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The Canadian Botanical Association Bulletin



Bulletin de l'Association botanique du Canada

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The first Recipient of the 2005 Undergraduate Botanical Presentation Regional Award

Jessie Carviel, student at McMaster University, received this CBA award for the best student paper presented at the 2005 Biology Day in Sudbury, ON, Canada. Miss Carviel is representing the Ontario Region for this contest.

The Undergraduate Botanical Presentation Award was created in 2003 by the CBA to encourage undergraduate students to pursue graduate research in botany and to enhance the visibility of the Association.

The program offers annually one award of \$200.00 for one of the undergraduate conferences/meetings in Biology for each of the five (5) regions of Canada: Atlantic region, Québec, Ontario, Prairies and Territories, and British Columbia.

Première remise d'un prix régional pour la meilleure communication étudiante de premier cycle

Jessie Carviel, étudiante à l'université McMaster, a reçu ce prix de l'ABC pour une présentation faite lors de la Journée de biologie 2005 qui s'est déroulée à Sudbury, Ontario, Canada.

Le prix de la meilleure communication étudiante de premier cycle a été créé en 2003 par l'ABC pour inciter les étudiant(e)s à poursuivre leurs études en botanique et pour améliorer la visibilité de l'Association.

Ce programme décerne annuellement un prix de \$200 à des étudiants de premier cycle participant à l'une des conférences ou réunions annuelles en biologie tenues dans chacune des cinq régions du Canada suivantes: région de l'Atlantique, le Québec, l'Ontario, les Prairies et Territoires, et la Colombie Britannique. Madame Carviel représente donc l'Ontario.

CBA Annual Meeting in Edmonton, Alberta
June 15-18, 2005

Congrès annuel de l'ABC à Edmonton, Alberta
15 au 18 juin 2005

<http://www.plantcanada2005.ca>

Canadian Botanical Association



Bulletin

The CBA Bulletin is issued quarterly (in theory in March, June, September, and December) and sent to all CBA members.

Information for submitting texts

All members are welcome to submit texts in the form of papers, reviews, comments, essays, requests, or anything related to botany or botanists. Any medium is acceptable for submission but electronic documents are likely to speed up the publication. For detailed directives on text submission, please go to the Editor's web site: http://www.umce.ca/cours/martin/CBA_ABC_Editor/ or feel free to contact the Editor (see below)

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

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.

Soumission de textes

Tous les membres de l'Association sont invités à envoyer des textes de toute nature concernant la botanique et les botanistes (articles, revues de publication, commentaires, requêtes, essais, etc.). Tous les supports de texte sont acceptés. L'utilisation de documents électroniques peut accélérer la publication. Pour des renseignements détaillés sur la soumission de textes, veuillez consulter le site web du rédacteur: http://www.umce.ca/cours/martin/CBA_ABC_Editor/ et n'hésitez pas à contacter le rédacteur (voir ci-dessous).

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

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Next issue / Prochain numéro

Texts for the next issue, **38(3)**, must be received before **August 31st**, 2005.

La date de tombée des textes du prochain numéro, le no **38(3)**, est le **31 août** 2005.

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Editor's Message

As you know, the CBA has now a web site with its own domain name (www.cba-abc.ca). This should result in a stability likely to promote new ways to make relevant information available to members.

As Editor of the Bulletin, I consider that availability and openness to members are very important. To help myself in reaching that goal, I created an Editor's Page (www.umce.ca/cours/martin/CBA_ABC_Editor/) where I want to explain what the Bulletin is made of. This web page may be reached through the CBA web site as well. All aspects of the Bulletin will be treated, from editorial policy to how to write a book review. These informations are updated regularly and should help, I hope, any members to learn how to contribute to their Bulletin. It is then an invitation to all of you to make a visit to the Editor's Page.

Message du rédacteur

Comme vous le savez, depuis quelques semaines, l'ABC s'est dotée d'un site web avec son propre nom de domaine (www.cba-abc.ca). Cette nouvelle stabilité devrait faciliter de nouveaux développements dans la manière dont l'Association rend l'information disponible aux membres.

En tant que rédacteur du Bulletin, l'ouverture vers les membres m'a toujours paru un objectif essentiel. Pour m'aider à l'atteindre, je me suis donné un outil supplémentaire, une page web consacrée aux différents aspects de la rédaction (www.umce.ca/cours/martin/CBA_ABC_Editor/). On peut également accéder à cette page à partir du site de l'ABC. Cette page constitue un recueil d'informations utiles pour mieux le Bulletin et ses rubriques et savoir de quelle façon on peut y collaborer. Cette page est destinée à s'enrichir constamment. J'invite donc les membres à parcourir la page du rédacteur.

PhD Opportunities

Student positions at the PhD level in **comparative analysis and modelling of population or community dynamics of boreal and tropical forests** are currently available. These are to begin as early as September 2005. Projects may involve field work in Northern Ontario and/or Brazil or accumulated datasets, based on the interests and expertise of the student. Excellent quantitative and/or analytical abilities required.

For more information please contact Dr. Madhur Anand, Canada Research Chair, Biology Department, Laurentian University, Sudbury, Ontario. manand@laurentian.ca

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Poorly Known Economic Plants of Canada - 45.

Eastern huckleberries (*Gaylussacia* spp.) and western huckleberries (*Vaccinium* spp.).

E. Small and P.M. Catling

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Central Experimental Farm, Ottawa ON K1A 0C6

Huckleberries were popular with pioneers and frontiersmen, and everyone has heard of "Huckleberry Finn," but few people today know what a huckleberry is or have tasted the fruit. However, interest in huckleberries is increasing and, in the future, these exceptional wild berries may be developed into cultivated crops.

