

# Nature Watch

## The Kokum Tree

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M D Subash Chandran combines teaching botany to under-graduate students and active research on forest history, coastal management, natural regeneration of forests and impact of forest-based industries on evergreen forests of Western Ghats.

The evergreen kokum tree found along the west coast of India is known not only for its beauty but also for its use as a condiment. Its economic and ecological potential make it ideally suited to the restoration of natural forests.

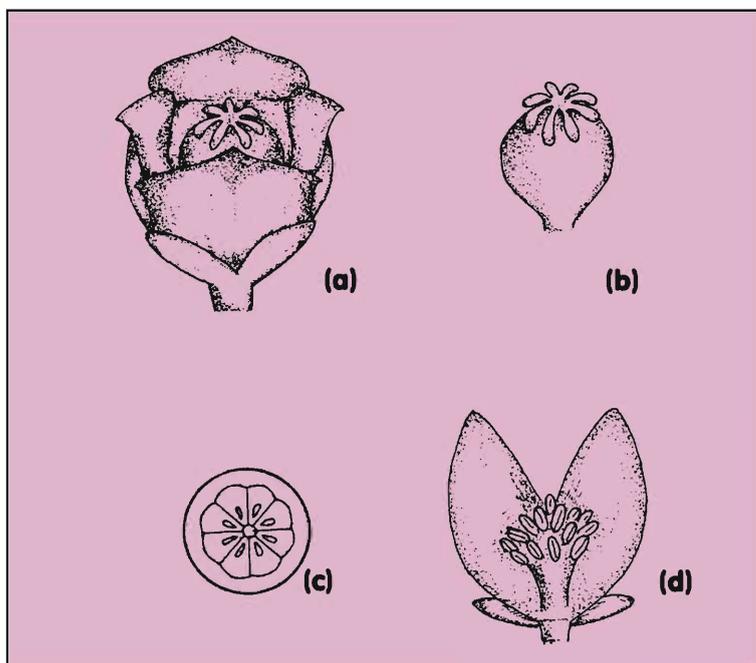
A beautiful evergreen tree mainly found along the west coast of the Konkan, Goa, Karnataka and North Malabar, the scientific name of kokum is *Garcinia indica* Chois. Known as *brindon*, to the Portuguese in Goa, *bhirand* or *amsol* in Marathi and Konkani, *murgal* in Kannada and *punampuli* in Malayalam, the scientific name *Garcinia* is derived from Garcias who described it in 1574. It occurs from the sea level plains upto an elevation of about 800 m along the westward slopes of the Western Ghats. Kokum is also a cultivated tree; unfortunately, its propagation is being neglected these days. The famous Cooke's *Flora of the Bombay Presidency* published in 1901, mentions that 13,000 trees were estimated to be cultivated in Ratnagiri district.

The genus *Garcinia* with about 435 species, chiefly confined to the humid tropical forests of Asia, Africa and Polynesia, belongs to Clusiaceae (Guttiferae), a family of latex bearing evergreen trees and shrubs. Yellowish latex is a notable feature of all the *Garcinias*. The mangosteen, from *Garcinia mangastana* is one of the popular fruits from the tropics of the Far East.

The kokum tree reaches a height of about 10 to 15 meters. Its dark green foliage, drooping branches and pyramidal shape make this slender tree look very graceful in a forest or garden (Figure 1). The simple and opposite leaves, about 10 cm x 5 cm, glabrous above and paler beneath, are red when young and dark green when mature. The tree comes to bloom from November to February and



Figure 1 *Garcinia Indica*.



**Figure 2** (a) female flower, (b) gynoecium, (c) cross section of ovary and (d) male flower with androecium exposed.

the fruits ripen in April-May. The flowers are small and unisexual; the male and female flowers are found on the same tree. The calyx is of four free sepals and corolla of four free petals. The male flowers have 10 to 20 stamens. The female flowers have ovary of 4 to 8 chambers which is topped with a lobed and sessile stigma (Figure 2).

The tree in fruit is an attractive sight. The berries, usually deep purple to pink, occasionally whitish, are the size of a lemon. The fleshy rind of the fruit is juicy and acidic. Five to eight large seeds are embedded in a soft and sweet pulp.

