Ocotea austinii C.K. Allen

E.M. FLORES
Academia Nacional de Ciencias de Costa Rica, Costa Rica

LAURACEAE (LAUREL FAMILY)

Ocotea irazuensis Lundell (Wrightia 5[9]: 339/ 1977)

Bambito rosado, ira colorado, ira rosa

Ocotea austinii is endemic to Costa Rica and Panama. The geographic distribution of the species includes the central volcanic mountain range from Palmira (Alajuela) in the north, throughout the Talamanca mountain range, to the hills in the northeastern Panama (Burger 1990). *Ocotea austinii* is a canopy species, and frequently emergent. The greatest abundance of the species is found in the lower mountain, wet tropical forests characterized by *Quercus* spp. In those forests the species has a density of five to six trees per ha, with trunk diameters above 30 cm.

Ocotea austinii is a tall or medium-sized tree. It may reach 40 m in height and more than 1 m d.b.h. The bole is oval or cylindrical and the base is wide, sometimes with small buttresses. The crown is wide and dense with thick, reddish-brown branches. The bark is deep reddish brown or grayish brown under direct light and irregular in texture. The inner bark is mucilaginous, brittle, pink or reddish colored, and aromatic, with an avocado odor. It exfoliates small plates. The average bark thickness is 1.0 to 1.2 cm. Phyllotaxy is spiral. Leaves are crowded at the branches' distal end. Leaves are subcoriaceous, oblong or elliptic-oblong, abruptly narrowed at the short-acute, acuminate, or obtuse apex. The leaf base is decurrent, with revolute margins. The species grows in well-drained plateaus or flatlands of volcanic origin, with small slopes in an elevation range of 1700 to 3000 m, temperatures between 6 and 20 ° C, and an annual rainfall between 3500 and 8000 mm.

The sapwood is light red in green condition and red in dry condition. The heartwood is deep red in the external layers and pale yellowish red toward the pith. When air-dried, the heartwood takes a reddish-brown color which changes slightly to yellowish red toward the pith. Growth rings are easily seen at first glance and are defined by deeper colored boundary stripes. The wood has a straight grain, sometimes intercrossed, and a uniform, medium texture. The luster is moderate, with silvered glare. The wood does not have figure; it is odorless and tasteless. The reddish-brown wood has good aspect, durability, and moderate heft. The basic specific gravity is 0.48, with slight variations correlated with the zone of origin. In Costa Rica the average weight of green wood is 710 kg per m^3, with 73 percent moisture content; in Panama the average weight is 920 kg per m^3 (57.5 pounds per cubic foot), with 94 percent moisture content. The wood is equivalent to *Ulmus americana* L. (American elm) and *Acer nigrum* Michx. (black maple) woods in its physical and mechanical properties, with the Costa Rican wood being superior to the Panamanian in mechanical properties. The wood is good for making paper. It is easy to work, finishes well, and has a moderate drying time. Its resistance to fungal and insect attack is variable. Wood preservation is difficult. The timber is excellent for making furniture, cabinets, doors, and doorframes. It is also used in turnery, interior and external construction, carpentry, plywood, and boats and ships (Record and Hess 1949, Van der Slooten 1968).

Commonly, numerous trees bloom in February and March or August through November. Frequently, the trees flower and fruit at the same time. Flowers are grouped in axillary inflorescences, in the distal leaf axils of minor branchlets. Inflorescences are determinate, usually pseudoterminal, dibotryoid, 6 to 25 cm long, pedunculate, with peduncles 3 to 12 cm in length, and finely puberulent. Rachis, lateral branches, peduncles, and pedicels are pink or reddish colored. The flowers are actinomorphic and bisexual. They form usually four-flowered umbels at the end of the inflorescence's lateral branches. Flowers are small, densely and minutely puberulent on the outside (calyx and pedicels). The perianth has two, three-tepaloid-cupuliform whorls; tepals are imbricate, fleshy, creamy or yellowish. The hypanthium is obconic and reddish or pink. The androecium has nine functional stamens distributed in three whorls. The gynoecium is monocarpellar,

monospermic, glabrous, and creamy or light green. The ovary is void and globose; the style, narrow; and the stigma, discoid. The pollination vectors are beetles (cantharophily).

Most fruits are produced from April to June. Sometimes there is a minor crop in August and September. Fruit dispersal is carried out mainly by birds, mammals (chiropterochory, dyszoochory), and gravity. Over long distances, bats are more efficient dispersers of the fruits and seeds than birds. The fruit is drupaceous. A fleshy receptacle, obconic and reddish, surrounds the fruit base. Fruits average 702 per kg. The seed is large and ovoid. The seedcoat is brown, thin, and formed by testa and tegmen in the early stages; the tegmen is destroyed and reabsorbed during seed development.