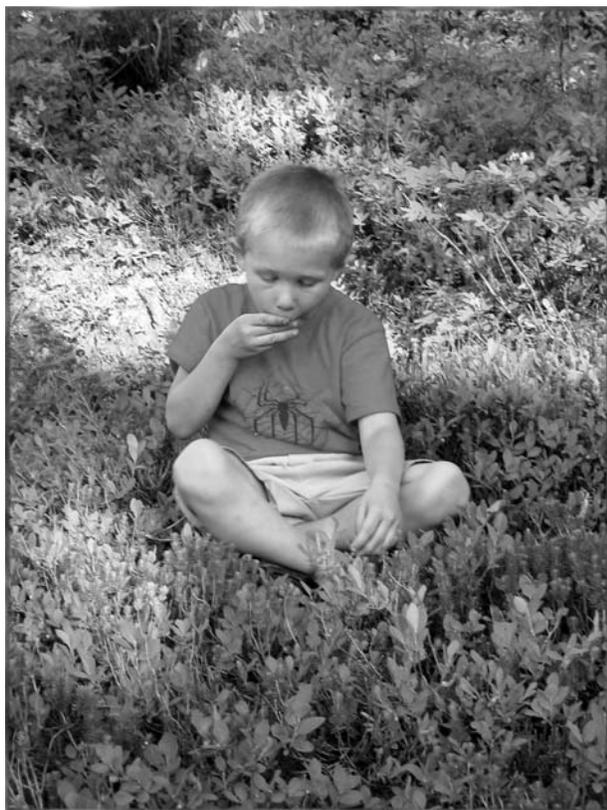


Figure 1. Four-year-old Gavin Robertson enjoying huckleberries growing in Mount Baker National Forest, Washington state. Photo by Matt Robertson.

Latin Names

The genus name *Gaylussacia* commemorates French chemist Louis Joseph Gay-Lussac (1778–1850). *Baccata* in the scientific name *G. baccata* (Wangenh.) K. Koch is Latin for berry-bearing. *Dumosa* in the name *G. dumosa* (Andrews) Torr. & A. Gray is Latin for bushy. *Bigeloviana* in the name *G. dumosa* var. *bigeloviana* Fern. is a reference to the discoverer of this taxon, Jacob Bigelow (1787–1879), a professor at Harvard University, physician in Boston, and author of *American Medical Botany*, a three volume survey of medicinal plants of the United States.

The genus name *Vaccinium* is the classical Latin name for the blueberry. It is presumed to derive from the Latin *vaccinus*, of cows, since cows seem to love the berries, a fact that was first recorded by English navigator and explorer Captain James Cook (1728–1779). The genus name has also been interpreted as originating from *bacca*, berry, in allusion to the numerous berries. *Membranaceum* in the name *V. membranaceum* Douglas ex Torr. means membranous, a reference to the thin leaves. *Deliciosum* in the name *V. deliciosum* Piper is Latin for delicious, referring to the exceptionally tasty berries.

English Names

The name "huckleberry" arose in America, a corruption of the English word hurtleberry. "Hurts" is from the archaic West-Country (English) verb "to-go-a hurting," i.e. collecting berries; "hurts" and "hurtleberries" are used in parts of England to designate the bilberry, *V. myrtillus* L. The word huckleberry came to be applied to edible berries of North American shrubs of the heath family (Ericaceae), most particularly species of *Gaylussacia*, but later also species of *Vaccinium*. In eastern North America, species of the two genera often grow wild near each other, and many people harvest both, alternatively referring to them as huckleberries and blueberries. Adding to the confusion, both blueberries and huckleberries are sometimes called "whortleberries." Since *Gaylussacia* species called huckleberries are entirely in eastern North America, and most *Vaccinium* species that are called huckleberries are substantially in western North America, the convention has developed of distinguishing North American *Gaylussacia* as "eastern huckleberries" and the principal edible wild-collected *Vaccinium* species of western North America as "western huckleberries."

The "garden huckleberry" is an unrelated plant, *Solanum scabrum* Mill., which also produces edible berries. Unfortunately this name is often difficult to interpret because some people use the name garden huckleberry for garden-planted *Gaylussacia* or *Vaccinium* species. "Fool's huckleberry" (or false huckleberry) is *Menziesia ferruginea* Sm., a shrub with inedible fruit, native to western North America.

G. baccata: common huckleberry. This is the most important eastern huckleberry. It is also called black and high-bush huckleberry. Unfortunately, several western *Vaccinium* species are also known as black huckleberry. To reduce confusion, this could be called the eastern black huckleberry. Black snaps, crackerberry, and crackers are old names for *G. baccata* that were coined because the seeds crack or snap between the teeth.

G. dumosa: dwarf huckleberry. This is also known as bush

huckleberry and bog huckleberry. *Gaylussacia dumosa* var. *bigeloviana* is here called Bigelow's dwarf huckleberry.

V. membranaceum: black huckleberry. This species indeed usually has black fruit. It is also known as big huckleberry, black blueberry, globe huckleberry (*V. globulare* Rydb. is synonymous), tall blueberry, and thin-leaved huckleberry. To reduce confusion (particularly with *G. baccata*), this could be called the western black huckleberry.

V. deliciosum: Cascade huckleberry. The name reflects its geographic location in the Cascade mountain range from northern California into British Columbia, is also known as alpine blueberry, blue huckleberry, blue-leaved huckleberry, Cascade blueberry, mountain bilberry, mountain huckleberry, and Rainier bilberry (Mount Rainier in the Cascade range of Washington state, and the allied Mount Rainier National Park, are prime sites for this huckleberry).

