Annona reticulata

L.

Annonaceae

LOCAL NAMES
Dutch (boeah nona,kasjoema); English (Jamaican apple,bullock's heart,custard apple,sugar apple,netted custard apple); Filipino (sarikaya); French (bois cachiman,cachiman,coeur de boeuf,corossol sauvage); Hindi (luvun,nonai,ramphal); Khmer (mo bat,mean bat); Lao (Sino-Tibetan) (khan tua lot); Malay (lonang,nona kapri); Portuguese (coração de boi,condesa); Spanish (anona colorada,mamon,anona rosada,anona roja,anona de seso,anona de redecilla,corazón); Thai (noi nong); Vietnamese (qua na,binh bat)

Bullock's heart (French B.)

Bullock's heart (139 French B.)

Bullock's heart cut (French B.)

BOTANIC DESCRIPTION
Annona reticulata is a low, erect tree, with a rounded or spreading crown and trunk 25-35 cm thick. Height ranges from 5-10 m.

The ill-smelling leaves are deciduous, alternate, oblong or narrow-lanceolate, 10-20 cm long, 2-5 cm wide, with conspicuous veins.

Flowers, in drooping clusters, are fragrant, slender, with 3 outer fleshy, narrow petals 2-3 cm long; light-green externally and pale-yellow with a dark-red or purple spot on the inside at the base. The flowers never fully open.

The compound fruit, 8-16 cm in diameter, may be symmetrically heart-shaped, lopsided, irregular, or nearly round, or oblate, with a depression at the base. The skin, thin but tough, may be yellow or brownish when ripe, with a pink, reddish or brownish-red blush, and faintly, moderately, or distinctly reticulated. There is a thick, cream-white layer of custard-like, somewhat granular, flesh beneath the skin surrounding the concolorous moderately juicy segments, in many of which there is a single, hard, dark-brown or black, glossy seed, oblong, smooth, less than 1.25 cm long. Actual seed counts have been 55, 60 and 76. A pointed, fibrous, central core, attached to the thick stem, extends more than halfway through the fruit.

BIOLOGY
The short twigs are shed after they have borne flowers and fruits.

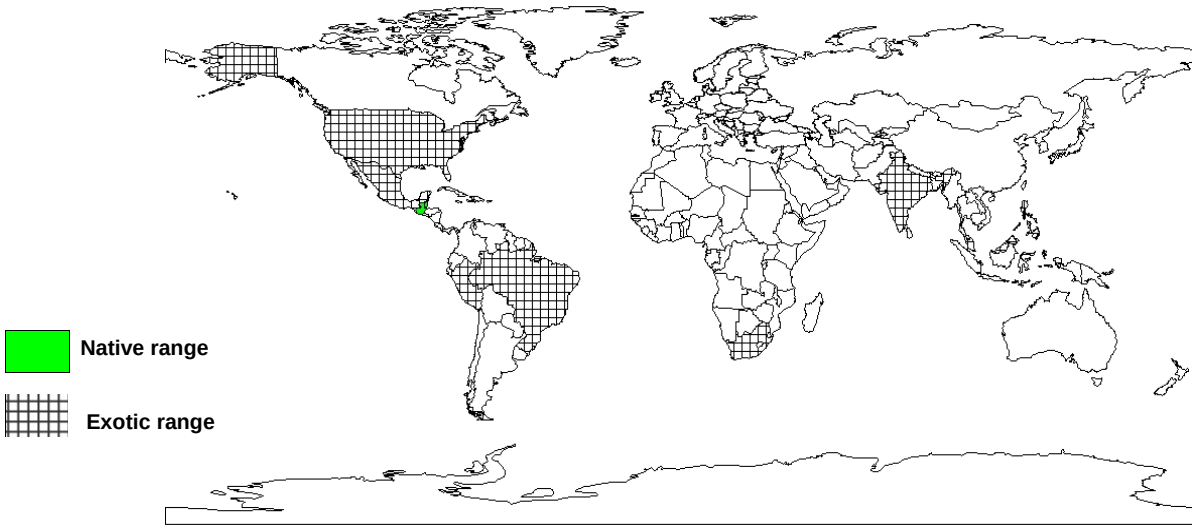
ECOLOGY
Annona reticulata is a pantropic tree that grows between 0-1 500 m in the areas of central America that have alternating seasons, and has spread to south America. The custard apple tree needs a tropical climate and it flourishes in the coastal lowlands of Ecuador to 1 500 m. In Guatemala, it is nearly always found below 1 220 m. In India, it does well from the plains up to an elevation of 1 220 m while in Sri Lanka, it cannot be grown above 915 m. Around Luzon in the Philippines, it is common below 800 m. Leaves are shed at the first onset of cold weather and the tree is dormant all winter. Fully grown, it has survived temperatures of 3º-2ºC without serious harm. This species is not drought-tolerant and prefers a more humid atmosphere.

