LOCAL NAMES
English (breadnut); Filipino (ugod,dulugian,kamansi,kolo,pakau); French (chataignier); Javanese (kulur,kulor,kelur,kuror); Malay (kulor,kulur,kuror,kelur); Spanish (castaña)

BOTANIC DESCRIPTION
Artocarpus camansi is a moderately fast growing, single-stemmed, evergreen tree of 10-15 m or more with a trunk 1 m in diameter or larger, often growing to a height of 5 m before branching; a spreading canopy of diameter about half of the tree height and a more open branching structure than breadfruit (A. altilis) or dugdug (A. mariannensis). The tree forms buttresses at the base; roots spread and grow on or slightly below the surface. Sticky, white, milky latex is present in all parts of the tree.

Leaves alternate, large, 40–60 cm long, moderately dissected with 4–6 pairs of lobes and sinuses cut half way to the midrib. New leaves on young trees can be 76 cm long or more; densely pubescent, with many white or reddishwhite hairs on upper and lower veins, lower leaf surface, and petiole. Blade is dull green with green veins. Two large green stipules enclose the bud, turning yellow before dehiscing.

Flowers monoecious occuring at the ends of branches, with the male inflorescence appearing first. Male flowers are club-shaped, up to 3 cm in diameter and 25–35 cm long or longer. Female inflorescences consist of 1500–2000 reduced flowers attached to a spongy core. Unlike breadfruit, the individual flowers do not fuse together along their length.

Fruit a large fleshy syncarp, oval or ovoid, 7-12 cm in diameter and weighs about 800 g; the skin dull green to green-yellow when ripe with a spiny texture from the pointed, flexible, long tips of the individual flowers; the scanty pulp yellow-whitish when ripe with a sweet aroma and taste.

Seeds, 12-150 per fruit, rounded or flattened, about 2.5 cm long with a thin, light brown outer seed coat patterned with darker veins, weighs 7-10 g each and comprising 30-50% or more of the total fruit weight.

Breadnut can be readily distinguished from its close relative, breadfruit (Artocarpus altilis), by its very spiny fruits with little pulp and numerous large, light brown seeds.
Artocarpus camansi has often been considered to be a form of seeded breadfruit. Breadfruit, however, is a separate species that originated from its wild seeded ancestor, breadnut.

BIOLOGY
Breadnut trees begin producing at 8–10 years of age. The fruiting season is October-May, with some fruits available into July in Hawaii, whereas in the Philippines it begins fruiting in April or May. The trees grow widely scattered in the forest and are dispersed by birds, flying foxes, and arboreal mammals that feed on the flesh and drop the large seeds. Seeds quickly germinate and will often sprout inside the fallen fruits.


tree (TopTropicals.com)


fruit (TopTropicals.com)


Fruits and foliage (TopTropicals.com)

ECOLOGY
In native range, breadnut is a dominant component of the vegetation of alluvial forests in lowland areas and is one of the first species to appear on the tops of frequently flooded banks of rivers. Associated species in the upper storey include Pometia pinnata, Ficus spp., Alstonia scholaris, and Terminalia spp.

Typical lowerstory trees are Garcinia, Diospyros, Myrstica, Maniltoa, and Microcos. Palm species, such as rattans and Licuala spp., gingers, and members of the Marantaceae family abound in the understory and shrub layer. In areas where the banks are higher and less frequently flooded, it is joined by Octomeles sumatrana, and a young forest dominated by one or both species develops. Ficus, Dendrocnide, Nauclea, Kleinhovia hospita, and Terminalia eventually invade the young forest.

During the clearing of the lowland forest for plantations and tree gardens, wild breadnut trees and other species such as Canarium indicum, Terminalia kaernbackhii, Dracontomelon puberulum, Pangium edule, Gnetum gnemon, Areca betel, and Ceiba bombax are left standing or planted.

Once established, breadnut trees can withstand a dry season of 3–4 months, although they prefer moist conditions. It can withstand strong winds and will re-sprout after sustaining wind damage. Seedlings do best in 20–50% shade but prefer full sunny conditions once established. It can tolerate waterlogged soils and periodic flooding for brief periods.

BIOPHYSICAL LIMITS
Altitude: 0–1550 m

Temperature: 15–40°C
- Mean maximum temperature of hottest month 32–38°C
- Mean minimum temperature of coldest month 16–18°C

Rainfall: 1300–3800 mm

Soil type: Deep, light, fertile, well drained soils, neutral to alkaline pH 6.1-7.4.

