

# *Ficus elastica*

India rubber tree

Moraceae

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## OVERVIEW

*Ficus elastica*, the rubber tree, is a popular ornamental tree grown around the world. It is grown indoors in cooler climates and outdoors in warmer tropical climates where it grows to a spectacular large spreading tree with attractive large glossy leaves. Several cultivars with varying leaf patterns are grown. In Hawai'i, there are no native species of *Ficus*, though many have been introduced for ornament and reforestation. Of the many introduced *Ficus* species, three have become naturalized after their associated pollinator wasps were introduced and established successful breeding colonies. *F. elastica* has not had its wasp introduced and does not set viable seeds yet in Hawai'i. It is unlikely that *F. elastica* would become a pest species in Hawai'i because fruit is rarely seen leaving little chance for wasps to establish even if they were introduced. In addition, *F. elastica* is reported as invasive in other parts of the world. Prevention of the introduction of the associated pollinator wasp would ensure that it does not begin to spread and cause problems in Hawai'i.

## TAXONOMY

**Family:** Moraceae (Mulberry family)

**Latin name:** *Ficus elastica* Roxb. ex Hornem (Bailey and Bailey 1976).

**Synonyms:** *F. belgica* Hort; *F. rubra* Hort., not Roth (Bailey and Bailey 1976).

**Common names:** Indian rubber tree, rubber plant, rubber tree, Assam rubber (Neal 1948, Bailey and Bailey 1976).

**Taxonomic notes:** The genus *Ficus* is made up of about 1,000 species from pantropical and subtropical origins (Wagner et al. 1999). Plants in the genus are all woody, ranging from trees and shrubs to climbers (Neal 1948).

**Nomenclature:** The common name, rubber tree, refers to the milky white sap which is tapped from the trees bark (Neal 1948).

**Related species in Hawai'i:** In Hawai'i, about 60 other species of *Ficus* are cultivated (Wagner et al. 1999).

## DESCRIPTION

"In cold countries it is used as a pot plant until 8 to 10 feet high...In Hawai'i, some specimens have had time to become medium sized trees. They grow best in damp, tropical forests, where some trees reach a height of 100 feet and have wide-spreading branches and buttress roots, also aerial roots dropping from trunk and large branches. From the tree's smooth, gray bark comes an elastic substance. Shiny, leathery, oblong leaves are enclosed, when buds, in rosy sheaths, which soon fall. Leaves on young plants

and on low branches of trees may be as large as 14 by 7 inches. On trees, they are ordinarily 3 to 6 by 1.5 to 3 inches. Oblong, greenish-yellow fruits about .5 inch long grow in pairs. In Hawai'i they drop without setting seed, as the wasp for fertilizing them is absent." (Neal 1948).

## **BIOLOGY & ECOLOGY**

**Cultivation:** *F. elastica* is one of the best known figs and is cultivated throughout the world (Neal 1948). Plants are grown for ornament indoors or in the ground in warmer climates. Rubber trees are valued in cultivation in the wet tropics for the large attractive size and shape of the leaves and tree (Riffle 1998). In cooler climates the tree does not spread as large and usually there are less aerial roots (Riffle 1998). This species was formerly important as a source of an inferior natural rubber. Several cultivars are grown including Cv. 'Decora' (*F. decora* Hort.) with leaves dark glossy green, ivory midribs, and red beneath; Cv. 'Doescheri' (*F. doescheri* Hort.) with leaves green at margins, marbled gray green with creamy-yellow midrib, and pink petioles; Cv. 'Variegata' with leaves light green and margined white or yellow (Bailey and Bailey 1976); Cv. 'Rubra' with maroon-red young leaves maturing to dark green with red midribs (Brickell and Zuk 1996), Cv. 'Abidjan'; and Cv. 'Asahi' (Dehgan 1998).

**Invasiveness:** *F. elastica* was listed by PIER (2002) as a problem species in Florida, though no specifics were given and no other Florida sources confirmed this. *F. elastica* is also listed as a weed by Randall (2002), though no specifics are given. There is no other evidence of *F. elastica* being invasive elsewhere. It is widely cultivated but is not known to be naturalized. Its large growth and buttressing roots may cause damage to structures nearby.

**Pollination:** The fruit (syconium or fig) and reproduction systems of species in the genus *Ficus* are unique. Each species of *Ficus* has an associated species of agaonid wasp (Hymenoptera: Chalcoidea: Agaonidae). *Ficus* species can only be pollinated by their associated agaonid wasps and in turn, the wasps can only lay eggs within their associated *Ficus* fruit.

