Berberis thunbergii 简体中文 正體中文

System: Terrestrial

Kingdom	Phylum	Class	Order	Family
Plantae	Magnoliophyta	Magnoliopsida	Ranunculales	Berberidaceae

Common name Japanese barberry (English), crimson pygmy (English)

Synonym *Berberis thunbergii* , var. *atropurpurea* (Chenault)
Berberis thunbergii , var. *maximowiczii*
Berberis thunbergii , var. *minor*

Similar species *Berberis vulgaris, Berberis canadensis*

Summary Berberis thunbergii is a shrub native to Japan. When introduced it can invade a variety of habitats from damp lowlands to dry roadsides and waste places. This species forms dense stands in a variety of these habitats, including closed canopy forests and open woodlands, wetlands, pastures and meadows. Berberis thunbergii is highly shade-tolerant and displaces a variety of native herb and shrub species in areas where it becomes well established. Manual hand-pulling is a favoured method of control as the species is easily unearthed. Chemical and mechanical methods are also often employed, depending on site conditions.

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Species Description
Berberis thunbergii is described as a compact, spiny shrub that commonly grows 0.6 - 0.9m tall (although it can grow up to 1.8m in height). Roots are shallow but tough. The smooth-edged leaves range from oval to spatulate in shape and are clustered in tight bunches close to the branches. The single spines bear small leaves in their axils. Yellow flowers bloom in May, are about one third of an inch wide, and are solitary or in small clusters of 2-4 blossoms. The bright-red fruits mature in mid-summer and hang from the bush during autumn and into winter. The berries are small, oblong, and found singly or in clusters (WDNR, 2004).

Notes
The Nature Conservancy (1996) states that, \"*Berberis thunbergii* was discovered in the mountains of Japan and sent to St. Petersburg Botanic Gardens by the Russian botanist Carl Maximowicz in 1864. About 1875, seeds from St. Petersburg were received at the Arnold Arboretum in Massachusetts and, from there, introduced to North America.\" From there Swearingen *et al.* (2002) adds that, \"In 1896, it was planted at the New York Botanic Garden.\" Silander and Klepeis (1999) report that, \"By 1920 the planting of *B. thunbergii* was encouraged as an ornamental shrub replacing the common barberry (*Berberis vulgaris*).\"

Lifecycle Stages
The Nature Conservancy (1996) states that, \"*Berberis thunbergii* flowers in May and the fruits hang from the shrubs during the fall and into the winter. In autumn, the leaves of *B. thunbergii* turn varying shades of orange, red, and crimson. The woody stems of this shrub persist through the winter.\"

Uses
Ehrenfeld (1997) reports that, \"*Berberis thunbergii* has recently become a favoured landscaping species because of the unpalatability of its foliage to deer.\" Tsuji and Takatsuki *et al.* (2004) documented on Kinkazan Island of Northern Japan that *Macaca fuscata* (Japanese macaque) prefers *B. thunbergii* as a food source. Kourtev et al., 1998 speculate that, \"*B. thunbergii* may stimulate localised increases in earthworm populations, and these localised increases may then cause localised increases in pH through a reduction in orgnaic acid inputs as the litter and organic horizons are incorporated, and through a net upward movement of base-rich soil material in casts of endogeic species. If localised increase in pH then stimulated increased nitrification, a positive feedback loop would be established in which *B. thunbergii* and earthworms mutually facilitate each other.\"

Habitat Description
Berberis thunbergii can be found along roadsides, fences, old fields and open woods. It is known to tolerate a variety of habitats from damp lowlands to dry roadsides and waste places. Populations do not expand rapidly into oak-dominant forests or on extreme north-facing slopes.

Reproduction
Lebuhn and Anderson (1994) characterise *Berberis thunbergii*'s method of reproduction as \"Anther Tripping\". The authors state that, \"Stamens of *B. thunbergii* respond to a tactile stimulus by snapping toward the stigma. When filaments are stimulated, anthers strike an object and deposit pollen on the creature.\" Lebuhn and Anderson (1994) continue on to report that, \"The anthers can re-cock and strike again, resulting in a pattern of diminishing proportional pollen removal as anthers are tripped over and over.\" Silander and Klepeis (1999) report that, \"Fruit production varies with light level, but even under very low light levels (4% full sun) some seeds are produced. Fruits are dispersed in late fall through late winter. Seed dispersal curves are highly leptokurtic; most seedlings re found under or adjacent to adults, but a small number may be found tens of metres from the nearest adult.\" IPANE (2001) states that, \"The fruit of *B. thunbergii* are dispersed by birds, which are most often ground birds such as turkey and grouse. Small mammals can also contribute to their dispersal.\" The WDNR (2004) states that, \"Branches root freely when they touch the ground; thus allowing single plants to become quite large.\"

