

Aonla (*Emblca officinalis* Gaertn.): A Promising Fruit Crop for Sustainable Horticulture

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Introduction:

Aonla (*Emblca officinalis* Gaertn) is an important fruit crop of commercial significance that belongs to the family Euphorbiaceae. The word phyllanthus is derived from the Greek words 'Phyllon's', meaning a leaf and 'anthus', standing for a flower: meaning thereby leaf flower referring to the apparent bearing of a flower.

Aonla is believed to be indigenous to tropical Southeast Asia. India is a place of its culture since time immemorial. Aonla trees are commonly seen growing wild in India and even in mixed deciduous forests up to an elevation of 1800 m. Aonla trees in their natural state have also been reported from Iran, Iraq, Java, China, Sri Lanka, Pakistan, the USA, and Puerto Rico.

In recent years, orchardists have attached much importance to its cultivation, and some good orchards are emerging in Uttar Pradesh, Bihar, Gujarat, Haryana, and Rajasthan. The aonla is commercially cultivated in Uttar Pradesh, particularly in the

districts of Pratapgarh, Varanasi, Azamgarh, Sultanpur, Allahabad, Bareilly and Raebareli. However, some new commercial orchards have also been planted in Kanpur, Etawah, Mainpuri and Farrukhabad districts of Central Uttar Pradesh. In India, aonla is cultivated in 107.00 thousand hectares of land, yielding 1378.00 MT. Uttar Pradesh is the leading producer of aonla.

Classification

The genus *Phyllanthus* comprises about 350 to 500 species, mostly shrubs, some herbs, or trees. Recently, with the revision of the genus. *Emblca officinalis* Gaertn under the genus *Phyllanthus*. There are other species which are also used for pickling etc., such as *Phyllanthusacidus* Skeels, popularly known as Taheti gooseberry, star gooseberry or country gooseberry. The somatic number of chromosome in aonla to be $2n = 28$ while a variation from $2n = 98$ to 104 was also observed.

Composition of aonla fruit

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The aonla fruits are well known for their antiscorbutic properties as they are a rich source of Vitamin 'C' (650-900 mg/100 g), which is more than that of guava, citrus and tomato fruits and also contains carbohydrates (14.10-21.89%), minerals (1.2% iron), and ellagic acid. The fruits are used as a blood purifier, antioxidant, laxative, liver tonic, and antibiotic, and is a very effective remedy for diarrhoea, jaundice, dyspepsia, cough, cold, asthma, diabetes, and chronic dysentery. The fruits are the richest source of ascorbic acid (vitamin C) after Barbados cherry (*Malpighia glabra*). The ascorbic acid content in aonla proves to be highly stable when the fruit is preserved in a salt solution or in the form of dry powder. Similarly, other important constituents, such as sugars, acids, starch, and proteins, are also conserved in dried aonla fruits. Fruits are commonly used to make preserves, pickles, candy, and other treats. The processing potentiality of fruits is yet to be fully tapped.

Besides antiscorbutic properties, it also possesses diuretic, laxative, alterative and antibiotic properties. It has got many medicinal, industrial and other uses and also, contains phenol, polyphenol, tannins and alkaloids etc. In brief, one or more parts of the plant could be used in treating chronic dysentery, diarrhoea, diabetes, dyspepsia, anaemia, jaundice, cough, bronchitis, and

fever. It's fruits are also rich in carbohydrates (14 %), mineral matters (1.27 %) and vitamin B complex group (30.2 mg/100g). The fruits are dried and used in famous Ayurvedic preparations, 'Triphala and Chavanprash', which are used for growth, vigour, and general maintenance of human health. It is also used in the preparation of preserves, candy, sauces, jelly, pickles, and various industrial products, such as inks, shampoos, and dyes for hair.

Importance in Sustainable Horticulture

Aonla plays a vital role in sustainable horticulture due to the following characteristics:

Soil and climate

Aonla is a subtropical plant that prefers a dry subtropical climate and can be successfully cultivated in a wide range of soil and climatic conditions. The aonla plant thrives well in sandy loam and clay soils of India. It can withstand well in salinity and drought conditions. Described it as highly successful in correcting alkaline soils. Many workers have found it suitable for various types of waste lands. Aonla is an ideal plant for arid zones. Aonla seedlings have demonstrated excellent salt tolerance up to an electrical conductivity of 43.5 ESP and 9.7 ECe (mmhos/cm).

While magnifying the importance of the aonla tree, it is described as a graceful plant resistant to wind, giving good production

without much attention in dry regions having poor soil, which otherwise are uneconomic for vast majority of fruit crops. I also found it suitable for the beautification of waste lands. Despite giving a good return to the grower, aonla could not gain popularity like mango, guava, banana, etc.

The aonla exhibits a deciduous nature. The tree becomes leafless by shedding its leaves and branchlets during the last week of February and the first week of March under agro-climatic conditions in the plains of Uttar Pradesh. The new branchlets appear in the second week of March, bearing both male and female flowers.

Propagation and Orchard Management

Propagation

Although aonla plants can be grown from seeds, their fruit is small, of poor quality, and genetically variable. Shield budding is currently the commercial technique used in India. The majority of rootstocks are seed plants. Aonla propagation is successful when using the forkert and patch budding techniques. One technique for producing high-quality propagules is grafting. In late spring, both male and female flowers emerge on the branchlets. According to some employees, "Top working" can easily transform inferior and older trees into superior varieties. 'T' budding is another way it can spread.

Cultivation

A thorough plowing, harrowing, and leveling of the field are necessary prior to planting. During May and June, pits measuring approximately 1 x 1 x 1 meter cubes should be excavated, with a 9 x 12 meter gap between each plant and row. The pits should receive 15 to 20 days of sun exposure. Together with surface soil, 10–15 kg of farm yard manure should be added to the pits. prior to the rain starting. In July, two to three seeds should be sown in each pit after additional soil has been added.

Yield and Economic Potential

- Full grown mature tree can produce average 50-70 kg fruit per year
- And aonla plant bearing starts in 4–5 years after planting
- High demand in pharmaceutical and processing industries
- It is most suitable for **value-added products** like; candy, pickle, juice, and powder

Constraints in Aonla Cultivation

- Fruit drop and unfruitfulness is major problem of aonla fruit tree
- Bark-eating caterpillar is most serious pest in aonla. It affect the main trunk of the plant and makes tunnels.
- Lack of organized marketing systems
- Limited awareness of improved production technologies

Conclusion

Aonla (*Emblica officinalis* Gaertn. is regarded as a very promising fruit crop for the practice of sustainable horticulture because of the fruit's high nutrient content, therapeutic qualities, climate tolerance, and low input demand. The plant can thrive in unfavorable conditions while promoting environmental sustainability, making it the ideal fruit crop to be developed in the future in terms of climate.