French Names

G. baccata: gaylussaquier à fruits bacciformes, gaylussaccia [note two c's] à fruits bacciformes, gueules noires (a name often used in Quebec for *Aronia melanocarpa* (Michx.) Ell. = *Photinia melanocarpa* (Michx.) Robertson & Phipps).

G. dumosa: gaylussaquier nain, gaylussaquier touffu, gaylussaccia touffu.

G. dumosa var. *bigeloviana*: gaylussaquier nain variété de Bigelow (name coined by Gauthier and Garneau (1999)).

V. membranaceum: airelle à feuilles membraneuses.
V. deliciosum: airelle délicieuse naine.

Morphology

EASTERN HUCKLEBERRIES (*Gaylussacia*)

Canadian eastern huckleberry plants are deciduous shrubs, bearing fruits in small clusters. The berries are blackish-blue or reddish-black, usually about 8 mm or less in diameter, and sweet or slightly tart when ripe. The berries of eastern huckleberry (*Gaylussacia*) species are reminiscent in appearance and taste to those of blueberries (*Vaccinium* species). However, blueberries have many, tiny, soft seeds, while the seeds of huckleberries (up to 10 in a single berry) are hard and large enough to be objectionable when consumed. (The true commercial blueberry (*Vaccinium*) species tend to have smaller seeds than those of the western huckleberries, the fruit of the latter therefore sometimes considered to be gritty.)

The common huckleberry (*G. baccata*) is the best known eastern huckleberry (figure 2). The species is a low-growing, colonial shrub. The plants produce upright aerial stems from shallowly-growing branched rhizomes, and form extensive clones. Fibrous roots develop at the base of each stem. The plant is 30–100(200) cm in height, producing pink or pale red flowers, and young growth that is resinous and sticky (hence the old name *Gaylussacia resinosa*). The black, shiny berries are about 6–8 mm in diameter, ripen in early summer, and are said to be the sweetest of the eastern huckleberries.



Figure 2. Common huckleberry (*Gaylussacia baccata*), fruiting and flowering branches. Source: Britton, N.L., and Brown, A. 1897. *An illustrated flora of the Northern United States, Canada and the British possessions from Newfoundland to the parallel of the southern boundary of Virginia and from the Atlantic westward to the 102nd meridian*. Charles Scribner's Sons, New York, NY. Vol. 2.



Figure 3. Dwarf huckleberry (*Gaylussacia dumosa*), fruiting and flowering branches. Source: same as Fig. 2.

The dwarf huckleberry (*G. dumosa*) is 10–50 cm tall (figures 3, 10 and 12). The plant can grow dense, with as many as 2,000 shoots/m² recorded. The species has white, pink, or red flowers, and berries that are black, 5–8 mm in diameter and, although edible, relatively insipid compared to the fruit of *G. baccata*. Unlike the berries of *G. baccata*, those of *G. dumosa* are glandular-pubescent. *G. dumosa* var. *bigeloviana* is distinguished from the remainder of *G. dumosa* by having glandular pubescence on both sides of the leaves and floral bracts, not just the lower surface.

WESTERN HUCKLEBERRIES (*Vaccinium*)

Canadian western huckleberry plants are deciduous shrubs. The two principal species, mentioned below, bear their fruits singly, unlike the cultivated blueberries, and also unlike the Canadian *Gaylussacia* species. Like the eastern huckleberries, the western plants are rhizomatous, forming extensive clumps.

The black huckleberry (*V. membranaceum*) is a semi-erect shrub, ranging in height from (20)45–110(300) cm (figure 4). It produces white to creamy or yellowish pink flowers, and black or deep purple or red berries 9–11 mm in diameter, occasionally as wide as 1.3 mm.

The Cascade huckleberry (*V. deliciosum*) is a dwarf shrub, (3)7–28(60) cm high (decumbent canes as long as 2 m have been recorded, these achieving a height of no more than 60 cm) (figure 5). It produces pink or creamy pink flowers and bluish (rarely black) berries of comparable size to the above species.

Classification and Geography

Key to Canadian *Vaccinium* and *Gaylussacia*

- 1a. Fruit with 10 seed-like nutlets; leaves resin-dotted at least beneath.....*Gaylussacia*
- 1b. Fruit with numerous small seeds; leaves not resin-dotted*Vaccinium*

EASTERN HUCKLEBERRIES (*Gaylussacia*)

The genus *Gaylussacia* contains some 49 species of shrubs, mostly indigenous to South America, but four are native to North America. The phyletic relationships of the species are unclear (the most recent analysis is Floyd (2002)).

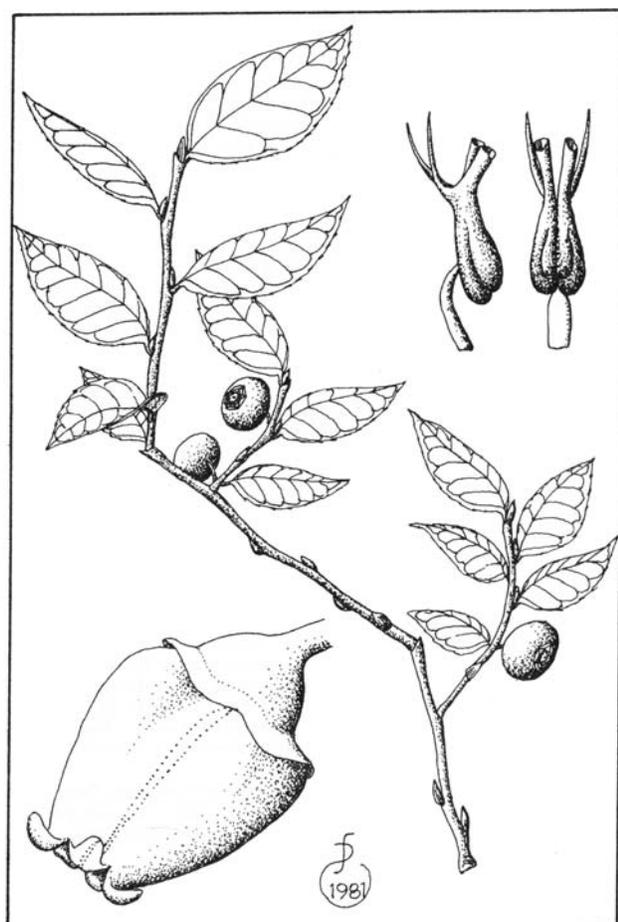


Figure 4. Black huckleberry (*Vaccinium membranaceum*), showing fruiting branch, flower, and views of stamen. Source: Vander Kloet (1988).



