

LOCAL NAMES

English (seeded breadfruit, Marianas breadfruit)

BOTANIC DESCRIPTION

Artocarpus altilis is a large evergreen, spreading canopy, single-trunked tree up to 20 m or more with buttressed trunks more than 2 m in diameter at the base often not branching below 5 m from the ground. The tree is shallow-rooted. Sticky white latex is present in all parts of the tree. The bark is smooth, brownish-gray, with new shoots purplish green.

Leaves alternate, 15–30 cm long, broadly obovate to elliptic, typically entire or shallowly 1–3 lobed on the upper third of leaf. Blade is smooth, glossy, flexible, dark green with greenish-yellow veins and few hairs on upper veins. Two large green stipules enclose the bud and turn yellow before dehiscing.

Flowers monoecious, occurring at ends of branches, with the male inflorescence appearing first. Male flowers club-shaped, up to 3 cm in diameter and 8–12 cm long. Thousands of tiny flowers with two anthers each are attached to a central spongy core. Female inflorescences consist of 1500–2000 reduced flowers attached to a spongy core. The flowers fuse together and develop into the fleshy, edible portion of the fruit.

Fruit a small fleshy syncarp, cylindrical, kidney shaped or asymmetrical, about 15 cm long, about 500 g; skin dark green, even when mature, with a pebbly texture from the raised, flattened, hexagonal disks of individual flowers; pulp whitish-yellow when immature and deep yellow when ripe, with a sweet aroma and taste.

Seeds large, dark brown, shiny, 1.5 cm long, with little or no endosperm, up to 15 per fruit.

Artocarpus mariannensis can be readily distinguished from breadfruit (*A. altilis*) by the small, typically entire leaves. The dark green, lumpy fruit is smaller and more asymmetrical than breadfruit, with a dark yellow pulp. *Artocarpus camansi* (breadnut, kamansi) has oblong, very spiny fruits with little pulp and numerous large, light brown seeds, and large, shallowly dissected leaves with 4–6 pairs of lobes.

BIOLOGY

Trees begin fruiting in approximately 5 years. The flowers are cross pollinated but pollination is not required for a fruit to form. Fruit is produced mainly in summer and the seeds are dispersed by flying foxes (fruit bats).

ECOLOGY

Seeded breadfruit grows in tropical regions, usually between sea level to 150 m usually with tall native-canopy forest and secondary forest, in coral limestone and volcanic islands with steep slopes and ridges and ravine forests from coastal to lower mountain slopes. On the inland areas of elevated limestone, it is often found associated with trees of the genera *Ficus*, *Pandanus*, *Intsia*, *Elaeocarpus*, *Aglaia*, *Fagraea*, *Pipturus*, *Cycas*, *Claoxylon*, *Osmoxylon*, *Syzygium* (*Eugenia*), *Premna*, *Guamia*, *Hernandia*, *Pouteria*, *Erythrina*, *Aidia*, *Melanolepis*, *Cynometra*, *Semecarpus*, *Meryta*, *Milletia*, and *Dracaena*.

It tolerates saline and coralline soils and atolls, can withstand drought for a few months, seedlings prefer 20-50% shade and generally requires a tropical climate and does well wherever breadfruit (*A. altilis*) is grown.

BIOPHYSICAL LIMITS

Altitude: 0 - 150 m

Temperature: 26 - 28°C

- Mean maximum temperature of hottest month: 29 - 31°C

- Mean minimum temperature of coldest month: 16 - 18°C

Rainfall: 1300 - 3800 mm

Soil type: Prefers light, well drained, and volcanic and shallow calcareous soils, either sandy, sandy loams or loams with alkaline to neutral pH 6.1-7.4.