**Propagation:** *F. elastica* can be propagated by cuttings or air layers (Brickell and Zuk 1996).

**Dispersal:** Plants are initially spread by humans who grow the plant for ornament. Because the pollinator wasp is not yet present, *F. elastica* seeds are not viable. Other species of *Ficus* that do have wasps present are spread by fruit eating birds. Various birds observed by the authors foraging and roosting in other *Ficus* trees on Maui include mynah birds (*Acridotheres tristis tristis*), blue faced doves (*Geopelia striata*), lace necked doves (*Streptopelia chinensis*), Japanese white-eye (*Zosterops japonicus*), and house sparrows (*Passer domesticus*), though there are probably more. Other animals, such as bats, pigs, rodents, parrots, and monkeys may be capable of spreading fruit.

**Pests and Diseases:** Brickell and Zuk (1997) report the following pests and diseases of *Ficus* spp.: mealybugs, scale insects, spider mites, root knot nematodes, and thrips occur

under most environmental conditions, fungal and bacterial leaf spots, crown gall, twig dieback, and Southern blight.

### **DISTRIBUTION**

**Native range:** *F. elastica* is native to Nepal, Bhutan, northeast India, Myanmar (Burma), Malaya, Sumatra, and Java (Riffle 1998). The vegetation type in this area is made up of a mixture of tropical rainforest, woodland and shrubland, and light tropical forest. Average temperatures range from 32–50 F (0-10 C) to over 68 F (20 C) in January and from 50-68 F (10-20 C) to over 86 F (30 C) in July. Average annual rainfall ranges from 40-60 in (100-150 cm) to over 80 in (200 cm) (Hammond 1986). In its native habitat, it usually begins life as an epiphyte, eventually strangling its host and becoming a typical large banyan type fig (Riffle 1998).

**Global distribution:** *F. elastica* is most vigorous in moister, warmer, tropical climates where it can reach heights of 75 - 100 feet with wide-spreading branches, buttressing roots, and aerial roots (Neal 1948). In cold regions, the tree is grown indoors as a potted plant reaching heights of 8-10 feet (Neal 1948). In frost-free dry Mediterranean climates, such as those of southern coastal California, though it does not thrive, it can be grown and is fairly manageable and attractive as a small tree with few aerial roots and lesser spread (Riffle 1998). In Florida, it reaches heights of about 25 feet (Dehgan 1998). The tree is so popular in the United States, that one year over 80, 000 plants were sold (Neal 1948). The following collections are reported from the Missouri Botanical Garden (2002): El Salvador, 830 m (2,723 ft), 13.45N 89.23W; Honduras, 700 m (2,297 ft), 14.15N 87.10W; Nicaragua, 125–445 m (1,460 ft), 12.00–12.26N 86.16–86.25W; Panama canal area, 9.10N 79.45W; and Bolivia in Santa Cruz.

**State of Hawai'i distribution:** *F. elastica* is widely cultivated in the State of Hawai'i. Trees in moist areas can attain a height of 100 feet (Neal 1948). *F. elastica* was planted as a forestry tree, though in lesser numbers than is planted in more recent times for landscaping and ornament. Skolmen (1910-1960) report a total of 321 trees planted during forestry efforts, mostly on O'ahu and the Big Island. According to recent baseline surveys, *F. elastica* is not as densely planted as *F. benjamina*, though it is not far behind, and many thousands of trees line Hawai'i's roads, yards, buildings, and parks.

**Island of Maui distribution:** On Maui, numerous specimens are cultivated in residential, urban, and rural areas across the island from sea level up to about 3,600 ft (1,097 m) in both moist and dry conditions.

### **CONTROL METHODS**

**Physical control:** *F. elastica* trees may grow very large and mechanical removal may only be possible with smaller trees.

**Chemical control:** "Fig trees are particularly sensitive to triclopyr herbicides as a basal or cut-stump treatment. Trees found growing on concrete or rock structures should be treated with herbicide while young to avoid costly structural damage. Use extreme caution when applying herbicide to figs growing as epiphytes to ensure that the poison

does not contact the host tree. When exotic figs germinate high in the branches of large trees in natural forest communities, it may be extraordinarily difficult to get close enough to the fig to treat it." (Hammer 1996).

**Biological control:** Nadel et al. (1991) report several pests that could be looked at for biological control potential including various ants which were seen carrying off pollinator wasps from *Ficus* fruits, Hymenoptera and mites that may be parasites of the pollinator wasps, and staphylinids which were seen entering *Ficus* fruits and eating the pollinator wasps.

**Cultural control:** The pollinator wasps should be prevented from entering Hawai'i in order to prevent spread of *F. elastica*. Other native or non-harmful non-native trees could be planted.

**Noxious weed acts:** None.

### MANAGEMENT RECOMMENDATIONS

*Ficus elastica* currently does not spread in Hawai'i. This species is widely cultivated throughout the world. There no evidence of it ever becoming invasive anywhere. In addition, fruit is rarely seen in Hawai'i. *F. elastica* is not likely to become invasive in Hawai'i. *Ficus* wasps should be prohibited from entry to Hawai'i to prevent future spread of *Ficus*.

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