Figure 5. Cascade huckleberry (*Vaccinium deliciosum*), showing fruiting branch, flower, and views of stamen. Source: Vander Kloet (1988).

Key to Canadian taxa of *Gaylussacia*

- 1a. Leaves pale and dull above, relatively thin, lacking a prominent (mucronate) tip; bracts of raceme small and deciduous; margins of sepals not ciliate; ovary and fruit glabrous; glands sessile (appearing as dots) *G. baccata*
- 1b. Leaves glossy green above, relatively thick or coriaceous, with a prominent mucronate tip; bracts of raceme leaf-like and persistent; margins of sepals glandular-ciliate; ovary and fruit glandular-pubescent; glands stipitate..... *G. dumosa* var. *bigeloviana*

Gaylussacia baccata occurs in Newfoundland, Quebec, Ontario, Manitoba, and Saskatchewan, and ranges south to Georgia, Alabama, Kentucky, and Illinois (figure 6). The species is rare in Quebec and confined to the western part of the province.

All Canadian plants of dwarf huckleberry are referable to *G. dumosa* var. *bigeloviana*, which also occurs in New England and southward (figure 7). Fernald delimited this northern variety from the southern phase of the species both by the morphological features mentioned above and by the differences in habitat mentioned below. The southern phase of the species, var. *dumosa*, is present in Florida and Mississippi. Between the extreme northern and southern phases of the species, in the middle part of the range of *G. dumosa*, transitional plants often occur. The species is considered to be “threatened” in Quebec and in four of the ten American states where it occurs.

WESTERN HUCKLEBERRIES (*Vaccinium*)

Like the familiar principal commercial blueberry species (*V. corymbosum* and *V. angustifolium*), western huckleberries belong to the genus *Vaccinium*. (Vander Kloet (1988) provides a key to the 26 species in North America.) All shrubby species of *Vaccinium* growing in western North America have been called “huckleberries.” However, the commercial blueberry species are in section *Cyanococcus* of the genus, while the most important (i.e. harvested) western huckleberries are in section *Myrtillus*. Of the eight species of section *Myrtillus*, the two featured here have the largest and/or best tasting berries, and are the chief sources of collected wild huckleberries. These western huckleberries produce berries singly in the axils of leaves on new shoots (i.e. of the current year) while the commercial blueberries develop clusters of berries on 1-year-old wood, and produce larger amounts of berries.

The black huckleberry (*V. membranaceum*) grows at elevations between 600 and 3500 m a.s.l. throughout forested areas of Idaho, western Montana, western Wyoming, Washington, Oregon, British Columbia, southeastern Yukon, and southwestern District of Mackenzie, with isolated occurrences in Utah, California, Arizona, Michigan, South Dakota, and Ontario (figure 8).

The Cascade huckleberry (*V. deliciosum*) occurs at elevations of 600–2000 m a.s.l. in the Pacific coastal mountain ranges from northern California to British Columbia (figure 9).

Key to North American *Vaccinium deliciosum* and *V. membranaceum* (based on Vander Kloet 1988)

- 1a. Berry 4-celled; corolla 4- or 5-lobed.....Sections *Oxycoccooides*, *Oxycoccus*, *Vaccinium*, *Vitis-Idaea*
- 1b. Berry 5- or 10-celled ; corolla 5-lobed.....(Sections *Myrtillus* and others) 2
- 2a. Calyx articulated with pedicel.....Sections *Batodendron*, *Cyanococcus*, *Herpothamnus*, *Pyxothamnus*
- 2b. Calyx continuous with pedicel.....3
- 3a. Stamens exerted; bud scales more than 2.....Section *Polycodium*
- 3b. Stamens included; bud scales 2.....(Section *Myrtillus*) 4
- 4a. Berries normally red; twigs angular..... *V. parvifolium* , *V. scoparium*
- 4b. Berries mostly black, blue or glaucous; twigs round or angular.....5
- 5a. Leaf margins sharply serrate throughout; blade glandular beneath.....6
- 6a. Young twigs green and angular..... *V. myrtillus*
- 6b. Young twigs purple-green, reddish-green, or yellow-green, and more or less rounded.....7
- 7a. Leaves less than 10 mm wide..... *V. geminiflorum*
- 7b. Leaves more than 10 mm wide..... ***V. membranaceum***
- 5b. Leaf margins entire or partly serrate; blade not glandular beneath.....8
- 8a. Shrubs more than 50 cm high; plants single-stemmed or clumped..... *V. ovalifolium*
- 8b. Shrubs 3–50 cm high; plants forming extensive patches.....9
- 9a. Plants green or pale-green; twigs puberulent..... *V. caespitosum*
- 9b. Plants glaucous; twigs glabrous..... ***V. deliciosum***

