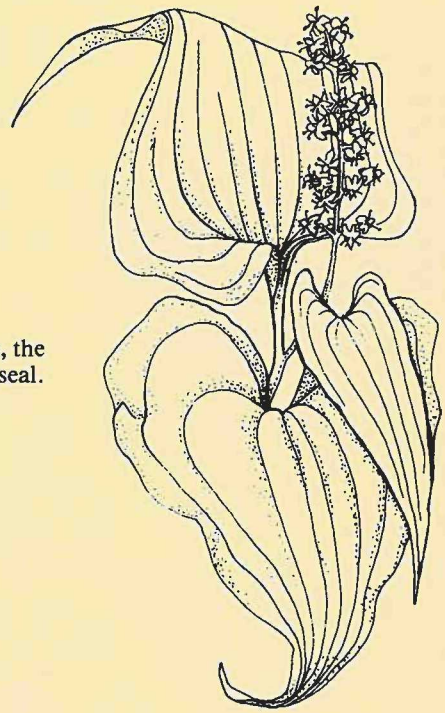
DAVIDSONIA

VOLUME 7 *NUMBER 1* *Spring 1976*

Cover:

Petasites palmatus, the Palmate Colt's-foot, an early-flowering member of the Aster family (Asteraceae). The leaves of this plant, which appear slightly later than the flowers, often become very large.



Maianthemum dilatatum, the Two-flowered False Solomon's-seal.

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Davidsonia is published quarterly by The Botanical Garden of The University of British Columbia, Vancouver, British Columbia, Canada V6T 1W5. Annual subscription, six dollars. Single numbers, one dollar and fifty cents. All editorial matters or information concerning subscriptions should be addressed to The Director of The Botanical Garden.

Acknowledgements

Pen and ink illustrations are by Mrs. Lesley Bohm; photographs are by Dr. Roy L. Taylor. The article on *Amelanchier* was researched by Mrs. Sylvia Taylor, and Dr. Nancy J. Turner kindly contributed the ethnobotanical information. Ms. Geraldine Guppy and Miss Ellen Campbell assisted with editing and layout. We are indebted to Professor Malcolm McGregor for the Latin quotation on page 4. The explanatory note accompanying the Climatological Summary was prepared by Mr. K. Wilson.

ISSN 0045-9739

The New Inventory of the Vascular Plants of British Columbia

ROY L. TAYLOR

This year saw the completion of the long awaited inventory phase of the Flora of British Columbia Program. The program was initiated in 1973 (see Davidsonia 4:37-40) and the resulting publication is scheduled for release by The University of British Columbia Press in February, 1977. The program was completed by the Botanical Garden with support by the National Research Council of Canada. The Vancouver Foundation and The Leon and Thea Koerner Foundation have provided additional support for the publication of the book. Some 42 specialists have contributed to the program and Vancouver Systems Services Ltd. provided programming expertise for the computer base. The computing facilities used were those of the Computing Centre of the University of British Columbia, and a total of more than 50,000 card entries were processed. Special thanks are expressed to the hard-working technical editorial staff: Geraldine A. Guppy, Olga Herrera-MacBryde, Linda R. Martin, Rosamund A. Pojar and Sylvia Taylor.

The inventory consists of four principal sections. The first group contains club mosses, quillworts, horsetails or scouring rushes, and ferns. The second group contains the conifers. The third group contains those flowering plants recognized as dicotyledons, and the final group contains those recognized as monocotyledons. The taxa are arranged alphabetically according to family, genus, species and infraspecific categories. Each section is preceded by a list of the families found in that section. Contemporary synonymy at the family and genus level is included within the inventory, and synonymy relating to species or infraspecific taxa is found in the index, cross-referenced to the appropriate taxon in the inventory. We have included in our synonymy all taxonomic names found in floras, manuals, checklists, and popular wild flower publications that are in common use in evaluating or keying out plants in British Columbia.

The program represents a unique departure from the traditional floristic inventory. The data is of two main types. First, nomenclatural data is provided; this consists of both the botanical and common name for each taxon. The plant name authorities, or authors of the botanical names, are given in full to provide those users who are not familiar with the abbreviated authorities an opportunity to recognize some of the history that relates to our flora. The common name for each taxon has been selected carefully from among those names that are in greatest use. Frequently, however, many names are used for a single taxon. In choosing the name, we have given consideration to its suitability, and also to the names used in other parts of the country. We have used standardized names from

FIGURE 1. A coastal British Columbia strand community in the transitional beach zone above the driftwood line.

publications such as *Common and Botanical Names of Weeds in Canada*, adopted by the Canada Weed Committee in 1969; *Recommended Plant Names* by A. A. Beetle, published in 1970; *English Names of Wild Flowers*, approved by *The Botanical Society of the British Isles*; and the miscellaneous publications of the Field Crop Branch of the Province of British Columbia. We have standardized the spelling of common names by referring to the guidelines published in 1969 by the Canada Weed Committee.

The second type of data found in the inventory consists of descriptive information concerning specific characteristics of each of the taxa. One of the problems encountered in the production of such an inventory is the necessity of accumulating a standard set of data for each of the taxa reviewed. This is associated with the use of a computerized data base system, which utilizes these standardized items of information in searching of the data base and output of data. The value of the data base increases when all characters are scored for a given taxon. We have not provided complete sets of data for all taxa, as the information is in many instances not available. A good example to illustrate this lack of information can be found in the chromosome complement data. There are many taxa in British Columbia for which no information on the chromosome complement exists, hence we cannot determine whether they are diploid, polyploid or aneuploid, give a base number for the taxon, or list the somatic chromosome numbers. It is clear that there are gaps in our knowledge of the genetic makeup of the taxa in our flora. Similar deficiencies are found in other characters studied. Such gaps should provide some guide for future research on the flora, and as new information is gathered it can be added to our data base. A total of 16 characters of descriptive data containing 160 character states are included for each of the 3137 taxa recognized in the flora. The potential value of this data base becomes apparent when it is realized that the possible search combinations add up to more than 337,000,000,000,000. The capability of searching for different combinations of data characteristics represents a major step forward in providing new insight into the relationships within our flora.

