

Contents
Table des matières

CBA/ABC 40th ANNUAL MEETING
David Punter
page 17

President's Message
Mot de la présidente
Liette Vasseur
page 18

Obituary / Nécrologie
J. Stan Rowe (1918-2004)
and his Manifesto
Ted Mosquin
page 19

Paper / Article



Poorly Known Economic
Plants of Canada - 41.
American elder (*Sambucus nigra*
subsp. *canadensis* (L.) R. Bolli)
and blue elderberry
(*S. nigra* subsp. *cerulea* (Raf.) R. Bolli)
E. Small, P.M. Catling, and C. Richer
pages 20-28

The Bulletin Over the Years
Les époques du Bulletin
The Editor / Le rédacteur
page 29

Book Review / Revue de livre
James B. Phipps:
Hawthorns and Medlars.
Tim A. Dickinson
pages 30-31

NEWS from Sections
NOUVELLES des sections

Teaching Section
Christine Maxwell
page 32

Ecology Section
Dianne Fahselt
page 32

The Canadian Botanical Association Bulletin



Bulletin de l'Association botanique du Canada

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CBA/ABC 40th ANNUAL MEETING WINNIPEG, Manitoba, 26-30 June 2004

There is still time to register for the **40th Anniversary Meeting of CBA/ABC** and celebrate the **centenary of the Department of Botany at the University of Manitoba**.

The program has something for all tastes. **Dr. Spencer Barrett** will be giving the Annals of Botany Invited Lecture on '*The Evolution of Combined and Separate Sexes in Plants*', **Dr. Nik Money** will deliver the Weresub Lecture entitled '*The Odd Couple: A Mycological Romance in Three Acts*', and **Dr. Jennifer Shay** at the banquet will remind us of our CBA heritage. There are **symposia** on '*Microfungi from roots - pathogens or symbionts?*', '*A new look at fungi*', and '*Invasive Plants*'; a **panel discussion** and open forum organized by the Teaching section, '*Turning teachers and students on to Plants*'; an **NSERC Workshop** on '*How to prepare a Discovery Grant application*'; a **workshop** on Invasive Plants and many other activities lined up for you. In addition to the symposia we have received abstracts for 35 oral presentations and 22 posters. You will also have an opportunity to see our recently renovated and expanded herbarium and an exhibit of archival materials commemorating the centenary of appointment of **Prof. A.H. Reginald Buller**.

The tall-grass prairie field trip is well supported but we need more to sign up for the others to be viable.

INFORMATION ON REGISTRATION AND ACCOMMODATION IS AVAILABLE AT:
http://www.umanitoba.ca/faculties/science/botany/faculty_staff/markham/CBA/index.html
or through a link at <http://www.uoguelph.ca/botany/cba/>

The Local Arrangements Committee looks forward to welcoming you in June.

AUCTION REMINDER

Dr. Hugues Massicotte will, once again, entertain us after the banquet with his skills as an auctioneer. We have some original art and books but he will need other attractive and exotic items to sell. Please dig through your possessions for any books, photographs, botanical memorabilia, art or crafts that might be of interest. Donations can be dropped off at the registration desk on arrival. Rest assured that the proceeds will go to a good botanical cause.

David Punter, CBA Vice-president and Organizer of the 2004 Meeting

Canadian Botanical Association



Bulletin

The CBA Bulletin is issued quarterly (in theory in March, June, September, and December) and sent to all CBA members. Comments or suggestions about the Bulletin should be directed to the Editor at the address below.

Information for submitting texts

Texts and illustrations for the Bulletin should preferably be sent to the Editor as electronic documents, nevertheless any medium is acceptable. Any format for texts or illustrations are welcome. Please make sure that scanned illustrations are done with a very good resolution. The pictures should be made available separately from the text. If you have any question about text submission, please contact the Editor.

For general info on CBA, go to the web site: <http://www.uoguelph.ca/botany/cba/>

Association botanique du Canada



Bulletin

Le Bulletin de l'ABC paraît quatre fois par année, normalement en mars, juin, septembre et décembre. Il est envoyé à tous les membres de l'ABC. Tout commentaire concernant le bulletin est apprécié par le rédacteur.

Directives aux contributeurs

Les textes et les images sont de préférence envoyés sous forme électronique, néanmoins, tous les supports de même que tous les formats imaginables sont acceptables. Les fichiers graphiques doivent être de très bonne définition et disponibles indépendamment du texte. N'hésitez pas à contacter le rédacteur pour toute information.

Infos générales sur l'ABC à l'url suivant: <http://www.uoguelph.ca/botany/cba/>

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Next issue / Prochain numéro

Texts for the next issue, 37(3), must be received before August 1st, 2004.

La date de tombée des textes du prochain numéro, le no 37(3), est le 1^{er} août 2004.

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President's Message

Dear members :

Another academic year is completed and with the spring comes the preparation of the CBA annual meeting. It is my last months as president of the CBA and I am confident that the work of the association will be on good hands with the new president to come, Vipen Sawhney. The CBA has been active in the past years in many issues from showing interests in biodiversity and invasive species to the establishment of regional undergraduate awards. Although this has not brought many actions for the first year, I believe that with more promotion, these regional awards should help encourage students pursuing research in Botany.

This spring unfortunately has also brought sad news, as many of you are probably aware. We lost one of our great contributions of the CBA and Canadian botanist, J. Stan Rowe. Professor Rowe contributed to the advancement of ecology in Canada and encouraged plant ecologists to join the CBA. He was the first chairman of the Ecological section of the CBA. The Ecology Award given annually to the best student paper in plant ecology was named after him to honour his contributions. In this issue of the Bulletin, there is a short manifesto that several of you might have seen. It represents his statement of conviction. Professor Rowe will never be forgotten by the CBA.

I again remind you that the CBA annual meeting will be in Winnipeg this June and we will be able to celebrate our 40th anniversary. Please contact David Punter or visit the web page at http://www.umanitoba.ca/faculties/science/botany/faculty_staff/markham/CBA for more information. Finally, I would like to thank all of you, especially the Board of Directors and the Section and Committee Chairs for the support that you have given to the association over the past two years. It represents the vitality of the association and the accomplishments that we can bring as a group.

I am looking forward to seeing you in Winnipeg.

Liette Vasseur, CBA President

Message de la présidente

Chers membres,

Une autre année universitaire qui s'achève et avec le printemps vient la préparation du congrès annuel de l'ABC. Il s'agit aussi de mes derniers mois en tant que présidente de l'ABC. Je suis confiante que le travail de l'association sera entre bonnes mains avec le nouveau président, Vipen Sawhney. L'ABC a été très active durant les dernières années sur plusieurs enjeux allant des discussions sur l'avenir de l'agenda scientifique en biodiversité au Canada à la création des prix régionaux pour les présentations par des étudiants de premier cycle. Bien que ces prix n'aient pas encore trop suscité d'activité durant cette première année, avec un peu plus d'encouragement il est à espérer que cela permettra de favoriser de nouvelles candidatures aux études graduées en botanique au Canada.