Nutrition
Silander and Klepeis (1999) report that, \"*Berberis thunbergii* thrives under a broad range of light and soil moisture conditions. Significant variation in stem growth can be explained as a function of light level. Even at less than 1% full sun, some positive stem growth can occur. Survival is quite high at intermediate to high light levels, and only under the lowest light levels (<1% full sun) does survival drop significantly. Biomass of *B. thunbergii* in field plots can be largely explained as a function of light availability and soil moisture. The biomass of co-occurring species is suppressed by *B. thunbergii*, and recovery is slow in the first year following *B. thunbergii* removal except under high light levels.\" Ness (1996) states reports that *B. thunbergii* requires partial shade to full sun, and can tolerate moisture levels anywhere from wet, to moist, and even dry. It can thrive on sandy, loam, or clay soil types within a pH range of 3.7 to 6.2. Cassidy *et al.* (2004) report that *B. thunbergii* is very responsive to nitrogen availability. In a forest understory, this species was able to increase productivity with increasing nitrogen availability. The observed response was a result of increased photosynthesis at the leaf level and altered biomass allocation patterns at the whole plant level (Harrington *et al.* 2004).

General Impacts
Berberis thunbergii is a popular ornamental plant and is present in gardens, parks, forests, and nature preserves. Its seeds are dispersed by birds and it is known to tolerate dense shade. When it escapes into natural areas its highly shade tolerant nature helps it to form dense stands in a variety of habitats, including closed canopy forests and open woodlands, wetlands, pastures, meadows and wastelands and dispace native herb and shrub species.

Management Info
Mechanical: Mechanical removal of *Berberis thunbergii* is recommended because it is effective and minimally intrusive. In early spring, this is one of the first plants to leaf out and can be distinguished easily from other shrubby vegetation. The use of a hoe, weed wrench, or mattock is suggested to uproot the entire bush and associated roots; gloves will help protect hands from the spines (The Nature Conservancy, 1996). The Southeast Exotic Pest Plant Council Invasive Plant Manual (2003) reports that, hand pulling is effective for small populations of *B. thunbergii*, since plants pull up easily in most forested habitats. Hand pulling is an extremely effective method of reducing population and seed productivity; and it can be done during most of the year. If plants have fruit present, they should be bagged and disposed of to prevent seed dispersal. Mowing and cutting is appropriate for initial small populations or environmentally sensitive areas where herbicides cannot be used. Repeated mowing or cutting will control the spread of *B. thunbergii* but will not eradicate it. Stems should be cut at least once per growing season as close to ground level as possible.
Chemical: Foliar Spray method should be considered for large thickets of *B. thunbergii* where risk to non-target species is minimal. Glyphosate and Triclopyr are suitable for this method. The Cut Stump method should be considered when treating individual bushes or where the presence of desirable species precludes foliar application. Stump treatments can be used as long as the ground is not frozen. Silander and Klepeis (1999) concur that, Glyphosate (Roundup) applied in early spring at first leaf out, when little else is in leaf, provides an effective means of eradicating *B. thunbergii* populations. Ehrenfeld (1997) comments that, as *B. thunbergii* is a deciduous shrub, and occurs under closed canopy forest, it is not feasible to use conventional methods of remote sensing to detect its presence over large regions. The author further states that, the extensive nature of the invasion and its lack of documentation in scientific literature suggest that much more attention needs to be directed to the problem of the spread of *B. thunbergii*.

Pathway
The Nature Conservancy (1996) reports that *B. thunbergii* was discovered in the mountains of Japan and sent to St. Petersburg Botanic Gardens by the Russian botanist Carl Maximowicz in 1864. About 1875, seeds from St. Petersburg were received at the Arnold Arboretum in Massachussetts and, from there, introduced to North America. Swearingen *et al.* (2002) adds that,*B. thunbergii* was planted at the New York Botanic Garden in 1896.

Principal source: *Berberis thunbergii* The Nature Conservancy, 1996.

Compiler: National Biological Information Infrastructure (NBII) & IUCN/SSC Invasive Species Specialist Group (ISSG)

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[39] UNITED STATES
[1] AUSTRIA
[1] DENMARK
[1] GEORGIA
[1] ITALY
[1] POLAND

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