International Journal of Chemical Studies

P-ISSN: 2349–8528
E-ISSN: 2321–4902
IJCS 2017; 5(4): 1807-1811

Received: 26-05-2017
Accepted: 27-06-2017

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Organoleptic evaluation of Aonla Squash during ambient storage condition

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Abstract
Osmo- air dried aonla powder was used for the preparation of aonla squash and ingredients used were Aonla powder, Sugar, Citric acid, Sodium benzoate, Apple green colour. The Aonla squash were analyzed organoleptically and placed in the category of 'liked moderately' to 'liked very much'. The squash prepared from the osmo-air dried aonla was found to be tasty health drink and was rated in the category of "liked moderately' to 'liked very much' even after 120 days of storage. The dried aonla is very rich source of ascorbic acid so the consumption of products in which dried aonla has been incorporated, is recommended to the vulnerable group of population which is generally anaemic, as ascorbic acid is very helpful in absorption of iron in the body.

Keywords: aonla squash, osmo-air dried, Sodium benzoate, aonla powder and organoleptically

Introduction
The fresh Aonla fruits are not popular as a table fruit due to their high astringency and its storability after harvesting is also limited due to its high perishable nature (Kumar and Nath 1993) [2]. It has got great potential in processed forms, which can have great demand in national as well as international market. Hence attention has been focused on the preparation of different value added products from aonla. Despite of potential source of Vitamin C traditional method of processing provides a poor quality of product with low nutrient content and limits the utilization of the fruit locally and internationally. Streaming or blanching the fruit prior to processing can minimize ascorbic acid loss in the products. Aonla fruits are a very rich source of Vitamin C having an ascorbic acid content varying from 0.9 to 1.3 per cent. It is therefore necessary to develop improved methods for processing. Efforts made by producers are still lacking in manufacturing Aonla based processed products. Singh *et* at. (2005d) [4] standardized the recipe for preparation of herbal squash. Five different recipes with or without asparagus juice and ginger juice were developed. Asparagus and ginger juice were mixed with aonla pulp and the remaining procedure is as such followed for simple squash. A recipe containing 25% aonla pulp, 5% asparagus extract and 2% ginger juice with 50% TSS and 1.2% acidity is found most ideal for preparation of herbal squash. Novel processing techniques are required to produce the products of high nutritional quality. In the last decades, food processors are emphasizing on the utilization of natural sources for improving human health and preventing diseases. Aonla being the natural richest source of phytochemical was selected for the preparation of squash.

Materials and methods
Mature aonla fruits, variety 'Banarasi' were obtained from the Indian Institute farming research system, Modipuram, Meerut during the months of December to February, 2016. The experiments were conducted in the Department of Agricultural Engineering and Food Technology, S.V.P. University of Agriculture and technology, Meerut. It includes the preparation of aonla squash using osmo-dried aonla powder and determined their sensory characteristics. The materials and methods used to conduct the present investigation were described in the following sections.

Preparation of aonla squash
Osmo- air dried aonla powder was used for the preparation of aonla squash and the ingredients were

used Aonla powder (100 gm); Sugar (400 gm); Citric acid (1 gm); Sodium benzoate (1g/L); Apple green colour (QS). The squash was prepared by extracting aonla juice after boiling with 'water and addition of sugar syrup containing citric acid, addition of preservative and colour. Squash was packed in bottle while still hot and capped for 120 days respectively.

Organoleptic evaluation of aonla squash

Organoleptic evaluation of aonla squash was done just after preparation and at interval of 10, 20 and 30 days by the method given by Ranganna (1986) [3]. A panel of 10 judges scored the quality characters (color, appearance, aroma, taste and overall acceptability) of the squash on a nine point hedonic rating scale in the Performa. The mean score was obtained from the values given by all the judges.

Organoleptic evaluation

A nine point Hedonic Rating Scale was used to evaluate the color, aroma, taste, appearance and overall acceptability of the aonla squash.

