

BRITISH COLUMBIA'S ALPINE AND SUBALPINE FLORA WITH GARDEN POTENTIAL

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The alpine and subalpine zones of British Columbia offer not only some of the most spectacular scenery in the world, but a wide range of plants with garden potential. Many of these are known in cultivation only to the avid alpine plant enthusiasts and are not generally available commercially.

A wide range of growing conditions in these zones, depending on aspect, soil and rock types, exposure and elevation, create microhabitats for a variety of plant species. Many of these habitats can be successfully recreated at lower elevations in the Pacific Northwest, even on the wet coast. The potential for using native plants for the drier interior of the Pacific Northwest has not been realized.

The plants discussed in this paper include those true alpinists as well as some from lower elevations in montane meadows. Although British Columbia's flora will be stressed, a number of plants from the Pacific Northwest or Western North America are also included. Some of the more familiar alpine plants, at least to the alpine enthusiasts, such as *Silene acaulis*, *Anemone* (or *Pulsatilla*) *occidentalis* and *Lewisia* species, especially *Lewisia tweedyi*, will not be discussed further, although it could be argued that even these need to be promoted to a wider market. The plants that will be discussed, alphabetically, will be those possibly less familiar to even the enthusiasts and those with some commercial potential.

The genus *Arnica* contains some of the most common species of montane and alpine plants in Western North America, where the center of distribution of the genus occurs. *Arnica cordifolia* is the most widespread species, found from montane forests to high alpine slopes. It is a rhizomatous species and thus somewhat invasive in the garden, but the bright yellow flower heads are showy in spring and it does well in cultivation throughout the Pacific Northwest. The small var. *pumila* from high elevations is better as a garden plant for small alpine gardens, because it is less rhizomatous and of smaller stature. *Arnica gracilis* (treated in some floras as a variety of the widespread *Arnica latifolia*, but generally accepted by experts in the genus as being a good species) is a non-rhizomatous, tufted plant of scree slopes and high, rocky alpine meadows. It varies greatly in nature, with some plants or populations being much more floriferous than others. It is not difficult to maintain in

gardens in a well-drained, sunny location. Two of the other smaller arnicas which are rarely, if ever, cultivated are *Arnica louiseana* and *Arnica rydbergii*. Both of these have relatively large flowers on low plants and are ideal for rock gardens. The flower heads of the Lake Louise arnica are nodding with pale yellow ray florets. *Arnica rydbergii*, sometimes called the orange arnica has distinctly darker orange-yellow rays than other *Arnica* species, with several flowers per stem. The plants are tufted or short rhizomatous. It is difficult to maintain on the wet coast, but easier in the drier interior. The greatest problem with growing arnicas in gardens is probably a general dislike of yellow "daisies" by many gardeners.

Coptis asplenifolia is a member of the buttercup family (Ranunculaceae) with very dark green, shiny, dissected leaves. The species name comes from the leaves looking like an *Asplenium* (one of the common genera of ferns). The leaves are at least partially evergreen, forming a good ground cover in very shaded situations. Small flowers are green and usually go unnoticed. It is found in peaty soil along the coast, often in subalpine areas. It is rarely, if ever, cultivated in gardens and is not commercially available, but has great potential as a ground cover or an accent plant in shade, where the glossy leaves appear to brighten dark places in the garden.

Forming low, dense mats on high, exposed alpine slopes is *Douglasia laevigata*, a member of the Primulaceae. When the shocking pink flowers are fully out, the mats of plants are visible at great distances. It is variable in size, colour and general growth habit in nature, offering possibilities for selection of individual wild plants for cultivation. It needs a sunny, very well-drained situation on the wet coast.

Dryas species are very widespread in arctic, subarctic, and alpine situation in the Northern Hemisphere. The plumed, wind-borne achenes (single-seeded fruits) make them ideal subjects for colonizing roadsides and barren areas. The potential for most of the species for sunny, dry situations is great. The leaves, flowers, and seed heads are all attractive and the plants are extremely cold-tolerant.

The *Eriogonum* species, usually known as a group as wild buckwheats, are common at high elevations and in the drier parts of most of Western North America. The range of variation among the species and within species and individuals in a single population is great. Flower color varies from nearly pure white to cream, yellow, orange and pink on plants that may be very low carpets to taller shrubs. *Eriogonum umbellatum* is one of the most widespread species in the western mountains and, not unexpectedly, the most variable species. It is uncommon in cultivation and is a plant with great potential for drier interior gardens. *Eriogonum compositum*, growing naturally from Washington to California, has bright yellow

flowers held above large gray leaves on low sub-shrubs, making it one of the showiest species in the genus. It needs a well-drained, dry, sunny location and is too large for all but the largest rock gardens. It is probably best used in a shrub border or as a specimen plant in the landscape.

Much work has been done in cultivation, selection, and breeding of the European herbaceous perennial geraniums, but little has been done with our North American species. Most our geraniums are not truly alpine plants, but more often a common component of mountain meadows. At least three species, *Geranium erianthum*, *G. richardsonii* and *G. viscosissimum*, have great garden potential if good forms are selected from the wild or are bred in cultivation. *Geranium erianthum* has good foliage texture and colour as well as good blues in the flowers. *Geranium richardsonii* has good pure white flowers and *G. viscosissimum* has large bright pink-purple flowers, on quite variable-sized plants. Shorter forms with large flowers of the latter species need to be selected in the wild. All three of these species are now being cultivated and some hybridization is being done in the UBC Botanical Garden. Spontaneous hybrids between the latter two species have occurred in the Garden.

