiosis, an emerging infectious disease caused by bacterial pathogens (species of *Ehrlichia*). It is a relatively rare disease causing headaches fever, nausea etc., with many cases of infection being mild and self-limiting or asymptomatic and it has a relatively low fatality level. Ehrlichiosis is transmitted by the Lone Star Tick (*Amblyomma americanum*) which feeds primarily on White-tailed deer (*Odocoileus virginianus*). The deer frequently use areas invaded by honeysuckle. Experimental removal of honeysuckle caused a decrease in deer activity and in infected tick numbers, as well as a proportional shift in the blood meals of ticks away from deer.



Figure 12: A witch's broom formation on *Lonicera* (DAO 709686 [01-01000588617]).

caterpillars to raise a family. In a study on effects on reptiles and amphibians, frogs and salamanders were significantly smaller in invasive *Lonicera* stands and Box Turtles were entirely absent.

(5) POISONING ***

Ingesting a large number of berries (ca. 30) may cause abdominal pain and vomiting in children and has caused poisoning symptoms in rabbits and sickness and death in mice.

Beneficial Aspects

These honeysuckles were initially imported and promoted as garden ornamentals, for value to wildlife and prevent soil erosion. Their value in these applications is less than initially suspected.

(1) ASSISTANCE TO POLLINATORS ***

A large number of pollinating insects can utilize the flowers as a source of both pollen and nectar. However, a variety of native species can provide these services over a more continuous period.

(2) EROSION CONTROL AND MINE RECLAMATION **

While the introduced honeysuckles may be useful in this regard, it is not clear that they are much more useful than native species.

(3) USE AS A DRUG *

We cannot vouch for the effectiveness or appropriateness of any of these *Lonicera* species in medicinal applications, and we warn of their use based on widely reported poisonous properties. However, "honeysuckle" in the broad sense has been used to treat inflammation, viral and bacterial infection, fever, diabetes, arthritis, and birth control. None of the species treated here are widely marketed in drug trade.

(4) INCREASE IN SOME ORGANISMS *

It is usually the case that despite general diversity decline caused by invasive species, some groups may increase. Spider diversity has increased substantially where Maack's Honeysuckle has become dominant.

What is Blue Honeysuckle?

Blue Honeysuckle (*Lonicera caerulea*), also known as Haskap, has an almost radially symmetric, instead of two-lipped corolla like the invasives treated here, and the blue berries are often elongate. Cultivars have been recently introduced into North America from Russia, and to a lesser extent from Japan and China. One of the most diverse collections of cultivated Haskap in the world is at the University of Saskatchewan. The species is native in the western montane region of North America including Canada. The Russian cultivars currently available in North America bloom and ripen early in the season. The fruit has high Vitamin C and antioxidant levels. It has substantial potential as a commercial berry crop providing an additional opportunity for small fruit growers in high latitudes with colder climates to diversify their production for high-end specialty crop markets. It is not known to be escaped from cultivation.



Figure 13: Blue Honeysuckle in fruit, NW Ontario, July 2014 ©Tyler Smith

(5) ORNAMENTAL VALUE *

This is not considered a large or significant benefit, especially with many other options (see below).

(6) FOOD AND COVER FOR WILDLIFE *

The berries are sometimes reported to be less valuable than those of native species, but studies need to take the duration of availability into account. Value as cover may be either positive or negative.

Management

Of particular interest is the “best management practices” (BMP) document for Ontario by Tassie and Sherman (2014). Other such documents are available online. Control is often followed by restoration and monitoring in a complete management program. The plants are sufficiently common, and widespread and management sufficiently labor intensive and costly, that only local infestations are likely to be effectively controlled to preserve specific biodiversity features or to ensure human health.

