

# West Indian Cherry ñ A lesser known fruit for nutritional security

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## Abstract

The fruits of West Indian Cherry, *Malpighia glabra* Linn. are of nutritional value because of their very high ascorbic acid content. The present paper gives information on its current status and large scale cultivation prospects in India particularly in Andaman and Nicobar Islands.

**Keywords:** West Indian Cherry, Barbados Cherry, Acerola, *Malpighia glabra*, Underutilized fruit, Andaman & Nicobar Islands, Cultivation.

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## Introduction

West Indian Cherry, Acerola or Barbados Cherry, botanically known as *Malpighia glabra* Linn. (Family-Malpighiaceae), is native of West Indies and Northern South America to Southern Texas. It was further introduced in tropical and subtropical areas like India. In India it is grown in Tamil Nadu and Kerala. Being tropical in nature few selections from Tamil Nadu and Kerala were introduced during 1995-96 in Andaman and Nicobar Islands<sup>1</sup> where the plants performed well due to tropical and humid climate. The fruits are small; weigh 4-5g/fruit, contain high percentage of vitamin C (4515mg/100g). The daily requirement of vitamin C is 28-70mg/person from child to adult. Therefore, a single fruit of West Indian Cherry can satisfy daily requirement of vitamin C of an adult living in this state<sup>2</sup>.

The crop has not gained popularity among the farmers due to lack of awareness of its cultivation, nutritional

value and standard methods to make processed products. A block has been established at CARI, Port Blair and packages of practices have been developed and planting materials are made available to the cultivators/local people round the year.

It is a low branching, prickly, bushy shrub reaches to a height of 2-3.5m. It can be pruned to any desired shape hence can be grown as ornamental plant. Multiple or single trunks can be trained but branches are brittle and easily broken. The root system is shallow and plants can be toppled by wind but recovered over time. Leaves are dark to light green, glossy when mature, obviate to lanceolate with minute hairs which can be irritating. Foliage will drop during water stress but recovers well with flush and flowering. The flowers are sessile or short-peduncled in cymes, with small pink to white flowers having five petals. Flowering can occur throughout the year, but is typically in cycles associated with rain. Fruits are

round to obovate, cherry like but with 3 lobes. They are bright red rarely yellow-orange with skin easily bruised. The pulp is juicy, sweet and sour in taste with a delicate flavour and apple notes.

## Cultivation and Economics

The plant prefers full sun for fruit development. Fruit yield severely reduced under shade. Due to its smaller and shallow root system, West Indian Cherry can be interplanted with other crops more closely than many trees. The plant grows well on limestone, clay and other heavy soils as long as it drains well but water



logging will cause plant death. Soil pH should be 6.5-7.5, as acid soils do not promote vigorous growth. Heavy rainfall ranging from 1000 to 3000 mm can be tolerated by these plants. It is drought tolerant also. Irrigation can be used to induce flowering and regulate flower cycles. Under irrigated conditions plant can achieve one to five flowering peaks in a year<sup>4</sup>.

Propagation can be done by seeds (though seeds viability is very low), cuttings, layering, grafting and other standard methods. Cuttings are considered the simplest and easiest method of propagation. Stem cuttings treated with IBA at 1500 ppm give good rooting and survival percentage. Grafting on *Byrsonima crassifolia* H.B. & K. rootstock has been successful<sup>5</sup>. Plants require a good balanced fertilized schedule with FYM 10-15 kg/pit, nitrogen 35g/plant, phosphorous 15 g/plant and potassium 30g/plant should be given at the time of planting. During second year double dose of NPK and FYM must be given before the onset of the monsoon. Since, the plant fruits primarily on current season growth, systematic pruning of the bushes to encourage new growth is necessary and pruning should be done only after harvesting of fruits preferably during October-November. There are no serious pests and diseases noticed on this crop. However, a few minor insect of this crop are mealy bugs and aphids.

Well managed plant starts yielding fruits after 3 years of planting and yield about 1.5 to 2 kg fruits/plant and after 5<sup>th</sup> year 4-5kg fruits/plant. According to Jackson and Pennock<sup>6</sup>, on a per hectare

basis at 4.9×4.9m spacings, 420 plants per hectare are required which yields about 22 tonne fruit containing approximately 448kg of vitamin C. The clone 'B-15' has been strongly recommended for commercial planting, because it is most productive with high vitamin C content (2280mg/100g of fruit) whereas clone 'Selection 1' available with us contain vitamin C more (>4000mg/100g) than the 'B-15'.

