Ficus elastica Roxb. ex Hornem

Moraceae

LOCAL NAMES
Chinese (yin de rong); English (India rubber tree,Indian rubber plant,assam rubber,snake tree,fig tree of the rubber,gomero,tree of the rubber,ficus of great leaf); French (arbre à caoutchouc)

BOTANIC DESCRIPTION
A large, evergreen, strangling tree, up to 55 m tall with abundant aerial roots from the trunk and the main branches which do not thicken to form 'pillar roots'. In its native habitat, it usually begins life as an epiphyte, eventually strangling its host to become like a large banyan type fig.

Leaves simple, spirally arranged; stipules 3-10 cm; petiole 2.5-10 cm. Leaf blade oblong-elliptic to obovate, 9-30 × 5-12 cm, leathery, base rounded, margins entire, apex abruptly short-acuminate or apiculate.

Flowers unisexual, sessile and inconspicuous.

Fruit oblong-ovoid greenish-yellow syconia, paired, sometimes solitary, sessile, glabrous, 9-12 mm x 8-9 mm; individual fruit a drupelet; basal bracts about 3 mm long, falling off very early with the stipules leaving annular scars.

Bark surface smooth, inner bark pale pink producing white latex; twigs glabrous.

BIOLOGY
Figs can only be pollinated by species-specific female agaonid wasps. The fig-wasp associated with F. elastica is Blastophaga clavigera. In F. elastica the wasps arrive when female flowers are receptive. In most places, F. elastica flowers throughout the year but rarely indoors. Figs on a single tree mature at the same time, while different trees of the same species flower out of synchrony, thus inducing cross-pollination.

Leaves and immature fruit at Kihei, Maui, Hawaii (Forest & Kim Starr)

Immature fruit at Kihei, Maui, Hawaii (Forest & Kim Starr)

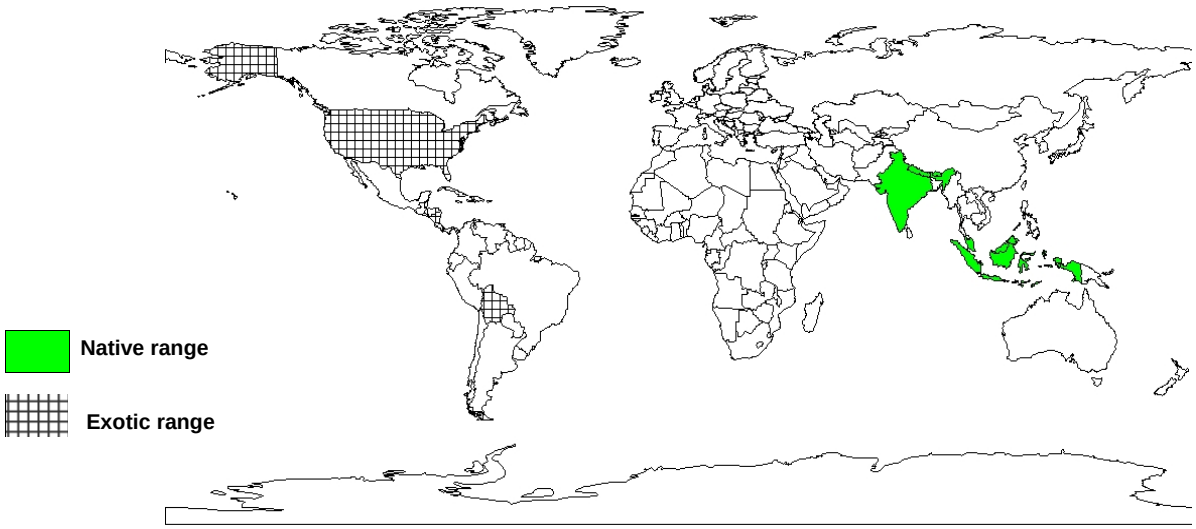
Roots at Haiku, Maui, Hawaii (Forest & Kim Starr)

ECOLOGY
Grows best in damp, tropical forests and can be found scattered in the lowland rain forest of southern West Java and in hill forest, particularly on cliffs and limestone hills.

BIOPHYSICAL LIMITS
Altitude: 0-1097 m
Temperature: 0-33ºC
Rainfall: 1000-3750 mm
Soil type: sandy; loamy; clay; acidic; alkaline; well-drained; occasionally wet with organic matter.

DOCUMENTED SPECIES DISTRIBUTION

Native: Bhutan, India, Indonesia, Malaysia, Myanmar, Nepal
Exotic: Bolivia, El Salvador, Honduras, Nicaragua, Panama, US



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
Latex or rubber: The latex from the bark of the stem and larger branches contains rubber, for all applications of natural rubber, such as tyres, rubber components for cars and machines and consumer products such as footwear, sport goods, toys and gloves. This use is now negligible. Centuries ago, the latex was used to line baskets of split rattan, to make them watertight. The ingestion of this substance or the contact with the skin can cause allergy.

Food: The very young leaf tips have been eaten as a vegetable in Java.

Fibre: The fibrous bark has been used in the manufacture of clothes and ropes.