DOCUMENTED SPECIES DISTRIBUTION

Native: Indonesia, Papua New Guinea
Exotic: Fiji, Guyana, Jamaica, New Caledonia, Palau, Philippines, Samoa, Trinidad and Tobago

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 fruits are nutritious and consumed when immature; thinly sliced and boiled as a vegetable in soups or stews. The seeds are high in protein and relatively low in fat compared to nuts such as almond, Brazil nut, and macadamia nut; are a good source of minerals and contain more niacin than most other nuts; can be roasted and are similar to chestnuts in texture and flavor; can be canned in brine, or processed into nut butter or nut paste, flour, or oil.

Medicine: No specific medicinal uses are reported, but the breadnut tree probably has medicinal properties similar to breadfruit.

Timber: The wood is lightweight, flexible, and easy to work and carve into statues, bowls, fishing floats, and other objects.

Fodder: All parts (flesh, peel, core, and seeds) of both mature and ripe fruits are edible and are fed to pigs and other livestock. Breadnut is also an important food source for flying foxes and arboreal mammals in its native range.

Apiculture: Honey bees visit male inflorescences and collect pollen and also collect latex that oozes from the fruit surface.

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

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

SERVICES
Intercropping: Breadnut can be interplanted with a wide range of crops and plants, such as yam, banana (Musa spp.), coconut (Cocos nucifera), sugarcane, medicinal plants, aroids, ginger, Indian mulberry (Morinda citrifolia, noni), small fruit trees, and field and vegetable crops such as corn, beans, peanut, tomato, and eggplant.

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

Erosion control: Breadnut naturally occurs on frequently flooded river banks.

Shade or shelter: Breadnut is planted in home gardens to provide beneficial shade to other plants. It could also be used as a trellis tree for yam (Dioscorea species).

TREE MANAGEMENT
The stocking rate should be 100 trees/ha. Young breadnut plants prefer partial shade and should be irrigated for the first 1–3 months of establishment. Mulching is necessary for the young plants and need to be protected from cattle, goats, horses, and pigs, which eat the bark and tender shoots.

GERMPLASM MANAGEMENT
Breadnut seeds have no period of dormancy and germinate immediately. They are unable to withstand desiccation. Only firm, shiny, uniform seeds should be selected and surface-cleaned in a 2% bleach solution for 5–10 minutes or be treated with a fungicide. Seeds are recalcitrant and cannot be dried or chilled, should be planted immediately.

PESTS AND DISEASES
Breadnut has few serious diseases or pests with low susceptibility to fruit rots caused by Phytophthora, Colletotrichum (anthracnose), and Rhizopus. Fruit flies are attracted to ripe fruits on the trees and ground.

Invasive potential: Breadnut has little potential for invasiveness since the large, fleshy seeds quickly lose viability and are not readily spread.

FURTHER READNG

Barrau J. 1976. Breadfruit and relatives. In: Simmonds, N.W. (ed.). Evolution of Crop Plants. Longman, London.

Brown WH. 1943. Useful Plants of the Philippines. Philippine Department of Agriculture and Natural Resources Technical Bulletin 10(1).

Coronel RE. 1986. Promising Fruits of the Philippines. University of the Philippines at Los Baños, College of Agriculture, Laguna, Philippines.

French BR. 1988. Food plants of Papua New Guinea: A Compendium. Australia and Pacific Science Foundation, Sheffield, Tasmania, Australia.

http://www.traditionaltree.org/extension.html

Negron de Bravo E, Graham HD & Padovani M. 1983. Composition of the breadnut (seeded breadfruit). Caribbean Journal of Science 19.

Paijmans K. 1976. Vegetation. In: Paijmans K(ed.). New Guinea Vegetation. Part II. Elsevier, Amsterdam.

Ragone D. 1997. Breadfruit, Artocarpus altilis. Promoting the conservation and use of underutilized and neglected crops. 10. Institute of Plant Genetics and Crop Plant Research, Gatersleben/International Plant Genetic Resources institute, Rome, Italy.

Ragone D. 2003. Breadfruit. In: Caballero, B., L. Trugo, and P. Finglas (eds.). Encyclopedia of Food Sciences and Nutrition. Academic Press, San Diego, California.

Ragone D. 2006. Artocarpus camansi (breadnut), ver. 2.1. In: Elevitch CR (ed.). Species Profiles for Pacific Island Agroforestry. Permanent Agriculture Resources (PAR), Hōlualoa, Hawai‘i.

Trujillo E. 1971. Breadfruit Diseases of the Pacific Basin.South Pacific Commission. Information Document 27. Noumea, New Caledonia.

Verheij EWM, Coronel RE (eds.). 1991. Plant Resources of South East Asia No 2. Edible fruits and nuts. Backhuys Publishers, Leiden.

Zerega NYC, Ragone D & Motley TJ. 2005. Systematics and species limits of breadfruit (Artocarpus, Moraceae). Systematic Botany 30(3).

SUGGESTED CITATION

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