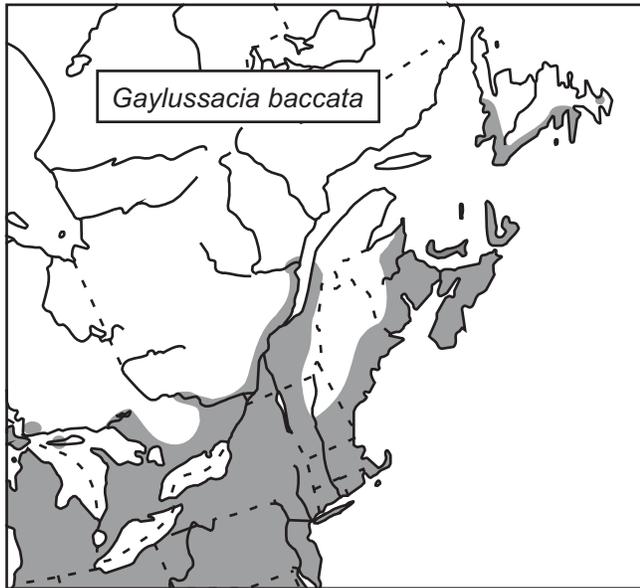


Figure 6. Distribution of common huckleberry (*Gaylussacia baccata*).

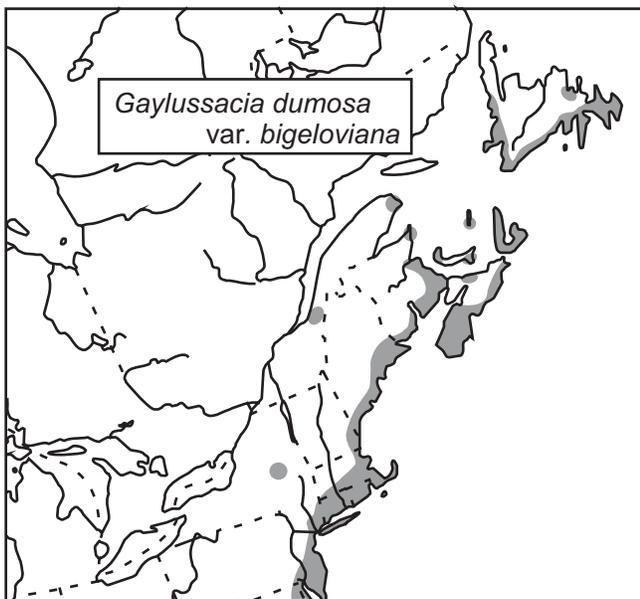


Figure 7. Distribution of Bigelow's dwarf huckleberry (*Gaylussacia dumosa* var. *bigeloviana*).

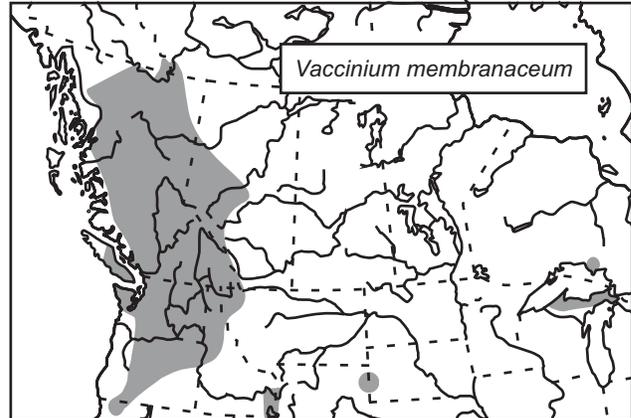


Figure 8. Distribution of black huckleberry (*Vaccinium membranaceum*).

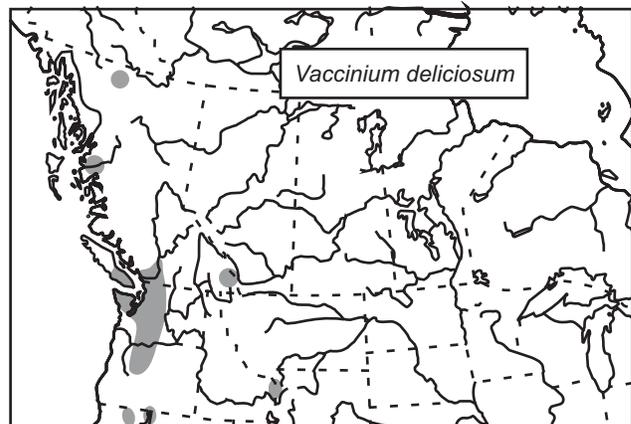


Figure 9. Distribution of Cascade huckleberry (*Vaccinium deliciosum*).

plant community. High diversity in huckleberry-dominated habitats may depend on disturbance. When natural disturbance patterns (such as erosion and fire) are eliminated, such as has occurred on Nantucket, huckleberry clones often expand, decreasing plant species diversity.

Both eastern and western huckleberries are pollinated by bees, particularly andrenid bees and bumblebees. The seeds survive digestive enzymes. Many kinds of birds and mammals that eat the berries contribute to long-distance dispersal of viable seeds. The food value of huckleberry shrubs represents a major resource, sustaining considerable animal biodiversity.

EASTERN HUCKLEBERRIES (*Gaylussacia*)

Common huckleberry (*G. baccata*) occurs in sandy or rocky soil, in dry or moist woods, thickets, clearings, bogs, and coastal dunes. The substrates occupied are usually acidic, and often dry. The plant is intermediate in tolerance to shade, becoming dwarfed in deep shade and developing densely in canopy gaps and clearings. Leaf break and flowering occur in early spring, flowering continuing through early summer. The species is self-sterile, and requires pollination. Fruit maturation begins in late summer, with fruits often remaining on the plants in the fall.

Ecology

Eastern and western huckleberries have many ecological features in common. Both regrow from rhizomes after fire. In some places the suppression of fires has enabled trees to invade open areas, resulting in declines in huckleberry populations. In many instances huckleberry shrubs survive for long periods in deep shade with little leaf and berry production until fire eliminates the shade, reduces competition, and releases nutrients. Production generally increases following fire.

