



E-ISSN: 2278-4136

P-ISSN: 2349-8234

www.phytojournal.com

JPP 2021; 10(1): 1331-1337

Received: 23-10-2020

Accepted: 05-12-2020

ML Jat

Department of Horticulture,
College of Agriculture, CCS
HAU, Hisar, Haryana, India

JS Shivran

Department of Horticulture,
College of Agriculture,
GBPUAT, Pantnagar,
Uttarakhand, India

RK Jat

Department of Fruit Science,
College of Horticulture, SDAU,
Jagudan, Mehsana, Gujarat,
India

Pragati

Department of Fruit Science,
MHU, Karnal, Haryana, India

Commercial products of aonla fruits, increasing the value addition

ML Jat, JS Shivran, RK Jat and Pragati

DOI: <https://doi.org/10.22271/phyto.2021.v10.i1s.13531>

Abstract

Present time need to more and emphasize supply of food for fulfill the increasing demand of food for the large population of the world. The value-added products of aonla are rich source of fiber, vitamins, minerals, anti-oxidants and have therapeutic values along with the medicinal values. However, they play an important role for the supply in sufficient amount of vitamins and minerals to meet the daily requirement of healthy human body. Development of value-added products of aonla like dried and dehydrated fruits, ready-to-serve, squash, candies, pickles and powders and condensed fruit juices provide enterprises for the peoples through the made big industries for the processing. Demand for aonla fruit value added products and profits could be increased through formation of small self-help groups one their training station. However, still awareness on benefits, their addition and market promotion is required.

Keywords: Aonla, Processing, Value added products, ready-to-serve, squash

Introduction

Aonla (*Emblica officinalis* Gaertn.) also known as Indian gooseberry, neli, amalkamu and wonder fruit for health and it is native of India, Srilanka, Malaysia and China (Kalra, 1988) [9]. The Aonla fruit valued for its nutritional and medicinal properties. It is a rich source of ascorbic acid (600-700 mg/100 g of pulp) and contains more ascorbic acid than that of citrus fruits (Chadha, 1992) [2]. Aonla fruit is also more valued for its antiscorbutic, diuretic, laxative and alternative antibiotic properties and used in Ayurvedic and Unani system of medicines since old age (Khan and Moheet, 1958; Tripathi *et al.* 1979) [10, 29]. The ripen fruits are widely used for preparation of ayurvedic medicines *i.e.* Chavanprash, Triphala, Ashokarishta, and Triphalamin (Pathak and Singh, 1988) [17].

Aonla plant parts are used for medicinal purpose like the fresh or dry fruits are used for the treatment of diarrhea, jaundice and inflammations (Deokar, 1998) [4], dispel headache and dizziness by the pulp of the fruit is smeared on the head (Perry, 1980) [18], fruits have been also used for fever and inflammatory treatments in its growing areas. The earlier study have demonstrated potent anti-microbial (Ahmad *et al.*, 1998) [1], anti-oxidant (Rege *et al.*, 1999) [21], hepatoprotective (Jeena *et al.*, 1999) [7], anti-tumour (Jose *et al.*, 2001) [8] and anti-ulcerogenic activities (Sairam *et al.*, 2002) [22]. Its fruit have excellent therapeutic value which is utilized for treatment of several diseases from ancient times in the fruits of aonla. Asthma, bronchitis, scurvy, diabetes, anemia, weakness of memory, cancer, tension, influenza, cold, loss and grayness of hair etc. (Kumar *et al.*, 2016) [12]. Ethanol and aqueous extract has shown significant anti-inflammatory activity (Sharma *et al.*, 2003) [23]. Aonla fruits used to prepare ready-to-serve beverage candy, powder, pickle, preserve, juice, shreds, dried powder etc. (Deka *et al.*, 2001) [3]. High astringency found in the fresh fruits and generally not consumed freshly but it has got great potential in processed forms (Ranote and Singh, 2006) [20].

Screening of Varieties for Processing

Singh *et al.*, 2004 [24] reported that the NA-6 variety found better attributes for processing of various value added products of economic importance and Chakaiya suitable for beverages (nectar, squash and syrup) and jams were as Banarasi showed its suitability for candy and pickle preparation evaluated by Nath and Sharma, 1998 [20].

Advantages of Processing

Aonla fruits have perishable nature and the postharvest losses in aonla vary from 30 per cent to 40 per cent, which reduces the market value. Storage of the fruits for the long times possible only through the processing of fruits and manufacture the value added products. Processing not only declines the post harvest losses but also provides higher returns to the growers.

Corresponding Author:**ML Jat**

Department of Horticulture,
College of Agriculture, CCS
HAU, Hisar, Haryana, India

Aonla value added fruit products are processed in big industries. Aonla fruits processing helps in converting perishable fruits with higher value in to durable form for the long term storage.

