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Standardization of recipe, processing and storage stability of aonla based tomato sauce

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Abstract

Possibility for utilization of aonla fruits in sauce industry has been examined. Sauce containing 0.5Kg. aonla pulp+0.5Kg. tomato pulp with 75g. Sugar, 10g salt, 50g. onion, 5g garlic, 10g ginger, 5g red chillies and 10g hot spices was found to be the most ideal for preparation of the quality of Sauce remained acceptable upto 12 months at room temperature. However, a little change in chemical properties was found after commercial processing of aonla based sauce will be helpful for establishing the acceptability of the agro-processing industry to utilize aonla fruits, as it is going to become the fruit of 21st century, as it is valued very high for its nutritional and medicinal properties.

Keywords: Recipe, processing, storage stability, aonla based tomato sauce

Introduction

Aonla (*Emblica officinalis* Gaertn) is valued for nutritional and medicinal properties. The fruit is one of the richest source of natural ascorbic acid. It is probably the only fruit to fill the gap of astringent food recommended by Ayurvedic and Unani systems of medicine. The fruit is not consumed much as fresh fruit as it is highly acidic and astringent in taste. The excellent nutritive and therapeutic values of the fruit have great potentiality for processing into a number of quality products like preserve, candy, dehydrated aonla, jam, pickles etc sauce is an important food product and mostly prepared from tomato fruits. Mixture of various other fruits and starchy vegetables like pumpkin and ashgourd are sometimes employed in the preparation of aonla sauce with tomato pulp is lacking in literature Aonla and tomato mixed sauce will not only be more nutritive, probably show better consumer appeal. Considering these facts, the preparing aonla based fruit sauce and assess the qualitative and storage stability of the product.

Materials and Methods

The investigations were carried out in the post Harvest Technology Laboratory of N.D University of Agriculture & Technology kumarganj, Faizabad during the year 2013-14. Fruits of promising aonla variety 'Narendra Aonla-6' used for experiment were harvested at maturity harvested at maturity. Firm ripe tomato fruits (Hybrid variety) were purchased from the local market.

Extraction of pulp

Fruits were washed gently in running water to remove dirt and dust particles. The technique used for extraction of aonla pulp is presented in the form of a sheet (Fig.1). Tomato pulp was extracted as per method described by Lal *et al.*, (1978).

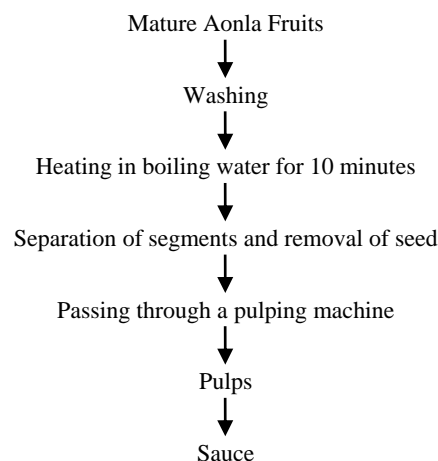


Fig 1: Flow sheet for extraction of Aonla fruit pulp

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Preparation of sauce

Five kg of sauce was prepared by mixing and cooking calculated amount of aonla pulp, tomato pulp, sugar, salt, onion, garlic, Ginger, red chillies and hot spices according to different recipes given in Table 1 and procedure shown in fig 2. Glacial acetic acid and sodium benzoate were used as

preservative at the rate of 1ml and 0.3Kg finished product, respectively. Products were evaluated organoleptically by a panel consisting of 7 members the samples were rated on Hedonic Rating scale where, 1 and 9 represented disliked extremely and liked extremely, respectively (Larmond, 1982) [5].

