GLOBAL INVASIVE SPECIES DATABASE

FULL ACCOUNT FOR: ***Paulownia tomentosa***

Paulownia tomentosa 简体中文 正體中文

System: Terrestrial

Kingdom	Phylum	Class	Order	Family
Plantae	Magnoliophyta	Magnoliopsida	Scrophulariales	Scrophulariaceae

Common name empress tree (English), foxglove-tree (English), kiri (Japanese), princess tree (English), karritree (English)

Synonym

Similar species *Catalpa speciosa*

Summary Paulownia tomentosa is a small to medium sized tree, native to Asia that was introduced to North America as an ornamental but is now also commercially farmed. Paulownia tomentosa grows best on moist, well-drained soils on steep slopes or open valleys, but it can also establish itself readily on poor quality sites, such as abandoned surface mines, along roadways, railways and steep, rocky waterways. Paulownia tomentosa is considered to be an aggressive ornamental tree that grows rapidly in disturbed natural areas.

view this species on IUCN Red List

Species Description
Remaley (1998) reports that *P. tomentosa* \"is a small to medium sized tree in the figwort family (Scrophulariaceae) that may reach 9-18 metres in height. The bark is rough, gray-brown, and interlaced with shiny, smooth areas. Stems are olive-brown to dark brown, hairy, and markedly flattened at the nodes. Leaves are large, broadly oval to heart-shaped, or sometimes shallowly three-lobed, and noticeably hairy on the lower leaf surfaces. They are arranged in pairs along the stem. Conspicuous, upright clusters of showy, pale violet, fragrant flowers open in the spring. The fruit is a dry brown capsule with four compartments that may contain several thousand tiny winged seeds. Capsules mature in autumn when they open to release the seeds and then remain attached all winter, providing a handy identification aid.\"

Lifecycle Stages
Remaley (1998) states that \"*P. tomentosa* trees start bearing seed after 8 to\r\n10 years and are very prolific. . . . The seeds of *P. tomentosa* germinate\r\nquickly and grow rapidly when conditions are favourable. The seeds show\r\ninduced dormancy and require light for germination. Laboratory studies have\r\nfound that light and many other treatments can cause germination. Cold\r\nstorage reduces the light requirement, however. Germination is epigeal.

Uses
P. tomentosa is promoted as a fast growing timber tree, although the fast growth makes for a soft timber which limits its usefulness. It grows more slowly in its native region (China, Japan) where it is used as a cabinet timber and for musical instruments. Bonner (1990) states that *P. tomentosa* \"was introduced into this country as an ornamental, and it still retains some popularity for that purpose. Its use in reclamation of the disturbed soils of surface mines grows yearly. The wood is highly prized for the manufacture of specialty items in Asia, and there is a brisk export business of logs to Japan. The export market has led to establishment of commercial plantations.\"

Habitat Description
Remaley (1998) reports that *P. tomentosa* \"grows rapidly in disturbed natural areas, including forests, stream banks, and steep rocky slopes.\" Bonner (1990) states that \"in China, the natural range is south of the 0° C January isotherm in areas which receive an annual rainfall of at least 1020mm. Naturally seeded or planted *P. tomentosa* survives and grows best on moist, well-drained soils of steep slopes or open valleys, but it will germinate and grow on almost any moist, bare soil. A highly adaptable 'escapee' such as *P. tomentosa* is found in many site, soil, and forest type conditions, including soils commonly found in the order Alfisols. Like most pioneer species, *P. tomentosa* needs bare soil, sufficient moisture, and direct sunlight for good seedling establishment. Seedlings are very intolerant of shade. The ability of *P. tomentosa* to survive, grow, and reproduce on such harsh, exposed sites, however, has made it a favourite for re-vegetating surface mine areas. The tree thrives on dry southern aspects, even though it generally has a shallow root system.\" The Southeast Exotic Pest Plant Council (Undated) reports that *P. tomentosa* \"tolerates high soil acidity, drought, and low soil fertility.\"