Result and discussion

Organoleptic acceptability

Color, aroma, taste, appearance and overall acceptability of the aonla squash prepared from controlled and blanching+ sulphiting osmo- air dried aonla powder were acceptable and the mean score observed were in the category of 'liked moderately' to 'liked very much'.

Table 1: Mean sensory scores for Colour, Aroma, Appearance, Taste and Overall acceptability of Aonla squash

0	Colour	Aroma	Appearance	Taste	Overall acceptability
Controlled	6.02	7.76	6.98	7.45	7.20
Blanching + sulphiting	7.55	8.19	7.36	7.94	8.80

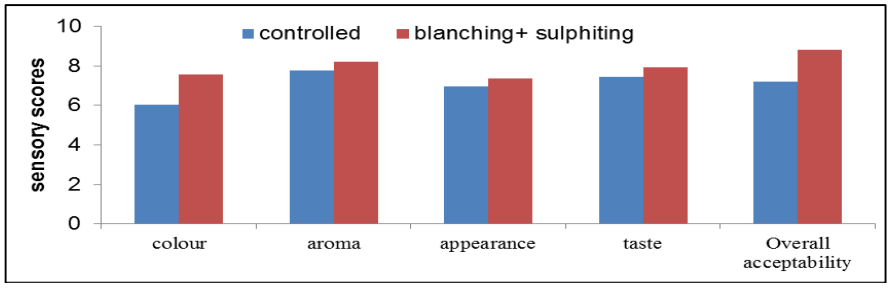

Fig 1: Mean sensory scores for Colour, Aroma, Appearance, Taste and Overall acceptability of Aonla squash

Colour The mean scores for colour were observed 6.02 and 7.55 for controlled osmosed and blanching+ sulphiting osmosed aonla squash as shown in table 2. A gradual decrease in colour was observed with the increase in storage period. Vashista (1998) [5] reported that the colour of tomato juice remained acceptable for two months with minor change in colour.

Table 2: Sensory score of aonla squash for Colour

Storage (Days)	Controlled	Blanching+Sulphiting
0	6.51	8.08
15	6.23	8.00
30	6.18	7.89
45	6.11	7.67
60	6.05	7.54
75	6.00	7.43
90	5.88	7.22
105	5.73	7.12
120	5.56	7.00
Total score	54.25	67.95
Mean score	6.02	7.55

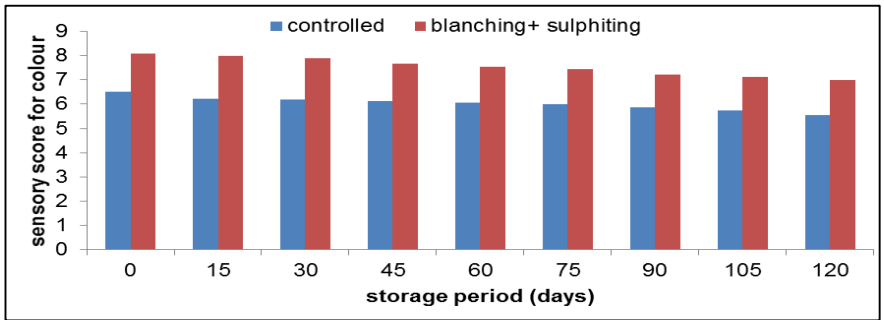

Fig 2: Sensory score of aonla squash for Colour

Aroma The mean scores for color was observed 7.76 and 8.19 for controlled osmosed and blanching+ sulphiting osmosed aonla squash as shown in table 3. The mean score for aroma declined at during 90 days of

storage then the values are almost same at 105th and 120th days of storage.

