

Crop Protection Compendium - *Cecropia peltata* L.

Updated by **Pierre Binggeli 2005**

NAMES AND TAXONOMY

Preferred scientific name

Cecropia peltata L.

Taxonomic position

Domain: Eukaryota
Kingdom: Viridiplantae
Phylum: Spermatophyta
Subphylum: Angiospermae
Class: Dicotyledonae
Order: Urticales
Family: Cecropiaceae

Other scientific names

Ambaiba peltata Kuntze
Coilotapalus peltata Britton

BAYER code

CECPE (*Cecropia peltata*)

Common names

English:

trumpet tree
trumpet wood
snakewood tree
pop-a-gun

Spanish:

guarumo
yagrumo hembra

French:

bois cannon
faux ricin

parasolier
pisse-roux

Germany:

Trompetenbaum

Notes on taxonomy and nomenclature

Cecropia peltata L. is the scientifically accepted name, with the common English name of the trumpet tree. The genus is now in the family Cecropiaceae, but has been formerly placed in both the Moraceae and Urticaceae. *C. peltata* is considered by some authorities to be a complex which consists of three species: *C. peltata* L. from Central America, the Caribbean and northern South America, *C. pachystachya* Trécul. from central South America and *C. concolor* Willd. from the Amazon Basin. They are morphologically similar but have different geographical or ecological ranges and misidentifications are often made as a result of this. The taxonomy is confusing within the genus and may be expected to change. The latter two species are not covered in this datasheet, which deals with only *C. peltata* in its restricted sense. A variety, *C. peltata* var. *candida*, has been described from Venezuela.

HOST RANGE

Notes on host range

C. peltata is primarily an environmental weed, though it is likely to invade forest plantations especially after clear-felling, natural forests after disturbance, also abandoned farmland.

List of hosts plants

Wild hosts

Musanga cecropioides (umbrella tree)

HABITAT

C. peltata is a pioneer tree species found in moist tropical and sub-tropical regions, often in disturbed areas, on steep slopes, alongside riverbanks, lava flows, in forest gaps and where landslides and tree falls have occurred. It has become a weed along watercourses, roadsides and abandoned land where introduced. It is absent from dry coastal and dry limestone areas.

Habitat descriptors

Weed in (importance not known) in: rail and roadsides; natural forests

GEOGRAPHIC DISTRIBUTION

Notes on distribution

C. peltata is native to the Caribbean and neighbouring countries to the west and south. It is present as far north as Mexico and the Greater Antilles though not known in the southern USA, and as far south as northern South America. It is probably present in more Caribbean islands than indicated in the distribution table. *C. peltata* has been introduced into parts of West Africa and some Pacific islands. A record for Washington, USA, appears erroneous.

Distribution List

Africa				
Cameroon	present	introduced	invasive	ISSG, 2003
Côte d'Ivoire	present	introduced	invasive	Ake Assi, 1980; ISSG, 2003
Ghana	present	introduced	invasive	Missouri Botanical Garden, 2003
Senegal	present	introduced		Berhaut, 1967
Central America & Caribbean				
Belize	present	native		USDA-ARS, 2003
Costa Rica	present	native		USDA-ARS, 2003
Dominican Republic	present	native		USDA-ARS, 2003
Guatemala	present	native		USDA-ARS, 2003
Haiti	present	native		USDA-ARS, 2003
Honduras	present	native		USDA-ARS, 2003
Jamaica	present	native		USDA-ARS, 2003
Nicaragua	present	native		USDA-ARS, 2003
Panama	present	native		USDA-ARS, 2003
Puerto Rico	present	native		USDA-ARS, 2003
Trinidad and Tobago	present	native		Mabberley, 1990
North America				
Mexico	present	native		USDA-ARS, 2003
[USA]				

Hawaii	present	introduced	ISSG, 2003
South America			
Colombia	present	native	USDA-ARS, 2003
French Guiana	present	native	USDA-ARS, 2003
Guyana	present	native	USDA-ARS, 2003
Suriname	present	native	USDA-ARS, 2003
Venezuela	present	native	USDA-ARS, 2003
Oceania			
French Polynesia	present	introduced	ISSG, 2003