Hesperochiron pumilus is a very attractive little plant in the Hydrophyllaceae. It is found in the edges of vernal pools or other areas with winter and spring moisture, but areas that become completely dry in summer. The stemless plants produce a small rosette of spoon-shaped leaves surrounding several showy flowers with yellow centers and white petals veined with purple. The plants are not easy to grow in cultivation, but are worth the effort to keep them growing. An alpine house or bulb frame is probably the best way to grow them successfully. The fleshy underground parts decay easily if grown in summer-wet conditions.

Iliamna rivularis is a plant of moist mountain meadows below the subalpine zone. It is almost unknown in cultivation and deserves to be grown in our perennial gardens. It looks like a small hollyhock, with palmately lobed leaves and pink flowers on spikes up to 2 meters (6 feet) tall. Plant height, size of leaves, color of petals and size of flowers is variable and the most desirable of these characteristics could be selected for in nature.

Most of the montias are not of any particular value for gardens, but the creeping *Montia parvifolia* [syn. *Claytonia parvifolia*] forms attractive mats of green or often coppery foliage that is almost covered with pink flowers in late spring. It likes moist soil in a sunny or slightly shaded situation. Although it is not evergreen, the plant has potential as a ground cover for the wild garden.

The genus *Penstemon* is a very large one, especially abundant in Western North America, growing in a wide variety of habitats from high mountain and alpine meadows to dry sagebrush hillsides.

The genus contains some of our most colorful of wild flowers and a great deal of selection and breeding of some of the species, especially those from desert regions, has already been done. However, very little has been done with selection and breeding of the Pacific Northwest species. *Penstemon fruticosus*, *P. davidsonii* and *P. procerus* are among the variable species with garden potential that are little-known in cultivation.

Most of the *Oenothera* species in cultivation are the yellow-flowered biennial species, commonly known as evening primroses. Two Western North American species, *O. pallida* and *O. caespitosa* are white-flowered perennial species. They are difficult to grow on the wet coast, but have great potential for dry interior gardens. *Oenothera caespitosa* is stemless with a basal rosette of gray-green leaves and large, white, evening-opening flowers. *Oenothera pallida* has definite stems and the flowers are smaller.

The genus *Phlox* also contains a large number of species and hybrids that are already in cultivation, but the native, caespitose species are not often grown in our gardens. *Phlox caespitosa* is one of the common species that has flower color varying from pure white through shades of pinks, mauves and blues.

Although the great majority of the Western North American members of the large genus *Potentilla* are herbaceous perennials, only the shrubby *Potentilla fruticosa* is common in cultivation. There are many herbaceous species with great garden potential, especially *P. flabellifolia*, a plant of peaty subalpine and alpine meadows.

Silene hookeri is a delightful little herbaceous plant of dry slopes in southwestern Oregon and northern California. It is usually found in heavy clay soils derived from serpentine rocks. It is among the choicest but most difficult plants to keep in alpine gardens. The petals are variably dissected and range in color from pure white through dark pink. The roots are very slender and thread-like, with few root hairs, which is likely the reason that plants cannot be transplanted easily. Starting them from seed is the best means of propagation, but keeping the plants going is a problem. Dry summer conditions are essential for success in the garden. Seeds available from various sources listed as this plant often prove to be one of the taller European species.

Sphaeralcea is a genus of variable plants in the Malvaceae. They are often a common component of dry sagebrush hillsides and roadsides. The gray-green, lobed or dissected leaves are an attractive foil for the orange-red or pink-red flowers. Dwarf forms are good for dry gardens, but the plants are difficult to keep growing on the wet coast.

Several shrubby members of the alpine or subalpine communities are difficult to propagate or maintain in gardens at lower elevations. Four members of the Ericaceae deserve further study to

successfully work out the propagation and cultural techniques. *Rhododendron albiflorum*, although not as showy as many of the other species or hybrids in the genus, has a subtle charm, with its white flowers late in the season in subalpine meadows and edges of high mountain forests. Usually growing with this *Rhododendron* is *Cladostamnus pyroliflorus*, the copper bush, a variable, deciduous shrub with five-petalled, coppery-colored flowers. It has been only rarely cultivated in gardens, and like the *Rhododendron* isn't spectacular, but of interest to those gardeners who want something different. Large flowered individuals need to be selected and propagated. *Cassiope mertensiana* (white mountain heather) and *Phyllodoce empetriformis* (red mountain heather), which are superficially similar, grow together in acid, subalpine to alpine meadows and boggy areas. Although they are both available commercially to a limited extent, there is still much to be learned about propagation and culture of these two attractive native sub-shrubs.

Saving the most difficult to the last, the semi-parasitic Indian paintbrushes (*Castilleja* species) are considered difficult, if not impossible, to propagate and maintain in the garden. This is unfortunate, as they are among the showiest of our Western North American plants and a common feature in our natural landscapes, from dry sagebrush country to mountain meadows and alpine slopes. If someone can find out how to successfully cultivate them, they will be popular garden plants. Some degree of success has been achieved in the UBC Botanical Garden Native Garden, when they are transplanted with the host plant or, if seed is sown directly around known host plants. *Castilleja miniata*, the most common species, has been brought in with the host, *Heuchera cylindrica*. After a few years the paintbrushes have now naturalized and become fairly common in the garden, growing on a number of host plants.

This list of potential plants could go on. Anyone else familiar with native plants of the Pacific Northwest could come up with a list of other species, equally as long. There still remains much work to be done on selective collecting, cultivation, and breeding of native alpine and subalpine plants for our gardens.