Oregon Grape (*Berberis aquifolium*), Our State Flower

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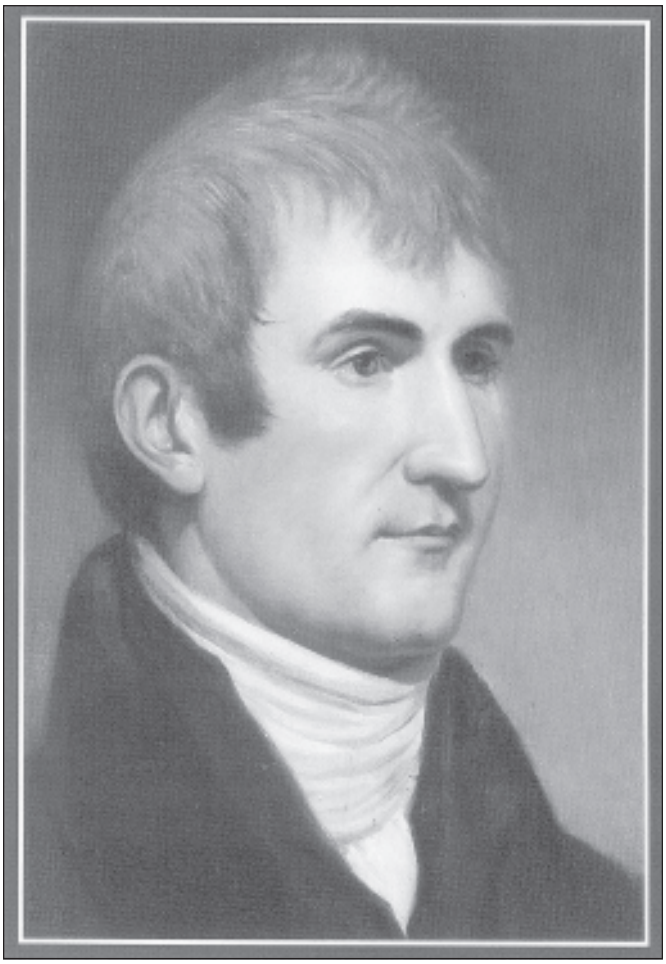
"...two species of evergreen shrubs I first met with at the grand rapids of the Columbia... I do not know the fruit or flower of either. the 1st resembles the plant common to many parts of the U'States called the mountain holley" – Meriwether Lewis' journal entry for February 12, 1806 with his first detailed description of Oregon grape



Meriwether Lewis. Portrait painted by Charles Wilson Peale in 1807, two years before Lewis' death (by suicide) in 1809. The original painting resides in the Independence National Historical Park Collection, National Park Service. Lewis died five years before the names of the plants he collected were published by Frederick Pursh in *Flora Americae Septentrionalis*.

Approximately 200 years ago, on April 11, 1806, Meriwether Lewis collected an evergreen shrub beside the Columbia River, which he referred to in his journal as "mountain holley" (Moulton 2003). Lewis had discovered the species along the river during a relatively rapid descent the previous autumn. He took advantage of the miserable winter spent at rainy Fort Clatsop to record observations from the trip in his journal, including the first reference to Oregon grape (above). In the early spring of 1806, when the Corps of Discovery was traveling back up the great River of the West, many plants were flowering, and Lewis was looking for better specimens of plants he had noted during the journey west. The day he collected two species of "mountain holley" (*Berberis aquifolium* and *B. nervosa*) was spent beside the river in today's Washington state, opposite what is now Hood River County's Cascade Locks. It was a particularly troublesome time for the expedition. The men were complaining of intense fatigue each evening due to the laborious up-river treks, during which they battled the strong currents and thundering rapids that springtime brought to the undammed Columbia.

Not only were they exhausted, but the men had to tolerate constant scrutiny by natives who ridiculed and threw stones at them. Lewis considered the "Wah-clel-lars" tribe villainous, because of their menacing actions. The thieves stole what they could from Lewis' men, unsuccessfully tried to rob their camp of tools, and then proceeded to make off with Lewis' beloved black Newfoundland dog, Seaman. Lewis sent three of his brigade to track the thieves and the men later returned with the dog. After breaking camp to continue up-river, the explorers encountered violent rapids where they lost one of their canoes. Because they needed a replacement to continue the expedition, the group was left with no choice but to barter with the natives whom Lewis feared would charge "an extravagant price." Despite turmoil and exhaustion, Lewis managed to collect plant eleven specimens, mostly on the day Seaman was stolen, including the one that later became known as *Berberis aquifolium*.

