

kiri

**LOCAL NAMES**

## Chinese

(maopaotong,zihuapaotong,rongmaopaotong,ribenpaotong,zitong); Dutch (Anna-paulownaboom); English (royal paulownia,princess tree,foxglove tree,empress tree); French (paulownia de Chine,arbré d'anna paulownia,paulownia tomenteux); German (blauglockenbaum,Kaiser-Paulownie,filzige paulownia); Italian (paulownia,paulovia); Japanese (do-boku,hana-giri,hitoha-gusa,kiri,kiri-noki); Korean (mukuinamo,otoung-nam); Trade name (kiri)

**BOTANIC DESCRIPTION**

*Paulownia imperialis* is a deciduous tree attaining a height of 12-16 m, occasionally over 20 m. The crown is open and domed, containing relatively few branches that often begin quite near the ground. Bark is smooth and delicately streaked, reddish-grey in colour on young trees and of a distinct grey hue in older trees.

Opposite leaves heart shaped with a basal notch, a light colouring of downy hairs on their top side and densely pubescent underside; entire, measuring up to 35 x 25 cm, with a stalk 10-15 cm long.

Flowers pale-violet to blue-purple, slenderly campanulate, up to 6 cm long, arranged on panicles 20-30 cm long.

Fruits grow on stalks, ovoid in shape, whitish-green in colour and sticky to the touch. About 3 x 1.8 cm in size; 2-10 grow on each panicle, each opening in 2 valves releasing winged seeds 3-5 mm.

*P. imperialis* was named in honour of Anna Pavlovna (1795-1865), daughter of Czar Paul I of Russia and wife of Prince (later King) Willem of the Netherlands.

**BIOLOGY**

*P. imperialis* bears fruit regularly from age 15 onwards. In eastern and southern USA, the flowers appear in April and May before the leaves emerge. The fruits turn brown in the autumn, when they mature and persist on the tree throughout the winter.

## Paulownia imperialis

Sieb. & Zucc.

Scrophulariaceae

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### ECOLOGY

*P. imperialis* prefers a warm temperate to warm climate. Studies in China have shown that it flourishes best at daytime temperatures of 24-30 deg. C; its height growth ceases at daytime temperatures of 15-20 deg. C. Sufficient ventilation of the soil is vital; on poorly draining sites, after 3-5 days of uninterrupted rainfall *P. imperialis* casts off its leaves and dies. It is easily damaged by wind.

It is an intolerant pioneer species, colonizing cleared disturbed areas such as roadsides, mined areas, sanitary landfills, abandoned agricultural soils, and deep, moist but well-drained alluvial soils along waterways.

### BIOPHYSICAL LIMITS

Altitude: 500-1 800 m, Mean annual temperature: -20 - 30 deg. C, Mean annual rainfall: 500-2 000 mm

Soil type: Thrives best in moderately acid to alkaline soils (pH 5-8), but is relatively undemanding to nutrient availability. It prefers well-drained, sandy to loamy soils.

### DOCUMENTED SPECIES DISTRIBUTION

Native: China

Exotic: Argentina, Austria, Belgium, Brazil, France, Germany, Greece, Ireland, Italy, Japan, Korea, Republic of, Netherlands, Paraguay, Portugal, United Kingdom, United States of America



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.

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**PRODUCTS**

**Fibre:** *P. imperialis* yields an excellent chemical pulp of a quality far superior to that of other fast-growing, broadleaved tree species.

**Apiculture:** In Kentucky this valuable tree provides pollen and nectar for bees (Hill and Webster, 1995).

**Timber:** The wood has a uniformly coloured, light-brown heartwood, and a narrow, light-grey sapwood. *P. imperialis* is the lightest wood grown in China (specific gravity 0.3 g/m<sup>3</sup>). It is odourless, has good physical properties and is easy to season but is only moderately durable. Because of its above-average acoustic properties, it is used in China for making traditional musical instruments. Its other applications include models and glider construction, sculptures, small utensils and domestic articles. In Japan, it is used for making matches, wooden shoes and crates. Plantation-grown wood from Brazil is often utilized for simple furniture.

The popularity of *P. imperialis* among the Chinese has inaugurated the convenient custom of planting a sapling at the birth of a daughter. By the time the girl is old enough to get married the tree is big enough to be used for the construction of her wardrobes, which are important articles in her dowry.

**Lipids:** Oil for varnishing is obtained from the seed.

**Medicine:** The leaves, flowers, fruits and roots are used in China for making medical decoctions. An aqueous solution prepared from the leaves and capsules is prescribed for daily application over the head to promote a healthy growth of hair, and another for turning grey hair black. An aqueous solution prepared from the leaves and wood is prescribed for swollen feet. A tincture prepared from heating the inner bark with water and whiskey is administered internally to patients having high fever and delirium. The leaves steamed in vinegar or the bark fried in vinegar are prescribed as a dressing for bruises. An aqueous concoction made from the flowers and other Chinese plants is administered internally for the cure of ailments of the liver or bile that cause dizziness.

**SERVICES**

**Shade or shelter:** *P. imperialis* is suitable for planting in shelterbelts.

**Reclamation:** Its tenacity in rooting and its tolerance of rocky, disturbed and relatively infertile soils boosts its potential use in reclamation of surface mines, for example in Kentucky, USA.

**Ornamental:** As a park and ornamental tree, it is widespread in temperate zones including Germany (in the wine-growing areas), southern Europe and USA.

**Intercropping:** Particularly well suited for intercropping with wheat, cotton and maize at spacings of 5 x 20 m and 5 x 50 m; the resulting yields of wheat are 16% higher, those of cotton 7% higher, and those of maize more than 11% higher than those from plots without *P. imperialis*.

**TREE MANAGEMENT**

*P. imperialis* grows extremely quickly. Stock grown from seeds attains a height of 3-4 m by the end of the 1st year, with a diameter of 3-5 cm at ground level. Root cuttings can be as high as 4-5 m, occasionally 8 m, after 1 year. Field planting is recommended of young plants 4-5 m tall with a diameter 4-6 cm just below the crown. Under favourable conditions a large tree may produce as many as 20 million seeds in a year. Paulownia is a pioneer species requiring direct sunlight. For this reason, young trees should be kept free from weed competition. A spacing that results in 500 trees/ha (about 2.75 x 2.75 m) is recommended to produce high-quality trees of good form.

**GERMPLASM MANAGEMENT**

Orthodox storage behaviour; 85-93% germination after 3 years hermetic storage at 4 deg. C. There are between 4 and 6 million seeds/kg, or about 6200 seeds/g.

**PESTS AND DISEASES**

Two species of fungi, *Ascochyta paulowniae* and *Phyllosticta paulowniae*, cause leaf spots during very rainy seasons.

**FURTHER READNG**

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**SUGGESTED CITATION**

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