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Studies on Sensory Parameters and Microbial Load of Aonla Blended Squash during Storage

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ABSTRACT: Aonla is a popular traditional medicine in India, and has been used to treat various ailments including anemia, diarrhoea, dysentery, jaundice, and fever. It is also believed to boost the immune system and improve digestion. Presence of high astringency and bitter taste reduces the table value of fresh raw aonla fruits. Processing of aonla fruits into different value added products is the only effective tool for reducing post-harvest losses in aonla, which vary from 30% to 40% due to its perishable nature and helps in reducing the market glut. Blending aonla juice with other fruits can help to reduce the acidity and astringency of the aonla juice and make it more palatable. Thus the present experiment entitled "Studies on sensory parameters and microbial load of Aonla blended squash during storage" was performed at Horticulture processing laboratory, Department of Fruit Science and Bio-control laboratory, IGKV, Raipur, Chhattisgarh during the year 2021-2022 and 2022-2023 to evaluate various sensory parameters and standardize the recipes of nutritionally enriched aonla blended squash based on consumer appeal. The research trial was carried out in Completely Randomized Design having 13 treatments combinations and 3 replications. It is evident from the experimental findings that the treatment T_{11} (50% Aonla + 48% Pomegranate + 2% Ginger) was found superior among all other treatments tested for different sensory parameters *i.e.* colour/appearance, taste, flavor, aroma and overall acceptability. However, the minimum organoleptic score for different sensory parameters is registered under the treatment T_{13} (100% Aonla). The treatment T_{11} reported minimum microbial count, while the maximum microbial colony count was recorded under the treatment T_{13} (100% Aonla).

Keywords: Microbial load, colony form count, squash, organoleptic, laminar air flow, incubator, hedonic scale.

INTRODUCTION

Aonla (*Emblica officinalis* Gaertn.) is a versatile fruit with a long history of use in traditional medicine. In recent years, aonla has gained popularity as a superfood due to its high nutritional value. It is rich in various biologically active compounds including polyphenols (gallic acid, ellagic acid, quercetin), minerals (Fe, Na, Zn, K, Ca), vitamins (C, A and B complex) and many enzymes signifying its functional importance in the general wellbeing (Kumari and Khatkar 2018). Aonla is also a good source of fiber, which can help regulate digestion and promote weight loss. The high acidity and astringency of aonla fruits can make them difficult to eat fresh. However, aonla can be processed into a variety of products, such as juice, unfermented beverages, powder, and jam. These products are more palatable than fresh aonla fruits and still retain most of the nutritional benefits. The blending of fruit juices is an important process in the production of beverages with a variety of flavour, textures, and nutritional profiles. For example, blending aonla juice with other fruits can help to reduce the acidity of the aonla juice and make it more palatable. It can also help to improve the flavour and nutritional profile of the beverage. In addition, blending fruit juices can help to overcome seasonal availability challenges. For example, aonla fruits are only available in season for a short period of time. By blending aonla juice with other fruits that are available year-round, it is possible to produce a beverage that can be enjoyed all year long. Finally, blending less expensive fruits with more expensive fruits can help to create a beverage that is both affordable and nutritious.

MATERIAL AND METHODS

The present experiment entitled "Studies on sensory parameters and microbial load of Aonla blended squash

during storage" was performed at Horticulture processing laboratory, Department of Fruit Science and Bio-control laboratory, IGKV, Raipur, Chhattisgarh during the year 2021-2022 and 2022-2023. The research trial was carried out in Completely Randomized Design having 13 treatments combinations and 3 replications, the treatment details is given in Table 1.

Sensory evaluation: The aonla blended squash was tasted by a panel of judges and were assessed for various sensory parameters *i.e.* colour/appearance, taste, flavour, aroma and overall acceptability.

Microbial load: Microbial analysis was carried out by first sterilizing the glass wares in an oven at 160°C for 2 hours followed by preparation of agar-agar media.

Plating technique: Six test tubes were taken, each containing 1 ml of sample and 9 ml of distilled water. The PDA medium was then put into these petri plates, and the petri plates were rotated properly to ensure that the content was well mixed. After solidification of media, the sterile petri plates were filled with a 1 ml dilution from each of the 4, 5, and 6 test tubes.

Incubation and counting of colonies: The plates were incubated in the incubator at 37°C temperature. Developed colonies were counted and expressed as colony forming units (cfu/ml) of sample.

RESULTS AND DISCUSSION

Sensory parameters: The data regarding changes in sensory parameters of aonla blended squash with the advancement in storage period are presented in Table 2-6 and discussed as follows:

Colour/Appearance: An inquisition of data presented in Table 2 revealed that the organoleptic scores for colour/appearance declined significantly in various treatments tested during the storage period. The maximum score for colour/appearance (9.00, 8.89, 8.74, 8.58 & 8.06 and 8.99, 8.89, 8.72, 8.54 & 8.14 and 9.00, 8.89, 8.73, 8.56 & 8.10) was observed under the treatment T_{11} (50% Aonla + 48% Pomegranate + 2% Ginger), while the minimum score (4.08, 3.84, 3.73, 3.62 & 3.07 and 4.29, 4.06, 3.92, 3.79 & 3.26 and 4.18, 3.95, 3.82, 3.70 & 3.17) was recorded under T_{13} (100% Aonla) at 0, 30, 60, 90 & 120 days after storage, during both the years of experimentation as well as pooled mean, respectively. The maximum reduction in the organoleptic scores for colour/appearance of fortified squash of aonla was noticed under the treatment T_1 (1.26, 1.26 & 1.26), while minimum reduction in the organoleptic scores for colour/appearance was recorded under T_{10} (0.78, 0.81 & 0.79) during both the years of investigation as well as based on pooled mean, respectively. The reason behind declining trend of organoleptic scores for colour/appearance might be due to the oxidation of phenols, which leads to degradation of colour or non-enzymatic reaction of organic acid with sugar. Sharma *et al.* (2021) in apricot and aonla blended aloe vera beverage, Singh *et al.* (2013) in aonla based blended squash, Prasad and Mali (2000); Srinivas *et al.* (2007) in pomegranate squash.

