Int.J.Curr.Microbiol.App.Sci (2019) *8*(12): 433-438

International Journal of Current Microbiology and Applied Sciences
ISSN: 2319-7706 **Volume 8 Number 12 (2019)**
Journal homepage: http://www.ijcmas.com

Original Research Article https://doi.org/10.20546/ijcmas.2019.812.058

Value Addition of Aonla (*Emblica officinalis*) Murabba with Cardamom

Dharmendra Singh*, Vijay Bahadur, Deena Wilson, Samir. E. Ttopno and Anita Kerketta

Department of Horticulture, Naini Agriculture Institute, Sam Higginbottom University of Agriculture, Technology & Sciences, Prayagraj (UP), India

**Corresponding author*

Keywords

Aonla fruit, TSS, Acidity, Total sugar, Flavor, Storage

Article Info

Accepted:
07 November 2019
Available Online:
10 December 2019

A B S T R A C T

The present investigation entitled "Value addition of Aonla (*Emblica officinalis*) murabba with herbal product cardamom" was carried out in Post-Harvest Lab, Department of Horticulture, Sam Higginbottom University of Agriculture Technology and Sciences, during the winter season of the year 2018-2019. The experiment was laid out in CRD with 10 treatments and 3 replications for preparation of Aonla murabba. T_8-(Cardamom 1.5%) + (Sugar 70%) proved to be the best in terms of TSS (58.0 °Brix), ascorbic acid (114.3 mg/100g) (6.23), Acidity (0.657 %), Fibre % (9.2) and total sugar (55.5 %).Whereas T_6 [Apple cheese + Lemon grass extract (0.75%)] was proved to be best in terms of sensory score like Colour (8.1), flavor (7.3), texture (9.5) and Over All Acceptability (8.6) the maximum cost : benefit ratio was observe in treatment T_7.

Introduction

Aonla is an important fruit crop indigenous to Indian sub-continent, which can be grown successfully in dry and neglected regions. The area under aonla has has been expanding rapidly in the last couple of years. Aonla is one of the oldest Indian fruits and considered as "*Wonder fruit for health***"** because of its unique qualities**.** It is a rich source of Vitamin C and its content of ascorbic acid is next to only that of Barbados cherry (*Malpighia glabra L.*). In India, aonla is grown in an area of about 50,000 ha with a production of around 2, 00,000 metric tonne. A fully mature aonla tree may yield 250-300 kg of fruit annually. The area under aonla (Indian gooseberry) has been expanding rapidly in the last couple of years. From about 3,000 ha in the early 80s the area had stretched to over 25,000 ha in 2000. It has doubled to 50,000 ha in the last two years. Aonlaor amla (*Emblica officinalis*), popularly known as the Indian gooseberry, is a small-sized, minor subtropical

fruit and grows widely along the hillsides and sub-mountainous areas of North India. It can be grown successfully in dry and neglected regions owing to its hardy nature, suitability to various kinds of wasteland. A mature aonla tree can tolerate freezing as well as high temperature of 46 °C.

The major Aonla producing States in India are Rajasthan, Uttar Pradesh, Gujarat, Tamil Nadu, Maharashtra, Andhra Pradesh, Karnataka and Bihar. Aonla is one of the important non-traditional fruit of Indian origin having immense potentiality of cultivation on marginal lends. Aonla is not consumed as fresh in its raw state due to its highly acidic and astringent taste. It is an edible fruit indigenous to tropical India. It is grown in diverse climate and soil conditions. The storage of Aonla depends on maturity at harvest.

The fruit keeps well in cool chamber for 17-18 days compared to 8-9 days at ambient temperature. Rich source of Vitamin C and has a medicinal and therapeutically value and frequently recommended for the treatment of common cold, cancer and heart diseases. It has superior antioxidant activity. Their trees continue to bear fruits till 60-70 years of age. Fruit season is short and usually October to January.