The vascular plant flora of British Columbia represents an important transitional flora linking the Pacific Coast Region of the United States with the Alaskan and Northern Canadian floras. The northeastern portion of the province contains many of the transcontinental Northern Boreal plant elements and in addition possesses a number of Great Plains plant taxa.

The area is a large one, 366,255 square miles (94.863 million ha) or 9.5% of Canada's surface, and has diverse topographic features extending from 48° 19′ latitude in the south to 60° latitude in the north. Altitudes range from sea level to 13,104′ (3,994 m) and there are 1,180 miles of continental coastline. The weather conditions show great variation, as reflected by 30 year records collected by the Atmospheric Environment Service between the years 1941 and 1970. Average frost-free periods range from 283 days at Victoria (elev. 79 m) to 12 days at Alexis Creek (elev. 1219 m) in the Cariboo region. Temperature extremes range from 42°C at Grand Forks (elev. 532 m) to -51°C at Fort Nelson (375 m) and annual mean precipitation varies from 241 mm (230 mm rain and 11 cm snow) at Prince Rupert (elev. 51 m) to 26 mm (18 mm rain and 8 cm snow) at Kamloops (elev. 378 m).

The diverse nature of the topography and climate has been used by Dr. Vladimir J. Krajina as a basis for mapping of the vegetation types in the province. A total of 12 biogeoclimatic zones have been established and are used for description of the plant distribution in the inventory.

The composition of the 3,137 vascular plant taxa shows three major affinities. These phytogeographic relationships reflect the recent migration of the flora during the past 13,000 years following the retreat of the last glaciation which covered all the province. A few ice-free headlands and nunataks persisted during the last glaciation on the Queen Charlotte Islands, with the result that a few endemic taxa have been recorded for this area (*Flora of the Queen Charlotte Islands, Part I, Systematics of the Vascular Plants* by James A. Calder and Roy L. Taylor 1968). It has been suspected that similar circumstances may have existed in some of the mountains on Vancouver Island, but no substantiating biological evidence has accrued to support the hypothesis.

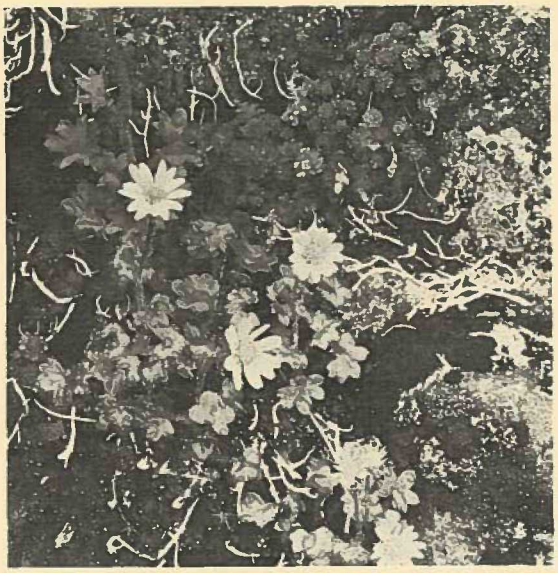

FIGURE 2. *Senecio newcombei*, Newcombe's Ragwort, is endemic to the Queen Charlotte Islands and was first collected there in 1897.

FIGURE 3. *Isopyrum savilei* or Queen Charlotte Isopyrum, first collected in 1957, is another endemic of British Columbia.

The majority of species in the indigenous vascular plant flora are of North American origin. There are a large number of southern taxa derived from the Pacific Coastal and Columbia Basin areas. Similarly a good representation of Great Plains species is found in the northeastern portion of the province.

The northern and montane species are largely derived from the Circumboreal and Circumpolar floristic elements. There are some elements represented by the Rocky Mountain flora to the south, but the majority of montane species are widespread alpine species.

The adventive or introduced component of the flora is large, 21.1%. This element of the flora has been introduced largely within the last 150 years and is continually increasing. The rapid urbanization of the Lower Mainland, Vancouver Island and parts of the Interior has accelerated this increase in numbers of adventive plants. It can be expected that this element of the flora will continue to grow rapidly. Such growth is not without benefit from a research point of view, as "weeds" provide excellent subjects for the study of biological phenomena related to evolution. These plants represent a living laboratory of enormous proportions that has not been adequately tapped for research purposes. Table 1 shows the breakdown of indigenous versus introduced taxa and the details of their respective life histories.

This inventory of the vascular plants has its roots in two previous programs. Agriculture Canada initiated a comprehensive survey of the vascular plants of the province in 1953 under the direction of James A. Calder. The program was designed to provide documented plant collections of all regions of the province. Although the program was never completed, extensive plant collections were made throughout the province and this collection combined with past and present information about the flora provided a base for developing a comprehensive inventory of the vascular plants.