Taste: A preview of data in reference to changes in organoleptic scores for taste is displayed in Table 3. The maximum score for taste (9.00, 8.93, 8.77, 8.52 & 8.00 and 8.98, 8.77, 8.64, 8.50 & 7.90 and 8.99, 8.85, 8.70, 8.51 & 7.95) was noticed under the treatment T_{11} (50% Aonla + 48% Pomegranate + 2% Ginger), while the minimum score (4.67, 4.48, 4.30, 4.19 & 3.51 and 4.65, 4.49, 4.33, 4.23 & 3.25 and 4.66, 4.48, 4.32, 4.21 & 3.38) was documented under the treatment T_{13} (100% Aonla) at 0, 30, 60, 90 & 120 days after storage during both the years of investigation as well as based on pooled mean, respectively. The maximum reduction in the organoleptic scores for taste of fortified squash of aonla was noticed under the treatment T_4 (1.46, 1.67 & 1.57) during both the years of investigation as well as pooled mean, respectively. Although, minimum reduction in the organoleptic scores for taste was recorded under the treatment T_7 (0.93 & 0.96) during first year of investigation and pooled mean, respectively, while in the second year of investigation the treatment T_{12} (0.91) recorded minimum reduction in taste score. There was sharp decrease in the organoleptic scores for taste in various treatments during the storage period at ambient condition, this might be due to the production of off taste in squash as a result of certain bio-chemical changes taking place under high temperature. Similar findings were also reported by Vaidya *et al.* (2017) in jamun and aonla blended nectar, Thakur *et al.* (2018) in RTS prepared from wild aonla, Choudhary *et al.* (2013); Singh *et al.* (2013) in aonla based blended squash.

Flavour: The data concerning with changes in organoleptic flavour score of aonla blended squash is presented in Table 4, which unveiled that maximum score for flavour (8.96, 8.78, 8.70, 8.63 & 8.01 and 8.98, 8.85, 8.71, 8.59 & 8.06 and 8.97, 8.82, 8.70, 8.61 & 8.04) was recorded under the treatment T_{11} (50% Aonla + 48% Pomegranate + 2% Ginger), while the minimum flavour score (5.21, 5.13, 4.97, 4.80 & 4.02 and 5.27, 5.17, 5.01, 4.88 & 3.97 and 5.24, 5.15, 4.99, 4.84 & 4.00) was reported under the treatment T_{13} (100% Aonla) at 0, 30, 60, 90 & 120 days after storage during both the years of investigation as well as pooled mean, respectively. The maximum reduction in the organoleptic scores for flavour of fortified squash of aonla was noticed under the treatment T_6 (1.90, 1.57 & 1.74) during both the years of investigation as well as based on pooled mean, respectively. Although, minimum reduction in the organoleptic scores for flavour was recorded under the treatment T_{10} (0.74 & 0.86) during first year of investigation and pooled mean, respectively, while in the second year of investigation the treatment T_{11} (0.92) recorded minimum reduction in flavour score. The decreasing trend noticed in the organoleptic scores for flavour in various treatments might be due to the fact that certain bio-chemical changes occur under low pH and high temperature that leads to production of off- flavour in the squash and loss of volatile substance responsible for flavour. Similar findings were also reported by Pavithra and Mini (2023) in dragon, Rajesh *et al.* (2009); Choudhary *et al.* (2013); Singh *et al.* (2013) in aonla based blended squash, Prasad and Mali (2000); Srinivas *et al.* (2007) in pomegranate squash.

Aroma: The observations pertaining to changes in aroma of aonla blended squash is displayed in Table 5. The maximum score for aroma (8.09, 8.00, 7.86, 7.74 & 7.29 and 8.19, 8.03, 7.88, 7.79 & 7.24 and 8.14, 8.02, 7.87, 7.77 & 7.27) was noticed under the treatment T_{11} (50% Aonla + 48% Pomegranate + 2% Ginger), while the minimum score (5.05, 4.96, 4.83, 4.71 & 4.00 and 5.17, 5.08, 4.89, 4.75 & 3.96 and 5.11, 5.02, 4.86, 4.73 & 3.98) was documented under the treatment T_{13} (100% Aonla) at 0, 30, 60, 90 & 120 days after storage during both the years of experimentation as well as based on pooled mean, respectively. The maximum reduction in the organoleptic scores for aroma of fortified squash of aonla was noticed under the treatment T_7 (1.41, 1.27 & 1.34) during both the years of investigation and pooled mean, respectively. Nevertheless, minimum reduction in the organoleptic scores for aroma was recorded under the treatment T_{11} (0.80 & 0.87) during first year of investigation as well as pooled mean, respectively. While, in the second year of investigation the treatment T_9 (0.91) recorded minimum reduction in aroma score. The reason behind gradual decrease in sensory scores of aroma of aonla blended squash during storage period might be due to continuous loss of volatile substance responsible for aroma or modification of many chemical constituents of the product. Vaidya *et al.* (2017) in jamun and aonla blended nectar, Madhu *et al.* (2008); Rajesh *et al.* (2009); Choudhary *et al.* (2013); Singh *et al.* (2013) in aonla based blended squash.

Overall acceptability: The data gathered on changes in organoleptic scores for overall acceptability is highlighted in Table 6. The treatment T_{11} (50% Aonla + 48% Pomegranate + 2% Ginger) documented maximum score for overall acceptability (8.95, 8.74, 8.58, 8.24 & 8.00 and 8.92, 8.72, 8.45, 8.32 & 7.58 and 8.94, 8.73, 8.52, 8.28 & 7.79), while the minimum score (5.72, 5.55, 5.18, 4.87 & 4.26 and 5.68, 5.40, 5.13, 4.96 & 4.13 and 5.70, 5.48, 5.16, 4.92 & 4.19) was registered under the treatment T_{13} (100% Aonla) at 0, 30, 60, 90 & 120 days after storage during both the years of experimentation as well as based on pooled mean, respectively. The maximum reduction in the organoleptic scores for overall acceptability of fortified squash of aonla was noticed under the treatment T_1 (1.87 & 1.69) during first year of investigation as well as based on pooled mean, respectively, while in the second year of investigation the treatment T_{13} (1.56) recorded maximum reduction in scores for overall acceptability. Minimum reduction in the organoleptic scores for overall acceptability was recorded under the treatment T_{10} (0.67, 0.95 & 0.81) during both the years of investigation and pooled mean, respectively. The reason behind downturn of organoleptic scores during storage might be due to masking of original taste, flavour and colour of the product as a result of certain bio-chemical changes taking place under high temperature. These findings were in close agreement with the findings of Roopak *et al.* (2006); Madhu *et al.* (2008); Rajesh *et al.* (2009); Choudhary *et al.* (2013); Singh *et al.* (2013) in aonla based blended squash, Prasad and Mali (2000); Srinivas *et al.* (2007) in pomegranate squash.

