Alnus japonica (Thunb.) Steud.

Betulaceae

LOCAL NAMES
English (Japanese alder); Japanese (hannoki)

BOTANIC DESCRIPTION
Alnus japonica is a deciduous or evergreen shrub or small tree, 3-10(-20) m tall; crown dense; bark gray, smooth; twigs with a 3-angled pith and stalked, twig ends rather sharply triangular, perular glands, glabrous or subglabrous.

Leaves simple, alternate, in 3 rows, mostly with domatia in the vein axils and often glandular-lepidote below; leaf blade ovate-oblong to elliptical oblong, 6-9.5(-13) cm x 2.7-5 cm, dentate, distinctly acuminate, base broadly or obtusely cuneate or subrotundate, with 6-7 pairs of lateral veins; petiole slender, 1-3 cm long; stipules early caducous.

Flowers in unisexual catkins. Male inflorescence a many-flowered pendulous catkin, 3-5 cm x 3-5 mm; flowers arranged in groups of 3 (triads) in the axil of a bract; flower with 4 perianth segments mostly connate at base, stamens 4, epipetalous, with short filaments; female inflorescence a short, upright catkin arranged in a terminal raceme on short shoots, catkin 1.5-2.5 cm x 1 cm, penducle 0.5 cm long, flowers in groups of 2 (diads) sustained by a bract concrescent with 4 bracteoles, without a perianth, styles 2 with stigmatose tip.

Fruiting catkin cone-like, woody, with 5-lobed scales and minute 2-winged nutlets, fruit a small nut, compressed, 1-seeded, crowned by the styles; nut obovate-orbicular, not emarginate, about 3 mm in diameter including the wings.

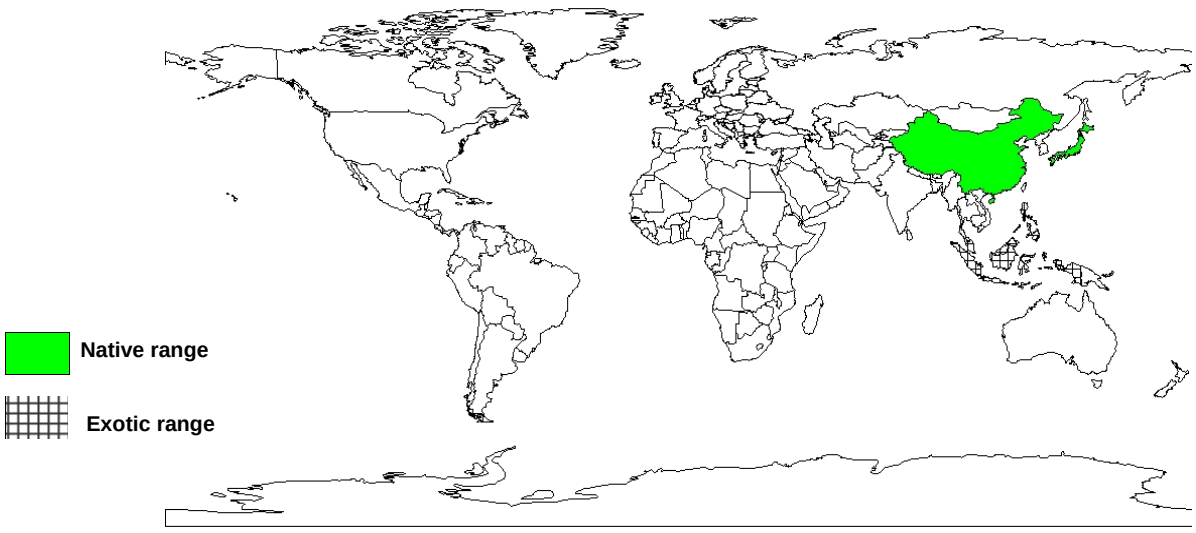
BIOLOGY
The tree flowers and fruits from April to November in its natural habitat. Pollination and seed dispersal is by wind. Flowers are unisexual.

ECOLOGY
The japanese alder is a native of Taiwan, Japan and North-east Asia (China, Korea, Siberia). As a pioneer, the tree grows well in full sunlight although shade is tolerated. It occurs in wet soils along streams and in swamps and also on exposed soils. In Japan, it occurs in marsh or swamp forest with a high water table and soil conditions tending to be anaerobic with high clay and organic matter contents. It does not require fertile soil, but prefers permeable soils and should not be planted in compact soils.

BIOPHYSICAL LIMITS
Soil type: Prefers soil conditions tending to anaerobic with high clay and organic matter contents.

DOCUMENTED SPECIES DISTRIBUTION

Native: China, Japan, Korea, Republic of, Russian Federation, Taiwan, Province of China
Exotic: Indonesia, Malaysia, Philippines



The map above shows countries where the species has been planted. It does neither suggest that the species can be planted in every ecological zone within that country, nor that the species can not be planted in other countries than those depicted. Since some tree species are invasive, you need to follow biosafety procedures that apply to your planting site.

PRODUCTS
Fuel: The tree is an important source of firewood.

Timber: In the Philippines, it has been found suitable as bed logs for shiitake mushroom (Cortinellus shiitake) cultivation. The wood is suitable for making furniture, tools, packaging, and production of charcoal for gunpowder.

SERVICES
Erosion control: The tree is planted to improve the stability on erodable slopes and landslides due to its extensive lateral root system.

Shade or shelter: Alnus japonica is planted for shade in coffee plantations and as a nurse tree in Pinus kesiya plantations in the Philippines.

Reclamation: It has been planted in reforestation for mine reclamation.

Nitrogen fixing: This is a nitrogen fixing tree and has been planted to improve degraded land. It forms a symbiosis with N-fixing actinomycetes of the genus Frankia.

Ornamental: The hannoki is planted as an ornamental.

Boundary or barrier or support: It is planted as living posts supporting wires for chayote (Sechium edule), a fruit vegetable in the Philippines.

TREE MANAGEMENT
A. japonica is shade tolerant and tends to retain its lower branches. While it is deciduous in Japan, it seems evergreen in the Philippines. Under flooded conditions, it retains leaves and can almost maintain its growth rate by forming adventitious roots. In the Philippines, the tree is planted at 15 m x 15 m to provide shade for coffee planted at 2 m x 2 m. The trees are pruned to a height of 3-5 m. The tree coppices easily and is sensitive to fire. On fertile sites, poles and firewood can be harvested after 5 years, small-diameter timber can be harvested in less than 10 years.

GERMPLASM MANAGEMENT
There are about 125 000 seeds/kg. Seeds retain viability for 3-6 months. Fruits are collected from the trees and seeds are released when fruits are left to dry in the sun. Treatment of seed with high temperature (90 deg C) increased germination of Alnus japonica by 88% in China. Seed storage behaviour orthodox. Hermetic air-dry storage at –20 deg C recommended.

PESTS AND DISEASES
Where the tree is introduced, it suffers only mild attacks by the sawfly (Fenusa dohrnii). The tree is host to Eotetranychus tiliarium, while in China, both the larvae and adults of Agelastica coerulea feed on its leaves. The drepanosiphine aphid (Symydobius minutus) attacks Alnus japonica in the Soviet Far East.

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SUGGESTED CITATION

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