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Paulownia tomentosa

[Synonyms : *Bignonia tomentosa*, *Incarvillea tomentosa*, *Paulownia imperialis*, *Paulownia recurva*]

PRINCESS TREE is a deciduous tree. Native to central and western China it has foxglove-like, slightly fragrant, darker spotted and yellow-striped inside, bluish-violet flowers just before the leaves.

It is also known as Chinese empress tree, Empress tree, Foxglove tree, *Glockenbaum* (German), *Huang Tung* (Chinese), Karri tree, *Kejsertæ* (Danish), *Kiri* (Japanese), Kiri tree, Mountain jacaranda, Paulownia (English, French), *Pavlovník plstnatá* (Czech), Rattlebox tree, Royal paulownia, Sapphire princess, and *Shima-giri* (Japanese).

The flowers emit their fragrance in the evening and this vanilla-like (*Vanilla planifolia*) scent can carry some distance. One small and hard, dark brown capsular fruit can contain as many as 2,000 tiny, winged seeds and one tree is capable of producing 20,000,000 in any one year. The seed can be dispersed long distances by the wind and by water. The lightweight, pale yellow to pale red wood hardens after it is cut.

This tree is viewed as an invasive weed in many countries in wet, sub-tropical and temperate climates – including in Tennessee in the United States where it is formally viewed as an invasive weed.

Tomentosa means ‘densely woolly, hairy or matted hairy’.

There are some authorities who claim that this tree has been cultivated in China for at least 2,300 years. Certainly some Chinese records show that princess tree was valued for its medicinal and ornamental attributes as early 3 BC. Other records indicate that it was used for making a royal coffin 600 years earlier still – and authorities draw particular attention to a book that preceded all of this and that apparently can still be referred to today..Published in 1049 BC it is entitled *A Monograph on Paulownia* and offers a detailed discussion of the morphology, properties, cultivation and uses then known.

The tree was associated with the Phoenix that could regenerate itself in fire and has thus been a Chinese symbol of good fortune for several thousand years. It has long been planted around Chinese homes especially in farming areas. According to ancient legend this mythical bird which brought good luck only ate bamboo fruit and only perched on princess trees in its flight path. But there were two caveats – the Phoenix would not land unless the tree was at the height of its excellence and the Country was led by a benevolent ruler. Some authorities suggest that the Chinese may already have appreciated that the tree’s ability to withstand being burnt and to regrow from its roots. Apparently another Chinese tradition required that a princess tree be planted when a girl-child was born and that it be felled when she was old enough to marry so that beautiful things could be made from it for her home as a dowry. In this instance authorities suggest that the tree’s rapid growth was acknowledged. (Chinese stories are also said to tell how the presence and age of a tree outside a home was a valuable signal to (wedding) matchmakers.

The tree was introduced to Japan and Korea over 1,000 years ago. Authorities acknowledge that it has been grown in Japan for centuries and is as highly respected there as it is in its

native China. (Records suggest that princess tree has a special association with the old imperial Japanese houses as it features in some Emperors' crests.)

It only appeared in the West a few centuries ago when the Dutch East India Company imported the tree to Europe in the 1830s. It then crossed the Atlantic some years later (the actual number are debated). Perhaps it should be mentioned here that the tree's dispersal to the West, as well as to countries passed on the trade routes going that way, was aided from the early 19th Century by China's increasing exportation of her delicate china to the 'foreign devils'. She packed the fragile porcelain in millions of the princess tree's tiny lightweight, fluffy winged seeds and very many of them escaped and were blown on to wasteland around ports frequented by the carriers.

For some authorities its introduction to North America as a Chinese ornamental plant occurred in 1834 but others suspect it was not seen there before about 1845 – and until recently it has been of desultory interest on that Continent. But since the mid-19th Century it has spread so that it can be found today in 25 states from Maine in the north-east to Texas in the south-west – surely a striking picture of its aggressive nature. Not only can it take hold on rocky cliffs and oust native flora thus depriving some native fauna of their natural habitat (as it has for example on cliff faces in Great Smoky Mountains National Park in the states of North Carolina and Tennessee) but as if that were not enough it is also exceptionally hardy. Any budded stems and roots will endure the ravages of fire or the axe, as well as bulldozing and other harsh intervention that could be experienced in construction areas.

The flowers have been eaten with Miso, the traditional Japanese paste based on fermented soya bean (*Glycine max*) that is used by the Japanese today, not only as an integral part of breakfast but also as a condiment. Authorities note too that the leaves have provided emergency rations when other food has been scarce.

