JUST AGRICULTURE
multidisciplinary e-Newsletter

Processing of Indian Gooseberry (Aonla)

Riya Barthwal[1] and Shikha Jain[2]

[1]Department of Food Science and Technology, Govind Ballabh Pant University of Agriculture and Technology, Pantnagar, Uttarakhand-263153
[2]Division of Fruits and Horticulture, ICAR- Indian Agricultural Research Institute, New Delhi

ARTICLE ID: 066

Introduction

The aonla fruit, also known as Indian gooseberry (*Emblica officinalis* Syn. *Phyllanthus emblica* L.), is India's oldest minor fruit. It is endemic to India and belongs to the Euphorbiaceae family. The vitamin C content of Aonla fruit ranges between 200 and 900 mg/100g in the pulp of fresh fruit, making it the highest source of the vitamin (Goyal *et al*., 2008). The fruit, due to its sour and astringent taste, has very limited table value. The fresh fruits are generally not consumed due to their high astringency but it has got great potential in processed forms. The fruit is used to make ayurvedic tonics such as chavanprash, triphala, and others. Aonla fruits, on the other hand, are processed into a variety of food products such as preserves, jams, jellies, candies, toffee, pickles, sauces, squash, juice, RTS beverage, cider, shreds, dried powder, and so on, but they are not widely distributed (Singh *et al*., 2005).

Processing of Aonla and its Products

Blanching of aonla: Blanching is the process of heating and immediate cooling of raw products like fruits, vegetables, etc. which prevents non-enzymatic browning and retains better colour of processed product during storage, because of higher degree of inactivation of enzyme polyphenol oxidase. Blanching aonla fruit before processing has a significant impact on nutrient retention and numerous fruit quality parameters including as TSS, acidity, sugars and pectin (Geetha *et al*., 2006).

Extraction of aonla Juice: The juice is traditionally made by boiling the aonla fruits in water for 6–8 minutes, then physically removing the stone with a knife, cutting the segments, and pressing the segments manually with muslin fabric, followed by filtering, thermal processing, chemical treatment, bottling, and so on.

JUST AGRICULTURE
multidisciplinary e-Newsletter

Shredding: Destoning and shredding aonla fruit can be done in the same machine or by hand with a knife. Kapadi *et al*. (2001) developed a continuous motorized shredding cum stone extracting machine for aonla with handling capacity of 100 kg per hour.

Pulping: The shreds are pulverized or pulped after shredding to minimize the size and generate homogeneous pulp. Pulverizing aonla fruit shreds improves juice recovery by increasing the surface area of the shreds by breaking them down into smaller bits.

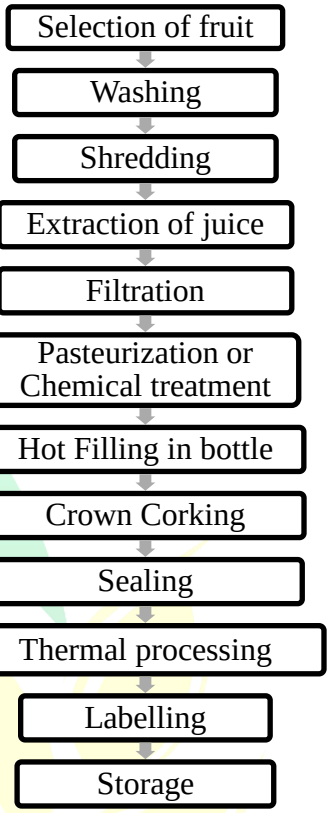
Juice extraction: To extract juice, the pulp is processed through a variety of devices (basket centrifuge, screw type juice extractor, hydraulic press, *etc*.) or muslin cloth.

Preservation of aonla juice: Freshly extracted juice, in fact, is more prone to spoiling than entire fruit. As a result, unheated juice quickly deteriorates microbially, enzymatically, chemically and physically. Microbial degradation must be the primary concern. The purpose of processing is to keep the natural quality of the initial fruit while minimizing unwanted reactions and, in some cases, increasing it. Chemical treatment and heat treatment of aonla juice has traditionally been used to preserve the juice.

Chemical treatment: Various concentrations of Class II preservatives have been used for preservation of fruit juices and pulps by many researchers. For 6 months, preserving aonla juice with SO_2 at 350 ppm as KMS and aonla pulp with 2000 ppm KMS results in lower vitamin C losses and lower enzymatic browning.