HISTORY OF INTRODUCTION AND SPREAD

In many parts of its range the species abundance has increased following human-related disturbance. In the early 1900s, *C. peltata* was introduced into Africa as an ornamental species into botanical gardens in Cameroon and as a shade tree in coffee plantations in Côte d'Ivoire in 1910. *C. peltata* has spread in disturbed areas, competing with native pioneer species. In Côte d'Ivoire the spread of *C. peltata* increased after the destruction of forest cover. *C. peltata* is also invasive in Hawaii, Tahiti and Raiatea. Material introduced into Java and hence to Malaysia originated from Brazil and would therefore appear to be *C. pachystachya*, whereas the identity of the Cameroon and Ivory Coast plants is unclear as their origin is unknown but is assumed to be *C. peltata*.

BIOLOGY AND ECOLOGY

Genetics

The chromosome number is $2n=28$ (Velazquez, 1971).

Physiology and Phenology

C. peltata seeds require full sunlight for germination to occur and in such conditions germination can reach 80-90% (Silander and Lugo, 1990). The leaves of seedlings are unlobed and downy on both sides. Seedlings grow rapidly and can reach 15 cm in 10 weeks. In one year, *C. peltata* trees can reach 2 m tall (Marrero, 1954). The maximum height of 20-25 m is reached after approximately 10 years and the species has a lifespan of 20-30 years (Crow, 1980).

Reproductive Biology

C. peltata is dioecious and becomes sexually mature in 3-5 years. In Puerto Rico, peak flowering occurs between January and March (Silander and Lugo, 1990). In Costa Rica flowering and fruiting are seasonal lasting about 9 months with a peak of 4 months during the early part of the wet season (Binggeli, 1999). Flowers are wind-pollinated and both staminate and pistillate trees flower and produce fruit all year. Females produce four spadices per inflorescence which can contain several hundred (up to 800) minute, single-seeded fruits. Seeds are orthodox in storage. Fruit clusters appear to take around a month to mature, and a large and persistent seedbank is formed in the forest soil.

Environmental Requirements

C. peltata is a tropical to sub-tropic species, intolerant to frost, and which prefers high rainfall and high relative humidity environments. It is a shade intolerant species and can grow on neutral to acidic soils. *C. peltata* can grow in a range of soil textures but clay loam soils are preferable (Binggeli, 1999).

Associations

Leaves contain a milky latex that attracts ants and other insects. A highly specialized symbiotic association between *C. peltata* and stinging ants (*Azteca* sp.); the ants feed on specialized Müllerian bodies produced at the base of petioles and protect the tree from other herbivores such as leaf-cutting ants. This occurs in most of the mainland native range (Downhower, 1975), but in Puerto Rico and other Caribbean islands this association does not exist (Janzen 1973; Putz and Holbrook, 1988).

Climatic amplitude (estimates)

- Mean annual rainfall: 990 - 3810 mm
- Mean annual temperature: 12 - 30°C

Soil descriptors

- Soil texture: light; medium; heavy
- Soil reaction: acid; neutral
- Special soil tolerances: shallow; infertile
- Soil types: acid soils; tropical soils

MEANS OF MOVEMENT AND DISPERSAL

Fruits of *C. peltata* are consumed and primarily dispersed by vertebrate frugivores such as birds, bats, monkeys and squirrels. The seeds pass through the digestive tract of the animal and are effectively spread considerable distances (Olson et al, 1968; Fleming and Heithaus, 1981; Fleming and Williams, 1990). Seeds may also be dispersed by water and deposited along riverbanks after flooding. There are no records of accidental intercontinental introductions, but the species has been intentionally introduced as a shade tree for coffee plantations and as a botanical specimen.