Wood: The wood is of poor quality and occasionally applied for boards, posts, boats and fuel.

SERVICES
Ornamental: F. elastica is probably the most well-known of the interior plants in South East Asia. It is also used for median strip plantings in the highway.

Shade or shelter: recommended for buffer strips around parking lots; as a deck or patio; container or planter. It is also trainable as a shade tree.

Its large growth and buttressing roots may cause damage to structures nearby, hence there is no proven urban tolerance.

TREE MANAGEMENT
The recommended spacing in F. elastica plantations vary from 2-12 m apart. A spacing of 10 m is favored in Indonesia. Common management practices such as weed control and protection from livestock and regular trimming of aerial roots is necessary.

House plants should be irrigated 3-4 days weekly in summer and winter, and liquid fertilizer added in the irrigation water, every 15 days in summer. Very slight pruning and removal of damaged branches should be done to slow down the growth of the plant, modify its form or rejuvenate it.

Trees found growing on concrete or rock structures should be treated with herbicides while young to avoid costly structural damage. Caution is necessary when applying herbicide to figs growing as epiphytes to ensure that host tree is not killed.

There is no evidence of F. elastica ever becoming invasive anywhere. Incase of such fear then associated wasps should be prohibited from entry into the country to prevent future spread.

GERMPLASM MANAGEMENT
For vegetative propagation the highest-yielding mother trees are chosen, since there is a large individual difference in latex yield. Seed viability is 20-50% and apparently does not decrease over the first three months of storage. After the seeds have been cleaned from the surrounding pulp they can be sown under shade.

Seedlings should be pricked out and placed in trays under shade after the first 2 pairs of leaves have developed. The seedlings are transferred to beds when they are several cm tall at a spacing of 25-40 cm apart. Planting out should be when the seedlings are about 3 m tall.

PESTS AND DISEASES
No serious insect or disease problems but occasionally scales, aphids, mealybugs, thrips and spider mites are a problem.

A common disease of F. elastica pot plants is anthracnose caused by the fungus Glomerella cingulata. Others are twig blight and canker caused by Fusarium lateritium.

FURTHER READNG

Abbiw D. 1990. Useful plants of Ghana. Intermediate Technology Publications and the Royal Botanical Gardens, Kew.

Bailey LH and Bailey EZ. 1976. Hortus. 3rd ed. Macmillan General Reference, NY.

Boer E & Ella AB (eds.). 2000. Plants producing exudates. Plant Resources of South-East Asia (PROSEA) No. 18. Backhuys Publishers, Leiden, the Netherlands.

Brickell C and Zuk JD. 1997. The American Horticultural Society A-Z Encyclopedia of Garden Plants. DK Publishing, Inc., NY.

Dassanayake MD & Fosberg FR (eds). 1983. A Revised handbook to the Flora of Ceylon. 4:196-487. Amerind Publishing Co. Pvt. ltd., New Delhi.

Dehgan B. 1998. Landscape Plants for Subtropical Climates. University Press of Florida, Gainesville, FL.

Hammer RL In: Randall JM & Marinelli J (ed.). 1996. Invasive Plants: Weeds of the Global Garden. Brooklyn Botanic Garden Handbook 149.

Hara H et al. 1978-1982. An enumeration of the flowering plants of Nepal. Trustees of British Museum (Natural History), London.

Howard R. 1974-1989. Flora of the lesser Antilles. Arnold Arboretum of Harvard University, Jamaica Plain, Massachusetts.

Liberty Hyde Bailey Hortorium. 1976. Hortus third. A concise dictionary of plants cultivated in the. United States and Canada. Macmillan Publications Company, New York.

Nadel H, Frank JH, and Knight RJ. 1992. Escapees and accomplices: The naturalization of exotic Ficus and their associated faunas in Florida. Florida Entomologist. 75(1): 29-38.

Pacific Island Ecosystems at Risk (PIER). 2000. Invasive plant species: Ficus elastica L., Moraceae.

Randall R. 2002. Global Compendium of Weeds. Department of Agriculture Western Australia.

Riffle RL. 1998. The Tropical Look. Timber Press, Inc., Portland, Oregon.

Terrell EE & Terrell EE. 1986. A checklist of names for 3,000 vascular plants of economic importance. USDA, Ag Handbook No. 505. Washington, DC.

Uphof JC Th. 1968. Dictionary of Economic Plants. Stechert-Hafner Service Agency Inc., New York, New York.

Wagner WL, Herbst DR, and Sohmer SH. 1999. Manual of the Flowering Plants of Hawai'i. 2 vols. Bishop Museum Special Publication 83, University of Hawai'i and Bishop Museum Press, Honolulu, HI.

Wu Zheng-yi & P. H. Raven et al., eds. 1994. Flora of China (English edition) Vol. 4. Science Press, Beijing.

SUGGESTED CITATION

Orwa C, Mutua A , Kindt R , Jamnadass R, Simons A. 2009. Agroforestree Database:a tree reference and selection guide version 4.0 (http://www.worldagroforestry.org/af/treedb/)