LISTING, LEGISLATION AND REGULATIONS

All of the honeysuckle species considered here are available for purchasing on-line and are also found in some Canadian garden centres. Some provinces and municipalities have added them to their list of invasive garden plants that should not be planted. Tatarian Honeysuckle is listed on the “Invasive Plants of Natural Habitats in Canada” of Environment Canada and *L. tatarica* is listed in a Summary Report of CFIA as an invasive Alien Species. They are on the noxious weed list in some U.S. states as a result of being classified as either “Invasive Banned”, “Prohibited”, “Potentially Invasive”, “Class B Noxious Weed” or “Prohibited Invasive Species”. According to the United States federal government, *Lonicera maackii* is a weedy, invasive species. However, this plant is so invasive that it is banned in Connecticut and prohibited in Massachusetts, while being considered noxious and invasive in Vermont.

HORTICULTURAL SUBSTITUTES

Instead of buying any of the invasive honeysuckles, it has been suggested that gardeners try growing any of these native shrubs: American beautyberry (*Callicarpa americana*), American hazelnut (*Corylus americana*), Common Elderberry (*Sambucus canadensis*), Flowering Dogwood (*Cornus florida*), Fragrant Sumac (*Rhus aromatica*), New Jersey Tea (*Ceanothus americanus*), Northern Spicebush (*Lindera benzoin*), various Serviceberries (*Amelanchier* spp.), and/or Wild Plum (*Prunus americana*).

MANUAL AND MECHANICAL METHODS

Hand pulling mature shrubs and seedlings can be effective. Cutting may also work well, but resprouting will have to be controlled. Machinery and tools are available to assist. The effect of cutting is vastly improved when it is followed by herbicide application.

BIOCONTROL

No biocontrol methodology has been developed for these species.

CHEMICAL METHODS

Cutting may lead to resprouting if not followed by application of 20% glyphosate with application in late summer or early fall when plant resources are flowing to roots. Winter application of triclopr diluted in oil and applied to stumps has worked well in Wisconsin.

BURNING

Burning has been applied effectively in Illinois and other parts of the U.S. It is usually part of a multiple control effort. Re-burning may have to be done at least every other year.

Prospects

There will continue to be biodiversity losses due to dominance of introduced honeysuckles. Control in some areas may facilitate other invasive plants. As with some other invasives it is anticipated that problems with these honeysuckles



Figure 14: Some non-native bush honeysuckle flowers turn yellow with age. Photo by A. Gould (CC BY-NC 2.0).

will become more critical and they will expand northward. There seems little doubt climate change will increase the occurrence of Maack's Honeysuckle in southern Canada and human health issues with the Lone Star tick will likely expand with it. If the past is any indication, we will not understand the environmental impacts very well.

Believe it or not

- 30% of cats react to wood from Honeysuckle (*Lonicera tatarica*) as they do to catnip (*Nepeta cataria*) and they go crazy.
- *Notable quotes:* "All natural resource agencies know these honeysuckle species are being discouraged, yet I still see many gardeners online selling them. Guess it's all about the money". "Ideally these species should no longer be sold in North America". "Spring and summer wildflowers are just annihilated".
- The "Honeysuckle Popper" (aka "Shrub Buster") is a very strong lever tool that uses the power of an 8:1 leverage advantage to remove shrubs.
- A pamphlet from Minnesota called "The Curse of the Bush Honesuckles" has a very clever old comic style cover with a screaming lady surrounded by *L. maackii*. Does the Iron Man save her? One has to read on!
- The scent of honeysuckle is said to clear the mind, stimulate psychic powers, sharpen intuition, encourage psychic dreams, sweeten any mood and stimulate generosity. So how much do we want to control?

Selected References

Allan, B.F., H.P. Dutra, L.S. Goessling, K. Barnett, J.M. Chase, R.J. Marquis, G.C. Pang, G.A. Storch, R.E. Thach and J.L. Orrock. 2010. Invasive honeysuckle eradication reduces tick-borne disease risk by altering host dynamics. *Proceedings of the National Academy of Sciences* 107(43): 18523-18527.

