

Value Added Products from Annona Fruit

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Abstract: Sugar apple fruit (*Annona*) is a tropical fruit very prized for its pleasant, aromatic and distinctive flavor. Annonas are generally consumed as fresh fruits, but are also widely used in semi-processed and processed products. *Annona* is ideal for processing due in part to the high recovery of pulp, and also because of its properties, especially the exotic taste and smell. The fruit is an excellent source of energy as it is high in carbohydrate. The fruit contains vitamin C, minerals such as calcium, phosphorus and potassium. Products such as juice, jam, nectar are widely commercialized. A large number of chemical compounds, including flavonoids, alkaloids and acetogenins, have been extracted from *annona* seeds and many other parts of the plant. The aim of processing the pulps of ripe fruits to add value to these fruits, jams, nectar, and juice have been developed.

Keywords: Annonaceae, nutritional value, tropical fruits.

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I. Introduction

The Annonaceae includes approximately 50 genera. The main commercial species are the cherimoya (*Annona cherimola* Mill.), the hybrid atemoya (*Annona cherimola* Mill. x *Annona squamosa* L.), the sugar apple or sweetsop (*Annona squamosa* L.), known as *pinha, ata* or *fruta do conde* in Brazil and the soursop (*Annona muricata* L.), known as *graviola* in Brazil. The generic term 'custard apple' is to the first three fruits. The fruits of sugar apple, atemoya and soursop are oval or heart-shaped with tender soft pliable spines which breakup easily when the fruit is ripe. Jam processing is a fruit preservation method and adds value to overripe fruits. In Brazil the most common commercial tropical fruits jams are made with guava, mango and jaboticaba. There is no commercial jam of sugar apple till now. Fruits in its both raw and processed form have long been important items of human diet. Processing has some other advantages. Fruits are perishable products, and cannot be stored for a longer period of time. Through processing, the shelf life of such products can be increased. For instance, juices, jam, jellies and canned fruits stay for a longer period. This process not only enhances the life of perishable products but also creates a good market relative to that in raw form. It helps to withdraw the surplus produce from the market in the post harvest season, stabilizes the prices and assists in maintaining a stock of fruits to meet the demand in off-seasons.

II. Harvesting Techniques

Annona fruits are usually hand-harvested by cutting the stalk with pruning scissors, leaving 0.5 to 1 cm of it to avoid loss in weight and post-harvest fungal diseases. Depending on tree size some species, such as sugar apple or sour sop, are harvested by climbing the tree, using a ladder or a picking pole with a hook and a basket at its end. Soursop harvest is more difficult and time-consuming than other *annona* because trees are usually taller and fruits are larger. Soursop left on the tree will eventually fall off naturally and, on the ground, will become rotten and unmarketable. These fruits should be picked up and destroyed as they encourage pests and diseases to reproduce and spread throughout the orchard. The fruit is usually round, slightly pine cone-like, 6–10 cm (2.4–3.9 in) diameter and weighing 100–230 g (3.5–8.1 oz), with a scaly or lumpy skin. There are variations in shape and size. The fruit flesh is sweet, white to light yellow, and resembles and tastes like custard. The edible portion coats the seeds generously; a bit like the gooey portion of a tomato seed. Sugar-apple has a very distinct, sweet-smelling fragrance. The texture of the flesh that coats the seeds is a bit like the center of a very ripe guava (excluding the seeds). It is slightly grainy, a bit slippery, very sweet and very soft. The seeds are scattered through the fruit flesh; the seed coats are blackish-brown, 12–18 mm (0.47–0.71 in) long, and hard and shiny.



III. Processing

Pre-processing of Annona Fruit:

Firstly, the annona fruits are cut into two halves, the pulp and the seeds are removed manually. Then, the fresh pulp is placed in the containers. Alternatively, the pulp is blended with potassium metabisulphite (0.4g/kg) in a frozen storage or by adding potassium metabisulphite (0.8g/kg) at room temperature. Then it is placed in jars and stored for about 5 months. The pre- processing of annona fruit is given in Figures. 1. a and 1.b

Fig 1.a. Processing and Storage of fresh pulp

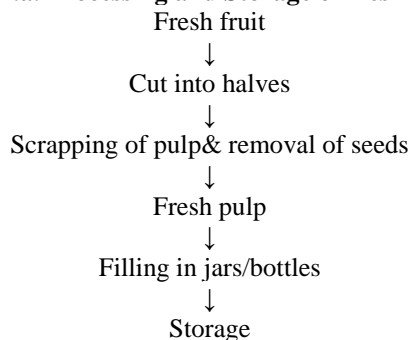
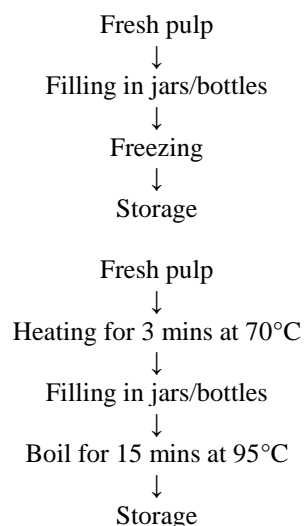


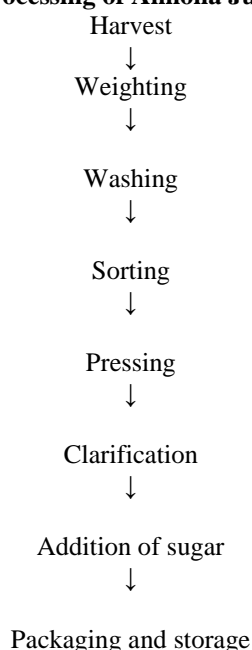
Fig 1.b. Processing and storage of frozen pulp



Annona Juice:

Annona juice is highly perishable when fresh, often spoiling within a day after being extracted. The annona juice processing is shown below. The pulp can be used for the juice extraction. The juice can be extracted with screw press, basket press or simple hand pressing; juice is strained through muslin cloth which is clarified by adding 1.4 gm of PVP (Poly Vinyl Pyrrolidone) per liter of juice. Juice is boiled with sugar and cooled. 10g sodium benzoate is added as a preservative. The mixture should be poured into well sterilized bottles, cork air tight with crown cork and store in a cool dry place.