Aonla fruits, which are very difficult to eat out of hand, can be processed in to a range of highly acceptable fruit product. The processed products are helps in reducing fruit wastage and increasing nutritive value.

Methods of Processing of Fruits into Products

Aonla and other fruits are processed by the different specific methods. These methods are named as below,

- i. Preservation by heat treatment.
- ii. Aseptic packaging.
- iii. Preservation of by removal of heat.
- iv. Quick freezing.
- v. Preservation by removal of moisture.
- vi. Preservation by addition of chemicals and
- vii. Minimal processing.

AONLA Value Added Products

In recent years, aonla fruits are processed into different value added products such as jam, jelly, syrup, sauce, chutney, preserve, candy, osmo-air dried aonla slices, pills, pickle, shreds and supari (Rakesh *et al.*, 2004) [19]. Some important value added products are descried below;

Aonla Jam

It is a concentrated fruit product abundant in natural fruit flavour, processing a fairly heavy form. Varieties which have low fiber content and higher pulp percentage highly suitable for the best quality jam can be preparation (Pareek *et al.*, 2011) [16]. Pectin in fruit provides it a good set and high concentration of sugar assists preservation of jam. Preparation of jam by the boiling of pulp and juice with adequate amount of sugar to a sensibly thick consistency to hold the fruit tissues in position. Generally, for the preparation jam contains 45 per cent of fruit portion and 68 per cent of total soluble solids (TSS).

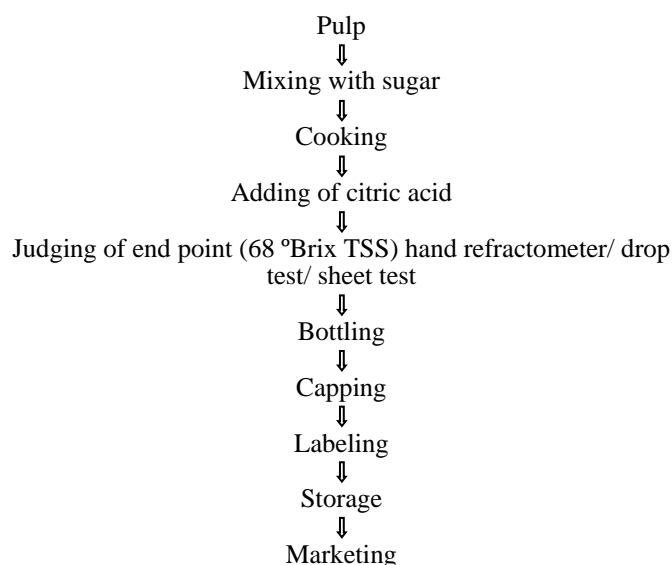


Fig 1: Technological flow chart for the preparation of Jam

Aonla Sauce

Cooking a sauce takes longer time than chutney because in case of sauce, fine pulp or juice is used. Five kg of sauce containing 50 per cent aonla pulp and 50 per cent tomato pulp with 75 g sugar, 10 g salt, 60 g onion, 6 g garlic, 12 g ginger, 5 g red chillies and 12 g hot spices were prepared. Aonla sauce have high storage period and it is also greatly adequate even later the storing period of above 9 months (Ranote and Singh, 2006) [20].

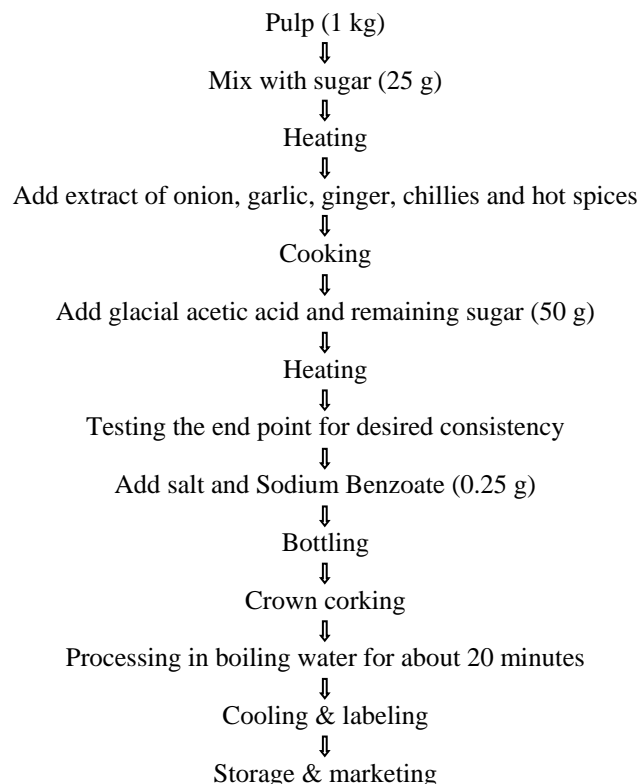


Fig 1: Technological flow chart for the preparation of Sauce

Aonla Chutney

It is usually hot, sugary, smooth spicy, mellow flavoured and delicious nature. For the increasing taste and nutritional value of its raising and dry fruits are also added.