Microbial load (cfu/ml): It is apparent from the data presented in Table 7 that there was no microbial growth during the initial days of storage in the aonla blended squash. The data correlated with pooled mean (at 120 DAS) concluded that the coliform count ranged between 1×10^{-6} and 11.50×10^{-6} (cfu/ml). The minimum coliform count of 1×10^{-6} (cfu/ml) was observed in $T_{11,}$ which was statistically similar with the treatments T_8,T_{12} & T_7 having coliform count of 1.50×10^{-6},2×10^{-6}&2×10^{-6} (cfu/ml), respectively. Minimum coliform count was registered under the treatment T_{11} (50% Aonla + 48% Pomegranate + 2% Ginger) with 1×10^{-6}cfu/ml at 120 DAS, while the maximum coliform count was registered under the treatment T_{13} (100% Aonla) (8×10^{-6} & 12×10^{-6} and 7×10^{-6}& 11×10^{-6} and 7.50×10^{-6}& 11.50×10^{-6}cfu/ml) during both the years as well as based on pooled mean, respectively. The reason behind absence of microbial growth during initial stage of storage might be due to incorporation of preservatives such as citric acid and sodium benzoate during preparation of aonla blended squash. The minimum microbial growth was seen in the treatments with high acidic environment as it restricts microbial growth. On the other hand, the treatments incorporated with 2% ginger also showed less microbial load due to antibacterial property of ginger. Gradual increase in microbial colony at room temperature was seen, which depends upon the environment available to the microbes and the storage temperature. Similar findings were reported by Choudhary *et al.* (2013); Sangeeta and Ansia (2014) in aonla squash, Malu *et al.* (2009) in ginger extract and Kulkarani *et al.* (2017) in aonla juice.

Table 1: Treatment details for Aonla blended squash.

Sr. No.	Treatment details	Notations to be used
1.	Aonla Juice: Mandarin Juice(25 : 75)	T_1
2.	Aonla Juice: Mandarin Juice(50 : 50)	T_2
3.	Aonla Juice: Mandarin Juice(75 : 25)	T_3
4.	Aonla Juice: Pomegranate Juice(25 : 75)	T_4
5.	Aonla Juice: Pomegranate Juice(50 : 50)	T_5
6.	Aonla Juice: Pomegranate Juice(75 : 25)	T_6
7.	AonlaJuice: Mandarin Juice: Ginger Juice(25 :73 : 2)	T_7
8.	Aonla Juice: Mandarin Juice: Ginger Juice(50 :48 : 2)	T_8
9.	Aonla Juice: Mandarin Juice: Ginger Juice(75 :23 : 2)	T_9
10.	Aonla Juice: Pomegranate Juice: Ginger Juice(25 : 73 : 2)	T_{10}
11.	Aonla Juice: Pomegranate Juice: Ginger Juice(50 : 48 : 2)	T_{11}
12.	Aonla Juice: Pomegranate Juice: Ginger Juice(75 : 23 : 2)	T_{12}
13.	Control(100%Aonlajuice)	T_{13}

Table 2: Changes in Organoleptic scores for colour/appearance of aonla blended squash during storage.

Treatments	0 DAS			30 DAS			60 DAS			90 DAS			120 DAS			Reduction in scores during storage		
	2022	2023	Pooled mean	2022	2023	Pooled mean	2022	2023	Pooled mean	2022	2023	Pooled mean	2022	2023	Pooled mean	2022	2023	Pooled mean
T_1	6.47^{d}	6.61^{de}	6.54^{d}	6.02^{c}	6.32^{e}	6.17^{d}	5.92^{d}	6.20^{d}	6.06^{e}	5.55^{c}	6.06^{e}	5.81^{e}	5.21^{c}	5.35^{d}	5.28^{e}	1.26	1.26	1.26
T_2	5.30^{b}	5.83^{b}	5.57^{b}	5.17^{b}	5.79^{b}	5.48^{b}	5.06^{b}	5.67^{b}	5.37^{b}	4.91^{b}	5.47^{c}	5.19^{b}	4.20^{b}	4.80^{b}	4.50^{b}	1.10	1.03	1.07
T_3	5.35^{b}	6.08^{bc}	5.72^{b}	5.10^{b}	6.02^{cd}	5.56^{b}	4.97^{b}	5.90^{c}	5.43^{b}	4.79^{b}	5.79^{d}	5.29^{b}	4.29^{b}	5.06^{c}	4.68^{c}	1.06	1.02	1.04
T_4	7.43^{e}	7.26^{f}	7.35^{ef}	7.20^{d}	6.95^{g}	7.08^{e}	6.92^{e}	6.82^{f}	6.87^{f}	6.74^{e}	6.50^{f}	6.62^{f}	6.33^{d}	6.21^{f}	6.27^{f}	1.11	1.05	1.08
T_5	7.53^{e}	7.68^{g}	7.61^{f}	7.23^{d}	7.39^{h}	7.31^{f}	7.00^{e}	7.21^{g}	7.11^{g}	6.80^{e}	7.03^{g}	6.91^{g}	6.45^{d}	6.62^{g}	6.54^{g}	1.08	1.06	1.07
T_6	6.19^{cd}	6.06^{bc}	6.13^{c}	6.01^{c}	5.86^{bc}	5.94^{c}	5.91^{d}	5.65^{b}	5.78^{c}	5.83^{d}	5.41^{bc}	5.62^{cd}	5.10^{c}	5.12^{c}	5.11^{de}	1.09	0.93	1.01
T_7	6.15^{c}	6.31^{cd}	6.23^{cd}	5.94^{c}	6.11^{d}	6.02^{cd}	5.84^{cd}	5.98^{c}	5.91^{d}	5.68^{c}	5.78^{d}	5.73^{de}	5.16^{c}	5.22^{cd}	5.19^{e}	0.99	1.09	1.04
T_8	8.58^{f}	8.49^{h}	8.54^{g}	8.32^{f}	8.41^{i}	8.37^{g}	8.14^{g}	8.27^{h}	8.21^{h}	7.96^{g}	8.03^{h}	8.00^{h}	7.41^{f}	7.45^{h}	7.43^{h}	1.17	1.03	1.10
T_9	6.18^{c}	5.96^{bc}	6.07^{c}	5.94^{c}	5.74^{b}	5.84^{c}	5.80^{c}	5.54^{b}	5.67^{c}	5.68^{c}	5.32^{b}	5.50^{c}	5.07^{c}	4.82^{b}	4.95^{d}	1.11	1.14	1.13
T_{10}	8.70^{f}	8.79^{hi}	8.74^{gh}	8.63^{g}	8.61^{j}	8.62^{h}	8.48^{h}	8.53^{i}	8.51^{i}	8.26^{h}	8.37^{i}	8.31^{i}	7.92^{g}	7.98^{i}	7.95^{i}	0.78	0.81	0.79
T_{11}	9.00^{g}	8.99^{i}	9.00^{h}	8.89^{h}	8.89^{k}	8.89^{i}	8.74^{i}	8.72^{j}	8.73^{i}	8.58^{i}	8.54^{j}	8.56^{j}	8.06^{g}	8.14^{i}	8.10^{i}	0.94	0.85	0.90
T_{12}	7.59^{e}	6.94^{ef}	7.27^{e}	7.49^{e}	6.73^{f}	7.11^{e}	7.41^{f}	6.58^{e}	7.00^{g}	7.26^{f}	6.40^{f}	6.83^{g}	6.61^{e}	6.01^{e}	6.31^{f}	0.98	0.93	0.96
T_{13}	4.08^{a}	4.29^{a}	4.18^{a}	3.84^{a}	4.06^{a}	3.95^{a}	3.73^{a}	3.92^{a}	3.82^{a}	3.62^{a}	3.79^{a}	3.70^{a}	3.07^{a}	3.26^{a}	3.17^{a}	1.01	1.02	1.02
SE (m) ±	**0.10**	**0.12**	**0.11**	**0.06**	**0.06**	**0.06**	**0.03**	**0.05**	**0.04**	**0.04**	**0.04**	**0.04**	**0.05**	**0.06**	**0.06**			
CD at 5%	**0.30**	**0.35**	**0.33**	**0.18**	**0.19**	**0.18**	**0.09**	**0.14**	**0.11**	**0.13**	**0.12**	**0.12**	**0.15**	**0.18**	**0.17**			