Processing of Annona Juice



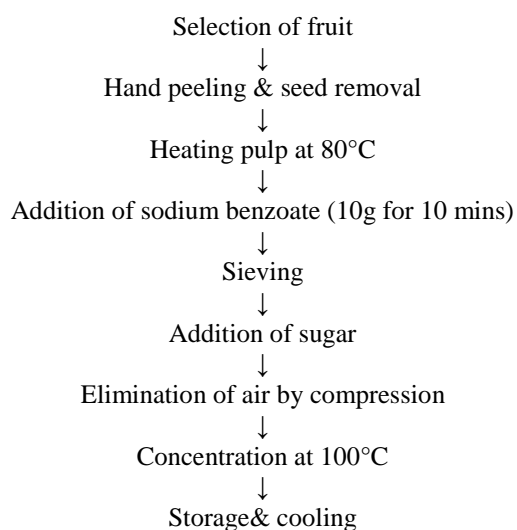
Annona fruit pulp concentrate:

Fruit should be selected, rinsed, and hand peeled, and the seeds removed. Heat pulp to 80°C for 1 minute then cool and determine soluble solids content (a measure of the sugars), using a refractometer or hydrometer. Add 10 g of sodium benzoate per 10 kg of pulp, blend for 10 minutes, then sieve. Add sugar and eliminate the air inside the pulp by compression, then concentrate it at 100°C for a few minutes. Place pulp into a storage container, cover, then cool, label and store it. Fruit should be hand-peeled and cored, as fruits have fragile skin, irregular shape and soft pulp, all of which limit machine processing. Fruit pulp processed below 93°C and frozen into polythene bags offers a high quality product with no loss of taste or smell. The annona juice processing is given in Fig.3.

Oxidation is a very common problem with processed annona pulp.

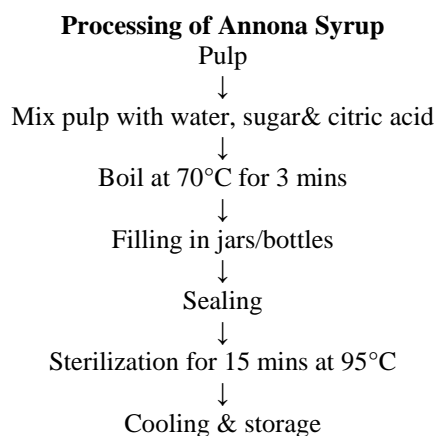
- To avoid oxidation, the pulp can be heated at 70°C for 20 minutes, and 0.5% of ascorbic acid can then be added.
- This preparation can be stored in polythene bags for one month at 5°C in a refrigerator.
- Frozen pulp should be kept at -18°C.

Processing of Annona Fruit Pulp Concentrate

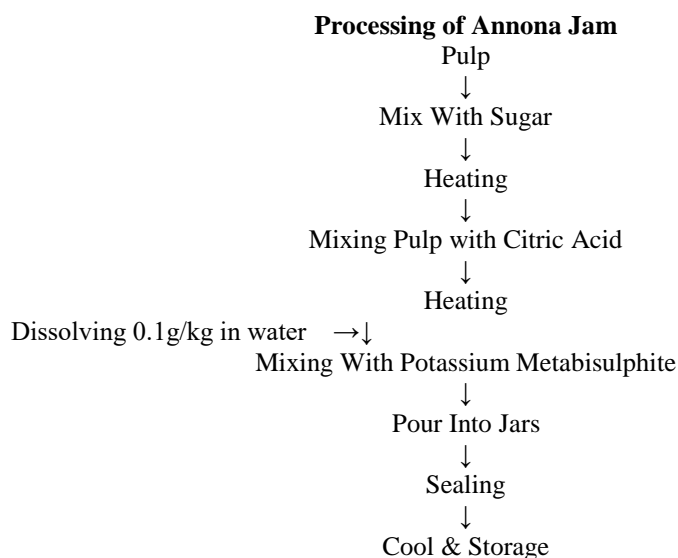


Annona syrup:

Extraction of juice and removal of astringency are done in the same way as in the pre-treatment of juice. Sugar is added at the rate of 0.37 kg for every litre of juice 1g citric acid per litre .then mix the pulp with water, sugar and citric acid and boil for 3 mins at 70°C. The clear syrup is cooled and filled in bottles. The bottles are sealed using crown caps and sterilized for 15 mins at 95°C. The process flow chart for Annona syrup is given below:

**Annona jam:**

Annona is thoroughly cleaned by washing with water. The skin is peeled and the seeds are removed manually. Then the pulp are crushed and mixed with sugar in the ratio of 1:1. then the mixture is boiled. A pinch of citric acid is added to improve the taste. The pulp is mixed with potassium metabisulphite (0.1g/kg in water). Finally it is stored well in sterilized jam bottles. The processing flow chart is shown below:

**IV. Conclusion**

Annona juice, being the highly nutritious food product that it is, merits closer attention because of its health obvious benefits and its economic potential for farmers, entrepreneurs and consumers. Furthermore, the fruit has medicinal properties. It is used for curing scurvy and diarrhoea, and it is effective in preventing cholera. Hence the value added products from annona is a new area of research for food technologist, industrialist and farmers and of course these products are a definite alternate solution for nutritional source.

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