

Tropical Forages

Erythrina poeppigiana

Scientific name



Erythrina poeppigiana (Walp.) O.F. Cook

Synonyms

Basionym: *Micropteryx poeppigiana* Walp.; *Erythrina micropteryx* Poepp. ex Urb.

Family/tribe

Family: *Fabaceae* (alt. *Leguminosae*) subfamily: *Faboideae* tribe: *Phaseoleae*.

Morphological description

A large tree with a moderately spreading crown rising from a long branchless bole. Evergreen in humid tropical environments, but becoming fully or partially deciduous in seasonally dry environments. Up to 25 m (occasionally 35 m) in height and 2 m in diameter. Bark is greyish-brown to grey-brown, of variable roughness from smooth to slightly furrowed, with conical thorns on the branches and young twigs. Leaves are alternate, trifoliolate, 15–30 cm long; leaflets rhomboid-oval or oval in shape, generally larger in saplings than in big trees; two prominent cup-shaped, nectar-producing glands below the paired lateral leaflets. Flowers produced in orange or reddish racemes with rachis 7–40 cm long; 5 petals and 10 brown stamens per flower; upper petal wide and open. Pods 12–25 cm long, falcate, slightly depressed between seeds, pointed at both ends, with a long peduncle; seeds ellipsoid to slightly curved, 10–20 mm long × 5–7 mm broad, brown. 3,500–6,500 seeds per kg.

Common names

Asia: dadap (Indonesia)

English: Coral tree, mountain immortelle, immortelle-tree

French: bois immortelle

Latin America: eritrina-do-alto, sinã (Brazil); amapola de sombra, amasisa, barbatusco, brucayo, bucare, búcare, bucaro, bucayo, bucayo gigante, cachimbo, cámbulo, ceibo, elequeme, gallito, helequeme, immortelle, palo de boyá, poró desombra, poró extranjero, poró gigante, saibo (Spanish)

Distribution

Native:

Central America: Panama (Darién)

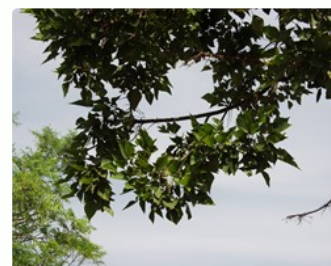
South America: Bolivia (Beni, La Paz); Brazil (Acre); Colombia (Boyacá, Cundinamarca, Putumayo, Santander, Valle); Ecuador (Esmeraldas, Loja, Los Rios, Morona-Santiago, Napo, Pastaza, Pichincha, Sucumbios), Peru (Cuzco, Huanuco, Pasco, San

Cultivated:

Widely cultivated.



Tree to 25m



Leaves trifoliolate; leaflets rhomboid-oval or oval in shape (ILRI 15010)



Flowers and immature pods on axillary raceme



Pod chartaceous, slightly depressed between seeds



Seeds



Cropping under *E. poeppigiana* (ILRI 15011)



Alley cropping with maize



Pollarding; pruning 1-year regrowth from mature trees



After pollarding in coffee plantation



6-month regrowth after pollarding in coffee plantation

Uses/applications

Forage

Foliage is used as a ruminant feed.

Environment

Primarily used to provide shade and nutrient-rich prunings or leaf-fall in tropical plantation crop systems (e.g. cocoa, coffee, pepper). Soil improvement via mulch.

Other

Has potential in alley cropping systems as an N-rich hedgerow species. Used as living fence posts and occasionally as a low-quality fuelwood.

Ecology

Occurs in the riverine and upland forests of the Amazon and Orinoco basins, and in the moist Pacific forests of Ecuador and Colombia, in humid and subhumid tropical lowlands receiving 1,000–4,000 mm annual rainfall.

Soil requirements

Tolerates low soil fertility; acid-soil tolerance (to pH 4.3) varies with provenance. Adapted to soil texture varying from heavy clays to medium loam and even coarse sands. Tolerant of moderate soil alkalinity to pH 7.5. Intolerant of saline soils.

Moisture

Adapted to humid and subhumid regions with mean annual rainfall from 800 to 2,000 mm, occasionally to 4,000 mm. Tolerant of temporary waterlogging; can be used to drain very wet soils.

Temperature

Grows at low to mid-elevations (to 1,200 m asl) in its native range, but has naturalized to 2,000 m asl in exotic locations. Average annual temperatures in these regions range from 22 to 24 °C, but *E. poeppigiana* will tolerate absolute maximum and minimum temperatures of 36 and 16 °C, respectively. Top growth is killed by frost.

Light

Prefers full sun, but will tolerate light shade.

Reproductive development

Pollinated by perching passerine birds. Leaf-fall occurs mostly in combination with subsequent flowering; the severity of leaf-fall is proportional to the length and severity of the dry season. Under humid conditions, leaf-fall is visible but not severe.

Defoliation

Tolerant of severe, regular pruning; pruned trees are usually kept at 2–2.5 m height. For highest production, defoliate a maximum of twice a year leaving 10–25% of leaf area intact to facilitate regrowth. Survives complete pruning twice a year but will be killed by more frequent pruning. Complete mortality of N-fixing nodules occurs with heavy defoliation and re-establishment of nodules does not occur until 6 weeks after pruning.

Fire

Resistant to fire.

Agronomy

Guidelines for establishment and management of sown forages.