Thermal treatment: Time-temperature relationship is very critical in juice processing. Vitamin C is very sensitive for thermal treatments and degraded as the temperature of processing increases (Pant *et al*., 2004). Aonla juice treated at higher temperature and less time have better retention of ascorbic acid than treatment at low temperature for longer time. Researchers have looked at a wide range of temperature-time ranges for thermal treatments. For greater vitamin C retention, Jain *et al.* (2003) discovered this combination of pasteurization at 90 °C for 1 minute, cooling at 60 °C, and 350 ppm SO_2 as a preservative.

JUST AGRICULTURE
multidisciplinary e-Newsletter



Flow chart of aonla juice processing

Different Products made from Aonla

Aonla candy: Because of their great acceptance, nutritional content, and longer storage life, fruit candies are becoming increasingly popular. According to Singh and Pathak (1987), aonla fruit can be used to make high-quality candy with intermediate moisture content (IMF). When comparing the candy made from lye-peeled aonla fruits to the candy made from blanched fruits, it was discovered that the candy made from lye-peeled fruits had a lower concentration of ascorbic acid. The effect of blanching on some nutritional indicators, on the other hand, was less severe than that of lye peeling.

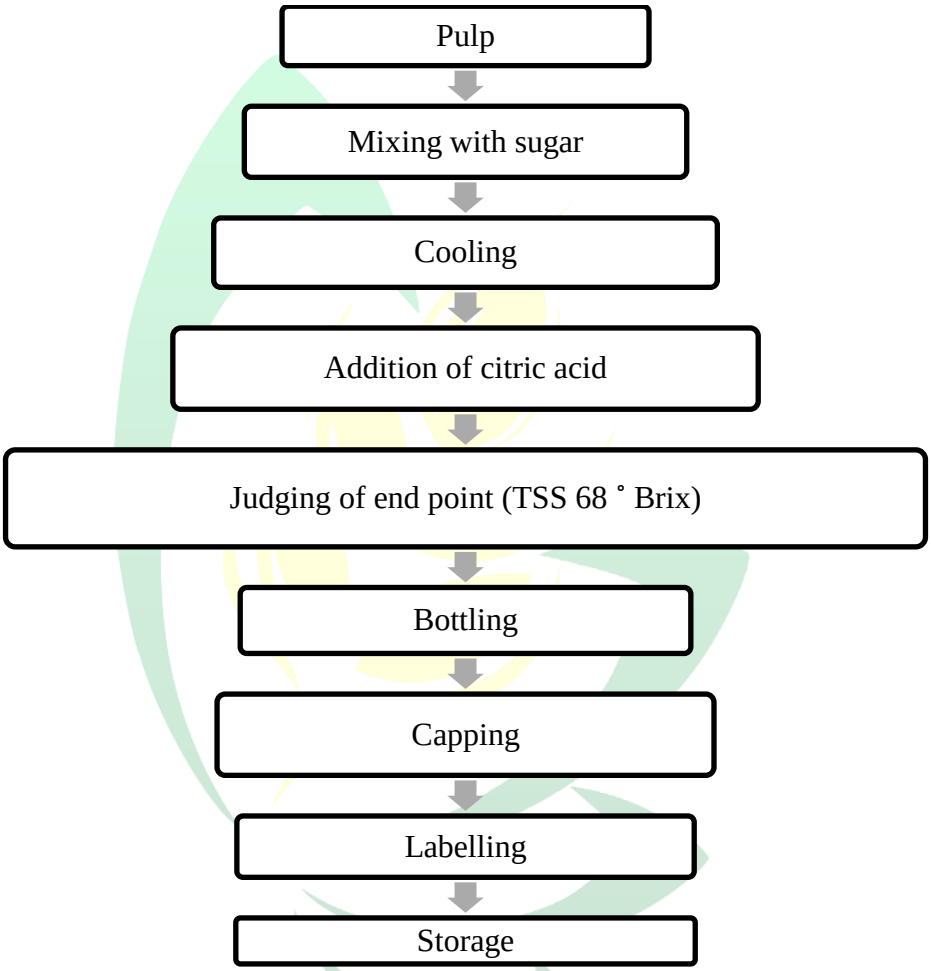
Aonla candy

Aonla jam

Aonla powder

JUST AGRICULTURE
multidisciplinary e-Newsletter

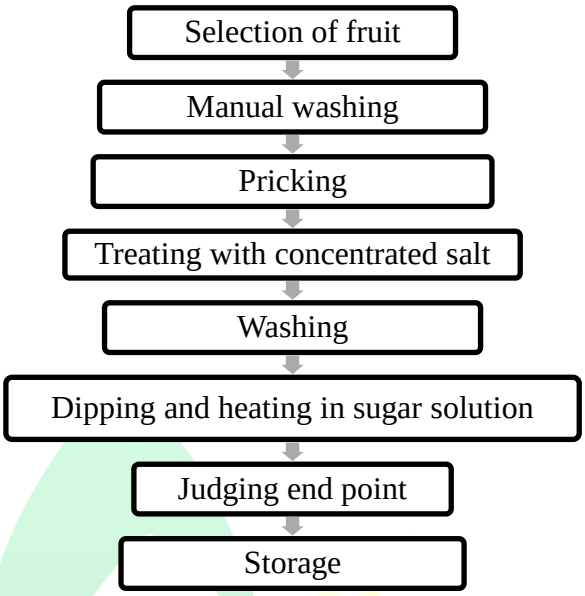
Aonla jam: A minimum of 45 % pulp, 68 % total soluble solids, and 0.5 % acidity are required in the perfect fruit jam. The greatest jam may be made with fruit varieties that have low fibre content and a high pulp percentage (Kaushik *et al*., 2011). To make aonla jam, firstly the pulp is separated from the fruit. This pulp is combined with the appropriate amount of sugar and citric acid, then boiled to the required consistency. The end point is determined using a refractometer (68 °Brix) or a drop or sheet test.



Flow chart for preparation of Aonla Jam

Aonla murabba: In India, preserves or murabbas of various kinds are used for taste as well as for medicinal purpose. It is known to provide energy to the heart, brain and liver. It is also said to be effective at stopping diarrhoea and treating giddiness.