Ce printemps, nous avons reçu malheureusement la triste nouvelle du décès de J. Stan Rowe. Nous perdons en lui une personne qui a grandement contribué à l'avancement de l'écologie végétale au Canada et au rayonnement de l'ABC, par exemple en étant le premier directeur de la section Écologie de l'association. Le prix en écologie donné pour la meilleure publication étudiante a été nommé en son honneur à cause de ses contributions. Dans ce numéro, il y a un court manifeste que plusieurs d'entre vous ont déjà reçu. Le Professeur Rowe ne sera jamais oublié par l'ABC.

J'aimerais encore vous rappeler que le congrès annuel de l'ABC se tiendra à Winnipeg en juin et nous célébrerons notre 40^e anniversaire. Je vous prie de contacter David Punter ou visiter la page web http://www.umanitoba.ca/faculties/science/botany/faculty_staff/markham/CBA pour plus amples informations. Finalement, j'aimerais remercier tout le monde, et tout particulièrement le Bureau de direction et les responsables des sections et des comités pour leur support et leurs efforts démontrés envers l'association au cours de ces deux années. Cela représente bien la vitalité de l'ABC et les résultats sont des plus encourageants.

J'ai bien hâte de vous voir à Winnipeg.

Liette Vasseur, Présidente de l'ABC

J. Stan ROWE (1918-2004) and his Manifesto

Dear Friends, fellow Ecologists, Philosophers, Environmentalists, Ethicists, Naturalists:

More than 3 weeks after suffering a massive stroke, Stan Rowe, ecologist and environmental ethicist, long time friend and supporter of environmental causes, died at 3:15 a.m on April 6th in New Denver, B.C. He was 85 years old. There was a deep sense of peace in his hospital room, as there had been for much of the preceding couple of weeks. Stan's partner Katherine and son John were with him. He was bathed in the light of a full moon, surrounded by love.

His passing is an indescribable loss to his family and many friends and to people working to curb the destruction of the Earth, its ecosystems and species. Just a couple of days before the stroke, Stan had the satisfaction of seeing in print the unique article 'A Manifesto for Earth' as published in the quarterly "Biodiversity, Journal of Life on Earth." The Manifesto was the culmination of a two year project that I was fortunate to have worked on with him. Stan's superlative literary skills shine through in the Manifesto...which is now available on the internet. Several magazines/journals have indicated their intent to publish it. One of these, "The Structurist," is a quality academic journal published at the Univ. Of Saskatchewan and where the Manifesto is in the final proof stage.

The 'Manifesto for Earth' is unique among Charters, Proclamations and the like in that it describes a thoroughly ecocentric worldview, as implied by the title. It runs to 3100 words and has the following structure:

- Preamble
- Statement of Conviction
- Core Principles
 - Principle 1. The Ecosphere is the Center of Value for Humanity
 - Principle 2. The Creativity and Productivity of Earth's Ecosystems Depend on their Integrity
 - Principle 3. The Earth-centered Worldview is supported by Natural History
 - Principle 4. Ecocentric Ethics are Grounded in Awareness of our Place in Nature
 - Principle 5. An Ecocentric Worldview Values Diversity of Ecosystems and Cultures
 - Principle 6. Ecocentric Ethics Support Social Justice
- Action Principles (duties flowing from the above)
 - Principle 7. Defend and Preserve Earth's Creative Potential
 - Principle 8. Reduce Human Population Size
 - Principle 9. Reduce Human Consumption of Earth Parts
 - Principle 10. Promote Ecocentric Governance
 - Principle 11. Spread the Message

The Manifesto can be found at:

- 1) Html (text only) file at: <<http://www.ecospherics.net/pages/EarthManifesto.html>> (50 Kb).
- 2) Pdf (illustrated) file at: <<http://www.ecospherics.net/pages/EarthManifesto.pdf>> (2.5 Mb). To open this file one needs to have Adobe Reader 5.0 or 6.0 installed. This file is the one that appears in the quarterly journal Biodiversity published some weeks ago. You can print it out on a regular inkjet or laserjet printer, but if you want a colour version (best) you will need a colour inkjet or colour laser printer. The pdf version has a photo of Stan and Katherine on Mt. Idaho with Slocan Lake and the Valhallas in the horizon.
- 3) Editorial comment on the Manifesto by John A. Livingston: <<http://www.ecospherics.net/pages/LIVINGSTONED.htm>> (15 kb).

The Manifesto was a summation of Stan's thoughts on reframing humankind's relationship with the Earth. More facets to those views will appear in a book Stan was asked to write that would follow up on the ideas raised in Home Place. The book was nearing completion when he had his stroke. We will let you know when it is published.

Some readers know of some magazines, journals, or newsletters whose editor might be interested in printing the Manifesto. I would appreciate pointers. As well, please feel free to distribute this text to friends and colleagues.

Ted Mosquin

Box 279, Lanark, Ontario K0G 1K0 CANADA
Anthology of Ecospheric Ethics <<http://www.ecospherics.net>>
A Manifesto for Earth (3 files at: <<http://www.ecospherics.net>>)

Poorly Known Economic Plants of Canada - 41.

American elder (*Sambucus nigra* subsp. *canadensis* (L.) R. Bolli) and blue elderberry (*S. nigra* subsp. *cerulea* (Raf.) R. Bolli).

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Although common, well-known, and enthusiastically consumed by animals, elderberries are not often eaten by people. However, they can be processed into important products for the growing health food industry, and the plants are valuable in landscape protection and rehabilitation. Despite its humble position in the food hierarchy, the elder may be a diamond in the rough, just waiting to be developed.

Latin Names

Sambucus nigra L. subsp. *canadensis* (L.) R. Bolli
(recognized as the species *S. canadensis* L. in most literature, but increasingly treated as a subspecies)
S. nigra subsp. *cerulea* (Raf.) R. Bolli
(recognized as the species *S. cerulea* Raf. in most literature, but increasingly treated as a subspecies).

The subspecific epithet is spelled two ways (*caerulea* and *cerulea*) with approximately equal frequency. *Caerulea* is the classical Latin word for blue (in the words of W.T. Stearn's Botanical Latin, "especially the deep blue of the Mediterranean sky at midday.") Rafinesque (in *Alsographia americana*, or an American grove of new or revised trees and shrubs of the genera *Myrica*, *Calycanthus*, *Salix*..., published in 1838) originally used the spelling *cerulea*. Although *cerulea* is not correct Latin, the available evidence suggests that Rafinesque may have intended this spelling, and consequently it is retained according to the International Code of Botanical Nomenclature.

The genus name *Sambucus* is derived from the classical Latin *sambucus*, the name of the plant, and more distantly from the Greek *sambuca* or *sambuce*. It has been contended that these ancient names were based on the sackbut, an archaic stringed musical instrument, much used among the classical Romans, and allegedly made of wood of the European elder. Coincidentally, elder branches are easily made into tubes, and have been used since ancient times to manufacture wind instruments such as flutes and whistles. As a result, the sackbut is sometimes incorrectly thought to be a wind instrument. *Nigra* in the scientific name of the species means black.