The main cultivated varieties are Banarasi (Drying), Bansi Red, Chakaiya (Pickle, Candy and Syrup), Desi, Krishna (Candy and Jam), Kanchan/NA-4 (Candy and Jam), Francis (Hathijool), NA 6, NA-7 (Candy and Jam), NA-8, NA-9, NA-10, Anand-7 (Pickle) and Pink tinged (Rakesh *et al*., 2004). The fruit is used as an antiscorbic, diuretic and laxative (Singh and Pathak 1987), hence used for treating common cold, gastric troubles, acidity and scurvy (Tandon *et al.,* 2003), dysentery and bronchitis, diabetes, diarrhoea, jaundice and dyspepsia (Bhosale *et al.,* 2000) and coughs, asthma, headache, ophthalmic disorders, colic, flatulence, skin diseases, leprosy, and greyness of hair etc. This fruit is extensively used in the preparation of Ayurvedic and Unani medicines like Chyavanprash, which promotes health and longevity (Rajkumar *et al.,* 2001). It contains 500-1500 mg of ascorbic acid per 100g of pulp. The gallic acid present in Aonla fruit has antioxidant properties. The fruit is a very good source of Vitamin C containing chemical substances called lucoenthocyanin and polyphenols which retard the oxidation of Vitamin C. The main objective of the review is to highlight its uses, existing processing methods and their limitations and further propose to develop pilot plant for aonla processing

Materials and Methods

The present experiment was conducted with the objective of assessing the qualitative changes in Aonla murabba during storage, work out economics of different treatments for "Value addition of Aonla (*Emblica officinalis*) murabba with herbal product cardamom".

Preparation of aonla murabba is as standard process followed by using cardamom at different concentration. The aonla murabba filled in glass jar was kept at ambient temperature and evaluated at 0 to 90 days of storage.

The detail of the materials and methods used in this experiment is given below:

Results and Discussion

Total soluble solids (ºBrix) in Aonla murabba increased gradually during ambient storage conditions and maximum TSS was recorded with the combined treatment of Aonla murabba with T_8- (Cardamom 1.5% + Sugar 70%) 56.2, 56.9, 58.3 58.0 at initial 30,60 and

90 days, respectively and minimum in control (Khusbu *et al.,* 2017). Acidity % in Aonla murabba decreased gradually during ambient storage conditions and maximum Acidity % recorded with the combined treatment of Aonla murabba with T_8- Cardamom 1.5% + Sugar 70%) i.e..467, 0.453, 0.447and 0.440 at initial 30,60 and 90 days respectively and minimum in T_0- (No herbal product) 1.855, 1.784, 1.667 and 1.660 in initial to 90 days respectively. Patel *et al.,* (2014). Total sugar % recorded with the combined treatment of Aonla murabba with T_8- (Cardamom 1.5%) + (Sugar 70%) 53.0, 52.9, 54.5 and 55.5 in initial to 90 days respectively and minimum in T_0- (No herbal product) 47.7, 50.4, 50.9 and 51.7 in initial to 90 days respectively. Bishnoi *et al.,* (2018) Fibre % in Aonla murabba increased gradually during ambient storage conditions and maximum Fibre % recorded with the combined treatment of Aonla murabba with T_8- (Cardamom 1.5%) + (Sugar 70%) 4.0, 5.4, 7.5 and 9.2 in initial to 90 days respectively and minimum in T_0- (No herbal product) 1.2, 1.5, 2.5 and 2.8 in initial to 90 days respectively (Patel *et al.,* 2013).

Ascorbic acid (mg/100g) of Aonla murabba increased gradually during ambient storage conditions and maximum Fibre % recorded with the combined treatment of Aonla murabba with T_8- (Cardamom 1.5%) + (Sugar 70%) 109.5, 114.5, 113.5 and 114.3 in initial to 90 days respectively and minimum in T_0- (No herbal product) 87.77, 91.4, 96.0 and 98.8 in initial to 90 days respectively. Ascorbic acid (mg/100g) of Aonla murabba increased gradually during ambient storage conditions and maximum Fibre % recorded with the combined treatment of Aonla murabba with T_8- (Cardamom 1.5%) + (Sugar 70%) 109.5, 114.5, 113.5 and 114.3 in initial to 90 days respectively and minimum in T_0- (No herbal product) 87.77, 91.4, 96.0 and 98.8 in initial to 90 days respectively (Vikram *et al.,* 2012). The highest organoleptic score for colour and appearance of Aonla murabba recorded with the combined treatment T_8- (Cardamom 1.5% + Sugar 70%) 9.7, 9.0, 8.5 and 8.1 in initial to 90 days respectively and minimum in T_0- (No herbal product) 7.8, 7.2, 6.9, and 6.0 in initial 30, 60, and to 90 days after storage 90 days respectively (Tripathi *et al.,* 1988; Kumar and Singh, 2001) (Table 1–3).