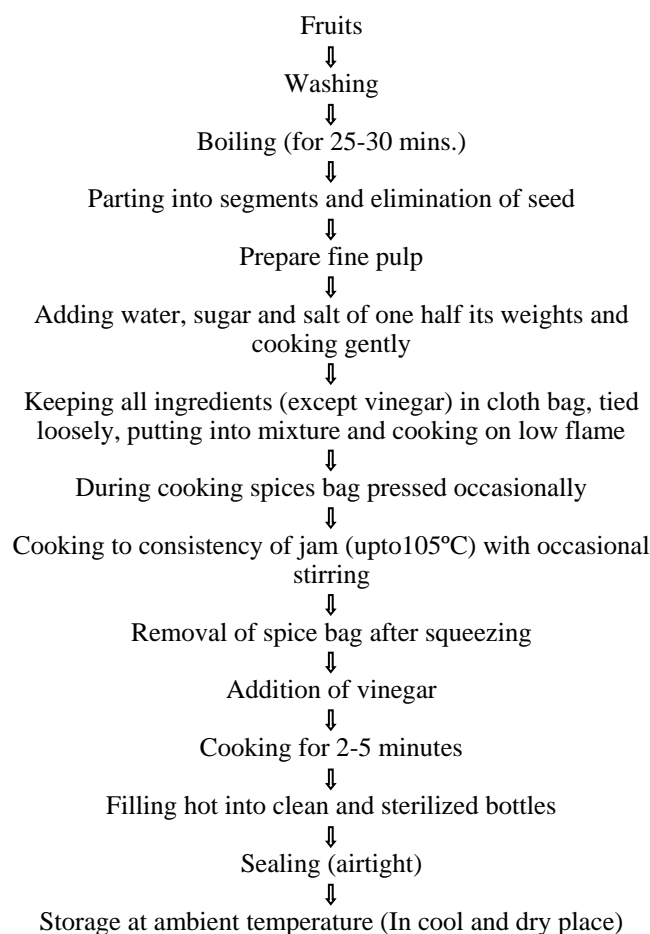


Fig 3: Technological flow chart for the preparation of Chutney

Aonla Preserve

It is a very common traditional product, other names is murabba in India. Aonla murabba beneficial for purifying blood, reducing the cholesterol level and refining eyesight (Ranote and Singh, 2006) ^[20].

It is prepared from matured, whole or in large pieces of fruit, in which sugar are soaked till it becomes tender and transparent. 55 per cent minimum fruit portion consisting preserve. Pricking/piercing done for the remove the astringency in aonla fruits after that sweetness increase by the allowing the syrup to go inside the fruits.