English Names

Sambucus nigra subsp. *canadensis*: American elder, blackberry elder, Canadian elder, common elder, common elderberry, elderberry, elder-blow, pie elder, sweet elder
Sambucus nigra subsp. *cerulea*: blue elderberry, blue elder,

blueberry elder, Arizona elderberry, New Mexican elderberry, velvet-leaf elder, hairy blue elderberry

The name "elder" comes from the Old English *aeld* and several variants of this. *Aeld* meant "fire," the name associated with the elder apparently because the pith of the young elder branches was removed and the tubes thus formed were used to blow up fires.

"Poison elder" is *Rhus vernix* L. [*Toxicodendron vernix* (L.) Kuntze, *R. venenata* DC.]. This is not an elder, but rather a relative of poison ivy, which is also called swamp sumach, poison ash, poison dogwood, and poison sumac. It occurs in swamps from Canada to the southern United States, and causes severe rashes.

French Names

Sambucus nigra subsp. *canadensis*: sureau du Canada, sureau blanc, sirop blanc
Sambucus nigra subsp. *cerulea*: sureau bleu

Morphology

The American elder and blue elderberry are deciduous shrubs, generally 1-4 m in height in Canada. In the southern portion of the range of American elder, in the United States, the plants can grow as tall as 9 m, and in Florida they have been reported to be evergreen. Both subspecies have large, opposite, pinnately compound leaves with 5-11 (typically 7) leaflets with sharply serrate margins. Their stems are soft or only slightly woody with a large white pith, and the main stems often cluster close together, arising from the base of the plant and arching outwards. The plants are stoloniferous and form thickets. The flowers in wild plants of both subspecies are usually white or cream, small, and very numerous in flat or slightly rounded clusters. The berries are small, about 4-6 mm in diameter, globose, juicy, with four (sometimes three or five) tan to yellowish prominent seeds. The berries are borne on broad, drooping clusters. The two native Canadian subspecies are distinguished in the key, below.

Classification and Geography

The genus *Sambucus* (Caprifoliaceae, honeysuckle family) includes about two dozen species, found particularly in the temperate regions of the world. In addition to the American elder and blue elderberry, the European elder (*S. nigra* subsp. *nigra*) grows widely throughout Europe, as well as in North Africa and western Asia. It is a large shrub or tree to



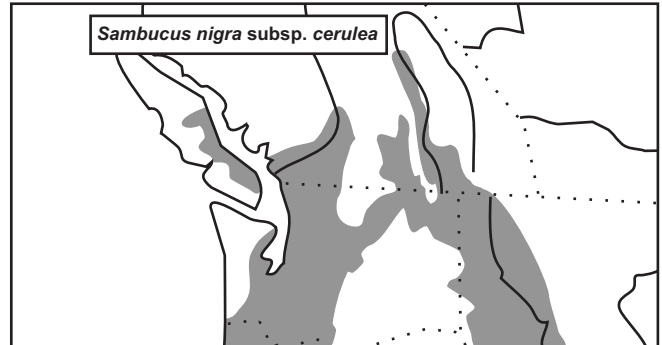
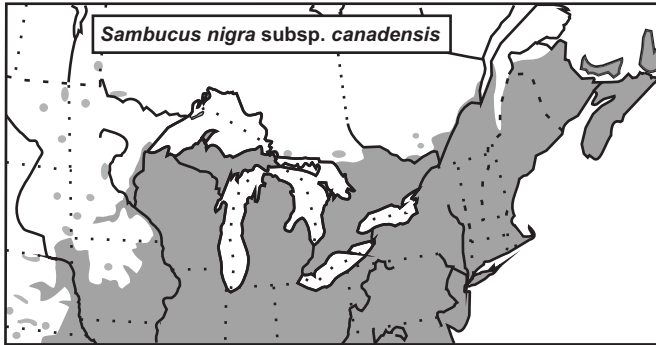
American elder (Sambucus nigra subsp. canadensis). Source: Bailey, L.H. (Editor). 1902. *Cyclopedia of American horticulture*. Virtue & Company, Toronto, Canada. Vol. 2.

10 m (33 feet) in height, differing most obviously from American elder by often growing into a tree, and tending not to develop numerous stems at the base.

The American elder is native to eastern and central North America, east of the Rocky Mountains, ranging from Nova Scotia south to Florida and west to Manitoba and Texas. Blue elderberry is native to western North America, from southern British Columbia south to California, Arizona, and New Mexico.

Hybrids of *S. racemosa* L. subsp. *pubens* (Michx.) House and *S. nigra* subsp. *cerulea* have been reported, and hybridization may be more widespread in the genus than is realized.

Young growth of elders could be confused with water hemlock (*Cicuta maculata* L.), but elders are distinguishable by their opposite leaves.



Key to Canadian taxa of *Sambucus*¹

1. Pith tan or orange-brown (on branches 1 or more years old); inflorescence pyramidal or elongate
 - *Sambucus racemosa* L. subsp. *pubens* (Michx.) House
 - 2. Fruits black or purplish-black; nutlets wrinkled or pebblyvar. *melanocarpa* (A. Gray) McMinn
(black elder - much of Canada, less often in and west of Coast-Cascade Mountains)
 - 2. Fruits red, yellow or white; nutlets more or less smooth
 - 3. Nutlets mostly smooth; plants 2-6 m tall.....var. *arborescens* (Torr. & A. Gray) A. Gray
(coastal red elder - British Columbia, mostly in and west of Coast-Cascade Mountains)
 - 3. Nutlets slightly wrinkled or pebbly; plants 0.5-3 m tallvar. *leucocarpa* (Torr. & A. Gray) Cronq.
(eastern red elder - throughout much of Canada)
1. Pith white (on branches one or more years old); inflorescence flat-topped
 - 4. Stems herbaceous, less than 1 m tall; lowest pair of leaflets close to the branch and stipule-like
.....*Sambucus ebulus* L.
(dwarf elder - Eurasian, introduced in eastern Canada)
 - 4. Stems woody, usually more than 1 m tall; lowest pair of leaflets not close to the branch and not stipule-like
 - 5. Leaflets mostly 5 (3-7); fruits black; second-year twigs with numerous lenticels; trees, not suckering from rhizomes..... *Sambucus nigra* L. subsp. *nigra*
(European elder - Eurasian, introduced in eastern Canada)
 - 5. Leaflets mostly 7 (5-11); fruit bluish or purplish-black; second-year twigs with few lenticels; shrubs, suckering from rhizomes
 - 6. Fresh fruit whitish-blue, non-lustrous (white powdery bloom over bluish-black); leaves finely serrate with 4-6 teeth per cm*Sambucus nigra* subsp. *cerulea* (Raf.) R. Bolli
(blue elderberry - southern British Columbia)
 - 6. Fresh fruit purplish-black, lustrous (without a white bloom); leaves coarsely serrate with 3-5 teeth per cm
..... *Sambucus nigra* subsp. *canadensis* (L.) R. Bolli
(American elder - eastern Canada west to southeastern Manitoba)

¹ Nomenclature and classification follow Integrated Taxonomic Information System (ITS), <http://www.itis.usda.gov/>



Blue elderberry (*Sambucus nigra* subsp. *cerulea*). Source: Sargent, C.S. 1893. *The silva of North America*. Houghton, Mifflin and Company, New York, NY. Vol. 5, plate 222.