Reproduction
Remaley (1998) states that *P. tomentosa* also spreads by seed and by\r\nsuckering. \"Each [seed] capsule contains up to 2,000 seeds, and a large tree\r\nmay produce as many as 20 million seeds a year. As the capsules break open\r\non the trees throughout the winter and into spring, wind dissemination\r\noccurs easily. . . . *P. tomentosa* roots sprout easily. In fact, lateral root\r\ncuttings of 1-year-old seedlings can be used for propagation directly in the\r\nfield.\" Further research has found that large capsules may contain > 2,500\r\nseeds and that seeds can remain in a seed bank for at least 3 years becoming\r\ndormant sometime in the late summer with very little seed predation\r\n(Longbrake, pers. obs.).

General Impacts
Remaley (1998) reports that *P. tomentosa* \"is an aggressive ornamental tree that grows rapidly in disturbed natural areas . . .\" The Southeast Exotic Pest Plant Council (Undated) reports that *P. tomentosa* \"can also colonize rocky cliffs and scoured riparian zones where it may compete with rare plants in these marginal habitats.\"

Management Info
Preventative measures: A Risk Assessment of \r\r\n*Paulownia tomentosa* for Hawai'i and other Pacific islands was prepared by Dr. Curtis Daehler (UH Botany) with funding from the Kaulunani Urban Forestry Program and US Forest Service. The alien plant screening system is derived from Pheloung *et al*. (1999) with minor modifications for use in Pacific islands (Daehler *et al.* 2004). The result is a score of 9 and a recommendation of: \"Likely to cause significant ecological or economic harm in Hawai'i and on other Pacific Islands as determined by a high WRA score, which is based on published sources describing species biology and behaviour in Hawai'i and/or other parts of the world.\"
A Risk assessment of \r\r\n*Paulownia tomentosa* for Australia was prepared by Pacific Island Ecosystems at Risk \r\r\n(PIER) using the Australian risk assessment system (Pheloung, 1995). The result is a score \r\r\nof 7 and a recommendation of: reject the plant for import (Australia) or species likely to \r\r\nbe a pest (Pacific).
Physical: Remaley (1998) States that *P. tomentosa*, \"can be controlled using a variety of mechanical and chemical controls. Hand pulling may be effective for young seedlings. Plants should be pulled as soon as they are large enough to grasp. The entire root must be removed since broken fragments may re-sprout. Cutting is most effective when trees have begun to flower to prevent seed production. Because *P. tomentosa* spreads by suckering, re-sprouts are common after cutting.\"
Chemical: \"Cutting should be considered an initial control measure that will require either repeated cutting of re-sprouts or an herbicidal treatment. Girdling is effective on large trees where the use of herbicides is impractical. This method will kill the top of the tree but re-sprouts are common and may require a follow-up treatment with a foliar herbicide. The cut stump method, that is applying herbicide to freshly cut stumps, should be considered for individual trees or when desirable plants are nearby that might be impacted by foliar applications\" (Remaley, 1998).

Pathway
P. tomentosa was introduced into the USA as an ornamental, and it still retains some popularity for that purpose (Bonner, 1990).The wood of *P. tomentosa* is highly prized for the manufacture of specialty items in Asia, and there is a brisk export business of logs to Japan. The export market has led to establishment of commercial plantations (Bonner, 1990).*P. tomentosa*'s use in reclamation of the disturbed soils of surface mines grows yearly and this has led to its spread (Bonner, 1990).

Principal source: *Paulownia tomentosa* (Thunb.) Sieb. & Zucc. ex Steud. (Bonner, 1990)
\r\n Princess Tree: *Paulownia tomentosa* (Thunb.) Sieb. & Zucc. ex Steud. (Remaley, 1998)
Pacific Islands Ecosystems at Risk, (PIER, 2002)

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

Review: A. Christina W. Longbrake, Washington & Jefferson College, Department of Biology.