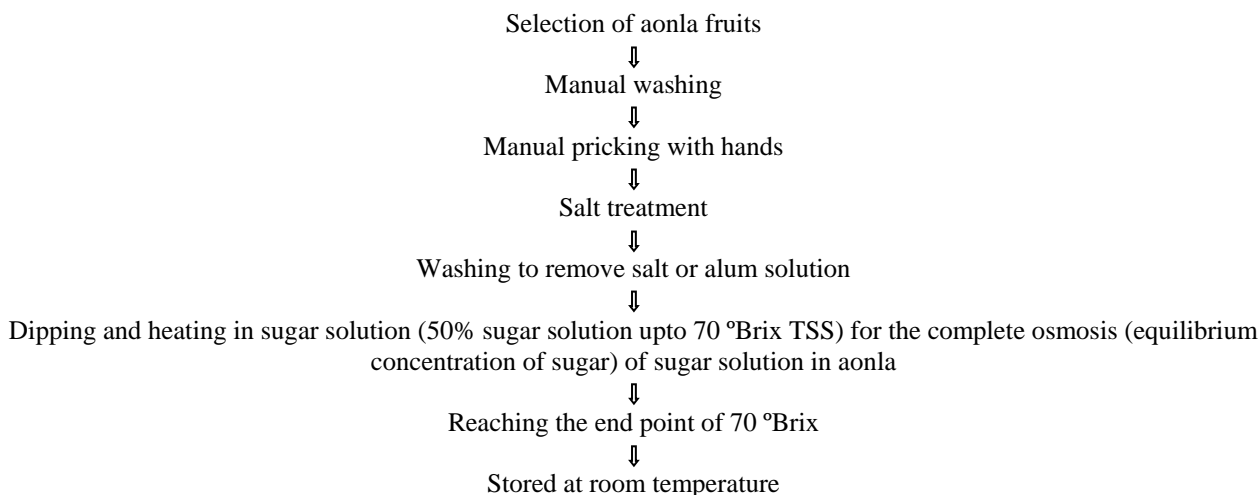


Fig 4: Technological flow chart for the preparation of Preserve

Aonla Candy

In fruit candies, Aonla fruit candies have gained popularity because of their some qualities like minimum volume, high acceptability, high nutritive value and longer storage life. These candies are also ready to eat snacks and least thrust provoking (Ranote and Singh, 2006) ^[20] while having maximum Brix as 75 % of total soluble solids. The recipe

contained 1 kg aonla fruit, 1 kg sugar and 1.5 kg water. Tandon *et al.* 2003 ^[26, 27] studied the effect of blanching and lye peeling on candy preparation. They found that the lye peeling affect more severe than blanching on some nutritional parameters and lye peeled candy fruits of aonla showed more decreased content of ascorbic acid.

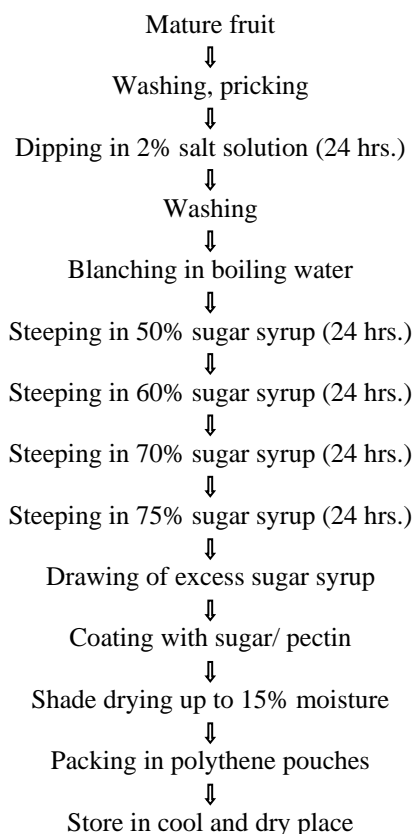


Fig 5: Technological flow chart for the preparation of Candy

Aonla Juice

Aonla fruits juice contains 1:1 ratio of crushed and pressed fruits (seed removed and blanched) and water. There are various treatment methods suggested by Jain *et al.*, 2003 [5] for longer duration storage of aonla fruits such as (A) Filling hot in pre-sterilized, hot glass bottles after pasteurization at 90 °C for 1 minute, (B) Adding 300 ppm SO₂ (KMS) and (C) A mixed method of pasteurization at 90 °C for 1 minute then cooling till 60 °C and addition of 350 ppm SO₂ before sealing in glass bottles.

It is also studied by Jain and Khurdia, 2009 [6] that ascorbic acid content and non-enzymatic browning in stored aonla fruits juice is affected by sulphitation and storage.

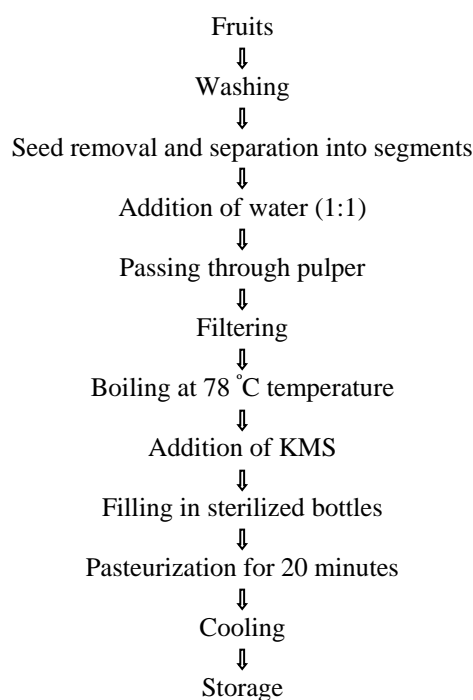


Fig 6: Technological flow chart for the preparation of Juice

Aonla Pickle

Pickling is the process of preservation of fruit or vegetables using common salt or vinegar. While spices and oil also provide added advantage for preservation. In most of the pickling 15% salt and 2% vinegar are added as to prevent spoilage and as preservative respectively.