Ecology

Both American elder and blue elderberry occur in successional, semi-open plant communities. Habitats include swamps, woodlands, roadsides, shrubby thickets, fencerows, and the edges of rivers and streams. Other habitats occupied are open montane forests, old fields, pastures, bogs, disturbed sites, and (occasionally) upland woods and forests. The plants prefer moist, well-drained, fertile soils but can tolerate very wet and droughty soils. Both taxa grow in sandy soils, heavy clays, peats, and muck. American elder tolerates a pH range of 5.5-7.5 (optimally 5.5-6.0). Neither subspecies grows well on saline soils. Both subspecies tolerate a wide range of climatic conditions. In the northern part of its range, American elder withstands winter temperatures down to -40°C, while in the southern part of its range summer temperatures are as high as 38°C and frost is rare. On the west coast of Canada, blue elderberry flowers in June, but further east in British Columbia it flowers in July. In Canada, American elder flowers in both June and July depending on location. Although full sun is preferred, American elder tolerates up to 2/3 shade. Both subspecies have a substantial tolerance of fire, resprouting readily from the root crown. Buried seed of blue elderberry germinates extensively in the first growing season following a fire.



Wild American elder (*Sambucus nigra* subsp. *canadensis*) in flower, photographed near St-Philippe, Quebec. Photograph from the collection of AAFC-St-Jean-sur-Richelieu.

Use as Food

The berries of several elder species are harvested, but the subspecies of *S. nigra* are most widely used as food. The European elder (*S. nigra* subsp. *nigra*) has been used since antiquity in Europe. American elder (*S. nigra* subsp. *canadensis*) is the main source of elderberries in North America. Blue elderberry (*S. nigra* subsp. *cerulea*) generally has larger and less acid fruit than American elder. Indigenous Peoples harvested elderberries long before the arrival of European settlers. Elderberry juice and preserves were often mainstays of rural pantries, and early settlers preserved them by drying. Elderberries have a sweet, slightly acid flavor, but are not suitable for use as an uncooked dessert fruit. At present, commercial cultivation is limited, and fruits are mostly harvested from the wild. Although the characteristic flavor is not universally appreciated, the fruit of the elderberry is especially popular for pies. Elderberries are also used for jams, jellies, juice, sauces, soups, chutney, and home-made wine. Wine from elderberries has often been used as an adulterant of fine wines and misrepresented as port. In 1747 the practice had reached such alarming proportion in Portugal that the cultivation of elders was forbidden. The purple-black fruits are highly regarded for coloring wines and jams. Commercially, elderberries are usually preserved frozen. Elderberries do not withstand shipment well because of their softness, and are most suitable for home-grown and local market purposes.

Almost a century ago, the idea was proposed that the objectionable taste of elderberries could be removed simply by drying them like raisins: "Many people are still ignorant of the fact that the berries of the common elder (*Sambucus canadensis*) make excellent pies. Others who have tasted so-called elderberry pie were inclined to call it a nauseating mixture. The trouble is not so much in the pie itself as in the way it is put together. Pies made of fresh elderberries are scarcely likely to appeal to many palates. The fruit still retains some of the rank elderly flavor possessed by the entire plant and made evident when the stem is broken; but if one will collect the berries when fully ripe and dry them in flat trays in the sun or in a warm oven he will have a cheap and appetizing material from which to manufacture pies all winter—and pies that are not inferior to huckleberry pies in flavor. The elderly flavor seems to be dissipated by drying." (W. N. Clute in *The American Botanist*, 1905. Cited in Fernald, M. L., A. C. Kinsey, and R. C. Rollins. 1958. *Edible wild plants of eastern North America*. Harper & Row, New York).

Several species of elder, notably *S. racemosa*, have the reputation of being poisonous, but the toxic potential is largely limited to the leaves, bark, roots, and seeds. The literature concerning edibility is often contradictory. The fruit of *S. racemosa* has been said to be poisonous, inedible, or edible and tasty. Possibly people differ in susceptibility, or races of the plant differ in chemistry, or both. Eating the fruit of *S. nigra* is safe, although uncooked berries are believed to cause nausea in some individuals. Occasional reports of people being poisoned by consuming elder may be due to mistaking poisonous species for elder species, or mixing leaves with the fruit. The leaves, stems, and especially the

roots of *S. racemosa* contain cyanogenic glycosides and alkaloids that cause nausea, vomiting, and diarrhea. Elder stems are often used by children for blow-guns, and chewing on these has been reported, rarely, to cause poisoning. As with the berries, elder flowers are used in preparing wines. Elder flowers are also occasionally fried in batter to make fritters. A colleague who prepared a dish of battered elder flowers reported that it produced diarrhea in several individuals who consumed it (to this day, flower extracts are sometimes employed in herbal medicine as a cure for constipation).

"Nutraceuticals," as the term is usually interpreted, refers to plant extracts with health-giving properties (e.g. cranberry extracts, currently used to treat urinary system infections). "Functional foods" are usually defined to mean conventional foods with health-giving properties (e.g. cranberry juice). Obviously these categories are closely linked. In some cases the health-giving materials are preferably consumed as an extract (e.g., when large quantities are required), whereas in other cases consumption of fresh material is preferable. In the case of elderberry, health benefits can be obtained both from fresh, processed, and dried berries, and from extracts. For more information (especially on antioxidant benefits), see the nutraceutical use discussed in the next section. Health-care professionals currently recommend five servings of antioxidant-rich foods each day.

Non-Food Uses

Elderberry has recently become an important source of nutraceuticals in Europe, particularly in Austria. The Haschberg cultivar of European elderberry has been reported to have an anthocyanin content of 1,500 mg per 100 g (for comparison: bilberry: 300-700, cranberry: 60-170, grape: 120, black currant: 250-600, wild European elder: 450-600). Anthocyanins have been shown to have a variety of health benefits, partly based on antioxidant activity. Antioxidants are thought to counteract the harmful effects of "free radicals" that are generated in metabolism. Free radicals are associated with damage to cells and the onset of some diseases, including cancer and cardiovascular disease, as well as aging.

Elder has long been an important source of medicinal substances, obtained from the leaves, flowers, bark, and fruits. Native North Americans traditionally used American elder to treat colds, colic, constipation, diarrhea, fevers, and rheumatism. Bark preparations were employed externally as a poultice for inflammations, and internally as a strong emetic. Europeans employed European elder as a herbal remedy for the treatment of numerous ailments. The flowers of European elder have strong diuretic and laxative effects, and elderberry tea has been used as a remedy for and to prevent colds, coughs, sore throat, and sinus congestion. Elderberry flowers are still commonly prescribed for colds in Europe.