Barron, J.R. and H.E., Bisdee. 1984. Hymenopterous parasites with lepidopterous and sawfly hosts on *Lonicera*

(Honeysuckle in the Ottawa area. *Canadian Entomologist* 116: 1345-1356.

Bartuszevige, A.M. and D.L. Gorchov. 2006. Avian seed dispersal of an invasive shrub. *Biological Invasions* 8(5): 1013-1022.

Batcher, M.S. and S.A. Stiles. 2005. Element stewardship abstract for *Lonicera maackii* (Rupr.) Maxim (Amur honeysuckle), *Lonicera morrowii* A. Gray (Morrow's honeysuckle), *Lonicera tatarica* L. (Tatarian honeysuckle), *Lonicera x bella* Zabel (Bell's honeysuckle). The bush honeysuckles. The Nature Conservancy.

Boyce, R.L., S.N. Brossart, L.A. Bryant, L.A. Fehrenbach, R. Hetzer, J.E. Holt, B. Parr, Z. Poynter, C. Schumacher, S.N. Stonebraker, M.D. Thatcher, and M. Vater. 2014. The beginning of the end? Extensive dieback of an open-grown Amur honeysuckle stand in northern Kentucky, USA. *Biological Invasions*. 16(10): 2017-2023.

Coleur, M.H., J.L. Vankat, and M.R. Huches. 2002. Diminished plant richness and abundance below *Lonicera maackii*, an invasive shrub. *American Midland Naturalist* 147: 60-71.

Gleditsch, J.M. and T.A. Carlo. 2014. Living with aliens: Effects of invasive shrub Honeysuckles on avian nesting. *PLoS One* 9(9): e107120.

Gould, A.M.A. and D.L. Gorchov. 2000. Effects of the exotic invasive shrub *Lonicera maackii* on the survival and fecundity of three species of native annuals. *American Midland Naturalist*. 144: 36-50.

Hartman, K.M. and B.C. McCarthy. 2008. Changes in forest structure and species composition following invasion by a non-indigenous shrub, Amur honeysuckle (*Lonicera maackii*). *Journal of the Torrey Botanical Society* 135(2): 245-259.

Hummer, K.E. 2006. Blue honeysuckle: A new berry crop for North America. *Journal American Pomological Society* 60(1): 3-8.

Hutchinson, T.F., and J.L. Vankat. 1997. Invasibility and effects of Amur honeysuckle in southwestern Ohio forests. *Conservation Biology* 11(5): 1117-1124.

Ingold, J.L., and M.J. Craycraft. 1983. Avian frugivory on honeysuckle (*Lonicera*) in southwestern Ohio in fall. *Ohio Journal of Science* 83(5): 256-258.

Larson, B.M.H., P.M. Catling and G.E. Waldron. 2007. The biology of Canadian weeds. 135. *Lonicera japonica* Thunb. *Can. J. Plant Sci.* 87(2): 423-438.

Lieurance, D. and D. Cipollini. 2012. Damage levels from arthropod herbivores on *Lonicera maackii* suggest enemy release in its introduced range. *Biological Invasions*. 14(4): 863-873.

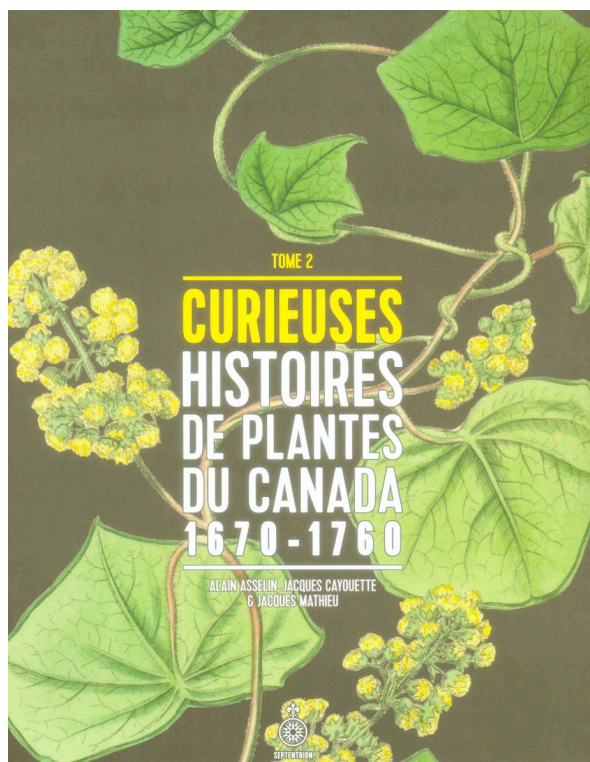
Luken, J.O. 2003. The invasion of Amur honeysuckle (*Lonicera maackii*; Caprifoliaceae): A chronicle of questions. *Journal of the Kentucky Academy of Science* 64(2): 97-99.

