The Pharma Innovation Journal 2022; 11(12): 1338-1340

www.ThePharmaJournal.com

The Pharma Innovation

ISSN (E): 2277-7695
ISSN (P): 2349-8242
NAAS Rating: 5.23
TPI 2022; 11(12): 1338-1340

www.thepharmajournal.com
Received: 26-09-2022
Accepted: 30-10-2022

Harsha S Kumbhalkar
PG Scholar, Department of Horticulture, College of Agriculture, Nagpur, Dr. Panjabrao Deshmukh Krishi Vidyapeeth, Akola, Maharashtra, India

VU Raut
Professor and Head, Department of Horticulture, College of Agriculture, Nagpur, Dr. Panjabrao Deshmukh Krishi Vidyapeeth, Akola, Maharashtra, India

PR Raut
PG Scholar, Department of Horticulture, College of Agriculture, Nagpur, Dr. Panjabrao Deshmukh Krishi Vidyapeeth, Akola, Maharashtra, India

PN Bhute
Senior Research Assistance, Citrus Excellence Center, Department of Horticulture, College of Agriculture, Nagpur Dr. Panjabrao Deshmukh Krishi Vidyapeeth, Akola Maharashtra, India

Corresponding Author:
Harsha S Kumbhalkar
PG Scholar, Department of Horticulture, College of Agriculture, Nagpur, Dr. Panjabrao Deshmukh Krishi Vidyapeeth, Akola, Maharashtra, India

Sensory quality of aonla candy with different brix concentration and steeping time

Harsha S Kumbhalkar, VU Raut, PR Raut and PN Bhute

Abstract
The present investigation studies on sensory quality of aonla candy was carried out during year 2020-21 at Post Harvest Technology Laboratory, Department of Horticulture, College of Agriculture, Nagpur. An experiment was laid out in Factorial Completely Randomized Design with (FCRD) with three treatments and three replications with 9 treatment combinations. From the findings sensory qualities of aonla candy, the overall scores of colour and texture found to decreased in trend with advancement of storage whereas taste found to increased in trend with the advancement of storage. However the treatment combination T_1S_1 and T_2S_1 recorded maximum score at 4 days of steeping time, highest nutrient content and no microbial count found upto 120 days of storage. Considering the economics of the best acceptable recipe, the candy prepared with the treatment combination of T_1S_1 was found economical as compared to the other treatment combinations under study.

Keywords: Aonla candy, sensory quality, shelf life

Introduction
Aonla is one of the oldest Indian fruits and considered as "Wonder fruit for health" because of its unique qualities. It is rich source of vitamin C and its content of ascorbic acid is next to only that Barbados cherry (*Malpighia glabra* L.) It is one of the three constituents of the famous ayurvedic preparation, triphala, which is prescribed in many digestive disorders. Aonla (*Phyllanthus emblica*), the king of arid fruits, popularly known as Indian Gooseberry is a minor Sub-tropical deciduous tree indigenous to Indian sub-continents. India ranks first in the world in aonla area and production volume. The tree belongs to the family of Euphorbiaceae botanically known as *Phyllanthus Emblica.* It is known by different names like Amla, Amalakki, Nelli, Indian Gooseberry etc. The Aonla gets ready for harvesting during November-December. However, the fruit may be allowed to remain on the tree till February without much fruit drops. A fully mature Aonla tree may yield 250-300 kg of fruit annually. Due to acidic and astringent taste the fresh consumption of aonla fruit is less and hence various products like murabba, segments-in-syrup, candy, squash, juice, powder, etc. are prepared from fruits. Candy is a sweet food prepared from fruits or vegetables by impregnating them with sugar syrup followed by draining of excessive syrup and then drying the product to a shelf stable state. Fruits and vegetables like apple, ginger, mangoes, guava, carrots and citrus peels have been used to prepare candies Mehta and Bajaj 1984 [5]; Sharma *et al.*1998 [9]. White sugar is the usual sweetening agent used in preparation of candies. Such sugar contains sucrose (99.7%). Aonla candies are becoming more and more popular because of high acceptability, minimum volume, higher nutritionally value and longer storage life. These have additional advantages of being least thirst provoking and ready to eat snacks (Vikram *et al.* 2014) [11]. The dried products save energy, money and space in packaging, storage and transportation (Nayak *et al.*, 2012) [6]. Aonla is presently an underutilized fruit, but has enormous potential in the world market. It is almost entirely unknown in the world market and needs to be popularized. In view of the health benefits, there is need to make the fruits more and more amenable to value added products. Among the unique products of aonla, the candy has much demand in domestic as well as export point of view. To strengthen market, storability and superior quality of aonla candy is of prime importance. Hence, the attempt to processing aonla to various value added products like aonla candies will be helpful in alleviating distress sale of the aonla fruits often observed in the market when the harvesting reaches the peak. Therefore, the present work has been attempted to investigate the effects of sucrose concentration on the organoleptic qualities and storage stability of aonla candy.