Establishment

Easily propagated from stem cuttings 0.5–1.0 (2–2.5) m in length, from branches at least 2 years old, from trees 5–8 years old. Animals will damage stem cuttings and must be excluded until an extensive root system has developed. Can also be planted from seedlings or direct planted into the field from seed. Seedlings establish rapidly but weeds should be controlled during the first year of growth to ensure rapid establishment. As a shade and mulch tree in coffee plantations, *E. poeppigiana* should be planted at 6 × 6 m spacing if pruned twice annually, and at 12 × 12 m spacings if unpruned.

Fertilizer

Not generally fertilised when planted as a forage. Relies on fertilizer applied to plantation crops (e.g. coffee) when planted as a shade tree. Up to 60 kg of atmospheric N/ha can be fixed per year.

Compatibility (with other species)

Not generally used as a component of a direct-grazed pasture. Has been grown experimentally in hedgerows with sward-forming grasses

(e.g. *Brachiaria decumbens*) in the inter-row. Suitable for growing in association with King grass (*Cenchrus purpureus* × *C. americanus*) and *Cynodon nlemfuensis*.

Companion species

Used as a shade and mulch crop over coffee. Planted as a hedgerow in maize (*Zea mays*) and bean (*Phaseolus vulgaris*) alley farming.

Pests and diseases

A range of fungal diseases attack *E. poeppigiana* including leaf spots (*Cercospora*, *Phyllosticta* and *Colletotrichum* spp.), wilts (*Verticillium* spp.) and black mildew (*Meliola* spp.). It is affected by root knot nematodes (*Meloidogyne* spp.). *E. poeppigiana* is a host for June beetles (*Phyllophaga menetriesi*) which lay eggs on young leaves. The larvae subsequently feed on the roots of associated crops including maize, although the damage is reported to be minor.

Ability to spread

Will not spread under grazing.

Weed potential

None reported in the literature. Related species are also of low weed potential.

Feeding value

Nutritive value

Leaves contain 20–22% DM and 22–34% crude protein. IVDMD ranges from 49 to 58%. Young leaves can have much higher CP content (up to 38%) and IVDMD (up to 74%).

Palatability/acceptability

Well accepted by cattle and pen-fed goats, even as the sole feed.

Toxicity

The seeds, bark and roots contain curare-like alkaloids such as erysodine, erysopine, erysothiovine, erysovine and hypaphorine and can be ground to produce insecticides and a preparation to stun fish so that they can be easily caught. Leaves are also reported to contain toxic alkaloids but no adverse effects have been reported for cattle or goats consuming the foliage.

Feedipedia link

<https://www.feedipedia.org/node/608>

Production potential

Dry matter

In Costa Rica, DM yields of up to 20 t/ha/year of leaf and branches have been produced yielding a total of 450 kg of N, but yields of 10 t/ha/year are more common. Planting density has little influence on DM yield at densities from 1,500 to 4,000 trees/ha as individual trees at low densities grow larger. Very high densities (60,000 trees/ha) will reduce forage yields. The productivity and quality of King grass (*C. purpureus* × *C. americanus* hybrid) was assessed alone and in a mixture with *E. poeppigiana* in Costa Rica. At a density of 3,333 plants/ha of *E. poeppigiana* and with 3 cuts/year the mixture produced 31 t DM/ha/year and 2.82 t CP/ha. Lower plant densities and more frequent cutting reduced yields. The grass alone produced only 22 t DM/ha and 1.03 t CP/ha.

Animal production

In Costa Rica, goats supplemented with *E. poeppigiana* produced 1.26 kg milk/day, compared with 1.11 kg/day for those supplemented with *Gliricidia sepium*. In a related study no improvements in the productivity of cattle supplemented with *E. poeppigiana* were reported, but higher economic returns were achieved. Also in Costa Rica, crossbred dairy cattle consuming a basal diet of low quality grass hay, rice bran and molasses supplemented with *E. poeppigiana* produced 7.3 kg milk/day, compared with 6.7 kg/day for those supplemented with urea. Lambs gained 74–128 g/day when fed *E. poeppigiana* at 3.5% of live weight. This range of weight gains accounts for other supplements added. Milk production in humid tropical Costa Rica was 10.5 kg/day when a basal diet of grass was supplemented with soya flour, 11.0 kg/day with fish flour supplement, 9.6 kg/day with *E. poeppigiana* supplement, and 9.3 kg/day with urea supplement. Economic net benefit was the highest using the *E. poeppigiana* supplement.

Genetics/breeding

2n = 42. Feasibility of intercrossing with other *Erythrina* species resulting in fertile hybrids is reported.

Seed production

Pruning trees once a year will impede flowering. No information regarding seed yields is available.

Herbicide effects

No information available.

Strengths

- Easy to propagate from seeds or stem cuttings.
- High N content of leaf makes excellent mulch (natural litter fall).
- Tolerant of high water table.

Limitations

- Seed, bark and roots contain toxic alkaloids.
- Brittle branches and superficial root system make exposed trees sensitive to wind damage.

Internet links

<https://www.cabi.org/isc/datasheet/22041>

http://apps.worldagroforestry.org/treedb/AFTPDFS/Erythrina_poepigiana.PDF

[https://uses.plantnet-project.org/en/Erythrina_poepigiana_\(PROSEA\)](https://uses.plantnet-project.org/en/Erythrina_poepigiana_(PROSEA))

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Cultivars

None released.

Promising accessions

None reported.

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