

***Mahonia repens* (Lindl.) G. Don**
BARBERIDACEAE

creeping barberry

Synonyms: *Berberis amplexans* (Eastw.) L.C. Wheeler
Berberis aquifolium Pursh var. *repens* (Lindl.) Scoggan
Berberis pumila Greene
Berberis sonnei (Abrams) McMinn
Mahonia amplexans Eastw. (additional synonyms: Natural Resources Conservation Service 2003)



General Description.—Creeping barberry, also known as Oregon grape, creeping Oregon grape, creeping mahonia, creeping hollygrape, ash barberry, and dwarf Oregon grape, is an upright to recumbent, evergreen shrub 12 to 40 cm in height and 3 to 9 mm in basal diameter. The stems are solitary, usually unbranched but occur in clonal groups arising from rhizomes. The main root is stiff and deep, and the lateral roots are short and fine. Stem bark is slightly rough and gray brown, and the inner bark is bright yellow, especially the inner root bark. The wood and pith are yellow. The alternate leaves, which have petioles 2 to 3 cm long, are pinnately compound with three to seven leathery, sessile, ovate leaflets that are dull on both surfaces, and have spiny-toothed margins. There are usually two to eight leaves per plant. Several flowers with six petals and six sepals, both yellow, are clustered in terminal racemes 3 to 7 cm long. Fruits are glaucous, blue berries containing one to four seeds. The seeds are 6 to 10 mm long. There

are $2n = 28$ chromosomes (Auger and other 2002, Harrison 2003, Lesica 2002, Rehder 1951, Welsh and others 1987). Creeping barberry readily hybridizes with *M. aquifolium* (Pursh) Nutt. and *M. pinnata* (Lag.) Fedde when growing near them (Pagahat.com 2003).

Range.—Creeping barberry is native to the Western United States as far east as Texas and Minnesota, and to British Columbia and Alberta in Canada. It is present (probably naturalized) in Indiana and Pennsylvania (Natural Resources Conservation Service 2003, Walkup 1991). The species has been planted widely as an ornamental and has probably naturalized in many areas outside its native range.

Ecology.—Low in stature and moderately tolerant of shade, creeping barberry is not highly competitive. In Utah, it will not grow in heavy grass and forb stands. It is most frequently seen in rocky or gravelly areas with low vegetative cover or under open conifer or hardwood stands with sparse understory vegetation. However, the species is reported to be the dominant understory shrub in closed-canopy Douglas fir in central Idaho (Walkup 1991). Creeping barberry apparently grows well under conifers that produce a thick layer of decomposing needles. However, it does not flower when growing in shade (Pagahat.com 2003). Natural populations are affected little by treatments such as prescribed fire, clearcutting, and scarification. It usually survives (by sprouting) even moderate and high-intensity fires (Walkup 1991). Creeping barberry is an invader of disturbed sites (Harrison 2003). It will grow in most well-drained soils and is especially common in rocky or gravelly soils. The species is much more common over limestone or other alkaline parent materials than granite or quartzite (Walkup 1991). It tolerates acidic soils but grows poorly when concentrations (less than 2.5 mg/L) of boron are low (Harrison 2003). Creeping barberry grows

at elevations of 1,125 to 3,300 m in the inland West (Harrison 2003, Walkup 1991). Although it is most common on north-facing slopes, it grows on south-facing slopes and ridge tops at higher elevations.

Reproduction.—Creeping barberry flowers in May through June and matures fruit in June through July (Rudolf 1974). The flowers are pollinated by bees and butterflies (Paghat.com 2003). Flowers not cross pollinated with other plants will self pollinate, but produce much fewer seeds (Walkup 1991). Ratio weight of fresh fruits to air-dried seeds is 12.5:1 (Auger and others 2002). There are 119,000 to 157,000 seeds/kg (Rudolf 1974). Cleaned seed can be sealed and stored for 5 years (Harrison 2003). Rudolf (1974) recommends stratification of 30 days at 1 °C followed by 60 days at 21 °C, and then 196 days at 1 °C. Treated thus, 74 percent of test seeds germinated. Alternately, a hot water treatment followed by cold stratification for 60 days is recommended (Kjelgren 2003). Seeds can be sown in fall without pretreatment. In nature, seeds are dispersed by birds and to a lesser extent by mammals including black bears and rodents (Auger and others 2002). Once established, plants spread through sprouts from rhizomes (Walkup 1991).