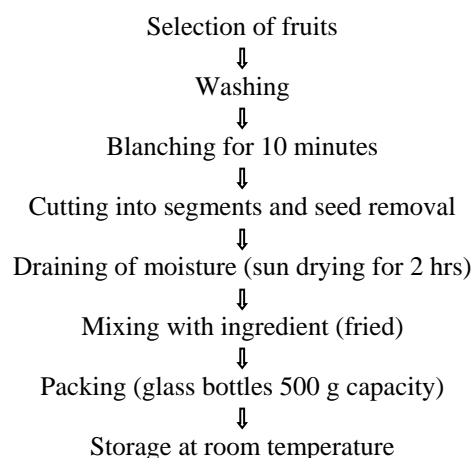


Fig 7: Technological flow chart for the preparation of Pickle

Aonla ready-to-serve (RTS)

Fruit beverages are well relished by all age groups of the society. It can help to reduce high cholesterol levels in our

blood. Functional beverages are drinks that have been enhanced with added ingredients to provide specific health benefits and disease preventing property beyond general nutrition. Aonla juice, lemon juice and ginger juice were utilized at various combinations with sugar and artificial sweeteners (aspartame and saccharine) for preparation of nutritious RTS beverages. During storage in RTS Tiwari and Deen also reported decreasing trend in overall acceptability of bael, guava and aloe vera.

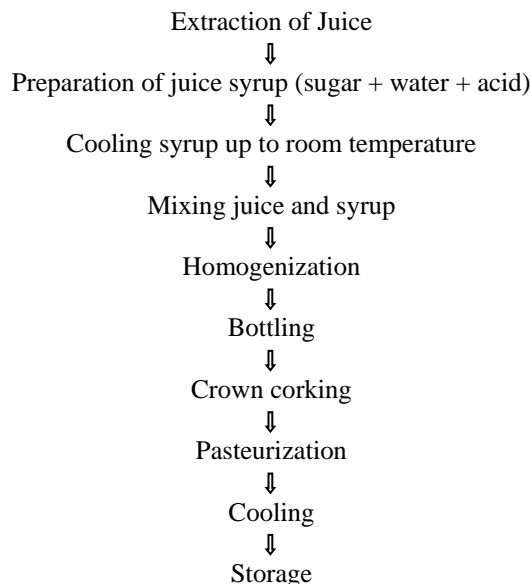


Fig 8: Technological flow chart for the preparation of RTS

Dried Products of Aonla Fruits

Osmo-Air Dried Aonla Slices

Osmo-air dried aonla slices is aonla fruits slices dipped overnight in sugar syrup of 70% concentration and then dried in an oven at 60 °C hot air for one day.

Osmo-Vac Dehydrated Aonla Segment

To overcome the astringency problem, the aonla fruits blanched in boiled 2 per cent NaOH (Alkali) solution for 5-8 minutes. Then to remove astringency and neutralize NaOH treatment effect treated fruits washed thrice in tap water and soaked in citric acid (0.1 per cent) for 20 minutes (Kumar and Sagar, 2012; Suresh and Sagar 2009) [11, 25]. Then blanched fruits is dipped in cold water for 2 minutes and weighed amount of aonla segments is suspended in 60 per cent sugar solution containing 0.05 per cent potassium Meta bisulphite (KMS) and 0.1 per cent citric acid in a stainless vessel to ease the process of manual separation of segments and removal of seeds. The temperature (60 °C) and sugar concentration (60 °Brix) of the solution were maintained at pre-set value. The ratio of fruits and osmotic solution was maintained at 1: 4 to ensure proper soaking of samples. Samples were withdrawn from osmotic solution after 6 hours of immersion, drained quickly and wiped gently with tissue paper to remove the adhering sugar solution from surface of the segments. The pretreated samples were spread on perforated aluminum tray load of 0.40 g/ cm² and were kept in vacuum drier 640 mmHg up to 9 per cent moisture of final product, then it air packed and stored at ambient temperature with 55-65 per cent relative humidity (Suresh and Sagar, 2009) [25].

Aonla Powder

Mishra *et al.*, 2009 [13] have been studied on Aonla powder from cultivar Chakaiya. Aonla fruits were cleaned and cut

into pieces, and immediately pressed to obtain juice using a small laboratory manual press. Juice were dried in five types of drier *viz.* freeze drying, sun drying, vacuum drying, spray drying and tunnel drying followed by grinding in a mixer grinder and filtration using muslin cloth. In all five methods they found that the freeze drying (Model Alpha 1-4, Martin Christ Germany at 16 °C for 16 hours) was best in respect of high retention of calcium, phosphorus, iron, ascorbic acid and colour followed by spray drier.

Aonla Pills

Aonla pills are prepared by drying aonla pulp mixed with ground cumin, ginger and sends salt. These pills are very delicious, digestive and rich source of vitamin C.

