

# *Cedrela odorata* L.

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## MELIACEAE (MAHOGANY FAMILY)

### *No synonyms*

Acajou amer, acajou pays, acajú, cedre, cedro, cedro amargo, cedro blanco, cedro caoba, cedro colorado, cedro español, cedro hembra, cedro mexicano, cedro oloroso, cedro real, cedro rojo, cedro vermelho, Central American cedar, cóbano, Jamaican cedar, kurana, leli, Mexican cedar, red cedar, West Indies cedar

Native to the tropical region of America, *Cedrela odorata* is naturally distributed from northern Mexico through Central America to Argentina in South America, and throughout the Caribbean islands. The species has been introduced in southern Florida, Nigeria, Tanzania, Ghana, Sierra Leone, and the Fiji Islands (Betancourt 1983, Little and others 1967, Webb and others 1980).

*Cedrela odorata* is a deciduous tree that can reach 35 m in height and 60 cm d.b.h. In exceptional cases, specimens 40 m or more in height and 2 m in d.b.h. can be found. The trunk is straight and cylindrical, sometimes with small spurs. The leaves are paripinnate or imparipinnate, 15 to 50 cm long, made up of 10 to 22 oblong or lanceolate leaflets that are asymmetrical, 4.5 to 14 cm long and 2 to 4.5 cm wide, and have a whole margin with an acuminate apex. The tree prospers in calcareous soils as well as in soils rich in organic matter. It grows in areas with an average annual temperature of 22 to 32 °C and an average annual precipitation of 1600 to 2500 mm. It requires a 3- to 4-month dry season and grows at elevations ranging from sea level to 1200 m.

The wood from this tree is among the most sought-after in Latin America and elsewhere, primarily for its value in the manufacture of veneer and furniture. Its specific gravity ranges from 0.42 to 0.63. It is resistant to attacks by fungi and insects, and it keeps a pleasant fragrance for many years. It is used for belt rails, staves, musical instruments, and interior decoration. An infusion of its bark is used as a remedy for diarrhea, fever, vomiting, hemorrhages, dyspepsia, bronchitis, and indigestion (Niembro 1986).

As a monoecious tree, *C. odorata* has flowers of both sexes in the same inflorescence. The flowers are yellow-green

and arranged in panicles. Flowering and fruiting periods vary throughout the tree's range. In Mexico, it blooms May through August, and the fruits ripen during the dry season from January through March in the following year. As the foliage begins to drop, the fruits dry and open. The fruits are capsular, oblong, or ellipsoid; 17.1 to 44.8 mm long and 14.0 to 21.1 mm in diameter; dehiscent; and green-gray to light brown with four to five valves and numerous lenticels (Little and others 1967, Pennington and Sarukhan 1968). Each fruit contains 13 to 34 developed seeds (Niembro 1995a). The seeds are samaroid, bulky at their apex, 2 to 3 cm long, and 5 mm wide (including the wing). The bulky part is oblong, slightly comose, laterally flattened, 7 to 8 mm long, 3.5 to 5 mm wide, and 1.2 to 1.5 mm thick. The seedcoat is light brown to red-brown, rugose, opaque, cartaceous, and expanded at the base on a thin and brittle lateral wing, which results from the extension of the raphe-exostome.

*Cedrela odorata* fruits change color as they ripen. Ripe fruits are dark coffee-colored and dehiscent. They must be gathered before they open and release the seeds. Dry and warm winds aid in ripening and dehiscence. Collectors climb the trees and cut the fruits from the trees using poles with metallic hooks. The fruits are transported in jute sacks to the processing plant, then placed in wood boxes with metallic mesh bottoms that provide air circulation and prevent the development of microorganisms. The boxes are placed in well-ventilated sheds. The fruits should not be placed in the sun to dry (a common practice in many areas), because this reduces seed viability by exposing them to high temperatures, causing irreversible damage. As the fruits dry, the valves open and release the seeds. Valves usually begin to open by the second

or third day. *Cedrela odorata* seeds have a fragile and brittle wing, which is removed by rubbing the seeds by hand. Resulting impurities are eliminated using sieves or a vertical column blower. *Cedrela odorata* seeds differ in size and weight but average 40,000 to 89,047 per kg (Betancourt 1983, Patiño and Villagómez 1976, Vega and others 1981).

Vega and others (1981) note that the seeds of this tree can be stored at ambient temperatures for a period of 10 months without significantly losing viability. However, other studies (Centro Aronómico Tropical de Investigación y Enseñanza 1997b) show that the viability of the seeds stored under natural conditions diminishes quickly after 1 month. Therefore, storing seeds in polyethylene bags at a temperature of 5 °C and a moisture content of 7 percent is recommended. Stored this way, seeds maintain a viability of 50 to 60 percent for 2 years.

Seed germination is epigeal or phanerocotylar (Duke 1969). Because the seeds do not have a latency period, they do not require pretreatment. In the Forest Seeds Laboratory of the China Experimental Field of the National Institute of Forest, Agricultural, and Cattle Research, located in Campeche, Mexico, seeds are placed in germinators with continuous light and a constant temperature of 28 °C.

Two methods are used to propagate the species: bare root and seed. Selection of a method is driven by the cost. In southeast Mexico, *C. odorata* is propagated in nurseries primarily through the less expensive, bare root method. In some forest nurseries, the species is propagated inside polyethylene

containers. Those who propagate using seeds prepare the beds by hand or by machine 4 months before planting. Seedlings that reach 30 to 40 cm in height and 1 cm in diameter at the neck of the root during the rainy season are outplanted (Patiño and others 1993b). During the first few years, *C. odorata* grows at an average annual rate of 1.3 to 1.8 m in height and 1.3 to 1.6 cm in d.b.h.

#### ADDITIONAL INFORMATION

The hilum is subapical, linear, and slightly deep-set; it sometimes has a remnant of funicular tissue. The micropyle is indiscernible. The endosperm is thin, pulpy, uniform, whitish, oily, and firmly attached to the embryo. The embryo has a straight axis and is almost bilaterally symmetrical, white, and located at the longitudinal axis of the seed. The cotyledons are narrowly ovoid, oblong, or elliptic; whole; flat; foliaceous; and independent of one another. The plumule is undifferentiated. The radicle is short and protrudes laterally (Corner 1976, Klein 1984, Niembro 1982, Pennington and Styles 1981, Pennington and Görts van Rijn 1984, Standley and Steyermark 1946b, Stoffers 1984, Wilson 1924).

Germination begins as the hypocotyl and radicle lengthen and the cotyledons rise above the ground. The cotyledons change from yellow to green, which indicates that photosynthetic activity has started in the plantule. Subsequently, the plumule develops. Plantules continue to grow and develop new leaves that gradually provide nutrients for the tree.