NATURAL ENEMIES

Kretzschmaria clavus (Fr.) Sacc., the causal agent of root rot of macadamia (*Macadamia integrifolia*) has been recorded on *C. peltata* in Hawaii. *C. peltata* is also attacked by *Historis* spp. and various moth species in its native range. The following insect pests have been recorded from Puerto Rico attacking the leaves: *Correbidia terminalis*, *Gynaecia dirce*, *Historis odious*, *Prepodes* spp. and *Sylepta salicalis* (Martorell, 1945), though their effects upon tree growth and survival is not known.

IMPACT

Impact on biodiversity

C. peltata is competing with and displacing native species in Cameroon (Binggeli et al., 1999), including specifically the native pioneer tree, *Musanga cecropoides* (McKey, 1998).

Summary of impact

Negative impact on: biodiversity; forestry production; native flora

SUMMARY OF INVASIVENESS

C. peltata is a pioneer tree in humid forests in its native tropical Americas and, as such, has characteristics of an invasive species with its ability to establish quickly in disturbed ground. It is weedy in its native range and spread is enhanced by increased human disturbance. It has become invasive where introduced, notably in parts of West Africa and the Pacific, and is listed as one of the 100 'World's Worst' invaders on the Global Invasive Species Database (ISSG, 2003).

Risk and Impact Factors

- invasive in its native range: no
- proved to be invasive outside its native range: yes
- highly adaptable to different environments: no
- high reproductive potential: yes
- highly mobile locally: yes
- its propagules remain viable for more than one year: unknown
- tolerates cultivation, browsing pressure, mutilation, fire etc.: yes
- competitive in crops or pasture: yes
- affects ecosystem: no
- adversely affects natural communities: yes
- adversely affects community structure: yes
- adversely affect human health: yes
- has sociological impacts on recreational patterns, aesthetics, property values: no
- harmful to animals: no
- produces spines, thorns or burrs: no
- host or vector of pests or diseases: yes
- likely to be accidentally transported internationally: no
- likely to be deliberately transported internationally: no
- difficult to identify or detect as a commodity contaminant: no
- difficult to identify or detect in the field: no
- difficult or costly to control: no

MORPHOLOGY

Plant type: tree; shrub; woody; seed propagated; perennial.

C. peltata is a fast-growing tree that can reach a height of 20-25 m, with slender trunks up to 50 cm in diameter and a narrow crown. Bark is grey and reddish in colour. The stems are hollow, partitioned at the nodes, bearing conspicuous, amplexicaul, stipular scars and large, U-shaped leaf scars. *C. peltata* is evergreen, with leaves that are alternate and deeply-lobed, ovate to palmate. They are 10-50 cm wide or more, dark green and scabrous above and densely white-tomentose beneath. Leaves contain a milky latex. Staminate, pistillate flowers are in an umbellate cluster of three or more, often four but up to 15, slender spikes (spadices), 4-10 cm long x 10-12 mm broad. Males produce approximately 20 smaller spadices (3-7 cm x 2-4 mm) per inflorescence (Burger, 1977). On female individuals, the minute one-seeded fruits (achenes) form large fruit clusters which appear

to take around a month to mature. The fleshy fruit clusters are cylindrical, yellowish in colour and measure 2-5 cm long. The numerous small seeds are approximately 1.9 mm long and weigh 1.6 mg (Perry and Fleming, 1980). Stilt roots are often conspicuous, as *C. peltata* is often found on steep slopes.

SIMILARITIES TO OTHER SPECIES

C. concolor, *C. pachystachya*, *C. obtusifolia* and *C. palmata* are all morphologically similar to *C. peltata* but have different geographical or ecological ranges, and may be separated in the native range by location though not where introduced.

CONTROL

No control methods have been reported in the literature.

USES

C. peltata is used by local people in its native range for many medicinal purposes, including as an analgesic, antiasthmatic, antibacterial, antifungal, anti-inflammatory, antioxidant, diuretic and as a laxative. It is also used to treat conditions such as Parkinson's disease, rheumatism, diabetes, liver disorders, high blood pressure and for the treatment of warts. *C. peltata* also has some use in the timber industry, being a light wood used for the production of plywood and low-quality timber products such as boxes, paper pulp and matchsticks. Fibres can be obtained to make ropes. The young buds of *C. peltata* are sometimes cooked and eaten as a vegetable. As a fast-growing species, it has also been planted as a shade tree in coffee plantations.