Elder has also been used in many other ways. The berries have been employed in dye-making, probably since pre-historic times, as a source of deep red and purple colors. Elderberries were used by Romans in ancient times to die hair black, a practice that was also known in recent

centuries in Europe. Today the colourant from the fruit is used as a natural dye in various foods, including wine. Because it is non-toxic, elderberry dye is used to mark off cuts of beef, pork, and other meat. Dye extracted from American elder has proven to be particularly resistant to light and heat.



Wild American elder (*Sambucus nigra* subsp. *canadensis*) in early fruit (Sept. 10, 2003). Photograph of cultivated plant at St-Jean-sur-Richelieu. Photograph from the collection of AAFC-St-Jean-sur-Richelieu.

In past times the pith was removed from the stems and used as tobacco pipe stems, peashooters, and many objects. North American Indians and pioneers used hollowed elder stems as spiles for drawing sap from sugar maple trees. The hollowed stems are still used in various crafts, especially for making whistles and toys.

The unpleasantly scented leaves of the elder have a reputation for repelling flies. The bridles of horses were often decorated with elder flowers in the belief that this would keep flies away. A decoction of the flowers and leaves, or an ointment containing them was once applied to large wounds to prevent visits from flies. Dried, powdered leaves have often been used as an insect repellent for people and animals.

In the early 20th century, elder flowers were used to make elder flower water, a common article among every lady's toiletries to keep complexions clear and remove freckles. Elder flowers are a mild astringent (so is water!), so wrinkles would be reduced, at least temporarily.

Both American elder and blue elderberry are often used for wildlife habitat improvement. The heavy summer fruit production benefits numerous song and game birds. Hummingbirds and many insects visit the flowers for nectar. Bears, chipmunks, foxes, mice, opossums, raccoons, and woodrats also feed on the berries, while squirrels, rabbits, and woodchucks eat both the berries and bark. White-tailed deer eat all above-ground parts of American elder, and blue elderberry is an important food of mule deer and elk. New growth contains a glycoside that may be fatal to cattle and sheep, and livestock generally show limited or no

enthusiasm for browsing on young growth of elders. However, mature growth of blue elderberry is generally rated as good to fair browse for livestock. North American elders tend to form thickets that provide cover and nesting sites, and are also used to establish farmland shelterbelts and windbreaks. Due to their forage and cover value, as well as high productivity, adaptability, and ease of establishment, both American elder and blue elderberry are useful for rehabilitation of disturbed sites.

Agricultural and Commercial Aspects

Although reported to be cultivated during early settlement in North America (American elder in 1761, blue elderberry in 1850), elders were not extensively grown until the 20th century. Berries were simply collected from the wild. Commercial crops are now produced in several US states, notably Ohio, Pennsylvania, Oregon, Kansas, and New York. In Europe, especially in Austria, the European elderberry has become an established cultivated crop.

The hard seed coat and dormant embryos delay seed germination. Without treatment, germination may be delayed 2-5 years after planting. Because seeds may be outcompeted by weeds, establishment of plants is best done using transplanted seedlings and rooted branches. Studies are currently underway in Canada to determine methods of improving production through adjustments of density, fertilization, irrigation, and assisted pollination. The text box presents a summary of research on elderberry at St-Jean-sur-Richelieu, Quebec, the major centre of elderberry research in Canada.

Elders can grow rapidly (shoots of blue elderberry grow up to 4.6 m a year). The yield of mature plants can reach 10 kg of berries per bush, and 15 tonnes/ha. American elder is reported to be relatively free of diseases and insects, although weed control is necessary during initial establishment. Cultivars are presently being evaluated in five provinces. The basic agricultural requirements of the American elderberry have been documented (see *Sources of Additional Information*).

Cultivars and Germplasm

There is a need for increased attention to *Sambucus* germplasm in Canada. The Canadian genebank network of AAFC ("Plant Gene Resources of Canada") protects genetic variation of crops and crop relatives valuable to Canada. It currently has four seed collections of *Sambucus* and eight accessions conserved as clones (i.e. as living plants).

The fruits of cultivars are larger (often averaging 8 mm in diameter) than wild fruits, and mature earlier. In the 20th century, high quality cultivars of American elder, selected for yield and quality of fruit, were released in Canada (including 'Johns', 'Kent', 'Nova', 'Scotia', and 'Victoria', all from the Agriculture Canada Research Station, Kentville) and the United States (notably 'Adam #1', 'Adam #2', and 'York' from the New York Agricultural Experiment Station). These cultivars are mostly direct selections from the wild, or from open-pollinated cultivars. Ironically the many Canadian

cultivars bred several decades ago have been cultivated in commercial orchards principally in the United States, rather than in Canada. 'Haschberg', a cultivar of European elder from the region of Vienna, is the main European cultivar grown as a fruit crop. New cultivars are required with improved nutritional value and especially improved pigment stability. Elder development is at a very early stage.

There are also ornamental cultivars, which produce masses of spectacular fragrant white flowers and abundant fruits that attract birds to the garden. Most ornamental elders bear fruits that are not as palatable as those of fruit cultivars. Cultivars with dissected leaves include 'Acutiloba', 'Dissecta', and 'Laciniata'. 'Aurea' has golden yellow leaves, and 'Chlorocarpa' has pale gold leaves and greenish fruit. 'Adams #1', 'York', and 'Maxima' have large flower and fruit clusters (inflorescences in 'Maxima' are up to 50 cm across). 'Black Beauty', with blackish-purple leaves and fragrant pink flowers, is a spectacular cultivar of subsp. *nigra*. Over the last few years, such new cultivars have attracted increasing attention to the ornamental use of elders.

An artificial hybrid involving *S. nigra* subsp. *canadensis* and *S. racemosa* var. *pubens* was created in Nova Scotia to produce earlier maturing fruit, since the fruit of American elder in this northern part of the range is often injured by early frost. The hybrid plants were uniform, produced fruit the first year after transplanting to the field, and the berries ripened one month earlier than that of local *S. nigra* subsp. *canadensis*, thus providing frost avoidance.

Prospects

Elderberries are very productive, easily-grown plants. Although the fresh berries are not attractive in taste and do not ship well, they are useful for processing into a variety of fruit products. Domestic and export demand will likely grow for all native berry crops in response to increasing clinical evidence of health benefits of a berry-rich diet (consumers are increasingly seeking such products, that prevent rather than treat disease). With selection of better fruit varieties, as well as development of processed products from the berries, there is good potential for elder to become a significant Canadian crop.

Myths, Legends, Tales, Folklore, and Interesting Facts

- Elders growing on wild lands may promote certain beneficial predatory insects that help to control pests of nearby crops.
- Elder wood from a giant elder tree was thought to have been used to make the Holy Cross on which Jesus was crucified. As a consequence of this and a long-standing tradition associating the elder with grief, the elder became an emblem of sorrow and death. In Germany, the notion developed that people should doff their hats when coming across an elder as a mark of respect to the plant which furnished the wood for the cross of Christ's crucifixion.
- *Arsenic and Old Lace*, a 1941 play by Joseph Kesserling, was released as a movie in 1944, and is considered one of Hollywood's classics. The slapstick

comedy film starred Carry Grant as the nephew of two murderous aunts who compassionately served up elderberry wine laced with arsenic to elderly gentlemen.

