

Clusia rosea

Autograph tree

Clusiaceae

Forest Starr, Kim Starr, and Lloyd Loope
United States Geological Survey--Biological Resources Division
Haleakala Field Station, Maui, Hawai'i

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OVERVIEW

A native to tropical America, *Clusia rosea* is widely grown as an ornamental in tropical regions of the world. In Hawai'i, *C. rosea* is commonly planted as a street, parking lot, or specimen tree. Plants readily spread from initial plantings to surrounding areas. Plants thrive in a variety of environments from dry barren lava landscapes to steep cliffs in wet areas. The seeds are presumably bird dispersed. *C. rosea*, like strangler figs, can germinate in the crotch of other trees and grow as epiphytes. They send down aerial roots and will eventually smother the host tree. *Clusia rosea* is known to be naturalized on Kaua'i, O'ahu, and Hawai'i (Wagner et al. 1999) and was recently documented as naturalized from Maui (Wagner et al. 1999; Oppenheimer and Bartlett 2000). On Maui, *C. rosea* is widely distributed in lowland urban areas. Natural areas nearby are threatened by future invasion of *C. rosea*. Early detection and control of *C. rosea* in these areas would help prevent major infestations from establishing. Eradication at this point would be difficult, if not impossible, and costly. The invasiveness of this species should be monitored and documented. It could be discouraged from use in plantings.

TAXONOMY

Family: Clusiaceae (Mangosteen family) (Wagner et al. 1999).

Latin name: *Clusia rosea* Jacq. (Wagner et al. 1999).

Synonyms: *Clusia major* (Jacq.) L. (Whistler 2000).

Common names: Autograph tree, balsam apple, cupey, copey, Scotch-attorney, pitch apple, monkey apple (Wagner et al. 1999, Whistler 2000)

Taxonomic notes: The genus *Clusia* is made up of about 145 species mostly from subtropical and tropical regions of the New World, Madagascar, and New Caledonia (Wagner et al. 1999).

Nomenclature: The tree is named in honor of a botanist of the Netherlands, Carolus Clusius (1526-1609) (Wagner et al. 1999).

Related species in Hawai'i: *Clusia rosea* is the most well known and widely planted species within the genus (Turner and Wasson 1997). Though no other species are currently reported from Hawai'i, a few other varieties are grown in cultivation elsewhere. These include a variegated form, a dwarf form known as "nana" or dwarf pitch apple, and a small leafed species, *C. guttifera*, which is becoming more popular in landscaping (Dehgan 1998).

DESCRIPTION

"Tree to 10 m tall or more with yellow sap, often beginning as an epiphyte on other trees and forming hanging aerial roots. Leaves simple, opposite, blade obovate, dark green 8-20 cm long. Flowers solitary, terminal or borne in the axils. Corolla of 6-8 free, obovate to nearly round petals 3-5 cm long, often notched at tip, white aging to pink, surrounding the numerous yellow stamens. Fruit globose green capsule 5-8 cm in diameter, splitting open from the top along 7-9 or more seams, with numerous red seeds." (Whistler 2000).

BIOLOGY & ECOLOGY

Cultivation: *C. rosea* is used for a variety of purposes. It is a hardy tree that tolerates coastal conditions and is valued in landscaping as a street tree or as a specimen tree. It can also be grown indoors in more temperate climates. It is a compact evergreen tree that has attractive pink and white flowers and unique shaped fruit that is sometimes used in flower arrangements (Whistler 2000). The common name is derived from the unique leathery paddle like leaves that last for a long time and are often etched with graffiti. The leaves have even been used as playing cards (Whistler 2000). In addition, the seeds contain a sticky sap which has been used to caulk the seams of boats (Bailey and Bailey 1976).

Invasiveness: *Clusia rosea* is widely planted in Hawai'i and is known to spread from initial plantings. These trees are extremely hardy and grow well in both wet and dry sites. Plants are similar to strangler figs (*Ficus* spp.) and *Schefflera* plants in that the prolific seeds are bird dispersed and can germinate in the crotch of other trees, sending down aerial roots, and eventually killing the host tree. According to Armstrong (1999), Dr. Erwin Ting of the University of California at Riverside has discovered that *Clusia* plants exhibit Crassulacean Acid Metabolism (CAM), a photosynthetic mechanism which aids in conserving moisture. This type of mechanism is also used by cacti and other succulents. In *Clusia*, CAM is useful during the epiphytic seedling stage until aerial roots are able to reach the ground and draw up nutrients and moisture.

Pollination: Unknown.

Propagation: *C. rosea* can be propagated by seeds, cuttings, or air layers (Brickell and Zuk 1997).

Pests and Diseases: Some common problems of *C. rosea* include root rot and leaf spot (Brickell and Zuk 1997).

Dispersal: Plants are mainly dispersed long distances by humans who use the tree in landscaping. Seeds have a dark red, fleshy aril, and are dispersed by birds in Hawai'i (Wagner et al. 1999).

DISTRIBUTION

Native range: *C. rosea* is native to the Bahamas, the Florida Keys, the West Indies, and southeastern Mexico down to northern South America (Riffle 1998). In wetter regions of its native habitat, trees may grow up to 50 ft (15 m) tall (Riffle 1998).

Global distribution: *C. rosea* is cultivated in at least Florida and Hawai'i. It is grown indoors in temperate climates.

State of Hawai'i distribution: *Clusia rosea* is known to be naturalized on Kaua'i, O'ahu, and Hawai'i (Wagner et al. 1999) and was recently documented as naturalized from Maui (Wagner et al. 1999; Oppenheimer and Bartlett 2000). *C. rosea* seems to have a tolerance for a wide variety of climates and has been observed thriving in dry lava landscapes to wet steep slopes. It is mostly observed at low elevations.

Island of Maui distribution: On Maui, *Clusia rosea* is densely distributed in lowland urban areas of Kahului, Lahaina, Kihei, Makawao, Haiku, and Hana. It is commonly planted in parking lots of shopping centers, schools, condominiums and residential areas. Naturalized plants are observed nearby plantings. The autograph tree is one of the more commonly planted trees, along with other popular ornamental tree species such as *Ficus* spp. and *Schefflera actinophylla*. All three species are often seen germinating in the crotch of the same tree. It is often seen germinating in cracks in the sidewalk or other concrete structures.

CONTROL METHODS

Physical control: No references to controlling *Clusia rosea* were found. Control may be complicated for trees growing as epiphytes in desirable trees. It probably is possible to pull small seedlings.

Chemical control: Larger trees most likely will require chemical control such as cut stump or basal bark methods. *C. rosea* seems to not be affected by foliar applications of glyphosate (Roundup) (R. Nakagawa pers. comm.).

Biological control: None known.

Cultural control: It could be suggested that the public plant other non-invasive tree species.

Noxious weed acts: *Clusia rosea* is currently not on any noxious weed lists.

MANAGEMENT RECOMMENDATIONS

Clusia rosea is far beyond the eradication stage on Maui. It is extremely popular and widely planted in Hawai'i. Natural areas near urban areas are likely threatened by invasion by *C. rosea*. Perhaps future plantings, especially near natural areas, could be discouraged. Plants that show up in preserves could be controlled. Control methodology is needed for epiphytic invaders such as *Clusia rosea*.

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