The second program that provided stimulus to the development of this project was the Flora North America Program, first discussed in 1966 and later initiated as a program in 1972. The present Flora of British Columbia Program was a direct outgrowth of the establishment of an editorial unit for the FNA Program at the Botanical Garden of The University of British Columbia. When the FNA Program was suspended in the spring of 1973, the National Research Council of Canada maintained research grant support for the editorial team to continue an FNA Program-based Flora of British Columbia. The objectives of the program were reviewed and a deliberate shift in the FNA

Table 1. Introduced and Indigenous Taxa in the Vascular Plant Flora of British Columbia*

	Annual	Biennial	Perennial	Total
Indigenous taxa	**314**	**49**	**2112**	**2475**
Percent of indigenous taxa	*21.68*	*1.98*	*85.34*	
Percent of total flora	*10.01*	*1.56*	*67.33*	*78.90*
Introduced taxa	**274**	**45**	**343**	**662**
Percent of introduced taxa	*41.39*	*6.79*	*51.82*	
Percent of total flora	*8.73*	*1.43*	*10.94*	*21.10*
Total taxa in the flora	**588**	**94**	**2455**	**3137**
Percent of flora	*18.74*	*3.00*	*78.26*	

*Excerpted from *Vascular Plants of British Columbia — A Descriptive Resource Inventory.*

Program was made to achieve a greater input of data of use to resource managers and planners. The result of this change in emphasis was to include a number of categories of information of specific interest to resource personnel. The basic premise was maintained, i.e., to develop a taxonomically accurate inventory with basic morphological descriptors. The distribution of taxa from a phytogeographic point of view was established and economically important categories of information were added.

The basic taxonomic inventory presented many difficult problems. The flora contains many northern extensions of more southern elements and southern extensions of northern elements. In some cases, the taxa in question had never been looked at critically to determine their taxonomic relationship. The problem is further compounded by the fact that the northern elements have been subject to detailed analysis by European-based authorities whereas the southern elements have been primarily researched by American taxonomists. The northern elements, because of their frequent circumboreal or circumpolar distribution, have usually been looked at from a broader point of view, whereas the southern elements, being mostly indigenous North American taxa, have been treated from a more restricted viewpoint. Our work with the British Columbian flora often required careful reconciliation of these two points of view. In addition, an overriding problem of our work was to ensure that more wide-ranging species, particularly the adventive taxa, were examined from the broad point of view to ensure that the taxonomy used was in keeping with the knowledge already available from their indigenous distributions. Such an emphasis demanded a careful examination of floristic and monographic treatments from their countries of origin. We made a concerted effort to evaluate such taxa from a worldwide point of view and have relied heavily on existing floras such as Flora Europaea and other contemporary European and Asiatic floras. Authorities have been rechecked for all taxa in an attempt to delete repetitious errors that have been perpetuated in other floras.

The production of this book begins an exciting new chapter in the development of our knowledge of B.C.'s flora. The information contained in the Inventory will provide a complete list of both botanical and common names of our vascular plant vegetation as well as pertinent descriptive information that is of particular interest to resource planners and managers. The unique storage of this floristic information in a computerized data bank will enable amended and new information to be added to maintain a contemporary inventory. We hope that the publication will stimulate new research emphasis on the flora so that we can quickly proceed to the second stage of the Flora of British Columbia Program, the development of an illustrated and keyed manual to our vascular plants.

Velut arbor aevo
Horace Ode 12 — Book 1

Amelanchier alnifolia (Nuttall) Nuttall

SASKATOON

Member of the Family Rosaceae

Natural Distribution

Amelanchier alnifolia is present from southern Alaska, the Yukon and Northwest Territories south to California and east to Alberta, the Dakotas, Nebraska, Colorado, New Mexico and Arizona. It is found throughout British Columbia.

Habitat

Amelanchier alnifolia is found in open woods, along canyons and on hillsides from near sea level to subalpine altitudes. In British Columbia the species is found in exposed places from sea level to 152 m elevation on the mainland, and to 457 m on the southeastern part of Vancouver Island. It normally grows in areas where the precipitation ranges from 58 to 165 cm annually.

Description

This species is variable, due to changes during development as well as differences in the environment. It is a low and spreading to erect and slender shrub or sometimes a small tree, (0.5-) 1-5 (-10) m tall, deciduous and unarmed. It has multiple trunks with an open crown, and sometimes forms vast thickets. If a tree, the trunk is erect and usually less than 5 m but occasionally to 10 m tall, with a DBH to 20(-35) cm. The crown is usually narrow to open with slender rising branches that tend to droop. In exposed situations it is sometimes dwarfed and prostrate. The roots are fibrous and deep.

The bark is light gray or reddish-brown, often with a pinkish cast, conspicuously marked by slightly twisted vertical lines of a darker color. It is thin and smooth, or slightly fissured on older specimens, especially near the base.

The branches are numerous, erect, flexible, reddish-brown, and glabrous or (more commonly) sparsely to thickly sericeous or grayish-tomentose at first, becoming glabrate and eventually grayish with age. The branchlets are slender, terete and zigzag, more or less circular and with an unpleasant odor and bitter taste. The pith is slightly five-sided, continuous, pale and small.

The wood is light brown, heavy and hard, fine-textured, tough and strong. The grain is straight to irregular with a large proportion of whitish sapwood; the heartwood is brown or reddish-brown but is usually absent from small specimens. The wood has no distinctive odor or taste. It is rather easily worked and takes a good polish, but is of no commercial value because of the scattered distribution and small size of the trees.

The buds are 3-6 mm long, asymmetrically ovoid to ellipsoidal, acute or acuminate, purplish to dark brown, and glabrous to pubescent. They are conspicuous, solitary and sessile, axillary or supra-axillary, alternately arranged and pressed against the twig. The buds are of two kinds: the larger and more dilated flower buds and the narrow, elongated leaf buds. Bud scales are several, imbricated, the outer ones shading from dull purple to red and often with yellow on the margins. The edges of the outer scales are pubescent, the apex emarginate with the tip of the keel extending beyond the teeth. The inner scales are ovate, acute, brightly colored and covered with pale silky hairs, usually protruding between the outer scales.