1. DAS – Days after storage
2. The superscript letter indicates that the treatment means with same letters are at par at 5% level of significance, while the means with different letters are significantly different at 5% level of significance. These letters have been affixed based on CD - value comparison of treatment means.

Table 3: Changes in Organoleptic scores for taste of aonla blended squash during storage.

Treatments	0 DAS			30 DAS			60 DAS			90 DAS			120 DAS			Reduction in scores during storage		
	2022	2023	Pooled mean	2022	2023	Pooled mean	2022	2023	Pooled mean	2022	2023	Pooled mean	2022	2023	Pooled mean	2022	2023	Pooled mean
T_1	7.15^{de}	7.43^{e}	7.29^{fg}	7.06^{e}	7.23^{f}	7.15^{g}	6.89^{fg}	7.05^{f}	6.97^{g}	6.69^{f}	6.89^{f}	6.79^{g}	6.13^{f}	6.43^{f}	6.28^{fg}	1.03	1.00	1.01
T_2	7.32^{e}	7.51^{e}	7.42^{g}	7.15^{e}	7.42^{g}	7.29^{h}	6.94^{g}	7.28^{g}	7.11^{h}	6.77^{g}	7.06^{g}	6.91^{h}	6.30^{g}	6.46^{f}	6.38^{g}	1.02	1.05	1.04
T_3	6.87^{c}	6.65^{b}	6.76^{c}	6.74^{c}	6.49^{c}	6.62^{c}	6.46^{c}	6.29^{c}	6.38^{c}	6.31^{c}	6.13^{c}	6.22^{c}	5.70^{c}	5.57^{bcd}	5.64^{cd}	1.17	1.08	1.12
T_4	6.95^{c}	6.82^{c}	6.89^{cd}	6.84^{d}	6.71^{d}	6.78^{de}	6.52^{d}	6.49^{d}	6.51^{d}	6.39^{d}	6.26^{d}	6.33^{d}	5.49^{b}	5.15^{b}	5.32^{b}	1.46	1.67	1.57
T_5	7.18^{de}	7.07^{d}	7.13^{e}	7.08^{e}	6.93^{e}	7.01^{f}	6.88^{f}	6.74^{e}	6.81^{f}	6.71^{fg}	6.60^{e}	6.66^{f}	6.00^{e}	6.03^{def}	6.02^{ef}	1.18	1.03	1.11
T_6	6.60^{b}	6.53^{b}	6.57^{b}	6.34^{b}	6.36^{b}	6.35^{b}	6.18^{b}	6.18^{b}	6.18^{b}	6.08^{b}	5.99^{b}	6.04^{b}	5.54^{b}	5.33^{bc}	5.43^{bc}	1.06	1.20	1.13
T_7	7.20^{de}	7.11^{d}	7.16^{ef}	7.10^{e}	6.93^{e}	7.02^{f}	6.93^{fg}	6.79^{e}	6.86^{f}	6.77^{g}	6.57^{e}	6.67^{f}	6.27^{g}	6.11^{ef}	6.19^{fg}	0.93	1.00	0.96
T_8	8.64^{f}	8.60^{f}	8.62^{h}	8.44^{f}	8.44^{h}	8.44^{i}	8.24^{h}	8.21^{h}	8.22^{i}	8.14^{h}	8.14^{i}	8.14^{i}	7.47^{h}	7.57^{g}	7.52^{h}	1.17	1.03	1.10
T_9	7.03^{cd}	6.79^{c}	6.91^{cd}	6.87^{d}	6.53^{c}	6.70^{cd}	6.68^{e}	6.31^{c}	6.50^{d}	6.48^{e}	6.18^{c}	6.33^{d}	5.98^{e}	5.75^{cde}	5.86^{de}	1.05	1.04	1.05
T_{10}	8.78^{f}	8.69^{f}	8.74^{h}	8.64^{g}	8.41^{h}	8.52^{i}	8.47^{i}	8.28^{h}	8.38^{j}	8.33^{i}	8.05^{h}	8.19^{i}	7.83^{i}	7.49^{g}	7.66^{hi}	0.94	1.20	1.07
T_{11}	9.00^{g}	8.98^{g}	8.99^{i}	8.93^{h}	8.77^{i}	8.85^{j}	8.77^{j}	8.64^{i}	8.70^{k}	8.52^{j}	8.50^{j}	8.51^{j}	8.00^{j}	7.90^{g}	7.95^{i}	1.00	1.08	1.04
T_{12}	6.88^{c}	7.04^{d}	6.96^{d}	6.68^{c}	6.95^{e}	6.82^{e}	6.46^{c}	6.76^{e}	6.61^{e}	6.37^{cd}	6.59^{e}	6.48^{e}	5.85^{d}	6.13^{ef}	5.99^{ef}	1.03	0.91	0.97
T_{13}	4.67^{a}	4.65^{a}	4.66^{a}	4.48^{a}	4.49^{a}	4.48^{a}	4.30^{a}	4.33^{a}	4.32^{a}	4.19^{a}	4.23^{a}	4.21^{a}	3.51^{a}	3.25^{a}	3.38^{a}	1.16	1.40	1.28
SE (m) ±	**0.06**	**0.04**	**0.05**	**0.03**	**0.02**	**0.03**	**0.02**	**0.03**	**0.02**	**0.02**	**0.02**	**0.02**	**0.04**	**0.17**	**0.11**			
CD at 5%	**0.19**	**0.12**	**0.15**	**0.09**	**0.06**	**0.08**	**0.06**	**0.09**	**0.07**	**0.07**	**0.06**	**0.06**	**0.12**	**0.51**	**0.31**			