Luken, J.O., and J.W. Thieret. 1995. Amur honeysuckle (*Lonicera maackii* Caprifoliaceae): its ascent, decline, and fall. *Sida* 16: 479-503.

Luken, J.O., and J.W. Thieret. 1996. Amur honeysuckle, its fall from grace. *BioScience* 46(1): 18-24.

- Madritch, M.D. and R.L. Lindroth. 2009. Removal of invasive shrubs reduces exotic earthworm populations. *Biological Invasions* 11(3): 663-671.
- McEvoy, N.L., and R.D. Durtsche. 2003. The effect of invasive plant species on the biodiversity of herpetofauna at the Cincinnati Nature Centre. *Norse Scientist* 1(1): 51-56.
- McEvoy, N.L., and R.D. Durtsche. 2004. Effect of the invasive shrub *Lonicera maackii* (Caprifoliaceae; Amur honeysuckle) on autumn herpetofauna biodiversity. *Journal of the Kentucky Academy of Science* 65(1): 27-32.
- McEwan, R.W., L.G. Arthur-Paratley, and L.K. Rieske. 2010. A multi-assay comparison of seed germination inhibition by *Lonicera maackii* and co-occurring native shrubs. *Flora - Morphology, Distribution, Functional Ecology of Plants* 205(7): 475-483.
- McEwan, R.W., M.A. Arthur, and S.E. Alverson. 2012. Throughfall chemistry and soil nutrient effects of the invasive shrub *Lonicera maackii* in deciduous forests. *American Midland Naturalist* 168(1): 43-55.
- McKinney, A.M., and K. Goodell. 2011. Plant-pollinator interactions between an invasive and native plant vary between sites with different flowering phenology. *Plant Ecology* 212(6): 1025-1035.
- Miller, K.E., and D.L. Gorchov. 2004. The invasive shrub, *Lonicera maackii*, reduces growth and fecundity of perennial forest herbs. *Oecologia* 139(3): 359-375.
- Nyboer, R. 1992. Vegetation Management Guideline: Bush Honeysuckles- Tatarian, Morrow's, Bell's, and Amur Honeysuckle (*Lonicera tatarica* L., *L. morrowii* Gray, *L. x bella* Zabel, and *L. maackii* [Rupr.] Maxim.) *Natural Areas Journal* 12(4): 218-219.
- Pringle, J.S. 1973. *Lonicera maackii* (Caprifoliaceae) adventive in Ontario. *Canadian Field-Naturalist* 87(1): 54-55.
- Rehder, A. 1940. *A Manual of Cultivated Trees and Shrubs*, second edition. MacMillan Publishing Company, New York: 996 pp.
- Rehder, A. 1903. Synopsis of the genus *Lonicera*. *Missouri Botanical Garden Annual Report* 14: 27-232.
- Rehder, A. 1937. *Manual of cultivated trees and shrubs hardy in America*. MacMillan Co., New York, 930 pp.
- Rich, R. 2000. Non-native Bush Honeysuckles: Invasive *Lonicera* species in the Midwest. *Restoration and Reclamation Review*. 6 (5)
- Schmidt, K.A. and C.J. Whelan. 1999. Effects of exotic *Lonicera* and *Rhamnus* on songbird nest predation. *Conservation Biology* 13(6): 1502-1506.
- Swink, F. and G. Wilhelm. 1994. *Plants of the Chicago region*, 4th ed. Indiana Academy of Science for Morton Arboretum, Indianapolis, Indiana. xiv + 921 pp.
- Tassie, Danielle and Sherman, Kellie. 2014. Invasive Honeysuckles (*Lonicera* spp.) Best Management Practices in Ontario. Ontario Invasive Plant Council, Peterborough, ON. www.invadingspecies.com/download/Guides/Best%20Management%20Practices%20in%20Ontario/OIPC_BMP_Honeysuckle_Feb182014_FINAL2.pdf.
- Todd, R. 1985. Honeysuckle controlled by hand pulling. *Restoration and Management Notes* 3(1): 41.
- Trisel, D.E. 1997. The invasive shrub, *Lonicera maackii* (Rupr.) Herder (Caprifoliaceae): factors contributing to its success and its effect on native species. Ph. D. Miami University, Ohio. 200 pp.
- Tu, M., and J.M. Randall. 2000. *L. maackii*, *L. morrowii*, *Lonicera tatarica*, and *L. x bella*, - the bush honeysuckles, - Element Stewardship Abstract, The Nature Conservancy. Arlington. 11 pp.
- Vellend, M. 2002. A pest and an invader: White-tailed deer (*Odocoileus virginianus* Zimm.) as a seed dispersal agent for honeysuckle shrubs (*Lonicera* L.). *Natural Areas Journal* 22(3): 230-234.
- Voegtlin, D., and M.B. Stoetzel. 1998. *Hyadaphis tataricea* (Homoptera: Aphididae): 10 years after its introduction into North America. *Proceedings of the Entomological Society of Washington* 90(2): 256-257.
- Williams, C.E., J.J. Ralley, and D.H. Taylor. 1992. Consumption of seeds of the invasive Amur honeysuckle, *Lonicera maackii* (Rupr.) Maxim., by small mammals. *Natural Areas Journal* 12(2): 86-89.
- Witmer, M. 1996. Consequences of an alien shrub on the plumage coloration and ecology of cedar waxwings. *The Auk* 113(4): 735-743.
- Woods, K.D. 1993. Effects of invasion by *Lonicera tatarica* L. on herbs and tree seedlings in four New England forests. *American Midland Naturalist* 130(1): 62-74.