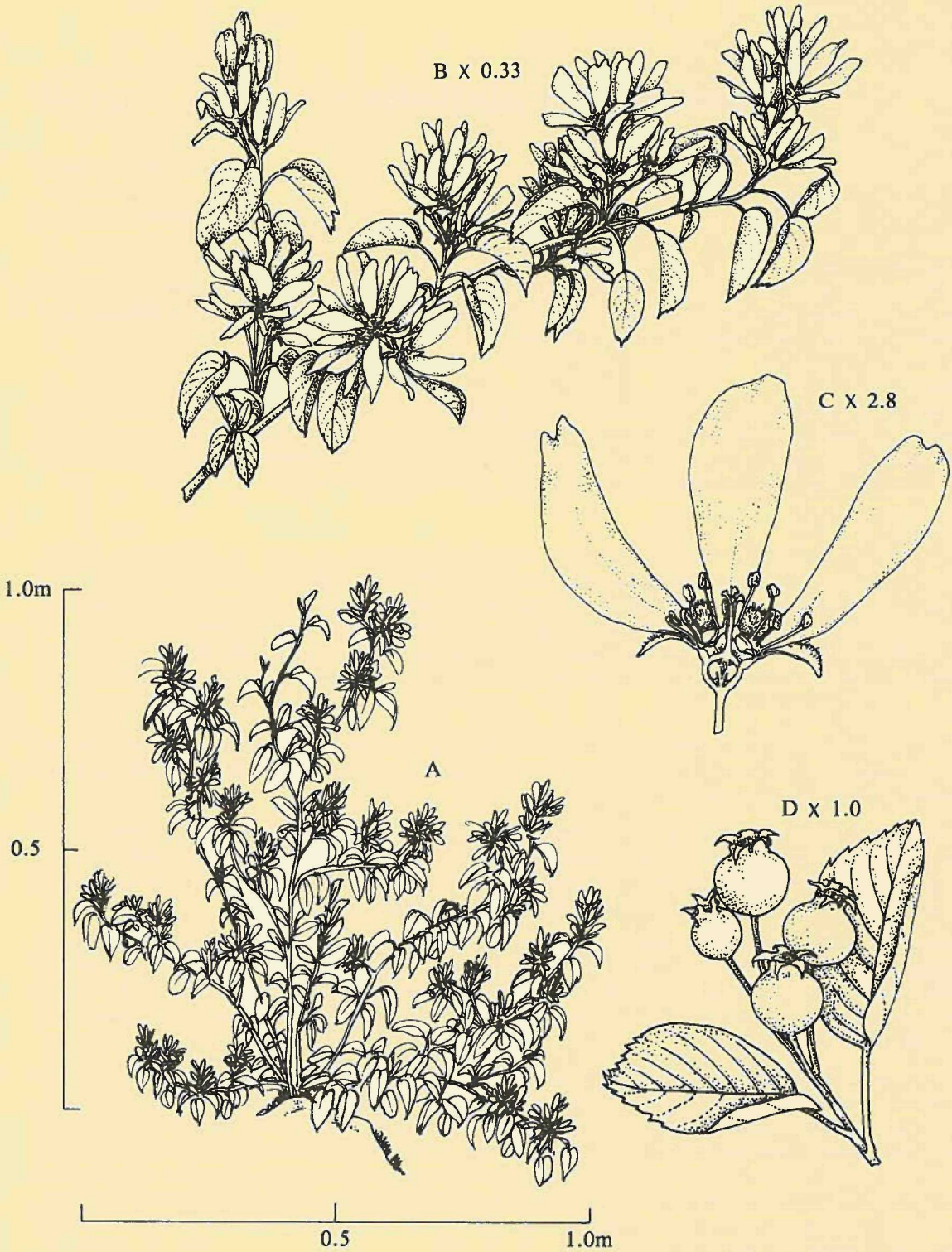

FIGURE 4. *Amelanchier alnifolia.* A. Habit of shrub, B. flowering branch, C. cross-section of a single flower showing the floral parts. D. twig with mature fruits.

The leaf scars on the twigs are alternate, raised, narrowly crescent-shaped or U-shaped, and constricted between bundle scars; there are three bundle traces.

The leaves are alternate, (1.5-) 2-4 (-5) cm long and 1.5-3 (-4) cm broad, oval to oblong or broad-ovate, the apex rounded to semi-truncate or acute and the base cuneate to rounded or subcordate. The leaf blades are thin to coriaceous, bright green above (often tinged with red at first) and paler beneath, often glaucous, and glabrous to copiously sericeous or grayish-pubescent when young, at least on the lower surface. The leaf margins vary from (occasionally) nearly entire to (usually) sharply serrate, the serrations extending across the tip or sometimes almost the full length of the leaf. The leaves are half to fully expanded at flowering time. Leaf stipules are paired, entire, small (6-18 mm long) and linear, rose-colored, soon falling. The leaf petioles are slender, (5-) 10-20 (-25) mm long, often villous-tomentose (at least when young), becoming glabrous with age. The leaves show extraordinary variation depending on stage of development and habitat.