Table 3: Sensory score of aonla squash for aroma

Storage (Days)	Controlled	Blanching+Sulphiting
0	8.45	8.92
15	8.23	8.73
30	8.11	8.54
45	8.00	8.23
60	7.81	8.11
75	7.66	8.02
90	7.31	7.93
105	7.20	7.70
120	7.11	7.61
Total score	69.88	73.79
Mean score	7.76	8.19

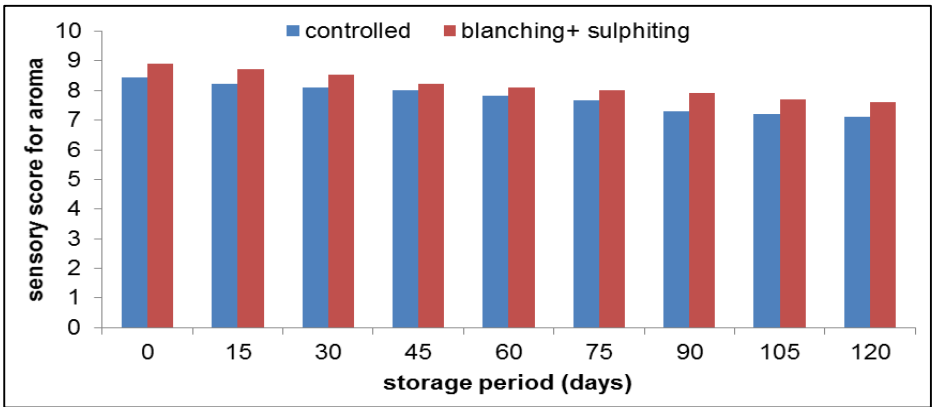

Fig 3: Sensory score of aonla squash for Aroma

Appearance Acceptability scores of appearance for controlled osmosed and blanching+ sulphiting osmosed aonla squash was found 6.98 and 7.36 and it remained almost similar after 75th days of storage as shown in table 4. A gradual decrease in Appearance was observed with the increase in storage period. **Vashista (1998)** [5] reported significant decrease in acceptability score of tomato juice through it remained acceptable even after storage for 60 days.

Table 4: Sensory score of aonla squash for appearance

Storage (Days)	Controlled	Blanching+Sulphiting
0	7.66	8.04
15	7.42	7.87
30	7.3	7.71
45	7.16	7.60
60	7.03	7.41
75	6.88	7.21
90	6.61	7.04
105	6.52	6.87
120	6.31	6.56
Total score	62.89	66.31
Mean score	6.98	7.36

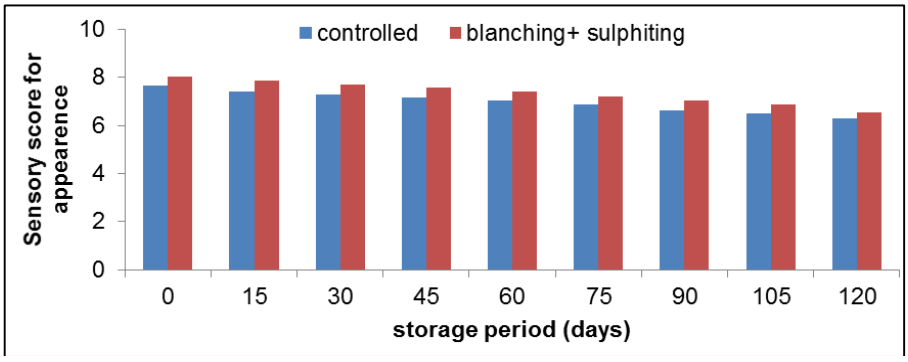

Fig 4: Sensory score of aonla squash for appearance

Taste Taste acceptability of the controlled osmosed and blanching+ sulphiting osmosed aonla squash 7.45 and 7.94 as observed from the table 5 and the taste of squash was liked and was acceptable throughout the storage period by the panel of judges. Kalra *et. al.*, (1991) [1] also observe and decline in organoleptic scores of spiced tomato juice and fruit based beverage upto two and six months of storage, respectively