BIOPHYSICAL LIMITS
Altitude: 0-1 500 m
Mean annual Temperature: 10-22ºC

Soil type: The custard apple does best in low-lying, deep, rich soil with ample moisture and good drainage. It grows to full size on oolithic limestone in southern Florida and grows wild in light sand and various other types of soils.

DOCUMENTED SPECIES DISTRIBUTION

Native: Belize, Guatemala
Exotic: Bahamas, Bermuda, Brazil, Guam, India, Malaysia, Mexico, Peru, Philippines, South Africa, 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
Food: In India, the fruit is eaten only by the lower classes, out-of-hand. In central America, Mexico and the west Indies, the fruit is appreciated by all. When fully ripe it is soft to the touch and the stem and attached core can be easily pulled out. The flesh may be scooped from the skin and eaten as is or served with light cream and a sprinkling of sugar. Often it is pressed through a sieve and added to milk shakes, custards or ice cream. A sauce is made by blending the seeded flesh with mashed banana and cream.

Fibre: A fiber derived from the young twigs is superior to the bark fiber from Annona squamosa.

Timber: Custard apple wood is yellow, rather soft, fibrous but durable, moderately close-grained, with a specific gravity of 0.65. It is used to make yokes for oxen.

Tannin or dyestuff: The leaves have been employed in tanning and they yield a blue or black dye.

Poison: The seeds are so hard that they may be swallowed whole with no ill effects but the kernels are very toxic. The seeds, leaves and young fruits are insecticidal. The leaf juice kills lice. The bark contains 0.12% anonaine. Sap from cut branches is acrid and irritant and can severely injure the eyes. The root bark has yielded 3 alkaloids: anonaine, liriodenine and reticuline (muricinine).

Medicine: A decoction of the leaf is given as a vermifuge. Crushed leaves or a paste of the flesh may be poulticed on boils, abscesses and ulcers. The unripe fruit is rich in tannin It is dried, pulverized and employed against diarrhea and dysentery. The bark is very astringent and the decoction is taken as a tonic and also as a remedy for diarrhea and dysentery. In severe cases, the leaves, bark and green fruits are all boiled together for 5 minutes in a litre of water to make an exceedingly potent decoction. Fragments of the root bark are put around the gums to relieve toothache. The root decoction is taken as a febrifuge.

TREE MANAGEMENT
The tree is fast growing and responds well to mulching, organic fertilizers and frequent irrigation if there is dry weather during the growing period. The form of the tree may be improved by judicious pruning.

The custard apple has the advantage of cropping in late winter and spring when the preferred members of the genus are not in season. The tree is naturally a fairly heavy bearer. With adequate care, a mature tree will produce 34-45 kg of fruits/year.

GERMPLASM MANAGEMENT
Seeds remain viable for more than 12 months in air-dry storage at 5 deg. C.

PESTS AND DISEASES
The custard apple is heavily attacked by the chalcid fly. Many, if not all of the fruits on a tree may be dried up before maturity. In India, the ripening fruits are covered with bags or nets to avoid damage from fruit bats.

A dry charcoal rot was observed on the fruits in Assam in 1947. The causal fungus was identified as Diplodia annonae. The infection begins at the stem end of the fruit and gradually spreads until it covers the entire fruit.

FURTHER READNG

http://www.hort.purdue.edu/newcrop/nexus/Annona_reticulata_nex.html

IBPGR. 1986. Genetic resources of tropical and subtropical fruits and nuts (excluding Musa). International Board for Plant Genetic Resources, Rome.

Jackson D. 1986. Temperate and subtropical fruit production. Butterworth Horticultural Books.

Martin FW, Campbell CW & Ruberte RM. 1987. Perennial edible fruits of tropics: an inventory. US Department of Agriculture, Agriculture Handbook No. 642. 252 pp.

SUGGESTED CITATION

Orwa C, Mutua A , Kindt R , Jamnadass R, Simons A. 2009. Agroforestree Database:a tree reference and selection guide version 4.0 (http://www.worldagroforestry.org/af/treedb/)