Amelanchier alnifolia flowers from April to July in British Columbia, and as early as March in the more southern parts of its range. The inflorescence is a small, terminal, erect raceme 4-8 cm long, borne on short leafy branchlets of the current season, with 3-20 flowers. The branches of the inflorescence are often villous-tomentose. The flowers are perfect, regular, fragrant, often showy, usually appearing with or slightly before the leaves. The calyx is more or less campanulate or urceolate, adnate at its base to the ovary, and varies from glabrous inside and out to sparsely or densely floccose or lanate, especially on the inner surfaces of the hypanthium lobes. The hypanthium is free and somewhat flared, 1-2 mm long, and lined internally with a thin to thickish glandular disc. The five calyx (hypanthium) lobes are (1-) 1.5-3.5 (-5) mm long, triangular to lanceolate, entire, acute to acuminate at the tip, spreading to recurved, and persisting on the fruit. The petals are 5, white or rarely pinkish, (5-) 10-20 (-25) mm long and 2-6 (-8.5) mm broad, ascending, more or less ciliolate, and with a small tuft of hairs at the base of a very short claw. They are linear to rather broadly linear-oblanceolate or oval, and characteristically are slightly twisted. The petals are attached on top of the hypanthium at the edge of the glandular disc. The stamens are approximately 12-15 (-20), inserted in three rows on the time of the calyx. The filaments are (1.5-) 2-3 (-4) mm long, slender, glabrous, broadened and sometimes very slightly connate at the base, somewhat persistent; the anthers are oblong and are 0.5-1 (-1.5) mm long. The styles are (4-)5, 1.5-2.5 (-5.0) mm long, free or united at the base or to the middle, the stigmas small and capitate. The ovary is almost completely inferior, its rounded top (inside the hypanthium) glabrous to densely grayish-tomentose. It is compound with 2-5 locules, each of these becoming divided into two as a result of the development of false partitions. The ovules are solitary in each locule. The pedicels of the flowers are mostly 5-10 (-15) mm long, slender, ascending, bractate at the base and with a second bract at or near the middle. The bracts are deciduous.

The fruit is a berry-like pome (6-)10-14(-15) mm long, dark purplish to black, glaucous to more or less glabrous or sparsely pubescent, nearly globose, fleshy and rather juicy and palatable. A cavity remains at the top of the fruit, surrounded by the calyx lobes and the remnants of the hypanthium. The seeds are 5-10(-14) in number, approximately 5 mm long and 2-3 mm wide, elliptic, dark-brown in color, smooth, and flattened. The fruits mature from (June) July to September. Abundant seed is produced nearly every year.

Propagation

The seeds may be sown as soon as they are ripe or stratified for four months at 5°C. Germination occurs relatively quickly in moist humus soil under partial shade. Seedlings may be planted out in a permanent position after 3 or 4 years.

The shrubby types of Saskatoon are easily divided, new sprouts quickly forming from the roots. Layering and grafting of special varieties have also been successful. Cuttings should be taken in the fall and stored in sand for the winter, then (if possible) placed under overhead mist for rooting.

Transplantation

Amelanchier species require severe pruning to survive transplantation when mature, and often then it is not successful. If transplantation is attempted, transplant with a root ball early in the spring, just before growth starts, into soil well enriched with plenty of humus.

Conditions for Cultivation

The rate of growth is moderate throughout the life of the plant; stems with a DBH of 5-10 cm are 9-20 years old. The recommended hardiness zone in Canada for *Amelanchier alnifolia* is Zone 1 (Sherk and Buckley 1968). This variable species is adapted to a wide range of cultural conditions, thriving in any good garden soil with a pH of 6.0-7.0(-7.5); it prefers sun or light shade, with ample moisture during the early part of the growing season. The species looks best when allowed to grow naturally with a minimum of pruning; if light pruning is necessary it should be done during the winter or just before growth starts in the spring. Severe pruning should be avoided whenever possible, except when transplantation takes place.

Landscape Value

Amelanchier alnifolia has many uses in landscaping, is attractive at all seasons and has been recommended for extreme northern regions. The abundant showy white flowers appear early in the spring, often before the leaves are fully developed. However, they may last only a few days if the weather is unusually warm. The flowers are followed by dark reddish or purple edible fruits in late summer, which attract birds, and by the richly colored fall foliage. In winter the slender branches and fine twigs produce an attractive delicate pattern, yet are strong enough to resist breaking. The light gray bark with a pinkish cast and striping is outstanding during the dull winter days. The shrub may be used in many places in the garden but is perhaps best suited to naturalized plantings, e.g., at the edge of woodlands or near ponds, and against a dark background to emphasize the different seasonal colorations. Because of its multiple trunks this plant makes a good screen and has been suggested for hedges. The roots are not invasive and shade cast is not heavy, so it is a good tree for gardens.

Availability

Amelanchier alnifolia and its cultivars are apparently not obtainable from nurseries in British Columbia but are sold by nurseries in Alberta and the eastern provinces, and also in the United States. Seeds are readily available from natural populations.

Varieties

Amelanchier alnifolia is a variable species complex which has been separated into a number of different species. It could just as readily be treated as a single species, or, at most, as an aggregate, since the different variants show almost complete intergradation. Both floral and vegetative features have been widely used in separation of the varieties, but many of these features show particular variation with age and habitat. The following varieties are those recognized in the Flora of British Columbia Program (Taylor and MacBryde):

(1) *Amelanchier alnifolia* var. *alnifolia*, Common Saskatoon. This is the common variety of the Great Plains. It occurs almost entirely east of the Coast Range, becoming more common southward and eastward to Alberta, the Dakotas, Utah, Colorado and Nebraska. Occasional specimens are found west of the Cascades. In B.C. this variety is most commonly encountered in the Peace River area.

(2) *Amelanchier alnifolia* var. *cusickii* (Fernald) C. L. Hitchcock in Hitchcock et al. *(A. cusickii* Fernald), Cusick's Saskatoon. This is the largest-flowered variety, and is rather clearly marked although often transitional to the other varieties. The petals are usually 16-25 mm long, the top of the ovary glabrous to somewhat hairy but never densely woolly-pubescent. This variety is common in southeastern Washington, northeastern Oregon and adjacent western Idaho, and also in the Okanagan region of British Columbia. It is the typical Saskatoon of the dry Interior and our most showy variety.