Dense thickets of huckleberries resist tree invasion. With periodic fires, huckleberry heathland can become a stable

The variety of dwarf huckleberry in Canada (*G. dumosa* var. *bigeloviana*, figure 12) occurs in sphagnum bogs in maritime regions, and usually grows in open or very lightly shaded areas. In Quebec, it flowers later than *G. baccata*.

Reproduction is predominantly vegetative, by rhizomes, and the species tends to form large clones. In the southern part of its range, *G. dumosa* (i.e. *G. dumosa* var. *dumosa*) occurs in dry barrens and pinelands, in sandy soils rather than in bogs.



Figure 10. Dwarf huckleberry (*Gaylussacia dumosa*) in flower. Source: Curtis, W. (Editor). 1808. *The botanical magazine*. London, U.K. (plate 1106, vol. 27).

WESTERN HUCKLEBERRIES (*Vaccinium*)

The black huckleberry (*V. membranaceum*) occupies coniferous woods, talus slopes, subalpine fir forests, and alpine heaths. It has wide ecological amplitude, tolerating dry sites, but generally occurring on moist, moderately deep, well-drained soils, and preferring a pH of about 5.5. The species is moderately shade tolerant, growing both under partially closed forest canopy and in sunny openings. Black huckleberry is often found in areas that have been disturbed. In the Pacific Northwest, Native Americans regularly burned vegetation in order to stimulate growth of black huckleberry. Bears (both black and grizzly) feed extensively on the berries, but also on the leaves, stems, and roots. Elk, moose, and white-tailed deer browse on the leaves and sometimes on the twigs.

The Cascade huckleberry (*V. deliciosum*) occurs in alpine meadows, subalpine coniferous woods, and talus slopes. It is relatively tolerant of waterlogged soils, and often grows near the edges of ponds.



Figure 11. Cascade huckleberry (*Vaccinium deliciosum*). Source: United States Department of Agriculture, Forest Service Collection #20406; artist: Jane Roller; Forest Service Accession number: 6725.2723 (<http://huntbot.andrew.cmu.edu/USDA/27/6725.2723.gif>); public domain illustration.

Use as Food

Note

“For most people “huckleberry” doesn’t sound like something you would want to put in your mouth. Associated far less with food than with the wily, rough-hewn Mark Twain character Huckleberry Finn or even the slow-moving blue cartoon dog Huckleberry Hound, this uncultivated cousin of the blueberry nonetheless is finding its way into many a fine kitchen... Smaller than blueberries, with thicker skins and bigger seeds, these expensive fruits, which grow only in the wild, are charming chefs across the country with their complex flavors and deep color.”

— Bret Thorn (in *Nation’s Restaurant News*, April 12, 1999 (http://www.findarticles.com/p/articles/mi_m3190/is_15_33/ai_54397962).

Huckleberries were used extensively by western North American native people, who travelled great distances to gather the fruit and hunt wildlife attracted to the plentiful berries. Likewise in the east, native people and pioneers

frequently collected the berries, so much so that they spoke of such habitats as “huckleberry bogs,” “huckleberry cuts,” and “huckleberry slashes.” The berries were a staple, often combined with other items to make a variety of nutritious foods. At an annual feast, the Cherokee of North Carolina still deep-fry a combination of berries and corn-meal dough. The fact that the berries could be dried and stored for winter use contributed to their importance. In the U.S. some huckleberry fields are reserved for use by native Americans. In general, huckleberry habitats have declined and huckleberry-picking today is only a small fraction of what it was in earlier times.

“Huckleberries” available in the marketplace are mostly western huckleberry (*Vaccinium*) species (huckleberry products coming from western North America are certain to be derived from *Vaccinium* species). Fresh huckleberries are in season from late summer to late fall. The fruits are not edible until quite dark and soft. They are occasionally available fresh or frozen in supermarkets. The texture of huckleberries is harmed by freezing, but their taste and colour are unaffected. The fruit is consumed fresh, or made into preserves, syrups, jams, jellies, wine, and filling for pies, muffins, pancakes, and tarts. A variety of huckleberry-flavoured goods such as tea, coffee, soft drinks, ales, salad dressings, honey, and candies are marketed, often produced as cottage (i.e. very small-scale) industries. Upscale restaurants are increasingly offering gourmet meals with huckleberries, especially as sauces and syrups for desserts such as pastry, sorbets, and ice cream, but more and more as an accompaniment to savoury foods, especially game meat. Because they are relatively rare and require effort to acquire, huckleberries generally are more expensive than blueberries. Recipes for using huckleberries can be found in wild food guides, but a variety of imaginative recipes are readily available on the Web (these are usually based on the western species). Huckleberry flavour is strong, and when substituting huckleberries for blueberries it is often recommended that half of the amount of fruit be added.

Non-Food Uses

Common huckleberry (*G. baccata*) is occasionally employed as an ornamental or landscaping plant. Once dense thickets are established it is difficult for trees to invade, and accordingly the species has been recommended as cover for power line rights-of-way.

Western huckleberries are used to a small extent to provide aroma for soaps, lotions, shampoos, and candles. Wildcrafted leaves and berries of *V. membranaceum* are used for the production of over-the-counter herbal medicinal preparations, particularly in the forms of capsules and extracts.

Both *Gaylussacia* and *Vaccinium* species are important sources of food for wildlife and, as components of forests, shrub lands, and bogs, they also provide cover and habitat.