Locally leaves and flowers have offered nutritious fodder for livestock, including cattle, pigs, sheep and rabbits – and the leaves have also been used successfully in some regions as a green manure.

The beautiful flowers can produce a large amount of honey. Beehives made from this wood have been found to have many advantages. They are relatively light to move and they reduce extremes in outside temperature (cooler in Summer and warmer in Winter) which can increase the honey yield.

The greyish-brown bark can be used to make dyes.

In the East the resonant quality found in this lightweight wood has long recommended it for musical instruments. The Chinese, who are said to hold it in especially high regard in this capacity, made their lutes with it and it attracted equal favour in Japan where the zither-like koto has been constructed with it. For centuries in many Buddhist monasteries the monks have been called together by a hollow fish-shaped bell carved from this wood. In fact it has been especially prized for carving and joinery – and it has been used for veneering, pulp, paper, manufacturing plywood, mouldings, pillars, roof beams, ceilings and poles (reportedly preferred by Chinese dockers), as well as ship- and aircraft building. Its versatility seems almost to be unrestrained as this pale yellow to pale red wood has also been made into furniture, and coffins, as well as boxes, barrels and other storage containers for a wide range of materials from fruit, grain, tea, wine and beer, to oil and acid. Other items for which this wood has proved to be suitable have included surfboards, life rafts, sledges and blackboards in addition to carved flower vases, statues and clogs. In the past it was also used for making charcoal of a quality suitable for various industrial purposes, and for crayons, fireworks and gunpowder. It is wood from this tree that will probably have been chosen for the pieces of Japanese lacquerwork (described under *Rhus verniciflua* the lacquer tree) most sought after today. Nowadays

both the Chinese and the Japanese use the princess tree's wood extensively for fine furniture, apart from the traditional Japanese lacquerware. Fine wood shavings have not been wasted either as they serve as insulation material, cushion filling and bedding for livestock - and have also been used to make toys. In fact at the turn of the 20th and 21st Centuries its importance in this market became so marked that plantations of these rapid growing trees were being established in the United States to take advantage of it and the logs from them now provide that Country with a highly desirable and valuable export commodity. Plantations have also been established in Australia where the wood has been considered for local markets as an alternative to imported rainforest timber.

It has been grown in plantations (initially very small) in China as witnessed by Chinese records of 300 BC that note '.... the people in Shucho supplied the king with *Paulownia*'. In more recent times in Asia the tree is also cultivated among tea bushes (*Camellia sinensis*) and other crops to provide shade and windbreaks. On the Chinese plains it is said to be much valued by farmers there for intercropping as it creates a microclimate that can enhance the growth of the agricultural plants in its shade. It is also grown all over the world as an ornamental plant.

Princess tree seems to be a mixed blessing primarily determined by climate. Although it has attracted a bad name in some wet, sub-tropical or temperate regions because of its tenacity this same quality has proved invaluable for environmentalists elsewhere. In North America it was chosen for revegetation programmes on stripmined sites because of its rapid growth – and its success has been such that there is increasing demand for its cultivation in these areas. Its satisfaction with poor soil has also recommended it to some urban planners who have proved its value as a street tree – while others reject it not least because of its extensive litter from falling flowers, the grey woolly underside of the dull green leaves and tiny woody seeds. Pursuing this theme a little further, in appropriate climates environmentalists have also prized it in some revegetation programmes in which its rapid growth has provided necessary cover for slower growing native plants that ultimately take over the habitat. It is also interesting to note that some research has been carried out on the possible effects on the quality of air in smoke and dust polluted districts by comparing similar areas in which the tree does and does not grow. The results suggest that apart from the fact that princess tree is more tolerant of poor conditions than very many other plants its presence may well improve the air quality too.

Princess tree has also offered qualities embraced by Chinese hairdressers. The leaves and fruit have not only been applied to enhance hair growth but they have also been used to darken grey hair.

Medicinally, most parts of the tree have been used in local Chinese medicine. The leaves, flowers and wood have been used in treatments for various respiratory problems. Fruit extracts have been used to treat blood pressure. A leaf and wood solution has been recommended for easing swollen feet, a leaf decoction has been used to wash ulcers and a leaf poultice has been applied to bruises. Bark tincture has been prescribed as a remedy for fevers and delirium, as well as a cure for worms.