(3) *Amelanchier alnifolia* var. *humptulipensis* (G. N. Jones) C. L. Hitchcock in Hitchcock et al. (*A. florida* Lindley var. *humptulipensis* G. N. Jones), Humptulip Saskatoon. This rather rare variety always occurs west of the coastal mountains, from southern B.C. to southwestern Washington. The flowers generally have 4 styles.
(4) *Amelanchier alnifolia* var. *semiintegrifolia* (W. J. Hooker) C. L. Hitchcock in Hitchcock et al. (*A. florida* Lindley var. *florida*), Pacific Saskatoon. This variety is intermediate between var. *alnifolia* and var. *cusickii* in petal length and in pubescence of the top of the ovary. It sometimes grows into a small tree. It is the typical coastal variety, and is common in and west of the Cascades and Coast Range from southern Alaska to northern California, occasionally in Oregon and central Idaho.

Key to Amelanchier in British Columbia

All members of this genus in British Columbia belong to one species, *Amelanchier alnifolia*. A number of segregates are recognized at the varietal level. Adjacent varietal populations often intergrade to produce plant speciments that are most difficult to identify. The key can be used to separate out the more distinctive elements of this aggregate complex which have been recognized as taxonomic varieties.

Petals longer than 15 mm, calyx lobes generally longer than 3 mm;
typically an Interior variety ..... var. *cusickii*

Petals shorter than 15 mm, calyx lobes generally less than 3 mm; range various
Styles 4; a coastal variety ..... var. *humptulipensis*
Styles 5; range various
Petals 8-11 mm long, calyx lobes usually 1.0-1.5 mm long; top of ovary
densely woolly-pubescent; occurring east of the coastal mountains ..... var. *alnifolia*

Petals 11-15 mm long, calyx lobes usually 1.5-25. mm long; pubescence
of top of ovary variable, but not densely woolly; generally occurring
west of the coastal mountains ..... var. *semiintegrifolia*

Hybrids and Ornamental Cultivars

Several cultivars are known to be in cultivation, many of which have been developed in Alberta, and they show varying degrees of hardiness. *Amelanchier alnifolia* cv. Altaglow is pyramidal in growth form, reaching a height of 5.5 m. It is an outstanding ornamental, the leaves coloring in the fall to glowing shades of gold, red and deep purple. The berries are large and white. The cultivar 'Forestburg' is a bush 2.4-3.0 m tall; upright and spreading, with large berries that are produced in considerable quantities but have a somewhat insipid flavor and watery texture. The cultivar 'Pembina' is 2.4-2.8 m tall, upright and slightly spreading, and very productive with berries that are large, firm, moderately sweet and full-flavored. This is the best of the cultivars for plant habit and fruit quality. *Amelanchier alnifolia* cv. Smoky is a bush 1.6-1.8 m tall, fairly upright and spreading, and also very productive with large and very sweet fruit. 'Honeywood' is a recently introduced variety from Saskatchewan which produces large clusters of large berries when young and has been budded onto the roots of *Cotoneaster acutifolius* with great success.

There is also an intergeneric hybrid between *Amelanchier* and *Sorbus*, x *Amelosorbus*, with one named species, x *Amelosorbus jackii* Rehder. It probably is a cross of *A. alnifolia* with *Sorbus scopulina* Greene (or possibly with *Sorbus sitchensis* Roemer). It is a natural hybrid occurring in Idaho and Oregon. The plant is a deciduous shrub with leaves 3.8-6.4 (-10) cm long, simple to pinnately lobed or partly pinnate on the lower part, coarsely toothed, loosely downy when young. The flowers are in branched clusters 5 cm long, white, with oblong petals and 4 or 5 styles; the fruit is subglobose, 6 mm wide, and dark red with a bluish bloom.

Other Uses

The wood is rather easily worked, takes a good polish and is suitable for lath work, but is of no commercial importance because of its small size. Under the name 'lancewood' it has been used for fish poles and umbrella handles.

The fruits are edible fresh, dried or cooked in pies, jams and jellies. Early explorers and prospectors found the berries a welcome addition to their food supplies, and members of the Lewis and Clark expedition are reported to have used them when food supplies ran short. The Indians of British Columbia and other areas used the berries in great quantities, and had many uses for the wood. A detailed discussion is given in the section on ethnobotany.

In nature the plants are browsed by domestic and wild animals, and birds and bears feed on the berries. At higher elevations and on open coastal bluffs *Amelanchier* often forms dense thickets.

Diseases and Problems of Cultivation

Amelanchier alnifolia is susceptible to several pests which may become serious in certain areas. The lace-wing fly, red spider, various species of scale, and fireblight (a bacterial disease spread by insects) are all known to attack this species and therefore it is advisable not to use the plant in large quantities, especially in areas where these pests are known to occur on other members of the family Rosaceae. Keeping the specimens in good vigor by feeding and watering will help to prevent damage. The most common disease of *Amelanchier* is the parasitic rust *Gymnosporangium* (Parmelee 1971). This rust has eleven species native to Western Canada and its life cycle depends upon two hosts: (1) woody plants of the Cupressaceae (*Juniperus,* Juniper, and *Chamaecyparis nootkatensis,* Yellow Cedar) and (2) deciduous shrubs of the family Rosaceae *(Amelanchier,* Saskatoon; *Crataegus*, Hawthorn; *Sorbus*, Mountain-ash; *Pyrus*, Apple; and *Cotoneaster*, Cotoneaster). The aecial stage of the fungus, which appears as a bright orange pustule-like growth on the back of the Rosaceae shrub leaves, can greatly disfigure the leaves and cause early leaf drop if attack is very severe. The telial stage of the rust is found on the conifers and produces large clusters of brownish-orange jelly-like horns from infected stem areas after spring and summer rains. Severe infection causes "Witches' Broom" growth on the conifers. Ziller (1974) has colored illustrations of the various stages of the rust.

Apiosporina collinsii (Schw.) Hoehn., which causes "Witches' Broom" in *Amelanchier*, is a fungus which has been reported in the wild from both the Cariboo and Coast Districts. Brooms should be cut off and burnt.