PLANTES DU CANADA ET LEURS USAGES: UNE INVESTIGATION HISTORIQUE ET SCIENTIFIQUE QUI SE POURSUIT



Curieuses histoires de plantes du Canada, tome 2, 1670-1760
Alain Asselin, Jacques Cayouette et Jacques Mathieu.

2015, 328 pages, Français

Les éditions du Septentrion, Québec, Canada.

ISBN papier: 978-2-89448-831-7 49,95\$

ISBN PDF: 978-2-89664-935-8 36,99\$

www.septentrion.qc.ca

Courriel: sept@septentrion.qc.ca

Télécopieur (Septentrion): 418-527-4978

Les connaissances historiques sur les plantes du Canada et leurs usages font partie du patrimoine culturel et scientifique nord-américain. Dans le premier tome de *Curieuses histoires de plantes du Canada**, publié en 2014, vingt et une histoires de découvertes et d'usages de plantes d'Amérique du Nord ont été présentées de façon chronologique, documentée et vulgarisée. Ces histoires, enrichies d'illustrations à saveur historique et d'encadrés détaillant des informations complémentaires, ont débuté avec l'exploration des Vikings à Terre-Neuve vers l'an mille pour se terminer avec la décennie 1670 en Nouvelle-France. Dans le tome 2, publié en novembre 2015, près d'une trentaine d'histoires se poursuivent selon la même présentation jusqu'à la fin du Régime français en 1760. Au long de ces chapitres, des explorateurs, des missionnaires, des militaires, des administrateurs, des savants, des médecins, des chirurgiens, des apothicaires, des religieuses et des botanistes font mention de divers usages de plantes alimentaires, médicinales, tinctoriales, ornementales, rituelles, sans oublier des espèces utilisées pour leurs fibres textiles. Comme pour le premier tome, le livre est destiné au grand public curieux d'histoire, de sciences naturelles et de l'évolution des sciences, comme la botanique, la médecine et la pharmacie.