1. DAS – Days after storage
2. The superscript letter indicates that the treatment means with same letters are at par at 5% level of significance, while the means with different letters are significantly different at 5% level of significance. These letters have been affixed based on CD - value comparison of treatment means.

Table 4: Changes in Organoleptic scores for flavour of aonla blended squash during storage.

Treatments	0 DAS			30 DAS			60 DAS			90 DAS			120 DAS			Reduction in scores during storage		
	2022	2023	Pooled mean	2022	2023	Pooled mean	2022	2023	Pooled mean	2022	2023	Pooled mean	2022	2023	Pooled mean	2022	2023	Pooled mean
T_1	6.55^{d}	6.41^{c}	6.48^{d}	6.37^{d}	6.27^{d}	6.32^{d}	6.23^{d}	6.13^{d}	6.18^{d}	6.10^{d}	5.89^{d}	6.00^{d}	5.47^{cd}	5.29^{c}	5.38^{c}	1.08	1.12	1.10
T_2	6.62^{d}	6.66^{d}	6.64^{e}	6.54^{e}	6.51^{e}	6.53^{e}	6.46^{e}	6.43^{e}	6.45^{e}	6.37^{e}	6.32^{e}	6.35^{e}	4.88^{b}	5.42^{c}	5.15^{b}	1.74	1.24	1.49
T_3	6.38^{c}	6.03^{b}	6.21^{c}	6.22^{c}	5.92^{c}	6.07^{c}	6.05^{c}	5.83^{c}	5.94^{c}	5.93^{c}	5.71^{c}	5.82^{c}	5.34^{c}	4.89^{b}	5.12^{b}	1.04	1.14	1.09
T_4	6.16^{b}	6.02^{b}	6.09^{b}	6.04^{b}	5.84^{b}	5.94^{b}	5.90^{b}	5.70^{b}	5.80^{b}	5.82^{b}	5.47^{b}	5.64^{b}	5.00^{b}	5.00^{b}	5.00^{b}	1.16	1.01	1.09
T_5	7.12^{f}	7.22^{f}	7.17^{g}	6.94^{g}	7.00^{g}	6.97^{g}	6.74^{g}	6.86^{g}	6.80^{g}	6.62^{g}	6.68^{g}	6.65^{g}	6.09^{e}	6.21^{de}	6.15^{e}	1.03	1.02	1.02
T_6	6.91^{e}	6.90^{e}	6.90^{f}	6.82^{f}	6.76^{f}	6.79^{f}	6.69^{f}	6.57^{f}	6.63^{f}	6.51^{f}	6.42^{f}	6.46^{f}	5.01^{b}	5.32^{c}	5.17^{b}	1.90	1.57	1.74
T_7	7.21^{f}	7.32^{fg}	7.26^{g}	7.12^{h}	7.19^{h}	7.16^{h}	6.99^{h}	7.10^{h}	7.04^{h}	6.86^{h}	6.95^{i}	6.90^{h}	5.58^{d}	6.12^{d}	5.85^{d}	1.63	1.20	1.42
T_8	8.79^{j}	8.77^{i}	8.78^{j}	8.63^{l}	8.63^{k}	8.63^{k}	8.50^{l}	8.49^{j}	8.50^{k}	8.41^{l}	8.35^{k}	8.38^{l}	7.16^{g}	7.70^{h}	7.43^{g}	1.63	1.06	1.35
T_9	7.73^{h}	7.39^{g}	7.56^{h}	7.64^{j}	7.18^{h}	7.41^{i}	7.51^{j}	7.08^{h}	7.29^{i}	7.37^{j}	6.86^{h}	7.12^{j}	6.01^{e}	6.35^{ef}	6.18^{e}	1.73	1.04	1.38
T_{10}	8.14^{i}	8.27^{h}	8.21^{i}	7.97^{k}	8.15^{j}	8.06^{j}	7.86^{k}	7.96^{i}	7.91^{j}	7.68^{k}	7.74^{j}	7.71^{k}	7.40^{h}	7.29^{g}	7.34^{g}	0.74	0.98	0.86
T_{11}	8.96^{k}	8.98^{j}	8.97^{k}	8.78^{m}	8.85^{l}	8.82^{l}	8.70^{m}	8.71^{k}	8.70^{l}	8.63^{m}	8.59^{l}	8.61^{m}	8.01^{i}	8.06^{i}	8.04^{h}	0.94	0.92	0.93
T_{12}	7.59^{g}	7.41^{g}	7.50^{h}	7.50^{i}	7.32^{i}	7.41^{i}	7.36^{i}	7.13^{h}	7.25^{i}	7.18^{i}	6.90^{h}	7.04^{i}	6.58^{f}	6.41^{f}	6.49^{f}	1.01	1.00	1.01
T_{13}	5.21^{a}	5.27^{a}	5.24^{a}	5.13^{a}	5.17^{a}	5.15^{a}	4.97^{a}	5.01^{a}	4.99^{a}	4.80^{a}	4.88^{a}	4.84^{a}	4.02^{a}	3.97^{a}	4.00^{a}	1.19	1.30	1.25
SE (m) ±	**0.04**	**0.04**	**0.04**	**0.02**	**0.02**	**0.02**	**0.02**	**0.02**	**0.02**	**0.02**	**0.02**	**0.02**	**0.06**	**0.06**	**0.06**			
CD at 5%	**0.11**	**0.11**	**0.11**	**0.07**	**0.05**	**0.06**	**0.05**	**0.06**	**0.05**	**0.07**	**0.06**	**0.07**	**0.19**	**0.16**	**0.18**			

1. DAS – Days after storage
2. The superscript letter indicates that the treatment means with same letters are at par at 5% level of significance, while the means with different letters are significantly different at 5% level of significance. These letters have been affixed based on CD - value comparison of treatment means.