- The “Victorian language of flowers” was a secret coded language in Victorian times, with flowers and plants symbolic of certain messages, so when the flower or plant was mentioned in a letter those who knew the

code could understand the hidden information. “Elder” meant “zealousness.”

- Hearse drivers used to carry a whip made of elder wood as protection from evil spirits. However, elder was not used to whip carriage animals, as it was thought to result in serious injury or death.

Note

Recherches sur le sureau au Centre de recherches d'Agriculture et agroalimentaire Canada à St-Jean-sur-Richelieu, Québec, effectuées par C. Richer et D. Charlebois

La compagnie Colarôme a développé une technique exclusive d'extraction d'un colorant alimentaire rouge issu des fruits du sureau du Canada. L'exploitation rationnelle de ce produit repose sur un approvisionnement stable et important de fruits. La constitution de vergers représente une alternative intéressante dans la mesure où la production de fruits est suffisamment importante et relativement constante. L'étude de cette nouvelle culture passe par une approche intégrée et certains facteurs de régie de production sont étudiés en priorité:

!La densité optimale de plantation peut varier selon la distance entre les plants et la distance entre les rangs. On vise la rentabilisation de la surface en production face à la compétition entre les plants et de l'accès aux plants.



Young shrubs of American elder (*Sambucus nigra* subsp. *canadensis*) in an experimental plot at AAFC Experimental Farm, Acadie, Quebec. These were established from cuttings 3 months earlier. Photograph from the collection of AAFC-St-Jean-sur-Richelieu.

Comme le sureau est une plante indigène, il est probablement capable de se développer sans apport externe de fertilisant. Par contre, la production optimale de fruits pourrait nécessiter la fertilisation des plants; trois régimes de fertilisation sont donc comparés.

Un volet sur la pollinisation vise à déterminer les conditions optimales de collecte, d'entreposage et d'application du pollen pour améliorer la production de fruits dans des conditions définies. Les informations recueillies pourraient mettre en lumière la nécessité de recourir à des insectes pollinisateurs ou à l'introduction de cultivars dans les vergers. De plus, il faudra définir l'importance des cultivars dans le processus de pollinisation. Différents régimes hydriques sont comparés.

La productivité de l'espèce dans différentes zones climatiques canadiennes de la zone 2b à 6b est évaluée. Les cultivars 'Kent', 'Nova', 'Scotia', 'Victoria' et 'York' sont comparés au sureau indigène dans le but d'obtenir des plants plus hâtifs, à plus gros fruits ou dont la récolte est facilitée par la présence d'un pédoncule plus facile à détacher. De plus, les caractéristiques des fruits seront déterminées en fonction de la production de colorant.

La mise au point d'un protocole de micropropagation permettra une production de masse de spécimens supérieurs (résistance aux maladies ou aux conditions environnementales défavorables, abondance de la fructification, qualité des fruits...) sélectionnés parmi les individus plantés (12 000 plants).

L'effet de divers paillis est évalué sur la croissance, le rendement, le temps d'entretien, le type et la fréquence des dommages hivernaux ainsi que sur la quantité et la qualité des fruits.

L'effet de la mycorhization de boutures ou de plants *in vitro* au moment de la propagation sera comparé avec celui de plants non mycorhizés.

- According to George Frazer's classic *The Golden Bough* (not always reliable), to produce rain in Roumania, gypsy girls, naked except for a short skirt of dwarf elder (*Sambucus ebulus* L.), went in a procession from house to house, singing for rain, while being drenched by people with buckets of water.
- Witches were thought to conjure up bad weather by stirring a bucket of water with a branch of elder. Some believed that a witch could transform herself into an elder. In Ireland, witches rode elder sticks, not broomsticks. In Europe as well as New England, to detect a witch an elder twig was dipped in oil, lighted, and floated on water; it was thought that it pointed to the nearest witch. In parts of the United States and in the Tyrol (Tirol, mostly in Austria, partly in Italy), burning elder in the fire on Christmas Eve was thought to reveal all the witches and sorcerers in the neighbourhood.