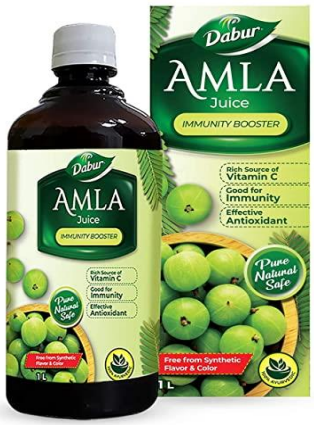
JUST AGRICULTURE
multidisciplinary e-Newsletter



Flow chart for preparation of aonla murabba

Aonla murabba

Chyawanprash



Aonla juice

Conclusion

The characteristics of aonla fruit differ depending on the locale and variety. The current article discusses the physico-chemical composition of aonla, as well as the importance of aonla and its therapeutic capabilities, as well as the many procedures for extracting aonla juice from aonla fruit. It also looks at how different processing methods, such as blanching, heat treatments, and chemical treatments, affect the physico-chemical features of aonla and aonla juice. Aonla, with its diverse product portfolio, can build an export market and offers promising export prospects in both fresh and processed forms.

JUST AGRICULTURE
multidisciplinary e-Newsletter

References

Geetha, N.S., Kumar, S. and Rana, G.S. 2006. Effect of blanching on physico-chemical characteristics of aonla. *Haryana Journal of Horticulture Science*, 35: 67-68.

Goyal, R.K., Patil, R.T., Kingsly, A.R.P., Himanshu, W. and Pradeep, K. 2008. Status of post-harvest technology of aonla in India – a review. *American Journal of Food Technology*, 3: 13–23.

Jain, S.K., Khurdiya, D.S., Gaur, Y.D. and Lodha, M.L. 2003. Thermal processing of aonla (*Emblica officinalis*) juice. *Indian Food Packer*, 57: 46-49.

Kapadi, S.S., Bhalodia, V. B. and Joshi, D. C. 2001. Motorized shredding-cum-stone extracting machine for aonla. *Beverage and Food World*, 28 (8): 43-44.

Kaushik, R.A., Pareek, S. and Rathore, N.S. 2011. Aonla (*Emblica oficinalis*): post harvest handling and processing technology, Rajasthan Coll. Agric., Techn. Bull. No.1, Udaipur, India, 45 p.

Pant, K., Dhawan, S.S. and Dhawan, K. 2004. Effect of pre-drying treatments on nutritional quality of aonla (*Emblica officinalis*). *Indian Food Packer*, 58: 67-70.

Singh, I.K. and Pathak, R.K. 1987. Evaluation of aonla (*Emblica officinalis*) varieties for processing. *Acta Horticulturae*, 208:173–177.

Singh, V., Singh, H.K. and Chopra, C.S. 2005. Studies on processing of aonla (*Emblica officinalis*) fruits. *Beverage and Food World*, 32: 50-52.