The derivation of the generic name *Amelanchier* is somewhat uncertain, but it is probably from *amelancier*, the French Provençal name for the European species *A. oralis* Medic (Snowy Mespilus). The specific name *alnifolia* means "with leaves like the alder", whereas the varietal epithet *Cusickii* was originally given to a species to honor the pioneer Oregon botanist William Conklin Cusick (1842-1922). The common name "Serviceberry" derives from the similarity of the fruit to the 'service' or 'sarvis', a forgotten English fruit (possibly *Sorbus forminalis* (L.) Crantz), which was rather like a pear and was eaten overripe like a medlar. "Shadbush" and "Shadblow" are names given to *Amelanchier* in the eastern U.S.A. and Canada because it is in bloom when the shad begin to ascend tidal rivers to their spring spawning grounds. "Saskatoon" is the white settlers' shortened version of the Blackfoot Indian name, and the city in Saskatchewan is named for the plant.

The type locality for *Amelanchier alnifolia* is "In ravines and in the elevated margins of small streams from Fort Mandan [N. Dakota] to the Northern Andes [Rockies]". It was first collected by Thomas Nuttall and was introduced to cultivation in Great Britain in 1918. The type locality for var. *cusickii* is "on stony hillsides, Union Co., Oreg." where it was collected by Cusick, being introduced to cultivation in Great Britain in 1934. The type locality for var. *semiintegrifolia* (as *A. florida*) is "on banks of the Columbia, near Fort Vancouver, Washington" where it was collected by David Douglas in 1825; it was introduced into Great Britain in 1826. The variety *humptulipensis* was first collected on "Humptulips Prairie, Grays Harbor Co., Wash." by G. N. Jones.

Studies are presently in progress at Beaverlodge, Alberta, into the possibility of crossing *Amelanchier alnifolia* with other members of the family Rosaceae to eventually produce a commercial fruit crop of Saskatoons. As many of these hybrids will not come true from seed, experiments are also being carried out to graft them onto various rootstocks, particularly ones hardy enough to allow the plants to be grown in the far north. There is also a suggestion that crossing with the quince may produce a saskatoon with juice acid enough to be used for wine-making (Wallace and Graham 1976).

Ethnobotany

Amelanchier alnifolia was a popular and widely used plant among many British Columbia Indian groups. Interior peoples used the berries in great quantities, and among northern groups they were often the only kind of fruit available in any quantity. They were of such importance that most tribes recognize many different types of Saskatoon, on the basis of size, color, seediness and taste of the berries as well as habitat, blooming time, ripening time and growth form of the bushes.

The Okanagan Indians of British Columbia distinguish eight different kinds of Saskatoon. The first of these, which has an Indian name meaning "bad little fruit", is a large bush with small berries that are only eaten fresh; another, the "short bush", has large blue berries with whitish flesh inside. A third, with a name that means "basin-eye", is a tall bush with large blue berries that have cherry-colored flesh. When dried this variety becomes raisin-like rather than hard. The "basin-eye" and the "short bush" are rated best for eating fresh. A fourth kind, the "wide-leaved plant", is another tall-bushed variety which grows close to water and has medium-sized berries. A fifth, called the "tall bush", is common on dry flats and sidehills; the berries are abundant but small, and are good for drying. The sixth kind, with a name meaning "high mountain-top", grows at high elevations and its berries are the last to ripen. The seventh, "chipmunk's little fruit", grows on very low bushes. The berries are good for cooking and fresh eating but are not suitable for drying. The last variety, whose name means "burst-eye", grows with the sixth variety and its berries also ripen late. They resemble those of the third variety but are more watery, and are not used for drying.

The Upper Lillooet Indians have a similarly complex system for classifying different kinds of Saskatoon. They recognize six different varieties, many of which seem to parallel the varieties known to the Okanagan people. The Thompson and the Shuswap each recognize at least four different varieties of Saskatoon. In the past many tribes held a ceremony and feast to celebrate the beginning of the Saskatoon picking season.

The berries were eaten both cooked and fresh. They were also dried for winter use by spreading them out on mats, or by mashing and boiling them and then spreading the pulp to dry in cakes. The dried cakes were prepared for eating in many different ways. Often they were cooked up with various other bulbs and berries, or with deer meat or bear grease. They were also eaten as snacks or desserts. The Lummi Indians of western Washington used to boil the dried berries with dog salmon for winter feasts. Dried Saskatoons were a common item of trade. The berries were also used as a dye by the Thompson and other Interior Salish peoples, who mashed them and used them to stain bark for making bags.

Saskatoons were also highly valued by the Coastal Indian peoples, though since the berries are less abundant on the Coast they did not have the same importance in their diet. The Coastal peoples obtained them by trade from the Interior. These berries were a major constituent of pemmican, a mixture of dried and pulverized deer or buffalo meat, Saskatoon berries and boiling fat, which was cooled and then moulded into cakes. This was a winter staple of most of the Plains Indian tribes.

The wood, which is hard and tough with a straight grain, had many uses. In particular it was the major arrow-making material of many Indian peoples. Thin straight branches were stripped of their leaves, twigs and bark (in some areas, the bark was loosened first by chewing) and then were hardened by heating them over a fire. The tip was sharpened or tipped with a bone, stone or metal point, and the other end feathered. Saskatoon wood was also used to make digging sticks, spear and harpoon shafts, handles for various implements, barbecue sticks, seed beaters, basket frames, and

cross-pieces for canoes. Saskatoon twigs were used to protect the bottoms of cooking baskets from direct heat, and to line cooking pits because they did not give a bitter flavor to the food. The Carrier Indians used the wood for shields and armor. On the Coast, Saskatoon wood was made into fish rakes used for catching herring or oulachen.