REFERENCES

- Ake Assi L, 1980. *Cecropia peltata* Linne (Moraceae): ses origines, introduction et expansion dans l'est de la Cote d'Ivoire. *Bull. Inst. Fond. Afr. Noire*, 42(1):96-102.
- Berhaut J, 1967. *Flore du Sénégal*. Dakar, Sénégal: Clairafrique.
- Binggeli P, Hall JB, Healey JR, 1998. An overview of invasive woody plants in the tropics. School of Agricultural and Forest Sciences Publication Number 13, University of Wales, Bangor.
- Binggeli P, 1999. *Cecropia peltata* L. (Cecropiaceae). *Woody Plant Ecology*. Website <http://members.lycos.co.uk/WoodyPlantEcology/docs/web-sp3>.
- Burger WC, 1977. *Moraceae*. *Fieldiana, Botany* 40:94-215.
- Crow TR, 1980. A rain forest chronicle: a 30-year record of change in structure and composition at El Verde, Puerto Rico. *Biotropica*, 12:42-55.
- Downhower JF, 1975. The distribution of ants on *Cecropia* leaves. *Biotropica*, 7:59-62.
- Fleming TH, Heithaus ER, 1981. Frugivorous bats, seed shadows, and the structure of tropical forests. *Biotropica*, 13:45-53.
- Fleming TH, Williams CF, 1990. Phenology, seed dispersal, and recruitment in *Cecropia peltata* (Moraceae) in Costa Rican tropical dry forest. *Journal of Tropical Ecology*, 6:163-178.

- ISSG, 2003. Global Invasive Species Database. Invasive Species Specialist Group, IUCN. Auckland, New Zealand: University of Auckland. www.issg.org.
- Janzen DH, 1973. Dissolution of mutualism between *Cecropia* and its Azteca ants. *Biotropica*, 5:15-28.
- Mabberley DJ, 1990. *The Plant Book: a Portable Dictionary of the Higher Plants*. Cambridge, UK: Cambridge University Press.
- Marrero J, 1954. Regeneration: Seed studies. *Cecropia peltata*. USDA Forest Service, Institute of Tropical Forestry Report. Rio Piedras.
- McKey D, 1988. *Cecropia peltata*. An introduced neotropical pioneer tree, is replacing *Musanga cecropioides* in southwestern Cameroon. *Biotropica*, 20:262-264.
- Missouri Botanical Garden, 2003. VAScular Tropicos database. St. Louis, USA: Missouri Botanical Garden. <http://mobot.mobot.org/W3T/Search/vast.html>.
- Olson SL, Blum KE, 1968. Avian dispersal of plants in Panama. *Ecology*, 49:565-566.
- Perry AE, Fleming TH, 1980. Ant and rodent predation on small, animal-dispersed seeds in a dry tropical forest. *Brenesia* 17:11-22.
- Putz FE, Holbrook NM, 1988. Further observations on the dissolution of mutualism between *Cecropia* and its ants: the Malaysian case. *Oikos*, 53(1):121-125. View Abstract
- Silander SR, Lugo AE, 1990. *Cecropia peltata* L. (Yagrumo Hembra, Trumpet-Tree). *Silvics of North America*, USDA Agriculture Handbook 654.
- USDA-ARS, 2003. Germplasm Resources Information Network (GRIN). Online Database. National Germplasm Resources Laboratory, Beltsville, USA. http://www.ars-grin.gov/cgi-bin/npgs/html/tax_search.pl.
- Velazquez J, 1971. Contribución al conocimiento de las especies del género *Cecropia* L. Moraceae- "Yagrumbos" de Venezuela. *Acta Botánica Venezolana*, 6:25-64.