Oregon state flower

It is fitting that less than a hundred years after these exciting events, Oregon grape was chosen as the state flower for Oregon. The committee that nominated the species to represent Oregon met near Hood River, close to the spot where Lewis first documented his "mountain holley." Attempts to choose a state

Flowers of Oregon grape: note exserted flower stigmas. Photo by Bob Vos.

flower had been initiated by the Oregon Horticultural Society in 1890; however, this body failed to reach a consensus after two years of wrangling. In 1892, George Henry Himes presented a motion in Hood River once again proposing that Oregon grape be our state's representative flower. On July 18, the committee agreed and forwarded the nomination to the state legislature. There, the Oregon Federation of Women's Clubs lobbied nearly a decade for its acceptance. At last, during the twentieth Regular Session of the Legislative Assembly of January 30 and 31, 1899, resolution number four was passed, declaring that Oregon had an official state flower, *Berberis Aquifolium* [*sic*], Oregon grape (State of Oregon 2006).

Taxonomy and ecology

Berberis is the type genus for the plant family Berberidaceae, an ancestral family in the order Ranunculales (Judd *et al.* 1999), represented by 16 genera and approximately 670 species worldwide (Hickman 1993). In the Northwest, we have three genera in the family: *Achlys, Berberis,* and *Vancouveria*. Of these perennial genera, *Berberis* is the only one whose members are woody shrubs. At first glance, it may not be obvious what characteristics place all these plants in the same family; they differ in habit, leaf structure, inflorescence, flower color, and type of fruit. To make the connection one must look closely into the flower, specifically at the anthers. While most flowers have anthers that shed pollen through longitudinal slits, these genera release their pollen through a pair of uplifted, flap-like valves (Hitchcock and Cronquist 1973).

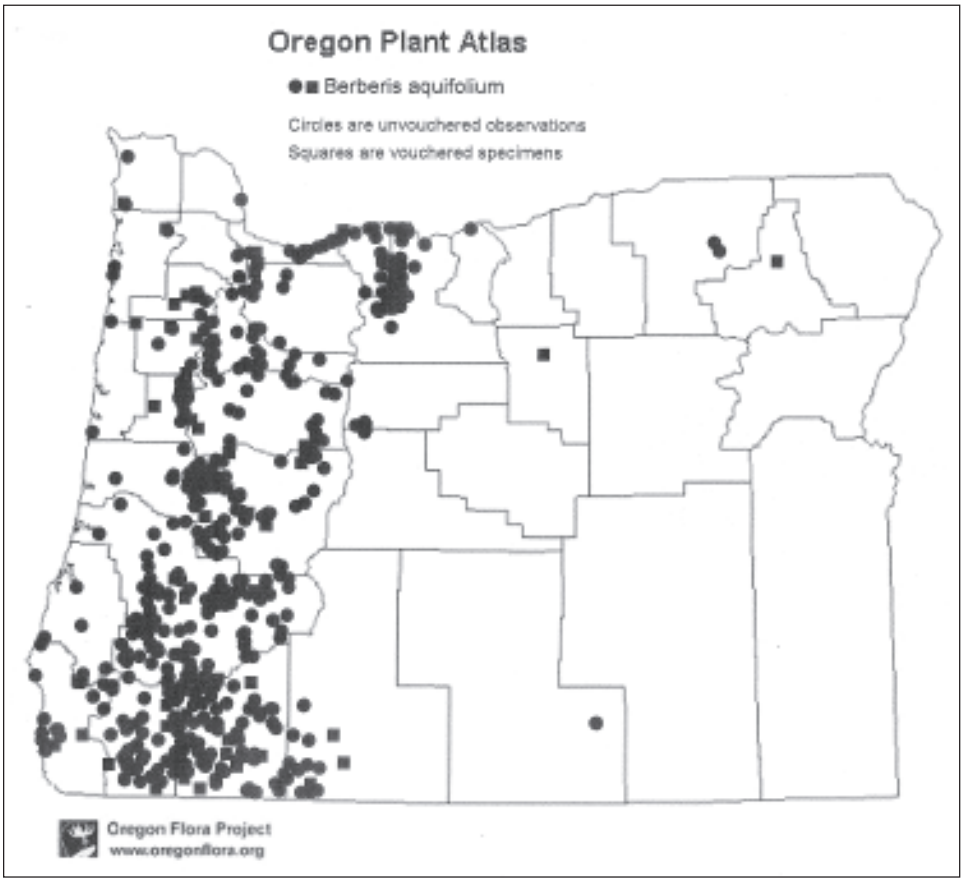
Of the approximately 600 *Berberis* species in the world, three grow in the Pacific Northwest. These are tall Oregon grape (*B. aquifolium*), mountain Oregon grape (*B. nervosa*), and creeping Oregon grape (*B. repens*). *Berberis aquifolium* is easily distinguished from the others by a few readily visible characteristics. The most consistent way to separate *B. aquifolium* from *B. nervosa* is the difference in the leaves; *B. aquifolium* has 5 to 9 leaflets on each leaf, whereas *B. nervosa* has 9 to 19. The venation of the leaflets is also distinctive, with *B. aquifolium* having pinnately branched veins, while those of *B. nervosa* are palmate. While *B. aquifolium* shares leaflet number and venation pattern with *B. repens*, these two species can be separated by *B. repens*' generally shorter habit, its more numerous, but less prominent leaflet serrations, and its restriction to areas east of the Cascade Mountains. *Berberis aquifolium* is widespread in the Northwest, ranging from British Columbia to California, and from the Pacific coast to the eastern base of the Cascades. It is common in open coniferous forest, oak woodlands, and riparian zones.