Agricultural and Commercial Aspects

Huckleberries are undomesticated, and not commercially cultivated. Except for the occasional home garden,

huckleberries (both eastern and western) are collected entirely from the wild. The western species are harvested far more than the eastern. The skin of western huckleberries tends to tear much more readily than that of blueberries (partly because of the lack of a well-developed basal abscission layer), making the marketing of undamaged fresh fruits very difficult. Accordingly, most of the fruit is frozen or processed into jam and other products. Western huckleberries typically wholesale at U.S.\$4.00–7.00/L, and under ideal conditions pickers harvest 3.8 L/ hour (subsequently the berries must be cleaned of debris). It has been estimated that managed wild plants of *V. membranaceum* can produce berries worth about U.S.\$2,000/ha. However, the volume of berries harvested is often quite variable from year to year and among sites, as is typical of wild fruit crops that are strongly influenced by weather conditions. Attempts are underway in the United States to develop the two western huckleberry species as managed, and possibly also as cultivated crops, notably at the Sandpoint Research Center of the University of Idaho. To facilitate this development, several publications on growing western huckleberries have been produced (see Sources of Additional Information). These include analyses of commercial prospects, as well as information on propagating, planting, pruning, harvesting, and marketing.

Cultivars and Germplasm

Cultivars of *Gaylussacia* do not seem to be available (statements in the literature to the contrary are likely based on confusion with *Vaccinium* species called huckleberries). The U.S. National Plant Germplasm System lists one (seed) collection of each of *G. baccata* and *G. dumosa*. *Gaylussacia* species are moderately widespread in eastern North America, and there are indications of substantial infraspecific variability in some of these, but this variation has not been well documented. Given that there are concerns about the survival of some of the species in the peripheral parts of their ranges, conservation measures are a priority.

The U.S. National Plant Germplasm System lists 64 collections of *V. membranaceum* and 11 of *V. deliciosum*.

Prospects

EASTERN HUCKLEBERRIES (*Gaylussacia*)

At this time there are no efforts underway to develop *Gaylussacia* species as either a managed wild crop, or a new, cultivated crop. Reasons that have been advanced to explain the lack of interest have focussed on the large, hard seeds. These are indeed an impediment to marketing eastern huckleberries as a fresh fruit crop but, as is evident for western huckleberries, there are numerous products that can be developed to utilize the pulp and juice. As the source of the best tasting fruit, *G. baccata* is the species of *Gaylussacia* most deserving of development. Both lowbush blueberry (*V. angustifolium*) and *G. baccata* are native to eastern Canada and the northeastern United States, and most commercial production of the former is from this range. The lowbush blueberry stands are managed much like garden plants—they are fertilized, and pests and weeds are controlled, but in many cases natural stands are simply

adopted, rather than planted. In the case of *G. baccata*, it seems necessary to first select superior strains, and to establish these in suitable plots. An investment in research and development is required, and this, combined with a general reluctance to add another berry crop to the already competitive market, represents a substantial hurdle. However, the facts that *Gaylussacia* is adapted to habitats unsuitable for most agricultural endeavours, and that there are environmental advantages to developing native crops in native habitats suggests that eastern huckleberries represent a potentially profitable new crop initiative worth exploring.

WESTERN HUCKLEBERRIES (*Vaccinium*)

The popularity of wild-collected western huckleberries as a gourmet item in upscale restaurants and occasionally in marketed processed foods shows that there is a market niche for the fruit. In Canada, there is a small amount of production of various goods based on wild-harvested fruit. In the United States, there have been several studies of how to manage western huckleberries as wild-growing crops, and there is some consideration being given to development of cultivars. Western huckleberries grow slowly, and are notably less productive than the commercial blueberries, so that considerable investment in research may be required to raise their status to the level of the commercial blueberry species. However, their superior taste characteristics ensure that they will at least remain an ongoing gourmet treat harvested from the wild.

In summary, both eastern and western huckleberries are undomesticated, wild plants, requiring considerable basic study to improve their productivity as crops. Studies of taxonomy, physiology, and agronomy are needed. Much of what has been learned about propagation and management of commercial blueberries applies also to huckleberries, thus providing a head start on crop development. Lowbush blueberry (*Vaccinium angustifolium* Aiton) serves as a model of a species that has been very successfully turned into a crop harvested mostly from managed natural populations, and to emulate this success story, additional management studies are required. Highbush blueberry provides a different model of a successful crop species—one that has been developed by intensive breeding—and to follow this example, there needs to be selection of germplasm with superior flavour; frost, drought, and disease resistance; abundant berry production; and suitable growth characteristics. The current commercial blueberry crops provide the chief competition and deterrent to development of huckleberries as new crops. However, the widespread marketing of huge but flavourless, watery blueberries suggests that the highly flavoured huckleberry could become increasingly popular with consumers. There is much interest currently in the health benefits from antioxidants in berries, and it may be that huckleberries could also be desirable in this regard. Canada is in a good position to develop huckleberry crops, and if not done in this country one may expect development elsewhere.

Myths, Legends, Tales, Folklore, and Interesting Facts

- Languages evolve, and huckleberry is illustrative of this. Huckleberries were extremely common in pioneer days in

the eastern United States, and came to be used in many expressions. Because huckleberries are a small fruit and were so widely available, “huckleberry” became a slang term for a person of no consequence or a small amount of something. “As thick as huckleberries” meant very thick. “To get the huckleberry” was used like “getting a raspberry” (or getting razzed) is today, i.e. to be laughed at or ridiculed. “To be a huckleberry to someone’s persimmon” was to be nothing in comparison with something else, while “to be a huckleberry over someone’s persimmon” meant to outrank someone.