Table.1 Treatment combinations

Treatments	Combinations
T_0	No herbal product
T_1	(Cardamom 0.5%) + Sugar 65%
T_2	(Cardamom 0.5%) + Sugar 70%
T_3	(Cardamom 0.5%)+ Sugar 75%
T_4	(Cardamom 1.0%)+ Sugar 65%
T_5	(Cardamom 1.0%) + Sugar 70%
T_6	(Cardamom 1.0%)+ Sugar 75%
T_7	(Cardamom 1.5%)+ Sugar 65%
T_8	(Cardamom 1.5%) + Sugar 70%
T_9	(Cardamom 1.5%)+ Sugar 75%

Table.2 Change in TSS (ºBrix), Acidity (%), Total Sugar (%), Fibre Percentage, of Aonla murabba during storage at ambient conditions

Treatment	T.S.S.				Acidity				Total sugar				Fibre percentage			
	Initial Value	30	60	90	Initial Value	30	60	90	Initial Value	30	60	90	Initial Value	30	60	90
T_0	51.4	53.4	54.4	54.8	1.855	1.784	1.667	0.660	47.7	50.4	50.9	51.7	1.2	1.5	2.5	2.8
T_1	54.4	55.5	56.3	57.0	0.757	0.761	0.627	0.621	51.2	51.7	53.5	54.4	2.2	3.8	5.3	5.9
T_2	54.6	56.3	56.6	57.4	0.747	0.740	0.637	0.617	51.4	52.2	53.6	54.5	2.3	4.4	5.8	6.4
T_3	52.4	54.2	55.6	56.3	0.591	0.543	0.537	0.513	49.2	51.1	51.5	51.8	1.7	2.3	3.0	3.4
T_4	55.4	56.4	57.1	57.5	0.767	0.763	0.633	0.627	51.7	52.3	53.9	54.6	3.0	4.6	5.9	6.8
T_5	55.5	56.5	57.6	57.6	0.773	0.767	0.643	0.623	52.1	52.4	54.1	54.8	3.1	4.7	6.9	7.7
T_6	53.2	55.0	56.0	56.2	0.657	0.743	0.627	0.613	50.8	51.3	52.7	53.9	1.9	3.2	4.1	4.7
T_7	55.8	56.6	57.8	57.8	0.797	0.775	0.657	0.640	52.6	52.6	54.2	55.2	3.9	4.8	7.1	7.8
T_8	56.2	56.9	58.3	58.0	0.467	0.453	0.447	0.440	53.0	52.9	54.5	55.5	4.0	5.4	7.5	9.2
T_9	53.9	55.3	56.1	56.8	0.723	0.753	0.627	0.613	51.1	51.4	53.1	54.2	2.1	3.5	4.8	5.5
F test	NS	S	S	S	NS	S	S	S	NS	S	S	S	NS	S	S	S
S.Ed	1.64	0.83	0.91	0.80	0.11	0.03	0.02	0.01	1.47	0.60	0.84	0.81	0.88	0.61	0.84	0.90
CD at 5%	3.42	1.73	1.90	1.66	0.23	0.07	0.04	0.02	3.06	1.25	1.75	1.69	1.83	1.26	1.75	1.88

Table.3 Change in Ascorbic Acid (mg/100g), Colour and Appearance, Texture and Body, Flavour Taste of Aonla murabba during storage at ambient conditions

Treatment	Ascorbic Acid				Colour and Appearance				Texture and Body,				Flavour Taste			
	Initial Value	30	60	90	Initial Value	30	60	90	Initial Value	30	60	90	Initial Value	30	60	90
T_0	87.7	91.4	96.0	98.8	7.8	7.2	6.9	6.0	5.9	6.2	6.5	6.8	7.1	6.3	5.6	4.8
T_1	96.2	98.4	100.6	104.0	8.8	8.3	7.7	6.7	6.8	7.2	7.8	8.0	8.0	7.1	6.8	6.5
T_2	98.6	103.84	105.1	107.8	8.9	8.5	7.9	7.0	7.1	7.5	7.9	8.2	8.1	7.3	6.9	6.6
T_3	87.9	95.2	96.7	98.9	8.2	7.8	7.3	6.1	6.2	6.6	6.8	7.3	7.2	6.7	6.0	5.6
T_4	104.5	108.1	109.3	109.9	9.3	8.6	8.1	7.2	7.6	7.9	8.2	8.3	8.3	7.5	7.0	6.7
T_5	106.4	109.6	110.4	112.7	9.4	8.7	8.2	7.3	7.8	8.1	8.4	8.5	8.4	7.7	7.1	6.8
T_6	91.4	98.5	97.6	100.0	8.4	8.0	7.4	6.2	6.3	6.7	7.0	7.4	7.6	6.8	6.3	6.1
T_7	108.9	111.9	112.3	112..9	9.5	8.8	8.3	7.7	7.9	8.3	8.7	8.8	8.6	8.1	7.2	7.2
T_8	109.5	114.5	113.5	114.3	9.7	9.0	8.5	8.1	8.0	8.8	9.2	9.5	8.9	8.3	7.4	7.3
T_9	92.2	96.8	98.8	103.6	8.6	8.2	7.6	6.4	6.6	7.0	7.3	7.5	7.7	7.0	6.6	6.4
F test	NS	S	S	S	SN	S	S	S	NS	S	S	S	NS	S	S	S
S.Ed	9.3	2.51	4.09	4.84	0.55	0.42	0.46	0.62	0.73	0.32	0.68	0.13	0.75	0.29	0.40	0.52
CD at 5%	18.84	5.24	8.54	10.09	1.15	0.87	0.96	1.29	1.52	0.68	1.41	0.27	1.57	0.60	0.83	1.09