Several species of moths, bees, wasps, and flies visit the brilliant yellow flowers of Oregon grape and are potential pollinators (Landolt and Smithhisler 2003). Its relatively early blooming period may make it an important spring nectar source. Oregon grape has sensitive anthers that spring forward and deposit pollen

on the heads of the insects that visit its flowers in search of nectar (Judd *et al.* 1999). Thus, the insects, lured by an early spring meal, unwittingly aid the reproductive success of the plant! This phenomenon can be witnessed by touching the stamens and watching them move.

Berberis or Mahonia?

While Hitchcock, Jepson, and the authors of *Flora of North America* (1997) all agree that *Berberis aquifolium* is the appropriate name for Oregon grape, another generic name, *Mahonia,* remains a synonym in common use, including the USDA P.L.A.N.T.S. website. The Oregon governor's mansion is called Mahonia Hall. Two Latin names for the same plant? The naming of this plant has an interesting history. After being collected by Meriwether Lewis, Oregon grape was described and named by German botanist, Frederick Pursh (1774-1820). Pursh originally designated it *Lewisia ilicifolia*, believing it was a new genus and wishing to honor Captain Meriwether Lewis (Pursh 1814; Reveal 2000). However, after further study Pursh realized the genus had previously been described by Linnaeus, as *Berberis*. Pursh's specific epithet, *ilicifolia,* came from the similarity of the Oregon grape leaflets to the leaves of holly (*Ilex*). In discarding his original name, Pursh also chose a more descriptive species name, *aquifolium*, meaning "spiny leaved," an epithet it shares with English holly (*Ilex aquifolium*). In fact, Oregon holly is another common name for Oregon grape.



Range of *Berberis aquifolium* in Oregon based on current Oregon Flora Project data at the Oregon State University Herbarium in Corvallis (www.oregonflora.org).

Where does *Mahonia* come from? The genus *Mahonia* was later proposed by Thomas Nuttall (1786-1859) as a group distinct from *Berberis*; he named his new genus after the prominent horticulturist, Bernard McMahon (or M'Mahon, 1775-1816) (Reveal 2000). Nuttall's morphological justification for this division was based on leaf structure; other members of genus *Berberis (sensu strictu)* have simple leaves, while *Mahonia* have compound leaves (Moran 1982). While it may make morphological sense to consider *Mahonia* a distinct group, in terms of evolutionary relationships, neither *Berberis*, nor *Mahonia* represent monophyletic groupings (Kim *et al.* 2004; Moran 1982). It is believed that within the Berberidaceae, simple leaves are derived from compound leaves (Moran 1982). Thus, botanists prefer to keep *Mahonia* submerged within *Berberis* (Moran 1982), while horticulturists invariably refer to our Oregon grapes as *Mahonia.*