There is not much information on the pollination of the kokum tree. However Clusiaceae family is known for bee pollination. In the Western Ghat forests, the butterfly *Papilo polymnestor* also visits the flowers of *Garcinia* spp. Bonnet monkeys, langurs, squirrels and fruit bats feed on the fruits of kokum. The monkeys also feed on the tender shoots. It is likely that frugivorous birds also eat the fruits.

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**Figure 3** *Garcinia* berries.



**Figure 4** *Kokum* juice - refreshing and medicinal.



**Figure 5** The dried rind of *Garcinia* fruits.

The sides of the newly-laid Konkan Railway tract, which passes through coastal hills and valleys, would provide a promising habitat for raising thousands of kokum trees.

## Uses of the Kokum Tree

The kokum tree is known for its various uses. The fleshy rind of the ripe fruits, which has a sweet and acidic taste, is sun-dried and used as a condiment like tamarind (*Figure 3*). For the traditional fish curry from the Konkan coast and Goa the kokum fruit rind is an usual ingredient. The dried rind, strained in water, is boiled into a soup called *Solkadi* (*Figure 4*). Spiced and sweetened with jaggery it is a must for marriage feasts and other functions in Uttara Kannada district of Karnataka. It is considered to be digestive. Wine red syrup extracted from the rind of the ripe fruit with the help of sugar, is stored in the household of the region for making cool drinks in summer. Various therapeutic effects are also attributed to it. The sweet pulpy cover of the seeds is eaten or made into curries. The fruit rind is also pickled (*Figure 5*).

Notable among the chemical components of the dried rind is malic acid (about 10%). Tartaric acid is also present in it. About 44% by weight of the kokum seed kernel is an edible fat. The sun-dried seeds are crushed and subjected to boiling. The oil which collects on the surface, on cooling, solidifies into a cake which has a pale yellowish colour and bland taste. It melts at 36.5°C. Known as kokum butter this fat is used as a specific remedy for diarrhoea and dysentery. About 10 gm of the kokum butter is administered along with milk three times a day until complete recovery. It is also used for cooking purposes, more so when one is suffering from stomach disorders. The fat is an important traditional emollient used for applying on dry, chapped or cracked skin of feet and soles and lips and for various other skin ailments. It is now being used in cosmetics and medicines. Known as *Vrikshamla* in Ayurveda, various parts of the tree like root, bark, fruit and seed oil are used for treating piles, sprue and abdominal disorders.

## Conditions for Growth

Kokum prefers to grow in well drained lateritic soils. It is found



naturally in the fire protected secondary forests of the Western Ghats and the west coast. It prefers partial shade rather than the open area or the deep shade of evergreen forests. The seed, like that of most rain-forest species, has poor dormancy and germinates at the beginning of the rainy season. In the unprotected state, the saplings could succumb to cattle grazing, trampling and ground fires. The tree is not usually grown as coppice.

### Ecological potential

The favoured habitats for the kokum tree are the secondary forests close to human habitation. Unfortunately, these are under great pressure. Kokum therefore requires greater attention from conservationists. In the silviculture of Indian forests the kokum tree appears to be almost ignored since it has no timber value. Of late, however, saplings in large numbers are being raised in the forest nurseries of coastal Uttara Kannada. This very useful and beautiful tree is ideal for planting in parks and gardens, roadsides, and in the compounds of houses and educational institutions. As the plant is associated with the vegetation of the ravines it should be tried also for stabilising gullies and ravines of the west coast. There is enormous potential for raising beautiful avenues of kokum trees alongside roads. The sides of the newly-laid Konkan Railway tract, which for most of its 750 km length passes through coastal hills and valleys, would provide a promising habitat for raising thousands of kokum trees. The tree, small in stature, would not pose any problem to the road and rail traffic while providing ecosystem and economical services of great value. Moreover since the diameter of the canopy is only about 3 to 6 m, it can be grown safely in home gardens even in crowded urban areas. This tree is endemic to the Western Ghats and has great ecological and economic potential. It should therefore be preferred to the several exotics that are being planted widely these days. In the effort to restore natural forests of the Western Ghats, the kokum tree should be accorded the importance that it so richly deserves.

### Suggested Reading

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