Growth and Management.—Growth is slow. Individual stems may live 10 years or more. It is difficult to imagine the need to control this unobtrusive species in its native habitat. On the other hand, it should frequently be planted as part of environmental restoration projects. The species can be artificially propagated by seed, divisions, cuttings, and layers (Walkup 1991). Direct seeding in the fall is the most practical method to introduce it to disturbed sites. Repellants or poisons may be necessary because the seeds are readily consumed by mice (Kjelgren 2003).

Benefits.—Creeping barberry adds beauty to the forest, helps protect the soil, provides food for wildlife, and makes a useful ornamental. It is planted as ground cover, especially under light tree canopy cover or on poor, gravelly ground. In the summer, the leaves are dark green; in winter they are green, mottled with bright red, or a bronze-purple. The species is particularly recommended because it requires little or no irrigation (Kansas State University Research and Extension 1996). It is included in reclamation plantings (Welsh and others 1987) and has been used especially for revegetation of mine spoils (Harrison 2003). Mule,

white-tailed deer, and sometimes elk browse creeping barberry during fall and winter. The protein content ranges from 4.7 to 5.5 percent, and the species contains high contents of carotene in July. Creeping barberry foliage is mildly toxic and domestic animals normally make little use of it for forage except when other food is scarce (Walkup 1991). In one case, browsing of creeping barberry killed cattle in Arizona (Harrison 2003). Many mammals (including black bears) and birds eat the fruits (Walkup 1991). The fruits become edible to humans after they have passed through at least one frost. They are used to make jelly, wine, and a juice drink (Harrison 2003). Native Americans used the berries and the roots for lavender and yellow dyes, respectively, and made teas from the roots to treat a range of afflictions (Lesica 2002, Paghat.com 2003). Creeping barberry contains the alkaloids berberine and oxyacanthin (Harrison 2003). The species is an alternate host for black stem rust of cereal grains (Walkup 1991).

References

- Auger, J., S.E. Meyer, and H.L. Black. 2002. Are American black bears (*Ursus americanus*) legitimate seed dispersers for fleshy-fruited shrubs? *American Midland Naturalist* 147: 352-367.
- Harrison, S. 2003. *Mahonia repens*. Crop Development Centre, University of Saskatchewan, Saskatoon, Saskatchewan, Canada. <http://www.usask.ca/agriculture/plantsci/classes/range/berberis.html>. 4 p.
- Kansas State University Research and Extension. 1996. Low water use plants for Kansas landscapes. MF2067. Kansas State University, Manhattan, KS. 4 p.
- Kjelgren, R. 2003. *Mahonia repens*. Utah State University, Logan, UT. <http://www.hort.usu.edu/natives/shrubs/repens.htm>. 1 p.
- Lesica, P. 2002. A flora of Glacier National Park, Montana. Oregon State University Press, Corvallis, OR. 512 p.
- Natural Resources Conservation Service. 2003. Plants profile: *Mahonia repens* (Lindl.) G. Don, creeping barberry. http://plants.usda.gov/cgi_bin/plant_search.chi?mode=Scientific+Name&keywordquery=Mahonia+repens&earl=plant_search.cgi. 5 p.

Paghat.com. 2003. Creeping mahonia, aka creeping barberry, aka creeping hollygrape, aka ash barberry, aka small or dwarf Oregon grape. <http://www.paghat.com/oreongrape2.html>. 4 p.

Rehder, A. 1951. Manual of cultivated trees and shrubs. The MacMillan Company, New York. 996 p.

Rudolf, P.O. 1974. *Berberis* L., barberry, mahonia. In: C.S. Schopmeyer. tech. coord. Seeds of woody plants of the United States. Agric. Handb. 450. U.S. Department of Agriculture, Forest Service, Washington, DC. p. 247-251.

Walkup, C.J. 1991. *Mahonia repens*. In: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory. Fire Effects Information System. <http://www.fs.fed.us/database/feis/plants/shrub/mahrep/all.html>. 10 p.

Welsh, S.L., N.D. Atwood, S. Goodrich, and L.C. Higgins. 1987. A Utah flora. Great Basin Naturalist Memoirs 9. Brigham Young University Press, Provo, UT. 894 p.

John K. Francis, Research Forester, U.S. Department of Agriculture, Forest Service, International Institute of Tropical Forestry, Jardín Botánico Sur, 1201 Calle Ceiba, San Juan, PR 00926-1119, in cooperation with the University of Puerto Rico, Río Piedras, PR 00936-4984