Emblica officinalis

Gaertner

Euphorbiaceae

Indian gooseberry, emblic myrobalan

LOCAL NAMES

Bengali (amla); Burmese (tasha,zibyu); Chinese (ganlanshu,youganzi,yougan,dianganlan); English (emblic myrobalan,malacca tree); Filipino (nelli); French (emblique officinale,groseillier de Ceylan); German (Amalanbaum,Graue Myrobalane,Amblabaum); Hindi (amla,amlika,aonla,usiriki); Indonesian (kimalaka); Javanese (kemloko); Lao (Sino-Tibetan) (mak-kham-pom); Malay (amlaka,asam melaka,melaka); Nepali (amala); Tamil (nelli); Thai (ma-kham-pom,ma-khaam pom); Trade name (Indian gooseberry,emblic myrobalan); Vietnamese (chu me,kam lam,bong ngo)

BOTANIC DESCRIPTION

Embelica officinalis is a graceful ornamental tree, normally reaching a height of 18 m and, in rare instances, 30 m. Its fairly smooth bark is a pale greyish-brown and peels off in thin flakes like that of the guava. While actually deciduous, shedding its branchlets as well as its leaves, it is seldom entirely bare and is therefore often cited as an evergreen.

The miniature, oblong leaves, only 3 mm wide and 1.25-2 cm long, distichously disposed on very slender branchlets, give a misleading impression of finely pinnate foliage.

Small, inconspicuous, greenish-yellow flowers are borne in compact clusters in the axils of the lower leaves. Usually, male flowers occur at the lower end of a growing branchlet, with the female flowers above them, but occasional trees are dioecious. The nearly stemless fruit is round or oblate, indented at the base, and smooth, though 6 to 8 pale lines, sometimes faintly evident as ridges, extending from the base to the apex, giving it the appearance of being divided into segments or lobes.

Light green at first, the fruit becomes whitish or a dull, greenish-yellow, or, more rarely, brick red as it matures. It is hard and unyielding to the touch. The skin is thin, translucent and adherent to the very crisp, juicy, concolorous flesh. Tightly embedded in the center of the flesh is a slightly hexagonal stone containing 6 small seeds. Fruits collected in South Florida vary in the range 2.5-3.2 cm in diameter but choice types in India approach 5 cm in width. Ripe fruits are astringent, extremely acid, and some are distinctly bitter.

The specific epithet is derived from opificina shortened to officina, originally a workshop or shop, later a monastic storeroom, then a herb-store, pharmacy or drug store: it more often refers to the past than the present.

BIOLOGY

Cross-pollination is desirable. Honeybees work the flowers in the morning and late evening. It is now known that lack of pollination is the cause of up to 70% shedding of flowers in the first 3 weeks after onset of blooming. The emblic is sensitive to day-length. In northern India, flowering takes place from March to May. In Madras, the tree blooms in June-July and again in February-March, the second flowering producing only a small crop. In Florida flowering occurs during the summer months, the main crop maturing during the winter and early spring. A few fruits developed from late blooms are found in summer and fall.

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ECOLOGY
The emblic is subtropical rather than strictly tropical. It survives the unusually cold winter weather in its natural habitat and often shows a remarkable ability to recover from cold injury. On the other hand, it is intolerant of excessive heat. In India, mature trees can stand temperatures up to 46º C in the summer but young plants must be shaded.

BIOPHYSICAL LIMITS
Altitude: 0- 1 800 m
Mean annual temperature: Up to 46 deg C.
Soil type: The emblic seems to grow equally well under both dry and humid conditions. It is noted for being able to thrive in regions too dry and soil too poor for most other fruit crops. For maximum productivity, the tree requires deep soil ranging from sandy loam to clay, light or heavy, slightly acidic to slightly alkaline. At high pH (as much as 8.0), nutritional deficiencies are evident. Limestone is considered unsuitable but the large, old trees in southern Florida are all in oolitic limestone. Good drainage is essential. A low degree of salinity seems to be fairly well tolerated.

DOCUMENTED SPECIES DISTRIBUTION

Native: Bangladesh, China, India, Malaysia, Pakistan, Sri Lanka
Exotic:

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: Rural folk in India claim that eating the highly acid, fresh, raw fruit followed by water, produces a sweet and refreshing aftertaste. Woodcutters in Southeast Asia eat the emblic to avoid thirst, as the fruit stimulates the flow of saliva. This is the one tree left standing when forests are clear-cut in Thailand, and buses stop along highways to let thirsty travelers run to the tree to get the fruits. The emblic is regarded as sacred by many Hindus and the Hindu religion prescribes that ripe fruits be eaten for 40 days after a fast in order to restore health and vitality. It is a common practice in Indian homes to cook the fruits whole with sugar and saffron and give one or two to a child every morning.
Fresh emblics are baked in tarts, added to other foods as seasoning during cooking, and the juice is used to flavor vinegar. Both ripe and half-ripe fruits are candied whole or made into jam and other preserves, sweetmeats, pickles and relishes. They are combined with other fruits in making chutney. In Indonesia, emblics are added to impart acidity to many dishes, often as a substitute for tamarinds.
During World War II, emblic powder, tablets and candies were issued to Indian military personnel as vitamin C rations.
In Thailand, where the tree is common in the forests, deer, especially the tiny barking deer, favours the fruits.