Aonla Shred

Aonla shred contains rich amount of vitamin C including dry form. In dried aonla, presence of the leucoanthocyanins or poly-phenols increases the stability of ascorbic acid. Aonla shred processing techniques includes grating of fruit into shreds after through washing and then adding 4 per cent salt and dry up to 15 per cent moisture content which make this technique very simple. Mostly 400-gauge polyethylene pouches are used for packaging and storage.

Aonla Supari

The traditional process to prepare Aonla supari have problem of darken in color and loss of ascorbic acid content because of drying the small pieces in sun light. A improved method have reported by Tandon *et al.*, 2003 [26, 27] in which fresh fruit is cut into 5-6 pieces and blanched in hot water for 5-6 minutes. Then osmosis process helps to extract water by salt treatment of blanched pieces. Then leach are removed and product is dried in tray drier at 60-70 °C. This method helps to retain about 50 per cent of ascorbic acid with improvement in the colour and texture.

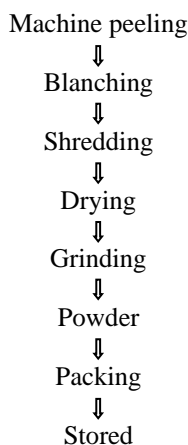


Fig 9: Technological flow chart for the preparation of Dried products

Ayurvedic Aonla Processed Products

Triphala

Triphala is an extensively acknowledged ayurvedic formulation for its innumerable health benefits, improving immunity and to aid in weight loss. It is a combination of three fruits - amalaki, bhibhitaki and haritaki and all these fruits are dried and powdered in accurate proportions for making Triphalachurna. Consumption of triphala daily on the empty stomach acts as a digestive cleanser, helps in liver function, flushes out toxins, enhancements immunity, treats dental problems like gum bleeding, gingivitis, mouth ulcers and plague. It is also useful for the treating computer vision syndrome in the form of drops.

Chyawanprash

Chyawanprash is aids in restoring health, vitality and acts as an aphrodisiac. A blend of various ingredients including aonla, ghee, sesame oil and honey, it helps in renewing and stimulating the body cells. Eat a spoonful of chyawanprash daily in the morning or mix it with milk for consumption act as a powerful immunity booster, encourages the production of hemoglobin, white blood cells and spleen besides toning muscles. It is used for respiratory health and to deal with problems related to fertility.

It revitalizes the metabolic functions and also cures to gas, cough and abnormality (Ojha *et al.* 1973) [15].

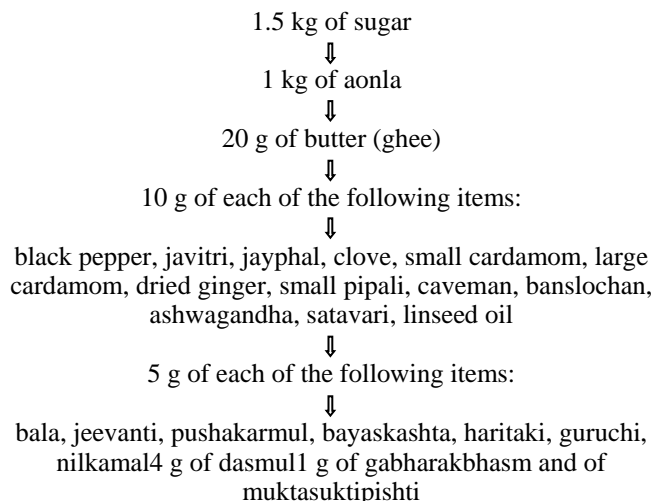


Fig 10: Technological flow chart for the preparation of Chyawanprash

Ashokarishta

Ashokarishta is an ayurvedic tonic that is mainly for hormonal balance in women. It is known as a 'natural' friend for women dealing with emotional and hormonal rollercoasters and it also increases fertility. The tonic is made by mixing Amalaki with other medicinal herbs like dhataki, musta, haritaki, jeera, jaggery, mango seeds along with the decoction made from Ashoka tree. It is rich in anti-inflammatory and analgesic properties and useful to treat pelvic inflammatory disease, eases menstrual cramps, prevents osteoporosis, depletion of minerals from the bones, promote digestions and boosting stamina.

KanchanarGuggulu

Kanchanar Guggulu is an ayurvedic formulation for treating hypothyroidism and joint pains. Preparation of the tablets from mixing amalaki along with the bark of kanchanar tree, ginger, black pepper, long pepper, haritaki, bhibhitaki, cardamom, cinnamon all in equal amounts.

New Aonla Fruit Products

Anola-ginger Toffee

Aonla-ginger toffee can be prepared from aonla pulp and ginger extract, using 80% aonla pulp, 20% ginger extract, 750 g sugar, 50 g skim milk powder, 50 g fat and 2 g common salt per kg pulp. Storage of toffee at ambient temperature with maintains good condition longer than 90 days.