Le tome 1 a été choisi comme finaliste aux Prix littéraires du Gouverneur général 2015 (section essais) et a reçu le Prix Marcel-Couture 2015 au Salon du livre de Montréal.

Les auteurs

Alain Asselin est professeur à la retraite du Département de Phytologie de la Faculté des sciences de l'agriculture et de l'alimentation de l'Université Laval. Il a publié de nombreux articles scientifiques dans divers domaines des sciences des plantes.

Jacques Cayouette est botaniste et chercheur à Agriculture et Agroalimentaire Canada à Ottawa depuis 1984. Il a participé à la troisième édition de la Flore laurentienne et aux projets *Flora of North America* et *Flore nordique du Québec et du Labrador*. Il a publié *À la découverte du Nord. Deux siècles et demi d'exploration de la flore nordique du Québec et du Labrador* (MultiMondes, 2014).

Jacques Mathieu est professeur émérite de l'Université Laval. Son domaine d'expertise est l'histoire de la Nouvelle-France et les études multidisciplinaires. Il a publié une vingtaine de volumes. En 2014, il a reçu le prix du Québec Gérard-Morisset pour sa contribution à la connaissance du patrimoine culturel.

CANADIAN PLANTS AND THEIR USES: AN ONGOING HISTORICAL AND SCIENTIFIC INVESTIGATION

Historical knowledge of Canadian plants and their uses is part of North American cultural and scientific heritage. In the first volume of *Curieuses histoires de plantes du Canada*,* published in 2014, twenty-one stories about North American plant discoveries and uses are presented chronologically, in non-technical language, with supporting references. Rich historical illustrations and text boxes with complementary information accompany these accounts, which begin with the Viking explorations in Newfoundland around the year 1000 and end in New France during the 1670s. The second volume, Tome 2, published in November 2015, contains nearly thirty stories, similarly presented, which cover the period up until the end of the French Regime in 1760. In these accounts, explorers, missionaries, soldiers, administrators, scholars, physicians, surgeons, apothecaries, nuns and botanists describe a variety of uses for plants—dietary, medicinal, tinctorial, ornamental and ceremonial—and mention specific plant species that were collected to obtain textile fibres. As with the first volume, Tome 2 is intended for members of the general public with an interest in history, natural science and the evolution of branches of science such as botany, medicine and pharmacy.

Tome 1 was shortlisted for the 2015 Governor General's Literary Awards (non-fiction category) and received the Prix Marcel-Couture 2015 at the Salon du livre de Montréal.

The authors

Alain Asselin is a retired professor in the Plant Science Department of the Faculty of Agriculture and Food Science at Université Laval. He has published numerous scientific articles in various fields of plant science.

Jacques Cayouette is a botanist and researcher who has worked for Agriculture and Agri-Food Canada in Ottawa since 1984. He contributed to the third edition of the book *Flore laurentienne* and to two other book projects, *Flora of North America* and *Flore nordique du Québec et du Labrador*. Mr. Cayouette is the author of *À la découverte du Nord : Deux siècles et demi d'exploration de la flore nordique du Québec et du Labrador* (MultiMondes, 2014).

Jacques Mathieu is a historian and professor emeritus at Université Laval with expertise in the history of New France and multidisciplinary studies. He has authored about 20 books. In 2014, Mr. Mathieu received a Government of Quebec award, the Prix Gérard-Morisset, for his contribution to promoting knowledge of Quebec's cultural heritage.



