

Erythrina poeppigiana

(Walp.) Cook

Fabaceae - Papilionoideae

LOCAL NAMES

English (coral tree, mountain immortelle); French (bois immortelle); Indonesian (dadap); Spanish (amapola de sombra, amasisa, barbatusco, brucayo, bucare, búcare, bucayo, bucayo gigante, amapola, cámbulo, poró gigante, immortelle, madre del cacao, mountain immortelle, palo de boya, pito, poró, poró desombra, cachimbo)

BOTANIC DESCRIPTION

Erythrina poeppigiana is a large tree, growing to 35 m in height and 2 m in diameter. The crown is moderately spreading and the bole tends to be branchless below 10-20 m. Bark is greyish brown or grey, with thornlike protuberances.

Leaves are alternate, trifoliolate; folioles rhomboid-oval or oval, 15-25 cm long, generally larger in saplings than in big trees; glandular stipules below the paired lateral folioles, large and cup shaped.

Flowers caducous, orange or reddish, produced in racemes; racemes 10-20 cm long; petals 5; stamens 10; anthers brown; upper petal wide and open.

Pods 12-25 cm long, with several seeds, falcate, slightly depressed between seeds, long stalked, pointed at both ends; seeds brown, about 2 cm long, slightly curved, 1-2 cm long, weighing about 183 g each.

Erythrina comes from the Greek word 'eruthros'-red, alluding to the showy red flowers of the *Erythrina* species.

BIOLOGY

Perching passerine birds pollinate *E. poeppigiana*. In Costa Rica, the phenology of unpruned *E. poeppigiana* shifts from evergreen to deciduous along a rainfall gradient from the humid lowlands to the subhumid mountains. The leafless period is quite short and is possibly caused by flowering rather than drought. A visible reduction of foliage during flowering also occurs under humid conditions.



Medium-sized 6 m tall tree of *E. poeppigiana*, Patulul, Guatemala. (Colin E. Hughes)



Ripe and unripe pods and seed of *E. poeppigiana*, Santa Ana, El Salvador. (Colin E. Hughes)



Flowering of *E. poeppigiana*, Turrialba, Costa Rica. (David Boshier)

ECOLOGY

E. poeppigiana is native to humid and subhumid tropical lowlands, such as the riverine and upland forests of the Amazon and Orinoco Basins, but cultivated and naturalized trees are now found at elevations up to 2000 m.

BIOPHYSICAL LIMITS

Altitude: 0-2 500 m, Mean annual rainfall: 1 000-4 000 mm

Mean annual temperature: 18.8-22.4 deg.C

Soil type: Tolerates low soil fertility and relatively high acidity (down to pH 4.3). However, tolerance varies by genotype.

DOCUMENTED SPECIES DISTRIBUTION

Native: Bolivia, Colombia, Ecuador, Venezuela

Exotic: Antigua and Barbuda, Bahamas, Barbados, Costa Rica, Cuba, Dominica, Dominican Republic, Grenada, Guadeloupe, Guatemala, Haiti, Honduras, India, Jamaica, Martinique, Mexico, Montserrat, Netherlands Antilles, Nicaragua, Panama, Peru, Puerto Rico, St Kitts and Nevis, St Lucia, St Vincent and the Grenadines, Trinidad and Tobago, Virgin Islands (US)



The map above shows countries where the species has been planted. It does neither suggest that the species can be planted in every ecological zone within that country, nor that the species can not be planted in other countries than those depicted. Since some tree species are invasive, you need to follow biosafety procedures that apply to your planting site.

PRODUCTS

Fodder: The green leaves of *E. poeppigiana* have a good nutritive value (20-22% of dry matter), are high in crude protein (27-34%), and have a good range of in-vitro digestibility (49-57%). However, due to their high cell wall content (55-58%), they should be supplemented with energy sources, such as tropical grasses, which are readily degradable in the rumen. The presence of potentially toxic alkaloids in the leaves of *E. poeppigiana* has not affected the health of cattle or goats, but feeding leaves to non-ruminants may be risky.

Fuel: Although the wood is light, with low calorific value, it is sometimes used as a firewood.

SERVICES

Shade or shelter: Planted as a shade tree in cacao plantations in the humid tropics, *E. poeppigiana* conserves soil and contributes to high and sustainable cacao yields.

Nitrogen fixing: *E. poeppigiana* nodulates abundantly with nitrogen-fixing bacteria of the genus *Bradyrhizobium*. Peak values exceeding 1000 kg/ha of nodules have been reported for unpruned cacao shade trees.

Soil improver: The green leaves of *E. poeppigiana* contain 4.1-4.9% nitrogen, which makes it an excellent species for green manure production. Production of nitrogen-rich litter is abundant, and the nitrogen supply in litter fall exceeds several times the export of nitrogen in the cacao harvest. The nitrogen supplied through pruning residues left on the ground fulfils recommended nitrogen application rates.

Intercropping: For alley cropping, *E. poeppigiana* should be planted in dense hedgerows (1-2 m between trees), with wide alleys (6-8 m) between tree rows. High and sustainable bean yield in the alley-cropping system has been observed. In Costa Rica, *E. poeppigiana* alley cropping has sustained 2 maize crops per year over 8 years without fertilization. Coffee and cacao may also be planted together with the trees.

TREE MANAGEMENT

E. poeppigiana can be planted at a spacing of 8 x 8 m for unpruned trees and 6 x 6 m for pruned trees. The seedling survival is generally good, but weed control may be necessary during the 1st year to enhance growth. A formation pruning is recommended about 4-6 months after planting to remove the lowest branches. Normal pruning management may start 9-12 months after planting. Tall crops should not be associated with *E. poeppigiana* before the 1st complete pruning, but low crops may be planted at the time of formation pruning. In coffee plantations in Costa Rica, *E. poeppigiana* is usually pruned completely and lopped to a height of 2-3 m twice a year to promote coffee flowering and ripening of berries. Due to the slow recovery of carbohydrate reserves, pruning *E. poeppigiana* more often than twice a year risks the debilitation and turnover of trees within a few years. Pruning trees periodically will prevent complete leaf fall, and pruning trees once a year is enough to impede flowering.

GERMPLASM MANAGEMENT

Seed storage behaviour is orthodox. The seeds may be stored for several years in tightly closed containers in a cool, dry place (about 5 deg. C, 30-40% r.h.). There are about 4500 seeds/kg. Immersing the seeds in water at room temperature for 24 hours enhances germination. The germination rate is about 70%.

PESTS AND DISEASES

Adult June beetles (*Phyllophaga menetriesi*, Coleoptera: Scarabaeidae) feed on young leaves of *E. poeppigiana*. Because June beetles lay eggs close to foraging areas, the root-eating larvae are a potential risk for associated crops. Only minor damage has been observed in maize alley cropped with *E. poeppigiana*.

FURTHER READNG

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SUGGESTED CITATION

Orwa C, A Mutua, Kindt R, Jamnadass R, S Anthony. 2009 *Agroforestry Database: a tree reference and selection guide version 4.0* (<http://www.worldagroforestry.org/sites/treedbs/treedatabases.asp>)