Aonla mouth freshener

High nutritive and delicious mouth fresheners were prepared from dehydrated aonla pulp of 'Desi' and 'Banarsi' cultivars by mixing carboxy methyl cellulose, gums, arcanut, cardamom, sugar and milk powder at different proportion. Mouth freshener prepared with 50 per cent dehydrated aonla

pulp, 15 per cent fennel, 10 per cent arecanut and 20 per cent sugar.

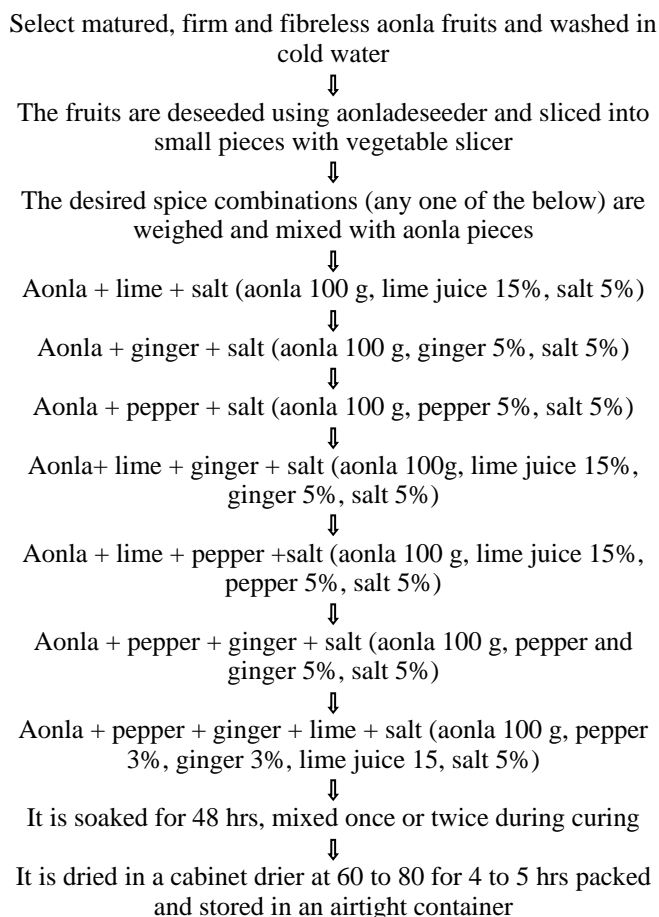


Fig 11: Technological flow chart for the preparation of Aonla mouth freshener

Aonla Juice for Hair

Drinking aonla juice daily is equally beneficial in stimulating hair growth. Regular intake provides immunity, strengthens hair follicles and adds volume to the hair, besides clearing dandruff.

Aonla Oil for Hair Care

Aonla is a must have ingredient in all herbal based hair care products and if your grandmother strongly recommended you apply aonla hair oil to stop hair fall, she has a reason because, aonla oil rich in carotene, iron and antioxidants, aonla oil not only rejuvenates hair follicles but also prevents loss of hair and baldness.

Conclusion

Consumers all the time welcome new products that are nutritious, attractive and delicately flavoured. A variety of products prepared from the aonla fruits would have great demand because of their nutritional value, attractive colour, exceptional flavor and therapeutic and medicinal value. Processing of aonla fruits can extend availability season and promote extensive marketing of the value added products. It would improve value, reduce wastages and ensure better utilization of the fruits.

Almost every day of their lives people consume and use an incredible variety of products prepared from the aonla fruits. The produce that the aonla fruit tree yield is used to manufacture a variety of products such as jam, candy, pickle, RTS, shred, supari, pills, etc. and some of the products, however, are already being traded in domestic as well as international markets.