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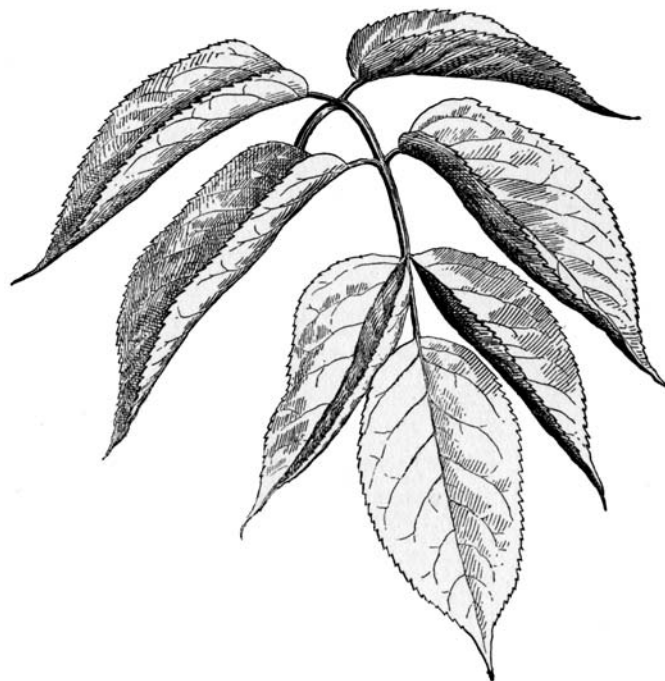
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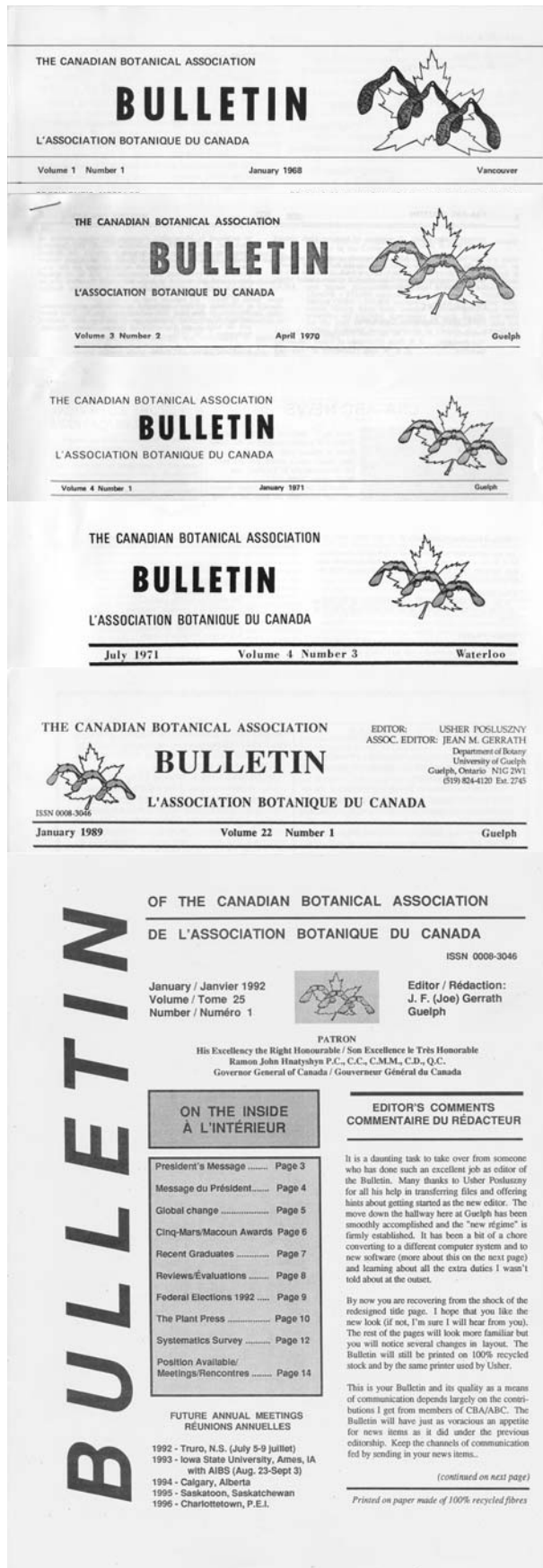
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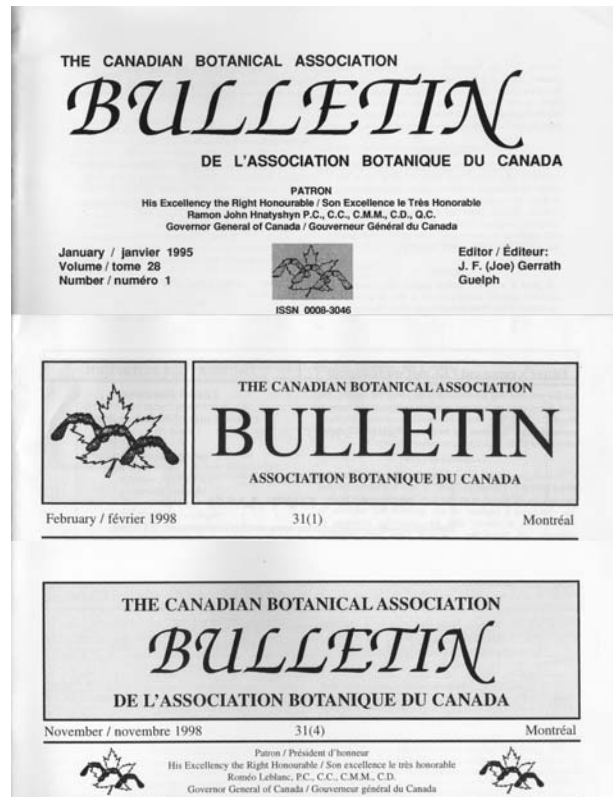


The Bulletin Over the Years

Anniversaries are often a time for a look back to the past. Here are samples of precedent headers of the Bulletin.

Les époques du Bulletin

Les anniversaires sont souvent l'occasion de jeter un regard vers le passé. Voici donc quelques extraits des numéros précédents du Bulletin montrant les différentes entêtes qui se sont succédé au long des années.



Book Review

Revue de livre

Hawthorns and Medlars.

By James B. Phipps, with Robert J. O'Kennon and Ron W. Lance, 2003.
Royal Horticultural Society Plant Collector Guide. Timber Press, Portland OR,
180 pp., 75 color photos, 5 b/w photos, 2 tables, 11 drawings, and 3 maps.
ISBN 0-88192-591-8
Price: USD\$24.95; CND\$34.95 (hardcover)



This book is offered as the penultimate summation of the first author's long experience with New World hawthorns. Jim Phipps took on the challenge of sorting out the taxonomy of *Crataegus* in the 1970s and, with excursions into the rest of Rosaceae subfamily Maloideae, this has been the focus of his botanical career since that time. Penultimate, because as Phipps writes, "My own monograph on *Crataegus* and *Mespilus*, in preparation and due to be published in a year or two, will constitute the only comprehensive treatment for the whole world of hawthorns and medlars." Since Hawthorns and Medlars includes a checklist (Appendix 2) of 137 *Crataegus* species and three of its hybrids that persist in the wild, arranged in 40 series, it can perhaps be taken as a trial balloon for the author's ultimate revision of this difficult genus.

This book is in fact aimed at horticulturalists and "plant collectors," and so is much less daunting to non-academic readers than a formal taxonomic monograph would be. The first part (chapters 1-5) is a general introduction to hawthorns and medlars, and covers folklore, natural history, uses, growing, and breeding and selection. The second part comprises a chapter on classification and identification, and then one each on *Crataegus* (43 species described in detail in alphabetical sequence, plus six hybrids and seven cultivars) and *Mespilus* (two species, and two hawthorn-medlar hybrids). In addition to the checklist already mentioned, there are appendices covering preparation of herbarium specimens, a tabular key, and charts for converting metric and English units of length, area, and temperature. A glossary, list of references, and index complete the book.

Because I began my Ph.D. studies with Jim Phipps shortly before the first three of his papers with M. Muniyamma appeared, there are three aspects of this book arouse my interest: taxonomy, identification, and the history and folklore of hawthorns and medlars. The first two of those papers definitively established that hawthorns may reproduce by means of aposporous apomixis (Muniyamma and Phipps 1979a), and confirmed the widespread occurrence of polyploidy in Ontario hawthorns (Muniyamma and Phipps 1979b). The third paper was a revision of the hawthorns of Ontario (Phipps and Muniyamma 1980). These three papers set the stage for studies of individual species complexes by Phipps' graduate students in which we attempted to refine the morphological species concept adopted in the 1980 paper, and employed in Phipps' subsequent publications up to and including this book. Phipps points out that both diploid and polyploid hawthorns are found, and that hawthorns vary in the breeding system that they exhibit (self-incompatible diploids, self-compatible tetraploids, and pseudogamous, polyploid apomicts). He notes that, in comparison with direct counts of chromosomes, flow cytometry "...is recommended for large-scale screening" but I wish that he had also pointed out that this recommendation is based on

results obtained by Toronto graduate student Nadia Talent. Moreover, the extent to which the occurrence of apomixis makes a morphological species concept problematic is not discussed, nor is the species concept that Phipps employs really explained in this book. Reference is simply made to the existence of 140-200 species of *Crataegus*, principally in three sections that Phipps suggests might comprise up to 145 species in all. A further 20 species are distributed among several much smaller sections of the genus.