Several parts of the shrub were used medicinally. The Bella Coola Indians boiled together the tips of small *Picea sitchensis* trees, blue currants *(Ribes bracteosum)*, Saskatoon berries (*Amelanchier alnifolia* var. *semiintegrifolia*), and crushed leaves and stems of garden snowberry (*Symphoricarpos albus*), then drank the concoction for gonorrhoea. The women of the Thompson Indians used to drink a warm decoction of Saskatoon stems and twigs after childbirth, or use it as a bath. Alternatively, they drank a very strong warm decoction of bark to hasten the dropping of the after-birth. An infusion of fresh bark, washed and then boiled, was drunk as a tonic.

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Climatological Summary*

Beginning with this issue you will see two major changes in the Climatological Summary. Firstly, the data is recorded in the metric system. Should you wish to compare the weather to that recorded previously the following formulas should be applied:

For temperatures: $\frac{\text{Fahrenheit} - 32}{9} \times 5 = \text{Celsius}$

For rainfall and snowfall: $\frac{\text{Inches}}{0.3937} \times 10 = \text{Millimetres}$

Changes in the data recorded in the summary will provide a more meaningful correlation of the effects of the weather on the growth and productivity of plants. It will also, we hope, provide better information for that perennial topic of conversation, "The Weather". Inclusion of the average maximum and average minimum temperatures will show the differences between day and night temperatures, a major factor in the growing of plants. The running totals of rainfall and snowfall will provide an immediate comparison with previous years at any given month. The snowfall total will cover the winter season, from October to April, rather than the calendar year. The average daily sunshine and number of days of total overcast will help in deciding the effect of sunshine, or lack of it, on plant growth and on production of flowers and fruit.

Data 1976	JANUARY	FEBRUARY	MARCH
Average maximum temperature	6.6°C	6.6°C	7.9°C
Average minimum temperature	2.4°C	1.5°C	1.4°C
Highest maximum temperature	11.1°C	11.1°C	11.6°C
Lowest minimum temperature	-1.6°C	-3.3°C	-6.1°C
Lowest grass minimum temperature	-7.2°C	-8.8°C	-10.5°C
Rainfall/no. days with rain	180.3 mm/23	137.1 mm/21	132.0 mm/17
Total rainfall since January 1, 1976	180.3 mm	317.4 mm	449.4 mm
Snowfall/no. days with snowfall	1.3 cm/1	32.5 cm/5	0
Total snowfall since October 1, 1975	26.2 cm	58.7 cm	58.7 cm
Hours bright sunshine/possible	34.5/265.3	59.7/278.4	106.9/361.1
Ave. daily sunshine/no. days total overcast	1.1 hr/14	2.0 hr/10	3.4 hr/8

**Site: The University of British Columbia, Vancouver, B.C., Canada*
Position: lat. 49° 15'29'' N; long. 123° 14'58'' W. Elevation: 104.4 m

Editorial Board

We are pleased to announce the establishment of an editorial board for Davidsonia. The new board members will assist in the development of the long range objectives for the journal and promote inclusion of a wide range of articles of interest to horticulture and botany in the western cordilleran region of North America.

We welcome constructive advice and criticism from our readers and contributors to foster the productive growth of our journal. The success of the journal will be directly related to your interest and support.

Fred R. Ganders, Vancouver, British Columbia. (Reproductive Biology)
Arthur R. Kruckeberg, Seattle Washington. (Systematics, Ecology)
Gerald A. Mulligan, Ottawa, Ontario. (Cytology, Weed Science)
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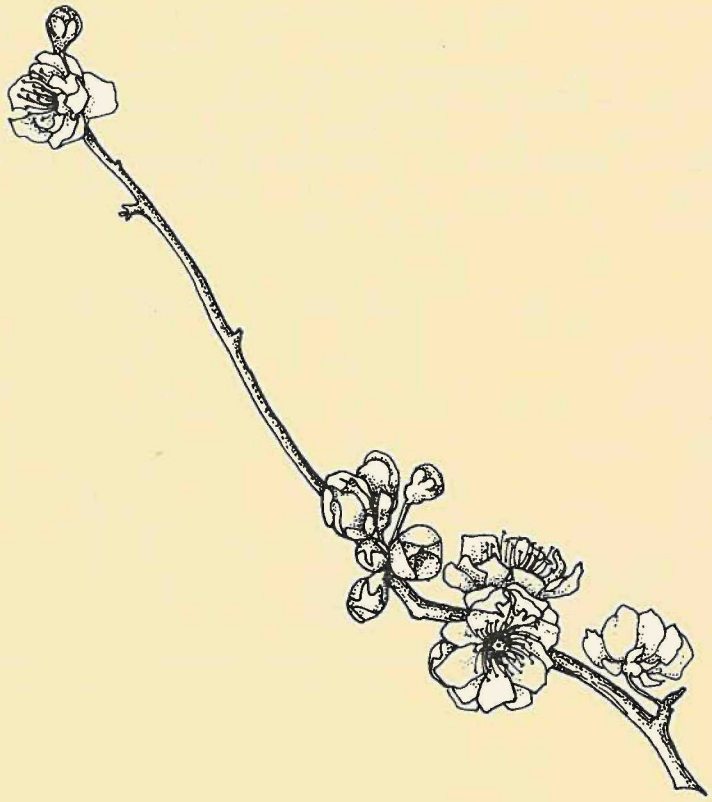
Janet R. Stein, Vancouver, British Columbia. (Phycology)
Oscar Sziklai, Vancouver, British Columbia. (Forestry)
Nancy J. Turner, Victoria, British Columbia. (Ethnobotany)

ERRATUM
Vol. 6 No. 4, p. 53: Figure 8 should be entitled *Larix occidentalis* rather than *Larix lyallii.*



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