References

- Ahmad J, Mehmood Z, Mohammad F. Screening of some Indian medicinal plants for their antimicrobial properties. *Journal of Ethnopharmacology* 1998;62:183-193.
- Chadha KL. The Aonla. *Indian Horticulture* 1992;37:4-8.
- Deka BC, Sethi V, Prasad R, Batra PK. Application of mixtures methodology for beverage from mixed fruit juice/pulp. *Journal of Food Science and Technology* 2001;38(6):615-618.
- Deokar AB. *Medicinal Plants Grown at Rajegaon*, first ed. DS Manav Vikas Foundation, Pune 1998, pp. 48-49.
- Jain SK, Khurdia DS. Ascorbic acid content and non-enzymatic browning in stored Indian gooseberry juice as affected by sulphitation and storage. *Journal of Food Science and Technology* 2009;46(5):500-501.
- Jain SK, Khurdia DS, Guar YD, Lodha ML. Thermal processing of aonla (*Emblia officinalis* Gaertn) juice. *Indian Food Packer* 2003;47(1):46-49.
- Jeena KJ, Joy KL, Kuttan R. Effect of *Emblia officinalis*, *Phyllanthus amarus* and *Picrorhiza Kurroa* on N-Nitrosodiethyl amine induced hepatocarcinogenesis. *Cancer Letter* 1999;136:11-16.
- Jose JK, Kuttan Y, Kutan R. Anti-tumour activity of *Emblia officinalis*. *Journal of Ethnopharmacology* 2001;75:65-69.
- Kalra CL. The Aonla. *Indian food packer* 1988;42:67-83.
- Khan MA, Moheet A. *Indigenous Drugs of India*. MalbaNizami, Kanpur 1958, pp. 3.
- Kumar PS, Sagar VR. Effect of concentration and temperature of osmotic solution on mass transfer kinetics and its influence on quality of aonla (*Emblia officinalis*) segments. *Indian Journal of Agricultural Sciences* 2012;82(4):318-322.
- Kumar R, Pathak S, Kumar AKU, Gautam DK. Studies on physico-chemical composition of aonla fruit (*Emblia officinalis* L.). *The Bioscan* 2016;11(4):2375-2377.
- Mishra P, Srivastava V, Verma D, Chauhan OP, Rai GK. Physicochemical properties of Chakiya variety of aonla (*Emblia officinalis*) and effect of different dehydration methods on quality of powder. *African Journal of Food Science* 2009;3(10):303-306.
- Nath V, Sharma RK. Screening of aonla (*Emblia officinalis* Gaertn.) cultivars for processing. *Progressive Horticulture* 1998;30(1 & 2):76-77.
- Ojha JK, Bajpai HS, Sharma PV, Khanna MN, Shukla PK, Sharma TN, *et al.* Chavanprash as an anabolic agent – Experimental study (Prelim. work), *J. Res. Indian Med* 1973;8(2):11-13.
- Pareek S, Rathore NS, Kaushik RA. Aonla (*Emblia officinalis* Gaertn.): Post harvest handling and processing technology, Rajasthan Collage of Agriculture, *Techn. Bull.* No. 1, Udaipur, India 2011, 45.
- Pathak RK, Singh BN. *Phal Phool* 1988;21:18-20.
- Perry LM. *Medicinal Plants of East and South East Asia: Attributed Properties and Uses*. MIT Press, Cambridge 1980.
- Rakesh, Arya SS, Moond SK. Processed products of aonla. *Processed Food Industry* 2004;7(4):20-23.
- Ranote PS, Singh S. Value added aonla products. The Schumacher Centre for Technology and Development Bourton-on-Dunsmore Rugby, Warwickshire, CV23 9QZ United Kingdom. Website: <http://practicalaction.org/practicalanswers>.
- Rege NN, Thatte UM, Dahanukar SA. Adaptogenic properties of six rasayana herbs used in Ayurvedic medicine. *Phytotherapy Research* 1999;13:275-291.
- Sairam K, Rao CV, DoraBabu M, Vijay K, Agrawal VK, Goel RK. Anti-ulcerogenic effect of methanolic extract

- of *Emblica officinalis*: an experimental study. Journal of Ethnopharmacology 2002;82:1-9.
23. Sharma SK, Perianayagam JB, Joseph A, Christina AJM. Anti-inflammatory activity of ethanol and aqueous extracts of *Emblica officinalis* Gaertn fruits. Hamdard Medicus 2003;XLVI:71-73.
 24. Singh V, Singh HK, Singh IS. Evaluation of aonla varieties (*Emblica officinalis* Gaertn.) for fruit processing. Haryana Journal of Horticultural Sciences 2004;33(1-2):18-20.
 25. Suresh KP, Sagar VR. Influence of packaging materials and storage temperature on quality of osmo-vac dehydrated aonla segments. Journal of Food Science and Technology 2009;46(3):259-262.
 26. Tandon DK, Kumar S, Diskhit A. Improvement in technology for aonla supari. Processed Food Industry 2003;6(8):23.
 27. Tandon DK, Yadav RC, Sood S, Kumar S, Dikshit A. Effect of blanching and lye peeling on the quality of aonla candy. Indian Food Packag 2003;57(6):147-149.
 28. Tiwari DK, Deen B. Preparation and storage of blended ready-to-serve beverage from bael and aloe vera. The Bioscan 2015;10:113-116.
 29. Tripathi VK, Singh RN, Tiwari CM, Upadhyay BM. Indian Medical Yoga Homeopathy, 1979;14:156-169.