- It has been claimed that a colony of the box huckleberry, *G. brachycera* (Michx.) A. Gray, a species native from Delaware and West Virginia south to Tennessee, holds the record for the greatest area covered by one “plant.” The colony was found in 1920, at which time it covered an area of 40.5 ha near the Juniata River in Pennsylvania. It is thought to have started 13,000 years ago from a single plant, which multiplied vegetatively to cover the huge area.
- “Fly cake,” “fly pie,” and “roach cake” are old lunch counter terms for a raisin cake or huckleberry pie.
- In 2000, the “huckleberry” was declared to be the “official fruit” of Idaho, a measure that was initiated by a group of fourth graders. (Dr. Pam Brunnsfeld, curator of the University of Idaho Stillinger Herbarium (ID), has advised us that the fruit in question refers to species of *Vaccinium*, especially *V. membranaceum*.)
- The disjunct occurrence of *Vaccinium membranaceum* — common in the cool mountains of western North America but rare in eastern Canada — is illustrative of a well known biogeographical pattern shared by a few dozen species. In Ontario, these species occur primarily in the cool humid region close to the shores of Lake Superior, and are believed to be post-glacial relics from a time several thousand years ago when cold conditions existed over broad regions of the receding glacial front. As the cold environment receded to the north, they survived in the cool microclimate of the shoreline. For more information on this pattern, see: Given, D.R., and Soper, J.H. 1981. The Arctic-alpine element of the vascular flora at Lake Superior. National Museum of Natural Sciences Publications in Botany No. 10. National Museums of Canada, Ottawa. 70 pp.
- Huckleberries are a favourite food of bears, which is worth remembering when collecting this fruit from wild stands.

Sources of Additional Information

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Figure 12. *Gaylussacia dumosa* var. *bigeloviana*. Artist: Réjean Roy. Provided by the Ministère du Développement durable, de l'Environnement et des Parcs du Québec.

News from Teaching Section

prepared by Christine D. Maxwell, Chair of the Section

The Teaching Section, working jointly with the Education Section of the CSPP has planned an exciting afternoon of presentations which will take place on **Thursday, June 16th 2005**, at the **Plant Canada Conference** in Edmonton. We hope as many of you will attend as possible.

To start the session we will have two presentations from 3M Teaching Fellowship winners, **Dr. David Cass** and **Dr. John Hoddinott**. David Cass is a Professor Emeritus at the University of Alberta. He was awarded the fellowship in 1996, in addition, has several teaching awards from the University of Alberta. His keen interest in teaching extends beyond the university level to the high school and elementary school systems. His talk is titled "*Plant biology for non-believers*." He will examine new approaches in our teaching to encourage undergraduate students to enter programs in plant biology.

Dr. John Hoddinott is currently Dean of Teaching and Research at Augustana College at the University of Alberta. He was awarded a 3M teaching fellowship in 1994, and has also won teaching awards from the University. He has been very active in curriculum development and initiated the peer consultation program at the university. He has also been active in research into student opinions on the effectiveness of learning and assessment in large classes. His presentation is titled "*Developing the Habits of the Mind and Heart in the Liberal Arts and Science Curriculum: A Place for Technology?*"

Continuing the program, **Dr. Frédérique Guinel** a plant physiologist and enthusiastic professor at Wilfred Laurier University in Waterloo, Ontario, will present a talk entitled "*Botany, an eye-opener to adaptation and diversity*" in which she describes a second year course entitled "Comparative Botany-Terrestrial Plants" which she developed when instructed to make students like plants!

After a short break **Elizabeth Straszinski**, a science teacher at the University of Toronto Schools (a co-educational school for high achieving students) will present two papers. The first is titled "*Plants Rule: Supporting Botany Education in Schools*", in which she will describe designing Botany-content lessons that will be not only welcome when presented by an expert but can easily be repeated by the teachers themselves. In the second presentation, titled "*Developing Scientific Writing Skills in Secondary Students*", she will discuss a skill-development exercise to integrate experimental design, execution, and analysis, with an emphasis on scientific writing.

The session will end with what we hope will be a lively round table discussion. The topic at the time of writing is "*Does the modern Biology student need Botany?*"



Green Graduates

from Department of Botany, University of Western Ontario, London, Ontario

gathered by Dianne Fahselt

This column welcomes information on new graduates from all Canadian universities who recently completed theses relating to plants, algae or fungi. Please send updates to the Editor.

Jeffery Dech, PhD (Dec. 2004), supervisor Anwar Maun. The ecological significance of sand burial to woody plants on coastal sand dunes.

Mana Farhang, MSc (Sept. 2004), supervisor Dan Brown. Bidirectionalization of the tCUP cryptic promoter.

Loreta Gudynaite-Savitch, PhD (Sept. 2004), supervisor Norm Hüner. Cytochrome F from the Antarctic green alga *Chlamydomonas raudensis*: structure, function, accumulation and assembly into the cytochrome B6/F complex.

Michael Lynch, MSc (Dec. 2004), supervisor Greg Thorn. Species richness and composition of soil Basidiomycota.

Jignasha Petel, MSc (Sept. 2004), supervisor Jim Brandle. Evaluation of elastin-like polypeptide (ELP) as a fusion partner for accumulation and purification in plant-based recombinant protein production.

Tessa Pocock, PhD (Sept. 2004), supervisor Norm Hüner. Phylogeny, photoinhibition and recovery of a new antarctic psychrophile, *Chlamydomonas raudensis* (UWO241).

Di Shao, MSc (Jan. 2004), supervisors Mark Bernards & Edmund Liu. Anti-inflammatory polysaccharides from the Thunder God Vine: *Tripterygium wilfordii* Hook F.

Michelle Sweeney, PhD (Sept. 2004), supervisors Sheila Macfie & Charlie Trick. Investigation of the differential response of near isogenic lines of durum wheat (*Triticum turgidum* var. *durum*) to cadmium (II).