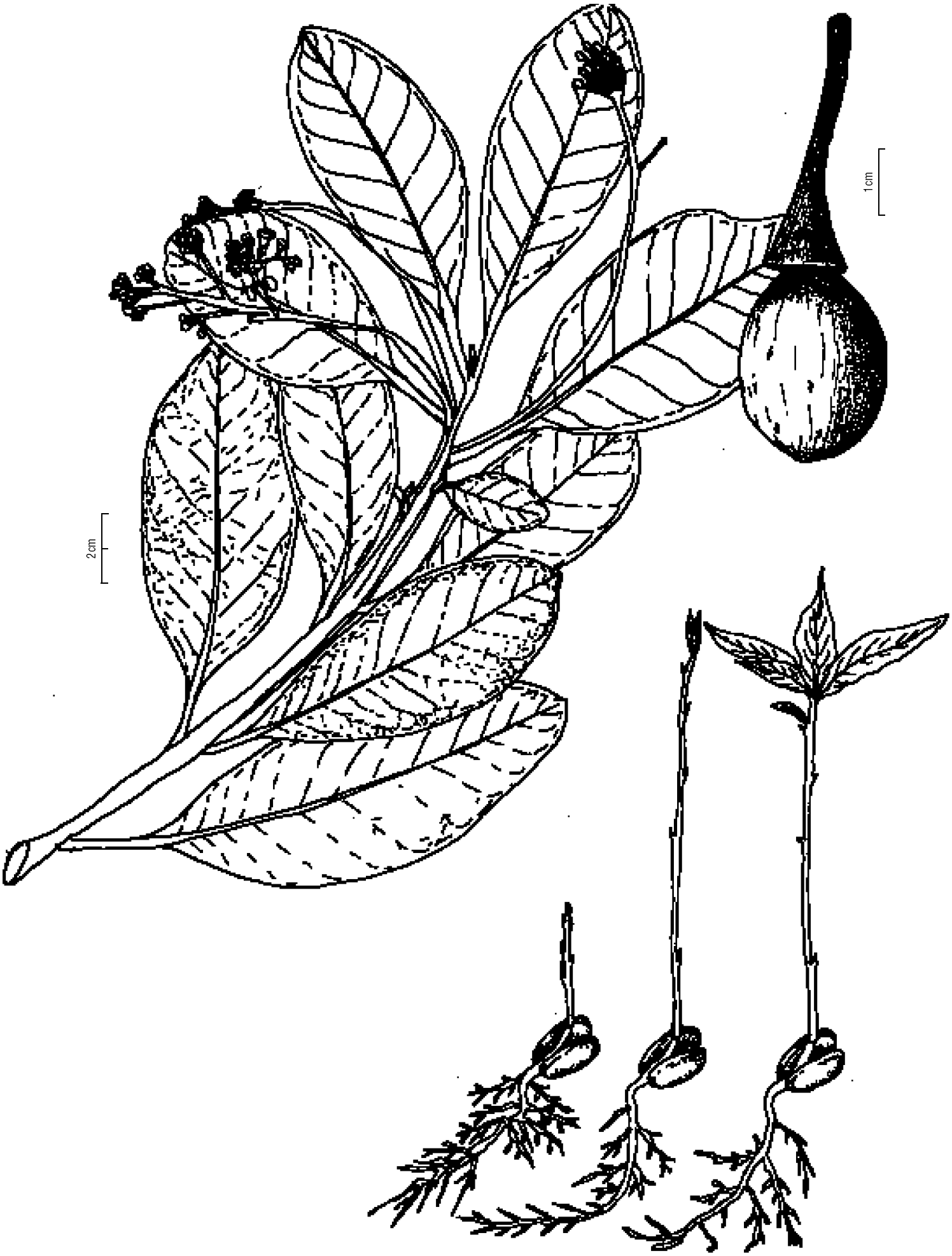
Fruits may be collected from the ground or the trees. The fleshy mesocarp must be removed before sowing the seeds. Seeds average 1,428 to 1,430 per kg. Seed water content is about 49 percent; it is mainly located in the cotyledons. Seed behavior is recalcitrant and viability diminishes with dehydration. Pregermination treatments are not required.

Germination is hypogeal, and seedlings are cryptocotylar. Under natural conditions, germination is good, but seedling mortality is high. Under greenhouse conditions, root protrusion begins 50 days after sowing. Seedlings must be transplanted when they are 4 or 5 months old. Seedling and sapling survival is satisfactory in experimental plantations if they are planted at elevations above 1700 m. The application of foliar fertilizer to 1- to 4-month-old seedlings showed good results.

ADDITIONAL INFORMATION

Ocotea species, including *O. austinii*, store aporphinoid alkaloids of complex biosynthetic origin and derived meolignans, which are structurally varied (Bradbury and others 1983, Castro 1993).

Cross-pollination is obligatory. Flowers are protogynous and the floral mechanism in the family is the synchronized dichogamy (Kubitzki and Kurz 1984). The species of the family have two types of flowering in different individuals. Some have flowers that open the female phase during the morning, closing it at noon. In the afternoon of the same day or the next day, the same flowers open the male phase, closing it at night. In other individuals the flowers open the female phase in the afternoon, closing it at night. The next morning they open the male phase. This mechanism prevents autopollination. If this rhythm is altered by climatic conditions, geitonogamy may occur but the young fruits show early abscission. A postzygotic mechanism of incompatibility has been strongly suggested.


1cm
2cm