

# Studies on Development of Amla and Its Products: A Review

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**ABSTRACT:** Amla plants are natural gift to human lives to promote disease free healthy life. Scientific name of Amla is *Phyllanthus emblica*. Amla has therapeutic potential against deleterious diseases. *Emblica officinalis* (Amla) has an important position in Ayurveda and it Indian indigenous system of medicine. Amla have strong antioxidant and biological properties. It prevents innumerable health disorders as it contains essential nutrients. This fruit for rich amount of vitamin C, polyphenols such as tannins, gallic acid, ellagic acid, flavonoids like quercetin and rutin. Consumption of amla fruit to prevent the cancer cells formation. It seasonal fruits and it is not easy to reap on its benefits throughout the year. Amla is found in the form of tablets, tonics and other supplements. Take amla supplements to lower the risk of side effects caused due to other medications, symptomatic relief, for treating chronic conditions like diabetes, hypertension and hormonal disorders. It can be used as varies sectors like food additive or in nutraceuticals and biopharmaceutical industries.

**Key words:** Amla, Antioxidant, *Emblica officinalis*, Nutraceuticals, Vitamin C.

## I. INTRODUCTION

Amla undeniably a powerhouse of nutrients. It is very delicious fruit. Amla Botanical Latin name is *Emblica officinalis*. It belongs to *phyllanthaceae* family. It is a little fruit stuffed with versatile and miraculous health benefits. It is also known as amla, amali, Indian gooseberry and nelli etc. Its play vital role in maintaining the human health. Survey of WHO 80% of the populations living in the developing countries rely almost exclusively on traditional medicine for their primary health care needs and play an important role in health care system of remaining 20% of population. Nature gift is Amla (Indian gooseberry).

Amla is one of the top selling fruit in market and it having diverse applications in

healthcare, food and cosmetic industry. An ancient Indian mythology, it is the first tree to be created in the universe. Amla contains protein, carbohydrates, fiber, amino acids. Calcium, phosphorus, iron, niacin, carotene, thiamine, riboflavin these are minerals present in fruit. Plant contains chemical constituents includes tannins, gallic acid, ellagic acid, emblicol, phyllembin, lupeol, essential oil, fixed oil etc. It's widely used in diuretic, laxative, liver tonic, antipyretic, hair tonic and ulcer prevention. Amla is the best natural source of vitamin C which helps in keeping the skin healthy and strengthens the immune system of the body. It has very good antioxidant that can prevent ageing and rejuvenate the cellular structure keeping it young and healthy for a long time. This herb prevents our body from bacterial and viral ailments like cold and cough.



**Fig 1 Amla Fruit**

Amla (*Emblica officinalis*) is one of the good natural sources of nutraceuticals and functional component. It is second richest source of vitamin C (ascorbic acid) having approximately 600 to 700 mg per fruit. It has high content of tannin which is responsible for its antioxidative property. Amla contains gallic acid which is a potent polyphenol and has been found to improve immunity system of our body. It is rich source of pectin. Dietary fiber regulates the bowel action, anti-diabetic, and treats scurvy and pulmonary tuberculosis.

Hundred grams of fruit pulp contains 14 g of carbohydrate, 0.5 g protein, fat 0.1 g, fibers 3.7g, mineral matter 0.7g, calcium 0.05 g, phosphorus 0.02 g, 1.5mg iron, 0.3 mg vitamin B and 600 mg of vitamin C, moisture 81.2%. It has several chemical constituents like tannins, alkaloids and phenols.

## II. 2 MORPHOLOGY:

It is a branching tree with average height of 8-18m with glabrous branches. Flowers are greenish-yellow in colour and its two types male flower and female flower. Fruit colour is pale-yellow and are 1.3-1.6cm in diameter. The fruits are shown fleshy with sour, astringent taste with spherical in shape and six vertical bands. The origin of amla is South and Central India, Sri Lanka, Malaysia and South China.



Fig 2 Amla tree

### 2.1 Climatic and soil requirements:

Amla is a subtropical fruit. Thrives are very well and comes to yield in tropical humid conditions also. The young plants are protected from both extremes of temperature, the mature trees can tolerate right from freezing (0C) to as high as 46 C and protected from during summer and water stagnation during heavy rains. Adult trees tolerate these two adverse conditions. Amla trees grow faster in well-drained loamy soil. It can grow in heavy clay also provided slight drainage is arranged during heavy rains. The crop growth phase in early stage first 2 – 3 years. It can also tolerate moderate alkaline soil. It requires pH of soil ranging 6.5-9.5. Avoid cultivation in heavy soils.