Ethnobotany

Indigenous tribes along the Columbia River were very familiar with Oregon grape. In fact, all *Berberis* species were used by various native tribes; and, to the north, *Berberis aquifolium* was known to the Chehalis, Samish, Skagit, Swinomish, and Snohomish peoples (Gunther 1995). Each tribe had its own uses for the plant, but most utilized *Berberis* roots for their yellow dye, which was employed primarily to color woven materials such as baskets and mats. Because of its popularity in dying, the plant was frequently traded and bartered amongst the natives. The Makahs of the Olympic Peninsula traded for the plant since it was not found in their region; however they did not ingest it, calling the berries "raven food," and stating they "make children ill." Other tribes, such as the Chehalis, made a *Berberis* berry or rhizome infusion called "bitter brew" because of its bitter taste. This was used for stomach ailments such as ulcerations and digestive difficulties, or to induce appetite. The same brew was also considered to be a successful blood purifier, and to cure sore throats and coughs. A wash from the bark was made to rinse sores in the mouth and on the skin. The berries, both raw and cooked, were eaten by the Samish, Snohomish, and Swinomish people. Although ripe berries were available only during early summer, the Oregon natives stated the best time to pick the root and harvest bark was in the autumn. The tribespeople believed that collecting in the early morning at that time of year ensured greatest potency in the plant, so it could be stored and used for medicine during the winter.

Many of the traditional uses of Oregon grape are still employed by

Drawing of *Berberis aquifolium* by Frederick Pursh in his *Flora Americae Septentrionalis* in 1814. (The word *septentrionalis* refers to the seven stars of the Big Dipper and was a synonym for "north.")

herbalists. These include its use for gastrointestinal complaints, as a liver stimulant and as an anti-microbial (Cernakova and Kostalova 2002; Mills and Bone 2000; Moore 1993). The primary active constituent in Oregon grape is berberine, a widely occurring alkaloid also found in goldenseal (*Hydrastis canadensis*) and goldthread (*Coptis laciniata*) (Mills and Bone 2000).

Landscaping with Oregon Grape

Berberis aquifolium is a wonderful evergreen shrub for Northwest native gardens (Kruckeberg 1982). Many landscapers do not realize that this is the only evergreen shrub native to the floor of the Willamette Valley. The plant's handsome, shiny, dark leaves can accent any planting, whether used for a woodland setting, formal hedges, border plantings, or a background for deciduous shrubs. In early spring, Oregon grape bears delicate yellow inflorescences followed by clusters of dark blue fruit in the summer. These reproductive parts are not only pleasing to the human eye, but can also make your garden attractive to various insect pollinators and birds. *Berberis aquifolium* grows best in well drained, moist, acidic soil, in shady locations, although full sun will not damage the plant if it is well watered through hot, dry seasons. Oregon grape can suffer if exposed to desiccating winds when the soil is dry. The shrub can be propagated by seeds and cuttings; however, vigorous plants for your garden are probably best obtained from a reputable native plant nursery. Certain horticultural varieties have been specialized for gardens, including Orange Flame, Mayhan, and Compacta. These are known for their size and color, but the native Oregon grape is still as colorful and beautiful as any variety.

Conclusion

The months the Corps of Discovery spent on the Columbia River were full of challenges, each day's trials and triumphs different from those of the day before. Although Captain Meriwether Lewis did not foresee it, three species of the 290 specimens that he and Captain William Clark collected on their homeward trek in 1806 became the official emblems of three northwestern states. These are bitterroot (*Lewisia rediviva*) in Montana, mockorange (*Philadelphus lewisii*) in Idaho, and our own Oregon grape. Even though the latter is the only one not bearing its discoverer's name, we believe it is the best of the lot. We can enjoy its bright yellow flowers in spring, its rich blue fruits in summer and its glossy, evergreen leaves throughout the rain-drenched winter.

Berberis aquifolium Pursh. Note the pinnate veins in the leathery evergreen leaves. Photo by Bob Vos.

Acknowledgments

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