Table 5: Changes in Organoleptic scores for aroma of aonla blended squash during storage.

Treatments	0 DAS			30 DAS			60 DAS			90 DAS			120 DAS			Reduction in scores during storage		
	2022	2023	Pooled mean	2022	2023	Pooled mean	2022	2023	Pooled mean	2022	2023	Pooled mean	2022	2023	Pooled mean	2022	2023	Pooled mean
T_1	5.21^{a}	5.34^{a}	5.28^{a}	5.09^{b}	5.21^{a}	5.15^{b}	4.91^{a}	5.03^{b}	4.97^{b}	4.83^{b}	4.94^{b}	4.89^{b}	4.04^{a}	4.29^{b}	4.17^{b}	1.16	1.06	1.11
T_2	6.25^{d}	6.29^{de}	6.27^{c}	6.20^{f}	6.10^{d}	6.15^{e}	6.10^{f}	6.04^{f}	6.07^{e}	5.98^{g}	5.90^{f}	5.94^{e}	5.12^{d}	5.20^{d}	5.16^{d}	1.12	1.09	1.11
T_3	5.73^{bc}	5.80^{b}	5.77^{b}	5.56^{d}	5.61^{b}	5.59^{c}	5.45^{c}	5.42^{c}	5.43^{c}	5.36^{d}	5.34^{c}	5.35^{c}	4.46^{b}	4.82^{c}	4.64^{c}	1.27	0.98	1.13
T_4	6.07^{cd}	6.24^{d}	6.16^{c}	5.94^{e}	6.08^{d}	6.01^{d}	5.84^{e}	5.90^{e}	5.87^{d}	5.71^{f}	5.81^{e}	5.76^{d}	4.99^{c}	5.23^{d}	5.11^{d}	1.09	1.01	1.05
T_5	6.14^{d}	6.43^{e}	6.28^{c}	5.89^{e}	6.36^{e}	6.13^{e}	5.67^{d}	6.09^{f}	5.88^{d}	5.56^{e}	5.95^{f}	5.76^{d}	4.92^{c}	5.41^{e}	5.16^{d}	1.22	1.02	1.12
T_6	5.61^{b}	6.00^{c}	5.81^{b}	5.35^{c}	5.86^{c}	5.61^{c}	5.23^{b}	5.76^{d}	5.49^{c}	5.09^{c}	5.63^{d}	5.36^{c}	4.54^{b}	4.95^{c}	4.74^{c}	1.07	1.05	1.06
T_7	6.79^{e}	6.92^{f}	6.86^{d}	6.64^{g}	6.76^{f}	6.70^{f}	6.26^{g}	6.49^{g}	6.38^{f}	6.12^{h}	6.33^{g}	6.23^{f}	5.38^{e}	5.65^{f}	5.51^{e}	1.41	1.27	1.34
T_8	7.13^{ef}	7.43^{g}	7.28^{e}	6.93^{h}	7.21^{g}	7.07^{h}	6.72^{h}	7.03^{i}	6.88^{h}	6.64^{j}	6.92^{j}	6.78^{h}	6.17^{g}	6.23^{h}	6.20^{g}	0.96	1.20	1.08
T_9	7.11^{ef}	6.96^{f}	7.04^{de}	6.85^{h}	6.81^{f}	6.83^{g}	6.63^{h}	6.70^{h}	6.67^{g}	6.50^{i}	6.61^{h}	6.55^{g}	6.00^{f}	6.06^{g}	6.03^{f}	1.11	0.91	1.01
T_{10}	7.93^{g}	7.84^{h}	7.89^{f}	7.82^{j}	7.65^{h}	7.73^{i}	7.71^{j}	7.53^{j}	7.62^{j}	7.58^{l}	7.42^{k}	7.50^{j}	7.06^{i}	6.90^{i}	6.98^{h}	0.87	0.94	0.90
T_{11}	8.09^{g}	8.19^{i}	8.14^{f}	8.00^{k}	8.03^{i}	8.02^{j}	7.86^{k}	7.88^{k}	7.87^{k}	7.74^{m}	7.79^{l}	7.77^{k}	7.29^{j}	7.24^{j}	7.27^{i}	0.80	0.95	0.87
T_{12}	7.32^{f}	7.25^{g}	7.29^{e}	7.13^{i}	7.13^{g}	7.13^{h}	7.04^{i}	6.97^{i}	7.00^{i}	6.93^{k}	6.84^{i}	6.88^{i}	6.50^{h}	6.11^{gh}	6.31^{g}	0.82	1.14	0.98
T_{13}	5.05^{a}	5.17^{a}	5.11^{a}	4.96^{a}	5.08^{a}	5.02^{a}	4.83^{a}	4.89^{a}	4.86^{a}	4.71^{a}	4.75^{a}	4.73^{a}	4.00^{a}	3.96^{a}	3.98^{a}	1.05	1.21	1.13
SE (m) ±	**0.12**	**0.06**	**0.09**	**0.03**	**0.05**	**0.04**	**0.04**	**0.03**	**0.03**	**0.03**	**0.02**	**0.03**	**0.03**	**0.05**	**0.04**			
CD at 5%	**0.35**	**0.18**	**0.26**	**0.09**	**0.13**	**0.11**	**0.11**	**0.09**	**0.10**	**0.09**	**0.06**	**0.07**	**0.08**	**0.14**	**0.11**			

1. DAS – Days after storage
2. The superscript letter indicates that the treatment means with same letters are at par at 5% level of significance, while the means with different letters are significantly different at 5% level of significance. These letters have been affixed based on CD - value comparison of treatment means.

Table 6: Changes in Organoleptic scores for overall acceptability of aonla blended squash during storage.