### 2.2 Popular varieties and their yield:

Table 1 Varieties and yield of amla

Varieties	Yield (g/fruit)
Banarasi	48
Krishna	44.6
NA-9	50.3
NA-10	41.5
Francis	45.8
NA-7	44
Kanchan	30.2
NA-6	38.8
Chakiya	33.4

### 2.3 Propagation:

Seeds propagation which has been in practice has given lot of variation in the progenies. Hence vegetative propagation was resorted to. Building using 1 year old rootstocks through “T” method (shield) or patch method is successful. In-situ budding will be better than budding in nursery and transplanting the budded plants. To raise rootstock seedlings, from the fully ripe mechanically or by drying in sun and the seeds are extracted. The seeds are hard and take long time to germinate. The seeds should be treated with con. H<sub>2</sub>SO<sub>4</sub> for 3 minutes and then washed with water and soaked in 500 ppm of Gibberellic Acid for 24 hours. Such treated seeds can be sown in nursery bed or polybag filled with pot mixture.



Fig 3 Propagation of plant

### 2.4 Field preparation and planting:

After deep and thorough ploughing, pits of 1 cubic metre size can be dug at a spacing of 9mx9m during May – June and filled up with 10-15 kg of well decomposed FYM. Budded plant or seedlings for in-situ budding (especially in dry areas) can be planted at the onset monsoon rains.

Amla rust can be controlled by spraying dithane Z.78 to M.45 at 0.2%. Blue mould develops water soaked lesions on fruits which are ultimately covered by bluish green pustules. This can be checked by a weak solution of borax or sodium chloride.

## 2.5 Fertilizer:

**Table 2** Nutrient Requirement (gm/plant)

NITROGEN	PHOSPHORUS	POTASSIUM
100	50	100

The land preparation, apply 10 kg FYM and mix well with soil. Apply fertilizer dose of N:P:K in the form of nitrogen at 100 gm/plant, phosphorus at 50 gm/plant and potassium at 100 gm/plant. Fertilizer is given to one year old plant and increased constantly up to 10 years. Dosage level of fertilizers full dose of phosphorus and half dose of potassium and nitrogen are given as basal dose in the month of January-February. Remaining dose is given in the month of August. Sodic soils, boron and zinc sulphate at 100-500g is given as per tree age and vigour.

## 2.6 Intercultivation and irrigation:

Initially the tress is rootstock sprouts should be nipped off. The growth should be trained to develop a low headed one. At about 75 cm to 1 m height the first two main laterals are allowed to grow out. When the crops started bearing early year after the harvest of fruits, dead, diseased, weak and criss- cross branches should be pruned. The water sprouts and rootstock growth should be watched and periodically removed. During early stages of establishment, the plants should be watered periodically especially during summer. Fully mature trees are seldom watered. However, irrigation during April-June one in 15 days will help to encourage fruit set and prevent fruit drop. The black polythene mulch is most effective in reducing the irrigation requirement in aonla. The N.A7 (60.86%) with an annual water requirement of 777.6 litres per tree.

## 2.7 Plant protection:

Bark borer makes tunnels along the bark. It can be controlled by injecting kerosene oil in the holes and plugging with cotton and clay during September – October and February–March spraying with phosphomidon 0.03%. The shoot gall maker can be controlled by pruning the affected shoots and spraying 0.1% monocrotophos.

## 2.8 Harvesting:

Plants start yielding in about 7-8 years. Harvesting is done in the month of February when fruits are green in colour and have maximum ascorbic acid content. Harvest fruits are done by vigorous shaking of tree. Fruits are fully mature they turn into dull greenish-yellow colour. Seeds extraction process mature fruits are used.

## 2.9 Post Harvesting:

After harvest the fruits are grade based on the size. The fruits are packed in bamboo baskets or crates or wooden boxes. The less spoilage of crops (or) fruits perfect packing is done and quick transport is required. An Amla fruit has several products like amla powder, churna, chavanprash, arista and sweet preserves are made.

## III. PRODUCTS AND ITS APPLICATION:

The mature amla fruits are washing thoroughly under turbulent to remove dirt, dust and adhered unwanted material. The cleaned and washed amla are subject to cutting in a specialized machine. The pulp is filter with filtration techniques, after filtration going to standardization and pasteurization process. The pulp is stored or otherwise can be used for making other value added food products. Boiling amla pulp or direct cooking of amla fruits for making products like candy, and pickle or mouth freshener. The pulp can be used in making chayavanprash, juices, ready-to-serve beverages, fruit bar, amla sauce, cosmetic products, etc. Amla is used make bakery products also.

