

Copaifera camibar Poveda, Zamora & Sánchez

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FABACEAE (BEAN FAMILY)

No synonyms

Camibar (Poveda and others 1989)

Copaifera camibar was originally reported as an endemic species of Costa Rica (Poveda and others 1989); however, the species has recently been found in Venezuela (Berry and others 1997). *Copaifera camibar* grows on moderately flat plains associated with other tree species, among them *Peltogyne purpurea* Pittier, *Caryocar costarricense* Donn. Sm., *Parkia pendula* (Willd.) Benth. ex Walp., *Caryodaphnopsis burgeri* Zamora & Poveda, *Humirastrum diguense* (Cuatrec.) Cuatrec., *Uribea tamarindoides* Dugand & Romero, and *Newtonia suaveolens* (Miq.) Brenan (Poveda and others 1989).

Copaifera camibar is a fast-growing tree that reaches 25 m in height and 75 cm d.b.h. It has a straight bole and a round crown. Young twigs are subcylindrical, with a dense ferruginous or gray-brownish pubescence. The old branches are smooth, glabrous, and gray to light brown. The outer bark is smooth, grayish, and aromatic. The sap is resinous and aromatic (Jiménez 1993, Poveda and others 1989). Leaves are alternate, paripinnate and 3.7 to 8 cm long, with 18 to 22 pairs of sessile leaflets that turn brown when dried. The leaflet blade is glabrous, shiny olive green adaxially, and dull green abaxially; leaflets are coriaceous, alternate, sometimes opposite or subopposite, and oblong, with petiolules up to 1 mm long. Leaflets are variable in size: the basal leaflets are 4 to 9.5 mm long and 2.9 to 4 mm wide; the middle leaflets are 7.5 to 12.9 mm long and 2.8 to 4 mm wide; and the distal leaflets are 5 to 9.5 mm long and 1.5 to 3 mm wide. The leaflet has an entire margin, an asymmetrical base, and a rounded apex that is slightly emarginate with a brown gland and a prominent midvein that projects abaxially. The secondary and tertiary veins are hardly visible. Marginal veins are parallel to the margin. Stipules are green, foliaceous, and pinnate, sometimes having simple trichomes at the apex and apical gland. The stipular base is truncate; the apex is acuminate; and the stipules have translucent points (Poveda and others 1989). The tree grows in

very humid, evergreen, primary forests with well-drained soils at elevations of 0 to 300 m; the temperature range is 28 to 35 °C and annual rainfall is above 4000 mm (Jiménez 1993).

The sapwood is pale brown and sharply demarcated from the dark brown or golden heartwood. The wood exhibits resinous spots in the tangential, radial, and cross sections. Wood texture is fine, with high luster and straight to slightly inclined grain. The wood is odorless and has a slightly sour and bitter taste. Growth rings are conspicuous and easily seen due to the alternating light and dark bands and annular (marginal) parenchyma. Numerous resin ducts appear as dark lines, particularly at the longitudinal planes (Canessa 1989). The timber is strong, hard, and heavy. The basic specific gravity of the wood (oven-dry weight/green volume) varies from 0.46 to 0.64. The green wood moisture content is 12 to 15 percent. The module of elasticity fluctuates from 2,270 to 2,650 at 70.3 kg per cm². The bending strength is 912.6 to 1490.5 kg per cm² and the maximum crushing strength is 426.8 to 752.3 kg per cm². Wood drying is slow to moderate; wood shrinkage (green to oven-dry) is normal (radial 4.4 percent; tangential 9.2 percent; volumetric 14.6 percent). The wood is easy to work and finishing is smooth. The wood is used for general construction, carpentry, turnery, furniture, and interior construction (Chudnoff 1984). The species has been exploited for many years, especially for extraction of the bark's aromatic resin. This resin is widely used in native and traditional medicines (Poveda and others 1989).

Copaifera camibar begins to flower after 5 years. It blooms in July and August and the fruits mature November to February. The flowers are grouped in axilar or terminal panicles with many branches, 1.2 to 2 cm long. The peduncle is ferruginous, 3 to 6 mm long, and up to 1 mm in diameter. The bracts are 1.9 to 3.7 mm long and 1.3 to 1.5 mm wide; they are imbricate, deltoid, concave, coriaceous, and glabrate at both

surfaces. When present, the trichomes are minute and scarce at the apex, margin, and base. Floral peduncles are pilose-ferruginous and 0.3 mm long. The flower is apetalous. The calyx is pentamerous; sepals are valvate, slightly imbricate in the bud, ovate-deltoid, concave, 4.3 to 5.5 mm long, and 2 to 2.7 mm wide; the apex is acute, and the base is truncate.

The fruit is a brown-reddish legume that is monospermous, ovoid, and laterally compressed. It is slightly rugose, glabrous, coriaceous, 3 cm long, and 2.3 to 4 cm wide. The fruit is stipitate and has a rounded apex and base. The pedicel is glabrous up to 1.5 mm long. The fruit is dehiscent and opens from the apex toward the base. Fruits are collected directly from the tree before pods open. The fruit has one ovoid black seed, half covered by an orange or yellow aril; when dry, the aril turns dull red. The seeds are 1.4 to 1.5 cm long and 0.7 to 1 cm wide (Poveda and others 1989). The seeds that lie on the soil are damaged by *Rhinoceros* sp. (Curculionidae) (Jiménez 1993).

The species is reproduced through seeds. Seed behavior is orthodox; germination is epigeal; and the seedling is phanocotylar. Seeds germinate in 20 to 34 days. Germination is approximately 50 to 65 percent after seeds have been soaked for 24 hours in running water. Seeds are sown in greenhouse beds—directly in the soil or in plastic bags filled with soil and sand.

ADDITIONAL INFORMATION

The name *Copaifera* comes from copai and the Latin verb fero (produce). The Tupi Indian tribes of the Amazon use the name copai to identify the resin of the copaiba tree (Allen and Allen 1981). In the past, *Copaifera camibar* was confused with *C. trapezifolia* Hayn; however, the collection and study of flowers and fruits led to its identification as a new species.

The sepals are glabrous abaxially and pubescent adaxially. The androecium has 10 stamens, which are free with glabrous filaments up to 1.1 cm long; anthers are oblong, glabrous, 1.6 to 2 mm long, 0.8 to 1.3 mm wide, and basifixed, with longitudinal dehiscence. The style is up to 3.2 mm long, slightly curved, and glabrous. The stigma is capitate. The ovary is unilocular, stipitate, and narrowly elliptic; with ferruginous pubescence at the margin, base, and apex; 2.4 to 3 mm long, and 1.5 to 2.3 mm wide. A glabrous, nectariferous disc basally surrounds it. Placentation is laminar. There are two ovules, which are suspended, overlapped, oblong, laterally compressed, 1 mm long, and 0.5 mm wide. The funiculus is up to 5 mm long.