Materials and Methods

Well matured, healthy and uniform size fruits variety Kanchan were carefully harvested from Regional Fruit Research Station, Katol and brought to the laboratory for further experimentation. The selected fruit were thoroughly washed with clean tap water to remove the dirt and dust particles adhered to pericarp of the fruit. Healthy and good quality matured fruits were selected for candy preparation and fruit boil in water till it become soft. For experimentation then seed were removed and segments were separated. The product was prepared by dipping the segments in successive increasing concentration of sugar syrup at room temperature till equilibrium at 50, 55, 60^0 Brix was reached as per the method described by Tondon *et al.* (2003) [6].

Firstly 50^0 Brix sugar syrup was prepared to which pre-treatment segments were transferred. After soaking for 24 hours, the segments were taken out and syrup were drained and their concentration were shifted 50, 55, 60^0 Brix concentration by adding sugar at proper proportion. The required quantity of sugar were added subsequently to obtained the required 50, 55, 60^0 Brix strength of syrup. The syrup concentration was increased by 5^0 Brix every time until the concentration reached up to 50, 55, 60^0 Brix. Finally the fruit segments was kept in 50, 55, 60^0 Brix syrup solution of sugar according to the treatment for three different steeping period *viz.* 4,8,12 days respectively until the equilibrium was reached between segments and the sugar syrup concentration. Finally, the segments impregnated in each treatment was drained free of syrup and rinse immediately with the tap water to remove the adhere sugar solution and dried in shade till the moisture content noticed upto 12%. After drying, the candy was packed in 250 guage polythene bags and stored under ambient condition. Sensory evaluation of developed aonla candy was conducted through a taste testing panel using 9-point hedonic scale by (Amerine *et al.* 1965) [1]. Each experiment was repeated in triplicate. The statistical analysis of the data was done by the method described by Panse and Sukhatme (1961) [7] using C.R.D. factorial experiment.

Result and Discussion

Changes in organoleptic quality of aonla candy during storage

The data with representing to the effect of different brix concentration and steeping time and storage on sensory scores (9-point hedonic scale) for attributes like colour, taste, texture and overall acceptability of candy prepared from aonla have been presented in Table 1. The mean scores for colour, taste, texture and overall acceptability of aonla candy of zero day ranged from 8.9 to 5.5, 8.5 to 5, 8.9 to 5.7 and 8.8 to 5.4 respectively. From Table 1. It is seen that there was a significant decrease in mean score for sensory attributes of aonla candy during four months (120 days) of storage. Treatment T_1S_1 had highest (8.4) overall acceptability score while T_3S_3 had lowest (5.0) score. These results are in close conformity with the results obtained by Hiremath and Rokhade (2012) [2] in sapota candy, Kumar and Singh (2001) [3, 4] in aonla candy and Rani and Bhatia (1985) [8] in pear candy.

Microbial count of aonla candy during storage

In microbiological load of testing of aonla candy, no colony forming units was detected, including that the aonla candy is safe from microbiological point of view upto 120 days of storage days.

Table 1: Interaction effects of different brix concentration and steeping time on sensory parameters of aonla candy during storage