By the result of sensory score for texture and body, treatment T_8- (Cardamom 1.5%) + (Sugar 70%) 8.0, 8.8, 9.2 and 9.5 in initial to 90 days respectively highest during the whole experiment and T_0- (No herbal product) 5.9, 6.2, 6.5 and 6.8 in initial 30, 60, and to 90 days after storage 90 days respectively scored least Yadav *et al.*, (2017). By the result of sensory score for Flavour taste, treatment T_8- (Cardamom 1.5%) + (Sugar 70%) scored 8.9, 8.3, 7.4 and 7.3 in initial to 90 days respectively highest during the whole experiment followed by treatment T_7- (Cardamom 1.5%) + (Sugar 65%) scored 8.6, 8.1, 7.2, 7.2 but treatment T_0- (No herbal product) 7.8, 7.2, 6.9, and 6.0 in initial 30, 60, and to 90 days after storage 90 days respectively scored least. Sahu *et al.*, (2010).

From the present investigation it is concluded that T8 (Cardamom 1.5%) +Sugar 70%) was found most suitable treatment in terms of physico- chemical properties, organoleptic test and Treatment T_7 (Cardamom 1.5%)+Sugar 65%) was recorded with highest cost benefit ratio(1:1.42) for preparation of Aonla murabba.

References

Bishnoi, J. P., Gehlot, R., Siddiqui, S. and Kaushik, I. (2018). Processing and Utilization of Satavari Roots for Preparation of Herbal Aonla Ladoo. *Int.J.Curr.Microbiol.App.Sci*. 7(3): 2698-2706.

Khushbu, Bairwa, M., Bahadur, V., Rolaniya, M. K. and Kumar, U J. (2017). Study on changes in organoleptic quality of value added blended herbal Ready-to-serve (RTS) of aonla (*Emblica officinalis* Garetn.) CV. NA-6 during storage period. *Journal of Pharmacognosy and Phytochemistry*. SP1: 708-711.

Patel, K.K., Gupta, R. and Kuchi, V. S. (2013). Influence of Pretreatments and Varieties on Biochemical Quality during Aonla (*Emblica officinalis* G.) Murabba Preservation. *International Journal of Agriculture, Environment & Biotechnology*. 6(4): 633-637.

Sahu, G.D., Singh, P and Singh, A.K. (2010). Studies on the physico-chemical changes in aonla preserve (murabba) of three cultivars during storage. *Res J. of Agric Sci.*1(4):419- 425.

Tripathi, V.K., Singh, M.B. and Singh, S. (1988). Studies on comparative compositional changes in different preserved products of aonla (*Emblica officinalis Gaertn.*) var. Banarasi. *Indian Food Packet.* 42(4): 60-66.

Vikram B., Man, B., Narayan, S. and Prasad, V.M. (2012). Effect of dried powder of Tulsi leaf, Ginger and Cardamom addition on Aonla Jam with granulated particles of Cashew. *Environment and Ecology.* 30 (3A): 635-640.

Yadav, A., Singh, U., Nagda, N. and Yadav, A. (2017). Aonla, physico-chemical and microbial quality during storage - a review. *International research journal of chemistry (irjc).* vol. 18, pp: 14-21.

How to cite this article:

Dharmendra Singh, Vijay Bahadur, Deena Wilson, Samir. E. Ttopno and Anita Kerketta. 2019. Value Addition of Aonla (*Emblica officinalis*) Murabba with Cardamom. *Int.J.Curr.Microbiol.App.Sci.* 8(12): 433-438. doi: https://doi.org/10.20546/ijcmas.2019.812.058