Pubblication date: 2005-01-24

ALIEN RANGE

[1] AUSTRALIA
[27] UNITED STATES
[1] GERMANY

BIBLIOGRAPHY
9 references found for **Paulownia tomentosa**

Managment information
Batianoff, George N. and Butler, Don W. 2002. Assessment of Invasive naturalized plants in south-east Queensland. Appendix. Plant Protection Quarterly 17, 27-34.
Summary: Available from: http://www.epa.qld.gov.au/publications/p00727aa.pdf/Invasive_naturalised_plants_in_Southeast_Queensland_ranked_list.pdf [Accessed 25 May 2007]
Bonner, F. T. 1990. *Paulownia tomentosa* (Thunb.) Sieb. & Zucc. ex Steud. Silvics of North America: 1. Conifers; 2. Hardwoods. Agriculture Handbook 654. U.S. Department of Agriculture, Forest Service, Washington, DC. vol.2, 877 p. [Online Database]
Summary: Information on habitat, life history, special uses, and genetics of species.
Available from: http://www.na.fs.fed.us/spfo/pubs/silvics_manual/Volume_2/paulownia/tomentosa.htm [Accessed 12 October 2003].
Daehler, C.C; Denslow, J.S; Ansari, S and Huang-Chi, K., 2004. A Risk-Assessment System for Screening Out Invasive Pest Plants from Hawaii and Other Pacific Islands. Conservation Biology Volume 18 Issue 2 Page 360.
Summary: A study on the use of a screening system to assess proposed plant introductions to Hawaii or other Pacific Islands and to identify high-risk species used in horticulture and forestry which would greatly reduce future pest-plant problems and allow entry of most nonpests.
PIER (Pacific Island Ecosystems at Risk), 2002. *Paulownia tomentosa*
Summary: Ecology, synonyms, common names, distributions (Pacific as well as global), management and impact information.
Available from: http://www.hear.org/pier/species/paulownia_tomentosa.htm [Accessed 5 February 2003].
Remaley, T. 1998. Princess Tree: *Paulownia tomentosa* (Thunb.) Sieb. & Zucc. ex Steud. Plant Conservation Alliance, Alien Plant Working Group: Bureau of Land Management, Washington, DC.
Summary: Information on native range, description, ecological threats, distribution, habitat, background, and current management strategies of species.
Availabe from: http://www.nps.gov/plants/alien/fact/pato1.htm [Accessed 12 October 2003]
Southeast Exotic Pest Plant Council. UNDATED. Invasive Plant Manual, Common Name: Princess Tree. The Bugwood Network: University of Georgia, College of Agricultural and Environmental Sciences.
Summary: Information on native range, description, ecological threats, distribution, habitat, background, and current management strategies of species.
Available from: http://www.se-eppc.org/manual/princess.html [Accessed 12 October 2003].
USDA-NRCS (Natural Resource Conservation Service) 2006. *Paulownia tomentosa*. The PLANTS Database Version 3.5 [Online Database] National Plant Data Center, Baton Rouge, LA
Summary: Available from: http://plants.usda.gov/java/nameSearch?mode=Scientific+Name&keywordquery=Paulownia+tomentosa&go.x=11&go.y=10 [Accessed 24 March 2006].

General information

ITIS (Integrated Taxonomic Information System), 2005. Online Database *Paulownia tomentosa*
Summary: An online database that provides taxonomic information, common names, synonyms and geographical jurisdiction of a species. In addition links are provided to retrieve biological records and collection information from the Global Biodiversity Information Facility (GBIF) Data Portal and bioscience articles from BioOne journals.
Available from: http://www.cbif.gc.ca/pls/itisca/taxastep?king=every&p_action=containing&taxa=Paulownia+tomentosa&p_format=&p_ifx=plglt&p_lang= [Accessed March 2005]
USDA-GRIN (Germplasm Resources Information Network) 2003. Taxon: *Paulownia tomentosa*. National Genetic Resources Program [Online Database] National Germplasm Resources Laboratory, Beltsville, Maryland.
Summary: Information on common names, synonyms, and the distributional range of species.
Available from: http://www.ars-grin.gov/cgi-bin/npgs/html/taxon.pl?27045 [Accessed 12 October 2003].