

Woodapple

Wood apple:

Botanical Name	:	<i>Feronia limonia</i> L.
Family	:	Rutaceae
Origin	:	India and Ceylon
Chromosome No.	:	2n=18
Type of fruit	:	Amphisarca (Berry)
Edible portion	:	Succulent placentae

Importance:- Wood apple is also known as kaith, kavat, curd apple and monkey fruit. It (*Feronia limonia* L.) relate to family rutaceae. It is found almost throughout the country. It is one of the very hardy trees found growing in arid and semi arid regions of the country. Hill region of northern India are supposed to be its native land (Reuther *et al.* 1967; Anonymous, 1948). Chundawat (1990) thoughtit to be native of India and Sri Lanka. It is a popular tree of forest, Indore yard garden and can be exploited for regular cultivation in dry areas. The cricket ball size fruits have sweet and aromatic pulp, eaten fresh or used for drinks, chutneys, jellies, etc. In Rajasthan forests, it is commonly found in Aravalli range and Hadoti Plateau.

Composition and Uses:-Fruit ripens in November to March. Sweetish, aromatic edible pulp of fruits is eaten as raw or with sugar. It ios also used as sarbat and chatney. Fruit is considered tonic, refreshing, cardiacal, astringent when unripe. It is used in the treatment of diarrhea and dysentery. Pulp is used in infection of gum and throat. Edible pulp contains 69.5 % moisture, 7.3 % protein, 0.6 % fat and 1.9 % mineral matter, TSS 7.2 per cent and acid about 2.3 per cent when full ripe. It is an excellent fruit for making jelly as it contains 3 to 5 % pectin. Bhat (1994) prepared its jelly with agreeable flavor. It is a rich source of riboflavin (170 mg/100 g)

Taxonomy:-Trimen (1893) described it as a small tree, branches numerous with smooth, whitish bark and with sharp, strait ascending spines 1.2 to 3.8 cm long, pinnate (7.5 to 10 cm ling), rachis and petiole flat, very narrowly winged, glabrous. Leaflets opposite in 2 or 3 pairs and usually a terminal one nearly sessile (2.5 to 3.8 cm long) oval or obovate, obtuse, entire, glabrous, basal ones are the largest, flowers small, numerous in small paniculate, sessile cymes from the axils of fallen inflorescences, peduncle slender, pubescent, calyx very small, petals ovate, acute, spreading, smooth, stamens 7-12, filaments very short, anthers very large, disc finely wooly, ovary with numerous ovules in each cell, style very short, stigma fusiform, fruit large (5.0-6.3

cm dia), globuse, hard, pericarp woody, rough, whitish, one celled, seeds oblong compressed and chromosome number $2n = 18$. Bradis (1906) noted dull red flowers, generally unisexual, male and bisexual flowers frequently on the same inflorescence. Trees are deciduous with 10 to 15 m height and 0.8 to 1.6 m in girth. S

Climate: -It is a tropical and sub-tropical region fruit. It is grown in hot and dry regions and shows tolerance to high up to 48°C and low temperature ($0-15^{\circ}\text{C}$). It does not grow above 1500 m.

Soil:-It can grow in wide variety of soils including soils of arid region and can tolerate salinity to certain extent. It grows well in wasteland also.

Varieties: - Wood apple is generally propagated by seeds and regular orcharding is lacking. Therefore, no descriptive cultivars are available. However, great variation exists which could be surveyed and exploited, on the basis of fruit size it can be classified in two groups.

(a). Large sized fruits :- The shell is thin. Flesh is non-astringent and sweet. Number of seeds is very less and soft.

(b). Small size fruits:- The shell is thick. Flesh is astringent and comparatively less sweet. Large numbers of seeds are present.

Recently a large fruited variety HB-10 has been released by the Marathwada Agricultural University, Parbhani, Maharashtra.

Propagation:-The wood apple is propagated by seeds. However, it can be successfully propagated by budding. The optimum time of budding is late summer or early monsoon. Budded plants are dwarf, precocious and prolific in flowering and fruiting. Under arid conditions the *in situ* budding would be advantageous.

Planting: - Generally wood apple are not planted as an orchard. However, if done it should be planted at 8 M x 8 M distance, being a large size tree. The planting should be done during rainy season *i.e.* July –August so plants can establish during this period. Plants are also planted during February- March if sufficient water is present.

Manuring:- Manuring is generally not done in wood apple. But a dose of 40 kg FYM or compost in the beginning of monsoon will help to improve fruit size and quality.

Irrigation:- It is a dry areas fruit crops and once the plants are establish, they hardly need any irrigation. Nevertheless, conservation of runoff rain water in rhizosphere will enhance the productivity of this crop.

Intercultural operation:- These trees come into bearing at the age of 5 years and till such periods intercrops can be taken. Generally leguminous crops and vegetable crops should be preferred.

Flowering and fruiting:-The wood apple flower 4-5 years after planting. Flowering and fruiting are dependent on climate and available moisture. In South India and Maharashtra it flowers in February- March and gives fruits from October to April (Bhore, 1998), while in Rajasthan flowering continues from February to May and fruits are available in winter (Chundawat, 1990). Numerous small flowers are produced on terminal or axillary panicles, mainly on new shoots. Botanically fruit is a hard shelled many seeded, berry fruit 5.0 to 8.0 cm in diameter, globose with a woody brown pericarp, filled with a white bloom. Seeds are oblong, numerous in number and embedded in pulp.

Harvesting: -The vegetatively propagated tree starts bearing after 3 years of planting. However, it takes about 10 years for a tree to provide optimum production. Generally fruits are ready for harvest in November during winter and the stage of harvest is determined by the use of fruits. For making chutneys, immature but fully developed fruits are preferred. However, for making squash, fully mature fruits are desirable. Fruits are harvested with footstalk carrying fruit.

Yield: - The yield varies according to age of the tree. Generally, a fully grown up tree can yield 200 to 250 fruits.

Insect –pest and disease management:-Therefore no record of any serious problem regarding insect, pest and diseases. However bacterial rot and fruit canker cause damage to some extent. It is caused by *Xanthomonas bilva*. Round water soaked lesions (0.5 mm) are developed on leaves, twigs and fruits, which increase in size up to 3-5 mm. The fruit and twigs are adversely affected. Application of copper oxychloride during rainy season can effectively control this disease.

Only four insects have been known to damage wood apple. The Castor Slug, *Parasalepida* Cram., damage foliage, the Anar Butterfly (*Virachola Isocrates* Fab.) and eucosmid (*Argyropluceillepida* Butl.) damage the fruit (Atwal, 1962) and Pyralid larvae (*Euzopheraplumbeifaciella* Hmps.) bores into wood (Ayyer, 1938)

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