Treatments	0 DAS			30 DAS			60 DAS			90 DAS			120 DAS			Reduction in scores during storage		
	2022	2023	Pooled mean	2022	2023	Pooled mean	2022	2023	Pooled mean	2022	2023	Pooled mean	2022	2023	Pooled mean	2022	2023	Pooled mean
T_1	6.80^{d}	6.46^{c}	6.63^{c}	6.57^{c}	6.25^{c}	6.41^{d}	6.22^{cd}	6.08^{c}	6.15^{c}	6.15^{d}	5.85^{c}	6.00^{c}	4.93^{b}	4.95^{b}	4.94^{b}	1.87	1.51	1.69
T_2	7.19^{e}	7.11^{de}	7.15^{e}	7.04^{e}	6.93^{f}	6.99^{f}	6.87^{f}	6.66^{e}	6.77^{e}	6.58^{f}	6.39^{e}	6.49^{e}	5.95^{ef}	5.69^{d}	5.82^{d}	1.25	1.42	1.33
T_3	6.44^{b}	6.57^{c}	6.51^{bc}	6.29^{b}	6.33^{d}	6.31^{c}	6.07^{b}	6.20^{d}	6.13^{c}	5.86^{b}	6.06^{d}	5.96^{c}	5.29^{c}	5.43^{c}	5.36^{c}	1.15	1.14	1.15
T_4	6.90^{d}	7.05^{d}	6.97^{d}	6.49^{d}	6.82^{e}	6.65^{e}	6.28^{d}	6.71^{e}	6.50^{d}	6.11^{d}	6.56^{f}	6.33^{d}	5.83^{e}	6.05^{e}	5.94^{de}	1.07	0.99	1.03
T_5	7.39^{f}	7.20^{de}	7.29^{f}	7.14^{f}	7.02^{g}	7.08^{g}	6.98^{g}	6.84^{f}	6.91^{f}	6.65^{g}	6.78^{h}	6.72^{g}	5.93^{ef}	6.23^{e}	6.08^{e}	1.46	0.96	1.21
T_6	6.64^{c}	6.12^{b}	6.38^{b}	6.38^{c}	5.99^{b}	6.18^{b}	6.13^{bc}	5.81^{b}	5.97^{b}	5.96^{c}	5.58^{b}	5.77^{b}	5.20^{c}	5.01^{b}	5.10^{b}	1.44	1.11	1.28
T_7	7.36^{f}	7.51^{f}	7.44^{g}	6.99^{e}	7.27^{h}	7.13^{g}	6.76^{e}	7.00^{g}	6.88^{f}	6.45^{e}	6.77^{h}	6.61^{f}	6.07^{f}	6.15^{e}	6.11^{e}	1.29	1.36	1.32
T_8	8.67^{i}	8.44^{h}	8.56^{i}	8.38^{h}	8.32^{j}	8.35^{j}	8.16^{i}	8.12^{i}	8.14^{h}	7.97^{j}	7.95^{j}	7.96^{i}	7.04^{g}	7.32^{f}	7.18^{f}	1.63	1.12	1.37
T_9	7.51^{g}	7.23^{e}	7.37^{fg}	7.33^{g}	7.09^{g}	7.21^{h}	7.10^{h}	6.89^{f}	7.00^{g}	6.96^{i}	6.67^{g}	6.81^{h}	6.05^{f}	6.19^{e}	6.12^{e}	1.47	1.04	1.26
T_{10}	8.56^{h}	8.25^{g}	8.41^{h}	8.42^{h}	8.11^{i}	8.26^{i}	8.21^{i}	7.97^{h}	8.09^{h}	8.10^{k}	7.81^{i}	7.96^{i}	7.89^{h}	7.30^{f}	7.59^{g}	0.67	0.95	0.81
T_{11}	8.95^{j}	8.92^{i}	8.94^{j}	8.74^{i}	8.72^{k}	8.73^{k}	8.58^{j}	8.45^{j}	8.52^{i}	8.24^{l}	8.32^{k}	8.28^{j}	8.00^{h}	7.58^{g}	7.79^{h}	0.95	1.34	1.15
T_{12}	7.37^{f}	7.27^{e}	7.32^{fg}	7.17^{f}	7.08^{g}	7.13^{g}	7.01^{gh}	6.86^{f}	6.94^{fg}	6.75^{h}	6.67^{g}	6.71^{g}	5.65^{d}	6.20^{e}	5.93^{de}	1.72	1.06	1.39
T_{13}	5.72^{a}	5.68^{a}	5.70^{a}	5.55^{a}	5.40^{a}	5.48^{a}	5.18^{a}	5.13^{a}	5.16a	4.87^{a}	4.96^{a}	4.92^{a}	4.26^{a}	4.13^{a}	4.19^{a}	1.46	1.56	1.51
SE (m) ±	**0.03**	**0.05**	**0.04**	**0.03**	**0.02**	**0.02**	**0.03**	**0.02**	**0.03**	**0.02**	**0.03**	**0.03**	**0.06**	**0.07**	**0.07**			
CD at 5%	**0.10**	**0.16**	**0.13**	**0.08**	**0.07**	**0.07**	**0.10**	**0.06**	**0.08**	**0.05**	**0.08**	**0.07**	**0.17**	**0.20**	**0.19**			

1. DAS – Days after storage
2. The superscript letter indicates that the treatment means with same letters are at par at 5% level of significance, while the means with different letters are significantly different at 5% level of significance. These letters have been affixed based on CD - value comparison of treatment means.

Table 7: Microbial colony count (cfu/ml) in aonla blended squash during storage.