Table 5: Sensory score of aonla squash for taste

Storage (Days)	Controlled	Blanching+Sulphiting
0	8.02	8.38
15	7.80	8.28
30	7.71	8.21
45	7.62	8.11
60	7.45	8.03
75	7.31	7.92
90	7.20	7.80
105	7.10	7.57
120	6.92	7.23
Total score	67.13	71.53
Mean score	7.45	7.94

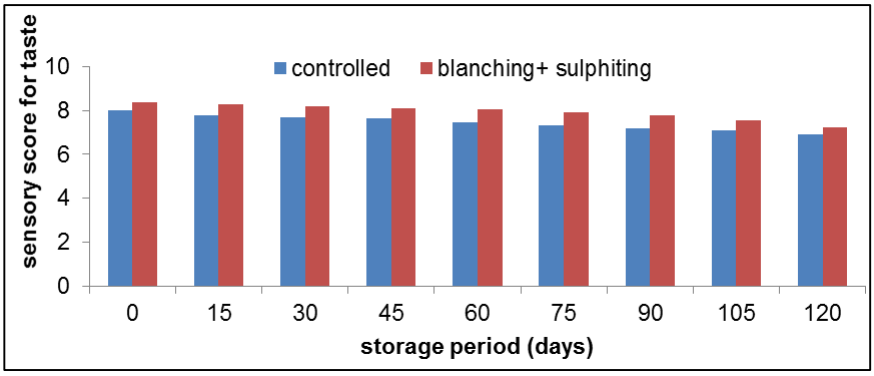

Fig 5: Sensory score of aonla squash for Taste

Overall acceptability

Overall Acceptability scores of appearance for controlled osmosed and blanching+ sulphiting osmosed aonla squash was found 7.2 and 8.8 as shown in table 6 and the aonla squash ranged between 'liked moderatly' to 'liked very much'. The values of mean scores for aonla squash declined slightly during the storage period still the overall acceptability of the squash was considered good.

Table 6: Sensory score of aonla squash for overall acceptability

Storage (Days)	Controlled	Blanching+Sulphiting
0	8.00	9.45
15	7.89	9.23
30	7.62	9.06
45	7.43	8.90
60	7.10	8.81
75	6.99	8.67
90	6.71	8.51
105	6.66	8.34
120	6.43	8.22
Total score	64.83	79.19
Mean score	7.20	8.80

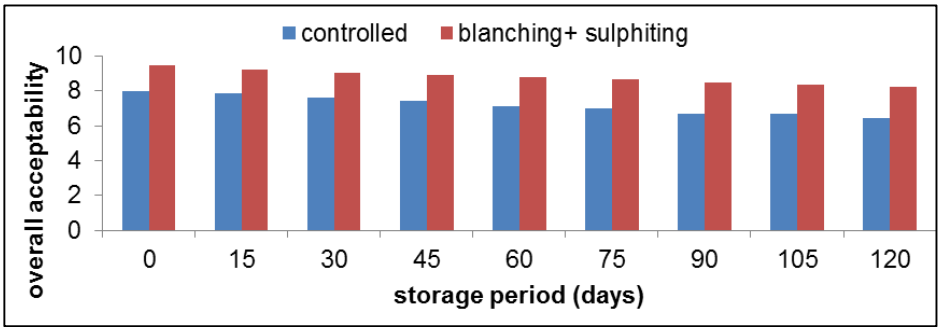

Fig 6: Sensory score of aonla squash for Overall acceptability

Summary and conclusion

The optimum levels of ingredients could serve as model to produce organoleptically accepted Aonla squash. The squash was organoleptically evaluated and was placed in the category of 'liked moderately' to 'liked very much'. The values of mean scores of aonla squash declined slightly during storage but still the overall acceptability of squash was considered good. Further studies are required on Aonla supplementation into different fruits products to enhance their nutritional value.

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