At the species level it may be instructive for readers of this book to compare the taxonomy presented by Phipps with the approach taken to *Taraxacum* in a recent British field guide (Dudman and Richards 1997). Its authors distinguish between wide-scope species like the nine well-characterized sections of the genus that they employ for the British and Irish dandelions, and the narrow-sense species represented by the 150 apomictic microspecies native to the British Isles. Phipps' use, however pragmatic, of a morphological species concept in *Crataegus* appears to have potential problems unless it is done in such a way that users can appreciate the difference between entities like sometimes male-sterile, triploid *C. succulenta* and the other diploid (*C. calpodendron*) and tetraploid (*C. macracantha*) members of the species complex to which it belongs (section *Coccineae* series *Macracanthae*).

Above the species level, the treatment of *Crataegus* and *Mespilus* as distinct genera is worth noting. Although Phipps has described a novel endemic from Arkansas as *Mespilus canescens* and argued for the naturalness of *Mespilus* as a genus (Phipps 1991; Phipps, Weeden and Dickson 1991), it is clear that the variation seen in medlars is readily encompassed by that exhibited by hawthorns. Differences in leaf margination and lobing vanish when all species are considered. Similarly, as Phipps points out (p. 58 and Appendix 3), the 30+ stamens of *C. triflora* make the similarly high stamen number of *M. germanica* seem less distinctive. The erect fruiting calyx of *Mespilus* (Plate 74) seems almost indistinguishable from that of tejocote, the Mexican species *C. mexicana* (Fig. 7.6) that, like the European medlar, is cultivated for its fruit. One might argue that the only reason keeping *Mespilus* distinct from *Crataegus* is its long history of cultivation in Europe. Perhaps if Linnaeus had lived in mesoamerica, or in China, where *C. pinnatifida* var. *major* is grown for its fruit, other species would have been recognized as genera. Appendix 3 is presented as a "Tabular Key to Hawthorns and Medlars." No explanation for its use is given (the advice "Learn to use a dichotomous key" is given on p. 61; "dichotomous key" is not explained in the glossary). Instead the word "Key" is repeated, this time referring to the explanation of the abbreviations and codes used in the table that follows. This carping aside, this appendix is in fact a valuable summary of the data by means of which 44 species (plus series *Aestivales* and

13 hybrids and cultivars) can be distinguished from each other. To the extent that these species represent most of the series presented in Appendix 2, the authors have presented us with the first database by means of which so many hawthorns and medlars from around the world might be identified. In fact, typing these data into a DELTA database (Dallwitz, Paine and Zurcher 1993) and querying them using the polyclave program Intkey (Dallwitz, Paine and Zurcher 2000) makes it clear that, at least for this sample of taxa, a multiple-entry key may be the means by which hawthorn identification can be simplified. Perhaps the second edition of Hawthorns and Medlars will include a printed polyclave like those devised for Turkish Umbelliferae by Hedge and Lamond (1964) and for the identification of *Taraxacum* microspecies by Dudman and Richards (1997). Alternatively, a DELTA database could be made available online by the publisher, or it could be deployed by means of a web-based polyclave like PollyClave (Pavacic 1999) or its successor, PollyClave 2 (Dickinson 2003).

The sections on the folklore and history of human uses of hawthorns seem to only scratch the surface of these topics. For example, hawthorn is Uath, the sixth letter of the Irish tree alphabet (and calendar), the Beth-Luis-Nion (Graves 1948). More importantly, hawthorns were sacred to the great goddess, under her various names (e.g., Maia, Cardea) and are associated with observances in her honor during the month of May. This association with pre-Christian European traditions probably explains the mixture of beneficence and ill-omen associated with hawthorns in Phipps' sampling of European folklore. The use of hawthorns in hedges is discussed principally in terms of the potential for hedges to act as windbreaks, reducing evapotranspiration in their lee and so contributing to greater crop yields. No mention is made of the way in which much of England was enclosed by hedges, from Tudor times onward, in order to convert fields into pastures for sheep and cattle (Hoskins 1971). Enclosing agricultural land with hedges was an idea that also migrated to Delaware and adjacent Pennsylvania at the end of the 18th century. For more than 50 years hedges of native North American hawthorns were employed as living fences in an effort not only to protect livestock and crops, but also to enable the landowner to conform to an esthetic of gentility (Bourcier 1984).

The concerns expressed above notwithstanding, this book is a valuable reference, and one that is beautifully illustrated. It includes 10 line drawings by Ottawa scientific illustrator and artist Susan Laurie-Bourque that appeared originally in Phipps' scientific publications. They are both handsome and highly informative and, together with Plate 6 (a reproduction of a color illustration of *C. nigra* from *Icones Florae Germanicae et Helveticae* by Reichenbach and Reichenbach 1903) they remind the reader how much more can be conveyed by an illustration than by any one photograph. Although the remaining color plates are photographs, mostly by Phipps, almost all are of very high quality, and some are particularly evocative.

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News from Ecology Section

prepared by Dianne Fahselt

Recently graduated students at the University of Alberta:

Lance Lazaruk (2002). Impacts of fire and partial-cut harvesting on abundance and diversity of ectomycorrhizal fungi. MSc, Department of Renewable Resources, University of Alberta.

Vern Peters (2002). Keystone processes affect succession in boreal mixedwoods - the relationship between masting in white spruce and fire history. PhD, Department of Biological Sciences, University of Alberta.

Amisul Islam (2003). Ecophysiological adaptations of black spruce (*Picea mariana*) and tamarack (*Larix laricina*) seedlings to flooding and nutrition stress. PhD, Department of Renewable Resources, University of Alberta.

Stephanie Kurulok (2004). Impacts of post-fire salvage logging on tree regeneration and understory plant communities in burned stands of mixedwood boreal forest. MSc, Department of Renewable Resources, University of Alberta.



Message du rédacteur / Message from the Editor

Veillez noter la date de tombée plus hâtive qu'à l'habitude du prochain numéro, le **37(3)** : le 1^{er} août 2004.

Please note that the deadline for texts in the next issue, **37(3)**, has been brought forward to the first of August 2004.



News from Teaching Section

prepared by Christine Maxwell

News for the upcoming meeting in Winnipeg.

The teaching section is pleased to announce that there will be a panel discussion followed by an open forum on June 29th 2004, starting at 8.30am until 10.15am. All are invited to attend and participate in the open forum. The topic is "Turning teachers and students on to Plants".

Four people have agreed to be panelists. They are:

Dr Kate Frego, Biology Department, University of New Brunswick, St John campus. Kate is well known to most of us as a founding member of the teaching section, and a person who has won several teaching awards for her lively and enthusiastic teaching.

Dr Barbara McMillan, Faculty of Education, University of Manitoba. Dr. McMillan, who has a background in Biology, is a specialist in early years science education and is involved in a program of inquiry into early years science teaching and learning.

Aileen Najduch, a science consultant in charge of curriculum, program development and implementation, with the Manitoba Department of Education, Citizenship and Youth.

Dr Bill Paton, Brandon University. He is the chair of the education and curriculum committee of the Manitoba Association of Plant Biologists.

Following the discussion and a coffee break there will be several contributed papers on aspects of teaching botany.