Chapter 3

Materials
3. MATERIALS

3.1 PLANT MATERIALS

3.1.1 *Naringi crenulata* (Roxb.) Nicolson

*Naringi crenulata*, belonging to the family Rutaceae is a small straight-stemmed tree, with pale corky bark and thorny branches, reaching a height of 25-30 ft, and a stem diameter of 6-12 inches. The tree is handsome with light green foliage. Leaves imparipinnate; leaflets 2-9; sessile, ovate, crenulate; flowers small, white, fragrant, borne in axillary racemes; fruit a small globose berry, black when ripe (Plate3.1.1).

The tree occurs nearly throughout India, from Punjab and Kumaon eastwards, in Bihar, Orissa, Assam, Madhya Pradesh, Bombay, Mysore and South India. It flowers during May-June and the fruits ripen in November-December.

The wood is hard, heavy, light lemon to brownish yellow in colour, smooth, lustrous, straight grained and fine-textured; durable and immune to insect and fungus attack.

3.1.1.1 Medicinal uses

Leaves, fruits and roots are medicinal. The root is yellow, bitter and aromatic and is reported to possess purgative and sudorific properties. It is employed for the cure of colic and cardialgia. The dried fruit is a tonic and stomachic, and useful in malignant and pestilent fevers. It diminishes intestinal fermentation, has the power of resisting the contagion of small pox. It is considered as an excellent antidote to various poisons, on which account it is much sought for, and forms an article of commerce with Arab and other merchants on the Western Coast.

Lisboa states that the berry is much used as a tonic in Malabar, and that its red coloured mucilage is considered to be an antidote against snake-bite and the poison of other venomous animals. Leaves are considered as a remedy for epilepsy.
Plate 3.1.1

*Naringi crenulata* (Roxb.) Nicolson

*Naringi crenulata* (Roxb.) Nicolson (Family- Rutaceae)
3.1.1.2 Other uses of the plant

In Burma and Siam, the bark of the wood compounded with sandalwood is ground and used as a cosmetic. The fruit is bitter and occasionally used as a condiment with fish, meat, etc, in India and Arabia. In Java, it is used as a substitute for soap. The wood is hard and durable; hence it is used for axles of carts, oil presses, rice pounders and walking sticks. It may be used as a substitute for boxwood and for tool handles, welding hammer shafts, mallet heads, scales, rulers, beading and in lay work and in cabinet making.

3.1.1.3 Chemical constituents

Root bark contains sitosterol, marmesin, suberosin, suberenol, xanthotoxin, ostenol, and coumarin. Bark contains antifungal agent psoralen, 4 methoxy-1 methyl 2 quinone. Leaves contain lurangetin, xanthotoxin, marmesin, umbelliferone, limonin, phenyl acetyl ester, sitosterol and its glucosides. Fruits contain servesrine palmitate. Bergapten and psoralen were isolated from the leaf extract. Bergapten has also been isolated from root bark (Bandara et al., 1989).

3.1.2 Aegle marmelos (L.) Corr.

Aegle marmelos belongs to the Rutaceae family. It is a medium sized armed deciduous tree upto 8.0m high with straight, sharp axillary thorns and yellowish brown shallowly furrowed corky bark; leaves trifoliate, aromatic, alternate, leaflets ovate, or ovate-lanceolate, crenate, pellucid-punctate, the laterals sub sessile and the terminal long-petioled; flowers greenish white, sweet scented, in axillary panicles; fruits globose, woody berry with yellowish rind; seeds numerous oblong compressed, embedded in orange brown sweet gummy pulp (Plate 3.1.2).

It is distributed throughout India, in dry forests and also cultivated. It is also seen in Sri Lanka, Pakistan, Bangladesh, Burma, Thailand and most of the South-East Asian countries.
3.1.2.1 Medicinal uses

The roots are sweet, astringent, bitter and febrifuge. They are useful in diarrhoea, dysentery, dyspepsia, stomachalgia, cardiopalmus, and vitiated conditions of vata, seminal weakness, uropathy, vomiting, intermittent fever, swellings and gastric irritability in infants. The leaves are astringent, laxative, febrifuge and expectorant and are useful in ophthalmia, deafness, inflammations, catarrah, diabetes and asthmatic complaints. The unripe fruits are bitter, acrid, sour, astringent, digestive and stomachoic, and are useful in diarrhoea, dysentery and stomachalgia. The ripe fruits are astringent, sweet, aromatic, cooling febrifuge, laxative and tonic and are good for the heart and brain and in dyspepsia.

The bark of the root especially is given in compound decoctions in intermittent fevers. It constitutes an ingredient in the dasamul or ten roots. A decoction of the bark of the tree is given in palpitations of the heart, and of the leaves in asthma. Water distilled from the flowers is reputed to be aledipharmic. The flowers allay thirst and vomiting, useful in dysentery.

The unripe fruit is cut up and sun dried. It is the form in which it is sold in the bazaars as whole or broken slices. It seems especially useful in chronic diarrhoea; a simple change of the hours of meals and an alternation in the ordinary diet, combined with bael fruit will almost universally succeed. In the Konkan, the small unripe fruit is given with the fennel seeds and ginger, in decoction for piles. According to Dr. Green, a sherbet of the ripe fruit taken every morning proves serviceable in moderate cases of dyspepsia. He further adds that the unripe fruit baked for 6 hours is a powerful astringent (Indian Ann. Med. Sc., ii224). The fresh juice of the leaves is given, with addition of the black pepper, in anasarca, with costiveness and jaundice. In external inflammations, the juice of the leaves is given internally to remove the supposed derangement of humours.
Plate 3.1.2: *Aegle marmelos* (L.) Corr. (Family - Rutaceae)
3.1.2.2 Economic uses

The mucus of the seeds is used as an excellent addition to mortar, especially in the construction of wells. A yellow dye is procured from the astringent rind of the fruit.

3.1.2.3 Chemical constituents

Various chemical constituents, viz, alkaloids, coumarins and steroids have been isolated and identified from different parts of bael tree, such as leaf, wood, root and bark (Chaterjee and Roy, 1957 and 1959; Chaterjee and Bhattacharjee, 1959 and Shoeb et al., 1973). The bael fruit contains 61.5g water, 1.8g protein, 0.39mg fat, 1.7g minerals, 31.8g carbohydrates, 55mg carotene, 0.13mg thiamine, 1.19mg riboflavin, 1.1mg nisicin and 8mg vitamin C per 100g of edible portion. No other fruit has such a high content of riboflavin.

Marmelosin is most probably the therapeutically active principle of bael fruit. It has been isolated as a colourless crystalline compound (Dixit and Dutt, 1932). Marmelosin acts as a laxative and diuretic (Nadkarni, 1954; Ambasta, 1986).