Treatments	Sensory Attributes																			
	Colour					Taste					Texture					Overall acceptability				
	Storage (days)					Storage(days)					Storage (days)					Storage (days)				
	0	30	60	90	120	0	30	60	90	120	0	30	60	90	120	0	30	60	90	120
T_1S_1	8.9	8.7	8.6	8.5	8.4	8.5	8.6	8.7	8.8	9.0	8.9	8.8	8.7	8.6	8.5	8.8	8.7	8.6	8.5	8.4
T_1S_2	7.7	7.5	7.4	7.3	7.2	7.4	7.5	7.6	7.7	7.9	8.5	8.4	8.3	8.2	8.1	7.9	7.8	7.7	7.6	7.5
T_1S_3	6.9	6.8	6.7	6.5	6.3	6.3	6.4	6.5	6.7	6.8	6.8	6.7	6.6	6.5	6.3	6.7	6.6	6.5	6.4	6.3
T_2S_1	8.8	8.6	8.4	8.3	8.2	8.1	8.3	8.4	8.5	8.6	8.8	8.7	8.6	8.5	8.4	8.6	8.5	8.4	8.3	8.2
T_2S_2	7.6	7.4	7.3	7.2	7.1	7.3	7.4	7.5	7.6	7.7	7.8	7.7	7.6	7.5	7.4	7.6	7.5	7.4	7.3	7.0
T_2S_3	5.7	5.6	5.3	5.1	5.0	5.4	5.5	5.6	5.7	5.8	6.7	6.6	6.5	6.4	6.0	5.9	5.8	5.1	5.5	5.6
T_3S_1	7.9	7.8	7.7	7.6	7.5	8.0	8.2	8.3	8.4	8.6	8.7	8.6	8.5	8.4	8.3	8.5	8.4	8.3	8.2	8.0
T_3S_2	6.8	6.7	6.6	6.4	6.1	6.4	6.5	6.6	6.7	6.8	6.4	6.2	6.1	6.0	5.8	6.6	6.5	6.4	6.3	6.2
T_3S_3	5.5	5.4	5.3	5.1	4.7	5.0	5.3	5.4	5.5	5.7	5.7	5.6	5.4	5.3	4.7	5.4	5.3	5.2	5.1	5.0

All values are mean± SEM of three replicates.

The test values along the same column carrying different superscripts for each composition contents are significantly different (p<0.05) within days.

T_1S_1-50^0 B concentration+ 4 days of steeping time, T_1S_2-50^0 B concentration + 8 days of steeping time, T_1S_3-50^0 B concentration + 12 days of steeping time, T_2S_1-55^0 B concentration + 4 days of steeping time, T_2S_2-55^0 B concentration + 8 days of steeping time, T_2S_3-55^0 B concentration + 12 days of steeping time,T_3S_1-60^0 B concentration + 4 days of steeping time, T_3S_2-60^0 B concentration + 8 days 0f steeping time, T_3S_3-60^0 B concentration + 12 days of steeping time.

Conclusion

In this experiment data recorded on sensory qualities of candy an interval of 30 days, it was found that, the overall scores of colour and texture found to decreased in trend with the advancements of storage. However the treatment combination T_1S_1 and T_2S_1 recorded maximum score at 4 days of steeping time, highest nutrient content and no microbial load found upto 120 days of storage. Considering the economics of the best acceptable recipe.

Acknowledgement

This study was made possible with the help of Post Harvest Technology Laboratory, Department of Horticulture, College of Agriculture, Nagpur, PDKV, Akola by providing necessary laboratory facilities for the experiment and my guide for their support and guidelines in conducting the experiment.

References

1. Amerine MA, Pangborn RM, Roessier EB. Principles of Sensory Evaluation of Food. Academic Press, New York and London; c1965. p. 456-465.
2. Hiremath JB, Rokhade AK. Preparation of sapota candy. International Journal of Food Agriculture and Veterinary Science. 2012;2(1):107-112.
3. Kumar S, Singh IS. Storage studies of aonla fruit products at ambient temperature. Prog. Hort. 2001;33(2):169-173.
4. Kumar S, Baig MJ, Singh RC, Kumar S. Comparative study of aonla cultivars in relation to physiochemical properties. Ranged Management and Agroforestry. 2001;22(1):128-129.
5. Mehta U, Bajaj S. Changes in Chemical composition and organoleptic quality of citrus peel candy during preparation and storage. J Food. Sci. Technol. 1984;21(2):422-42
6. Nayak P, Tondon DK, Bhatt DK. Study on changes of nutritional and organoleptic quality of flavoured candy prepared from aonla (*Emblica officinalis* G.) during storage. International Journal of Nutritional and Metabolism. 2012;4(7):100-106.
7. Panse VG, Sukhatme PV. Statistical methods for agriculture workers, ICAR Publication, New Delhi 2nd. c1967. p. 63-66.
8. Rani U, Bhatia BS. Studies on pear candy processing Ind. Fd. Pack. 1985;29:40-46.
9. Sharma S, Dhaliwal YS, Kalia M. Candid apple a new perspective. J Food. Sci. Technol. 1998;35:79-82.
10. Tandon DK, Yadav RC, Sood S, Kumar S, Dikshit A. Effect of blanching and lye peeling on the quality of aonla candy. Ind. Fd. Pack. 2003;57:147-152.
11. Vikram B, Prasad VM, Saroj PL. Comparative study of varieties, honey coating and storage durations on aonla candy. Indian J Hort. 2014;71(1):104-108.