Treatments	0 DAS			30 DAS			60 DAS			90 DAS			120 DAS		
	2022	2023	Pooled mean	2022	2023	Pooled mean	2022	2023	Pooled mean	2022	2023	Pooled mean	2022	2023	Pooled mean
T_1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00^{ab}	1.00^{ab}	1.00^{ab}	3.00^{bc}	4.00^{cd}	3.50^{bc}
T_2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00^{bc}	2.00^{b}	2.00^{bc}	4.00^{cd}	3.00^{bc}	3.50^{bc}
T_3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00^{ab}	1.00^{ab}	1.00^{ab}	2.00^{ab}	5.00^{de}	3.50^{bc}
T_4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.00^{d}	5.00^{c}	4.50^{d}	7.00^{e}	10.00^{f}	8.50^{e}
T_5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.00^{cd}	4.00^{c}	3.50^{cd}	5.00^{d}	6.00^{e}	5.50^{d}
T_6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00^{ab}	2.00^{b}	1.50^{ab}	2.00^{ab}	5.00^{de}	3.50^{bc}
T_7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00^{ab}	0.00^{a}	0.50^{ab}	3.00^{bc}	1.00^{a}	2.00^{ab}
T_8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00^{a}	0.00^{a}	0.00^{a}	1.00^{a}	2.00^{ab}	1.50^{a}
T_9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00^{ab}	1.00^{ab}	1.00^{ab}	4.00^{cd}	3.00^{bc}	3.50^{bc}
T_{10}	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00^{bc}	1.00^{ab}	1.50^{ab}	5.00^{d}	5.00^{de}	5.00^{cd}
T_{11}	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00^{a}	0.00^{a}	0.00^{a}	1.00^{a}	1.00^{a}	1.00^{a}
T_{12}	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00^{ab}	0.00^{a}	0.50^{ab}	2.00^{ab}	2.00^{ab}	2.00^{ab}
T_{13}	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.00^{e}	7.00^{d}	7.50^{e}	12.00^{f}	11.00^{f}	11.50^{f}
SE (m) ±	-	-	-	-	-	-	-	-	-	**0.64**	**0.42**	**0.53**	**0.55**	**0.53**	**0.54**
CD at 5%	**NS**	**NS**	**NS**	**NS**	**NS**	**NS**	**NS**	**NS**	**NS**	**1.86**	**1.23**	**1.55**	**1.61**	**1.54**	**1.58**

1. DAS – Days after storage
2. The superscript letter indicates that the treatment means with same letters are at par at 5% level of significance, while the means with different letters are significantly different at 5% level of significance. These letters have been affixed based on CD - value comparison of treatment means.

CONCLUSIONS

It is concluded from the experiment carried out during the year 2021-2022 and 2022-2023 that the treatment T_{11} (50% Aonla + 48% Pomegranate + 2% Ginger) was found superior among all other treatments tested for different sensory parameters. However, the minimum organoleptic score for different sensory parameters *i.e.*colour/appearance, taste, flavor, aroma and overall acceptability is registered under the treatment T_{13} (100% Aonla). The treatment T_{11} reported minimum microbial count, while the maximum microbial colony count was recorded under the treatmentT_{13} (100% Aonla).

FUTURE SCOPE

The best treatment combination identified in the present study can be commercially exploited to increase utilization of natural beverages *i.e.* aonla blended squash in place of synthetic drinks. Recipe of the best treatments can be standardized and further analysed for several years for different bio-chemical parameters and microbial load. Various aonla based fortified processed products can also be prepared by using locally available underutilized fruits to enrich the nutritional qualities of the products and comprehensive study on microbial load of fortified nectar and squash should be made under different storage conditions.

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Conflict of Interest. None.

REFERENCES

Choudhary, M. L., Verma, I. M., Singh, J., Chandra, A. and Godara, S. L. (2013). Studies on biochemical changes in Aonla (*Emblica officinalis* Gaertn.) squash under storage condition. *Progressive Horticulture, 45* (2), 281.

Kulkarani, P., Pandey, H., Sharma, A. K. and Joshi, D. C. (2017). Physico-chemical properties of Aonla fruit and juice. *ChemSci Rev Lett., 6*(22), 1343-1347.

Kumari, P and Khatkar, B. S. (2018). Nutritional composition and drying kinetics of aonla fruits. *J Food Sci Technol., 55*(8), 3135–3143.

Madhu, G., Kavita, S. and Vrinda, K. (2008). New vistas of value addition to utilize Amla *(Emblica officinalis)* and Ber (*Ziziphus Mauritiana*) fruits. *Journal of Dairying, Foods & H.S. 27*(2), 145-147.

Malu, S. P., Obochi, G. O., Tawo, E.N. and Nyong, B. E. (2009). Antibacterial activity and medicinal properties of Ginger (*Zingiber officinale*). *Global Journal of Pure and Applied Sciences, 15*, 365-368.

Pavithra, K. J. and Mini, C. (2023). Development and quality evaluation of dragon fruit (*Hylocereus undatus*) based blended RTS beverages. *Asian Journal of Dairy and Food Research, 42*(1), 110-116.

Prasad, R. N. and Mali, P. C. (2000). Changes in physico-chemical characteristics of Pomegranate squash during storage. *Indian J. Hort., 57*(1), 18-20.

Rajesh, L., Sindhu, S. S., Jithender, K. and Sehrawat, S. K. (2009). Storage studies of Aonla blended squash with different fruit juices. *Haryana Journal of Horticultural Science, 38*(3-4), 264-269.

Roopak, J., Singh, G. and Singh, A. K. (2006). Evaluation of Aonla *(Emblica officinalis* Gaertn.*)* cultivars for squash making. *Progressive Agriculture, 8* (1), 29-31.

Sangeeta, V. and Anisa, D. (2014). Studies on preparation and shelf life of honey aonla squash. *International Journal of Engineering Research and Sports Science, 1*(5), 1-3.

Sharma, R., Burang, G., Kumar, S., Sharma, Y. P. and Kumar, V. (2021). Optimization of Apricot (*Prunus armeniaca* L.) blended Aloe vera (*Aloe barbadensis* M.) based low-calorie beverage functionally enriched with aonla juice (*Phyllanthus emblica* L.). *J. Food. Sci. Technol., 59*, 2013-2024.

Singh, O., Sanjay, P. and Singh, R. (2013). Studies on suitable blending ratio for the preparation of Aonla based quality beverages. *Annals of Horticulture, 6*(2), 198-204.

Srinivas, K. N., Revanna, M. L. and Jamuna, K. V. (2007). Standardization of recipes for production of squash in pomegranate (*Punica granatum* L.) cv. Ganesh and Mridula. *Journal of Dairying Foods and H. S., 26*(2), 133-136.

Thakur, N. S., Thakur, N., Kumar, P., Hamid and Thakur, A. (2018). Formulation and optimization of vitamin C rich Ready-To-Serve juice based beverage from wild aonla fruits and its quality evaluation during storage. *Journal of Pharmacognosy and Phytochemistry, 7*(1), 1796-1802.

Vaidya, A. A., Relekar, P. P. and Pujari, K. H. (2017). Studies on qualitative changes in the blended jamun (*Syzygium cuminii* Linn.) and aonla (*Emblica officinalis* Gaertn.) nectar during storage. *International Journal of Tropical Agriculture, 35*(4), 1115-1119.

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