The fruits can be harvested after 3 years of planting, though, plants attain its peak bearing stage in 7-8 years of planting. Productivity increases up to 15 to 20 years and then stabilizes or declines but the plants can yield up to 40 years. Harvesting of fruits depends upon its use. Fruits should be harvested at green stage for pickle purpose, for *murabba* (preserve) light green mature and for candy purpose fruits should be harvested when fruits are red in colour. The fruits deteriorate rapidly once removed from the tree. Sensory difference can be noted within 4 hours. The fruits under rapid fermentation is unusable within 3-5 days and unrefrigerated fruits develop mould quickly.

### **Utilization and Chemical Composition**

The fresh ripe fruits are used for making jams, preserves as *murabbas*, jellies, candies, syrups, juices and pickles<sup>2</sup>. The fruit has also been used in baby food and many recipes as a supplement source of vitamin C. The ripe fruit contains: moisture, 92.17; crude protein, 8.75; crude fibre, 15.45; ash, 4.45;

insoluble ash, 0.10; calcium, 0.50; and phosphorous, 0.168% on dry matter (7.82%) basis<sup>2</sup>. The length of the fruit was recorded 1.70 cm with specific gravity (wt/volume) 1.96. The recovery of the juice was, 36.11; pulp, 82.56; and seed, 17.44%. TSS (fruit) 5.44°Brix and acidity 1.18 per cent<sup>2</sup>. The vitamin C content of the fruit varied from 3097 to 4515mg/100g at ripe stage. Because of the high vitamin C content, it can also be blended with other fruit juices, which are low in vitamin C. There are seasonal factors affecting ascorbic acid synthesis and retention in the West Indian Cherry fruits. It is observed that ascorbic acid content is higher in fruits of grafted plants<sup>7</sup>. Our previous studies concluded: (i) Ascorbic acid content reached a peak between the 16<sup>th</sup> and 18<sup>th</sup> day after floral anthesis with an amount exceeding 4000mg/100g of fruit, then declined to concentration lower than those found on 12<sup>th</sup> day after anthesis. These observations are in general agreement with those of Del Campillo and Asenjo<sup>8</sup>; (ii) Fruits from plants grown in 5 levels of sunlight intensity were analyzed for ascorbic acid and observed that fruits from plants grown in direct sunlight gave the highest assay, with declining amounts of sunlight the vitamin C assay decreased. Several other plant characteristics were affected by low sunlight intensity.

The vitamin C content in West Indian Cherry fruits was much higher than other major fruits like *Aonla* (600-700mg/100g), *Guava* (200-300mg/100g), *Citrus* (50-100mg/100g) and *Jamun* (290mg/g). Calcium and phosphorous contents were also higher than many other

major fruits like grapes, mango, papaya and guava<sup>9</sup>. A concentrate prepared from these fruits is considered useful for the liver, blood circulation, gall bladder and in case of viral hepatitis<sup>10</sup>.

### Conclusion

The species being hardy can be grown on a wide range of soil. The nutritive value and applicability of West Indian Cherry in the preparation of various products and condiments suggests its commercial cultivation in Andaman and Nicobar Islands.

### References

1. Singh DB, Attri BL, Suryanarayana MA and Sharma TVRS, West Indian Cherry- A rich source of Vitamin C, *Agro India*, April 1999.
2. Singh DR and Medhi RP, West Indian Cherry Cultivation in Andamans, *Bulletin* No.15, Published by Director, CARI, Port Blair, 2003.
3. Singh DR and Medhi RP, Effect of different growth regulators on rooting in the hard wood cuttings of West Indian Cherry, pp.11, *Res Bull*, No.15, Published by Director, CARI, Port Blair 2003.
4. Website:<http://www.crfg.org/pubs/ff/acerola.html>
5. Cooper F, The Acerola comes to California loaded with vitamin C, *CRFG Yearbook* 3, 1971, pp 2-8.
6. Jackson JC and Pennock W, Fruit and Vit. C production of five and six and years old Acerola trees, *J Agric Univ*, Puerto Rico, 1958, **42**, 196-199.
7. Nakasone HY, Miyashita RK and Yamana GM, Factors affecting ascorbic acid content of the acerola (*Malpighia glabra* Linn.), *Proc Amer Soc Hort Sci*, 1966, **89**, 161-166.
8. Del Campillo A and Asenjo CF, The distribution of ascorbic acid, dehydroascorbic acid and diketogulonic acid in the acerola fruit at different stages of development, *J Agric Univ*, Puerto Rico, 1957, **41**, 161-166.
9. Bal JS, Fruit growing, Kalyani Publishers, Ludhiana, 1997, pp. 6.
10. Website: [http://www.life-enthusiast.com/ingredient/plants/acerola\\_cherry.htm](http://www.life-enthusiast.com/ingredient/plants/acerola_cherry.htm)