DOCUMENTED SPECIES DISTRIBUTION

Native: Palau

Exotic: Fiji, Kiribati, Marshall Islands, Micronesia, Nauru, Tokelau, Tuvalu



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

Food: The nutritious fruits are consumed when mature or ripe and are typically roasted or baked. Ripe fruits can be eaten raw but are usually cooked. The seeds are high in protein, carbohydrates, low in fat, and a good source of minerals and vitamins, especially vitamin A. Cooked sprouted seeds are a delicacy on some atolls.

Medicine: All parts are used medicinally, especially the latex, leaf tips, and inner bark. The latex is massaged into the skin to treat broken bones and sprains and is plastered on the spine to relieve sciatica. It is commonly used to treat skin ailments and fungus diseases such as "thrush," which is also treated with crushed leaves. Diluted latex is taken internally to treat diarrhea, stomachaches, and dysentery. The sap from the crushed petioles (leaf stalks) is used to treat ear infections or sore eyes. The root is astringent and used as a purgative; when macerated, it is used as a poultice for skin ailments. The bark is also used to treat headaches.

Timber: The light-weight, flexible wood is easy to work and used to make small canoes, carve into statues, bowls, fishing floats, and other objects, although the wood needs to be protected from direct sunlight.

Fuel: The wood is fast burning, but generally older, less productive trees are used for this purpose.

Fiber: The inner bark was once used to make bark cloth (tapa). It has also been traditionally used to make strong cordage used for fishing.

Gum or resin: The sticky white latex is used as a chewing gum and an adhesive. It is still used to caulk canoes.

Fodder: All parts of both mature and ripe fruits are edible and are fed to pigs and other livestock. The leaves also are edible. Breadfruit is an important food source for flying foxes, native doves, and other birds in the Pacific islands.

Apiculture: Honeybees forage the male inflorescences and collect pollen and latex that oozes from the fruit surface.

Poison: Dried male flowers can be burned to repel mosquitoes and other flying insects.

SERVICES

Erosion control: It naturally occurs on steep ridges, cliffs, and shallow calcareous soils where it acts as a soil stabilizer.

Intercropping: It can be inter-planted with a wide range of fruit and vegetable crops such as yam, banana, coconut, taro, sugarcane, arrowroot, beach hibiscus, Indian mulberry, papaya, citrus, soursop, medicinal plants, aroids, ginger, noni, among others.

Soil improver: The leaves provide abundant mulch for the tree and other plants growing beneath the canopy.

Shade or shelter: Dugdug is ideal for home gardens on atolls because of its adaptability to calcareous soils and saline conditions and especially for the beneficial shade it produces. The tree can also be used as a trellis for yam

Ornamental: Dugdug is an attractive, stately evergreen tree with a rounded canopy.

Other services: The flexible leaves are used to wrap foods for cooking in earth ovens, and as plates.

TREE MANAGEMENT

Out planting should be done when the seedlings are approximately 1.25 m tall and 2 cm in stem diameter. A small amount of slow-release fertilizer such as 8-8-8 should be added to the bottom of the hole during planting. Young plants grow best in partial shade. Irrigation for the first 1–3 months of establishment is necessary. Mulching young plants is beneficial and seedlings should be protected from cattle, goats, horses, and pigs, which eat the bark and tender shoots. Close to 100% success rate can be expected.

GERMPLASM MANAGEMENT

Seeds are recalcitrant and cannot be dried or chilled. Seeds should be cleaned in a 2% bleach solution for 5-10 minutes or be treated with a fungicide.

PESTS AND DISEASES

Artocarpus mariannensis has few serious diseases or pests other than some damage by termites. Tree decline and dieback has been a problem throughout the atolls. No pathological cause has been identified. It has little susceptibility to fruit rots caused by *Phytophthora*, *Colletotrichum* (anthracnose), and *Rhizopus*. *Phellinus noxius*, a root rot, can be a problem, especially when trees are planted in areas of native forest that have been recently cleared. Fruit flies are attracted to ripe fruits on the trees and ground.

FURTHER READING

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SUGGESTED CITATION

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