Fodder: The foliage furnishes fodder for cattle.

Timber: The hard but flexible red wood, though highly subject to warping and splitting, is used for minor construction, furniture, implements, gunstocks, hookas and ordinary pipes. Durable when submerged and believed to clarify water, it is utilized for crude aqueducts and inner braces for wells, and branches and chips of the wood are thrown into muddy streams for clarification and to impart a pleasant flavour.

Fuelwood: The wood serves also as fuel and a source of charcoal.

Tannin or dyestuff: The tannin-rich bark, as well as the fruit and leaves, is highly valued and widely employed in conjunction with other so-called myrobalans, especially fruits of various species of Terminalia. The twig bark is particularly esteemed for tanning leather and is often used with leaves of Carissa spinarum and Anogeissus latifolia.

The dried fruit yields ink and hair-dye and, having detergent properties, is sometimes used as a shampoo. Dyes from the fruit and leaves impart an appealing light-brown or yellow-brown hue to silk and wool. When sulfate of iron is added as a mordant, the color becomes black.

Essential oil: A fixed oil derived from the fruit allegedly acts as a hair-restorer and is used in shampoos in India. This oil is the main ingredient in an "Amla Conditioner" currently sold by Shikai Products of Santa Rosa, California, by mail and through "health food" stores and other "natural" product outlets.

Medicine: The emblic is of great importance in Asiatic medicine, not only as an antiscorbutic, but in the treatment of diverse ailments, especially those associated with the digestive organs. For such use, the fruit juice is prepared in the form of a sherbet or is fermented. In the latter state, it is prescribed in jaundice, dyspepsia and coughs. The dried chips of flesh are dispensed by apothecaries and often are mixed with grape juice and honey for dosage. The fruit is considered diuretic and laxative.

Triphala, a decoction of emblic with Terminalia chebula and T. bellerica is given for chronic dysentery, biliousness, hemorrhoids, enlarged liver and other disorders.

A powder prepared from the dried fruit is an effective expectorant as it stimulates the bronchial glands. The juice that exudes when the fruit is scored while still on the tree is valued as eyewash and an application for inflamed eyes. An infusion made by steeping dried fruit overnight in water also serves as eyewash, as does an infusion of the seeds.

Liquor made from the fermented fruits is prescribed as a treatment for indigestion, anaemia, jaundice, some cardiac problems, nasal congestion and retention of urine.

The flowers, considered refrigerant and aperient, and roots, emetic, are also variously employed.

An ointment made from the burnt seeds and oil is applied to skin afflictions. The seeds are used in treating asthma, bronchitis, diabetes and fevers. They contain proteolytic and lipolytic enzymes, phosphatides and a small amount of essential oil. Approximately 16% consist of a brownish-yellow fixed oil.

Other products: A most curious custom is the making of simulated pottery jars from a paste of the boiled fruit, the surface being decorated with impressed colored seeds.

SERVICES
Soil improver: The branches are lopped for green manure. They are said to correct excessively alkaline soils.

TREE MANAGEMENT
It is recommended that the trees be spaced 9-12 m apart and planted in well prepared holes enriched with a composted manure and soil mixture, and well watered. Thereafter, watering is done only in the dry season. Trees usually begin to bear when 5 to 6 years old and normally bear for about 50 years.
There are no standard practices for fertilizing the emblic but 28-42 g of nitrogen per tree for each year of age up to 10 years has been suggested. After 10 years the nitrogen is increased and potash and superphosphate are added. Half of the fertilizer should be given after fruit-set and the other half 4 months later.

Emblic trees bearing fruits of inferior quality may be top-worked by cutting back to a height of 1.2 m and applying coal tar to the cut surfaces. Trials at Saharanpur showed that this is best done in March when the trees are not in active growth. Budding of the new shoots can be done successfully any time from June to September.

The branches are brittle and judicious pruning to develop a strong framework is advocated to avoid branch breakage from heavy loads of fruit.

GERMPLASM MANAGEMENT
The seed is extracted by drying the ripe fruits in the sun until they dehisce and the seeds escape. The seed is dried before storage. Seeds weigh 65 000-69 000/kg. The seed does not store well.

PESTS AND DISEASES
The chief pest of this tree in India is the bark-eating caterpillar, Indarbela sp., which tunnels into the branches and trunk. A secondary enemy produces shoot galls. A non-pathogenic problem, especially in India in 'Francis', is called "fruit necrosis", characterized by internal browning which gradually extends to the surface where dark spots become corky and gummy evidences it. Bi-monthly sprays of borax can overcome it in September and October.
There are few serious diseases but the fungi, Bestonea stylophora, Phakospora phyllanthi and Ravenelia emblicae, cause ring rust, leaf rust and fruit rot.
Fresh emblics on the market or in storage are subject to blue mold and rotting caused by Penicillium islandicum. Rinsing with very dilute borax or sodium chloride solutions helps retard such spoilage.

FURTHER READNG

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