IDENTIFICATION WORKSHOPS

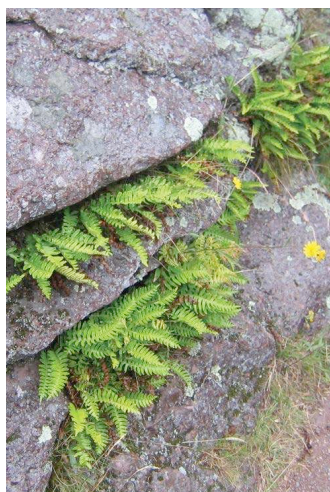
For conservation and environmental professionals, ecologists, and horticulturists

Courses are also suitable for graduate students, amateur botanists and master gardeners. Through illustrated lectures and hands-on practical sessions, Royal Botanical Gardens' botanists and visiting scientists demonstrate key identification characteristics and share their expert tips for identification.

SPRING HAWTHORN IDENTIFICATION

Thursday and Friday, June 2 and 3;
9:30 a.m. to 4:30 p.m. at RBG Centre.
Fee: \$275 (RBG members: \$250;
Students: \$200)
MAXIMUM 20.
PRE-REGISTER BY MAY 24.

Ontario hawthorns (*Rosaceae*, *Crataegus* L.) present field botanists with a challenge: they look almost alike, and making an identification usually requires information from both flowering and fruiting specimens. This workshop places the Ontario species of *Crataegus* in the context of the genus as a whole, and suggests what features need to be examined in order to be able to make an identification using the just-published treatment of the genus in *Flora North America* (Phipps 2015). Instructors: Timothy Dickinson, senior curator emeritus, Royal Ontario Museum Green Plant Herbarium, and Nadia Talent, research associate, Royal Ontario Museum Green Plant Herbarium.



FERNS AND ALLIES

Thursday and Friday,
August 11 and 12;
9:30 a.m. to 4:30 p.m. at RBG Centre.
Fee: \$275 (RBG members: \$250;
Students: \$200)
MAXIMUM 20.
PRE-REGISTER BY AUGUST 3.

Are you interested in learning how to identify ferns, horsetails, lycopods and other pteridophytes in southern Ontario? Join us for an intensive two-day, hands-on workshop with Dr. Jim Pringle and Nadia Cavallin. Over the two days, participants learn about the unique life cycles of ferns and are introduced to their unique botanical morphology and terminology in a classroom and during field visits to nearby natural areas. Participants gain valuable field recognition skills and practice keying out species in the classroom. Ecological niches and habitat specificity are also covered. Be prepared to go out in all weather conditions. Bring along your hand lenses, field guides or botanical keys, and even your mystery specimens! Bring your lunch.



ASTERS & GOLDENRODS IDENTIFICATION WORKSHOP

Thursday and Friday,
September 15 and 16;
9:30 a.m. to 4:30 p.m. at RBG Centre.
Fee: \$275 (RBG members: \$250;
Students: \$200)
MAXIMUM 20.
PRE-REGISTER BY SEPTEMBER 7.

Are you ready to take on the challenge of identifying asters and goldenrods? Join us for an intensive two-day, hands-on workshop with Dr. Jim Pringle and Nadia Cavallin. Over the two days, the unique botanical morphology and associated terminology specific to the aster and goldenrod groups are introduced and illustrated in both a classroom setting and during field visits to RBG's nature sanctuaries and nearby natural areas. Participants gain valuable field recognition skills and practice keying out species in the classroom using appropriate magnification. Both fresh and pressed specimens are examined. Ecological niches, habitat specificity, population ranges and distribution are also covered for a variety of aster and goldenrod species in southern Ontario. Be prepared to go out in all weather conditions. Bring along your hand lenses, field guides or botanical keys and even your mystery specimens! Bring your lunch.

**FULL COURSE INFORMATION AT: www.rbg.ca/plantidentification
REGISTER: <http://tickets.rbg.ca/PEO> or 905-527-1158 ext. 270**