### 3.1 Amla bread:

Fresh amla fruits are imported from India. It was procured from the local market. The fruit was washed thoroughly in running warm water to remove adhering dust and other impurities, seeds removed, pulped in a blender and then taken for drying by sun drying. Initially water, sugar and yeast and mix well. The mixture stands for 10 mins. Seeds are removed from the amla and coarsely blend them with the syrup. In a greased mixing bowl, add the flours, salt and mixed well. Add the oil, egg, yeast mixture amla and knead for 8-10 minutes. Dough place in a well-greased container, covered in a warm place for 2 hours. Let rise for an hour. Bread dough baked at 180 C for 30 minutes. After cooling the bread was sliced.



Fig 4 Process flow for amla bread

### 3.2 Amla biscuits:

Biscuits are lowest cost processed foods in the country. It is choicest snack of children as well as adult alike. Dietary fibre, vitamin C and antioxidant enriched biscuits have been developed by incorporation of amla fruits (a by-product generated during amla juice processing) as one of the biscuits ingredients. The fibre enriched biscuits may be helpful in prevention of disease. The dietary fibre content of the finished product is about 5 times higher than the control while the vitamin C and antioxidant concentrations are 15.6 mg per 100g and 0.25 g per cent respectively. Biscuits have a shelf life of more than 6 months.

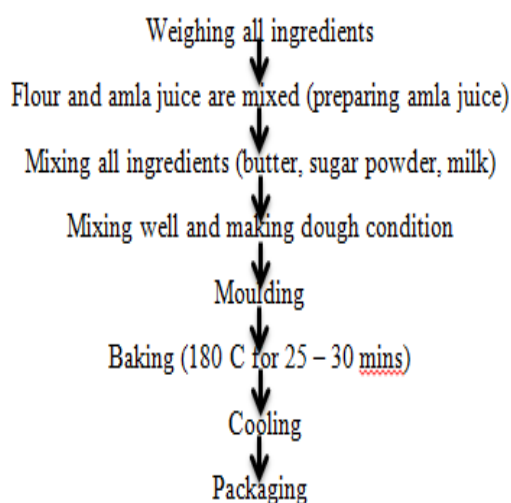


Fig 5 Process flow for amla biscuit

### 3.3 Amla Ice cream:

The ice cream was manufactured by amla fruit in the form of shreds, pulp, preserve, candy and powder. These are mixed during the freezing step. Amla products processed significantly influenced the composition of ice cream. Nowadays new varieties of ice cream are coming out in market. Amla has a sour and astringent taste after sweet taste. It is rich in carbohydrates, fats, proteins, some vitamins (A, D, E) and mineral calcium. Mostly ice creams are poor in natural antioxidants (vitamin C, antioxidants and phenolics).

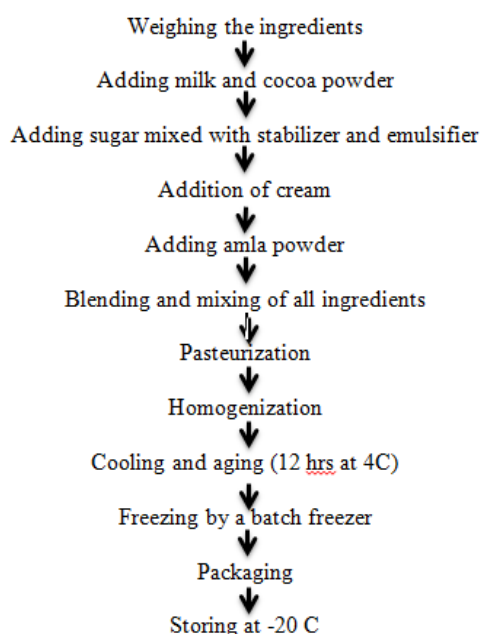


Fig 6 Process flow for amla ice cream

## IV. CONCLUSION

*Emblca officinalis* is the most widely used herb in the Ayurvedic system of medicine. It is useful for many severe diseases, including diabetes, respiratory disorder, diarrhea, heart diseases, and dental disease. It helps to improve memory power of human brain. Nowadays herbal product usage increased day by day. Amla products are low or no side effect all over the world. Therefore, our careful consideration must be needed for increasing the use of amla for the treatment of various diseases and its development of different products.

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