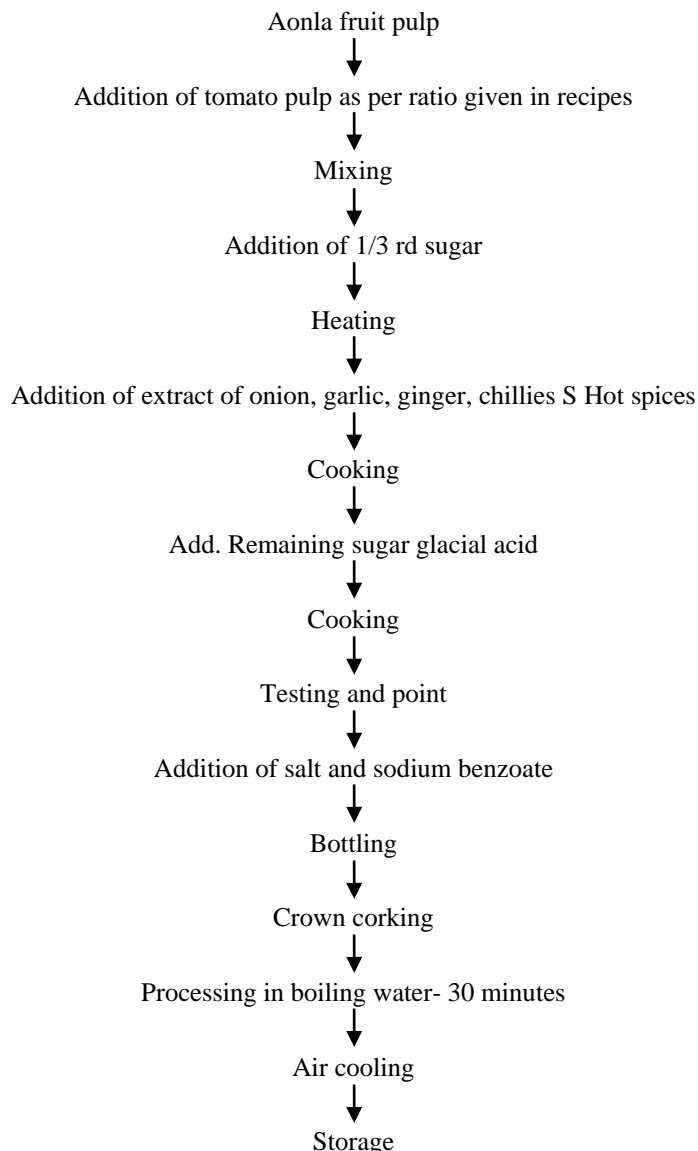


Fig 2: Flow sheet preparation of aonla and tomato mixed sauce

Storage studies

To study storage stability of the product, five kg sauce of ideal recipe (Recipe No.3) as judged by panel, containing 50 per cent aonla pulp and 50 per cent tomato pulp with other ingredients was prepared as per procedure mentioned above. Sauce was bottled crown corked and pasteurized for 30 minutes in boiling water, air cooled and kept at ambient temperature for storage studies. Observation on ascorbic acid, total phenols, browning and organoleptic quality were recorded at monthly intervals. Ascorbic acid content was estimated by titrating aliquat against 2, 6- dichlorophenol-indophenol-dye solution as described by Ranganna (1986) [9]. The method explained by swan and Hills (1959) was applied for estimation of total phenols. For measuring non- enzymic

browning.10ml of sauce added with 10ml of distilled water were mixed with 30ml of alcohol. After filtering the content through Whatman filter paper No.1 O.D. of the extract was recorded at 440nm using 60 per cent aqueous alcohol as blank Browning was expressed in of O.D. (Raganna, 1986) [9].

Results and Discussion

The aonla pulp was the major constituent and tomato was used to impart colour, flavour and taste to the aonla based sauce. The preliminary trials conducted for standardization of recipe indicated significant in the taste and acceptability score of the sauce prepared by using different levels of aonla pulp (Table-1).

Table 1: Organoleptic rating of aonla based sauce prepared from different recipes.

Recipies	Aonla pulp (kg)	Tomato pulp (kg)	Sugar (g)	Salt (g)	Onion (g)	Garlic (g)	Ginger (g)	Red Chillies	Hot spices	Organoleptic Score	Quality rating
1	1.00	-	75	10	50	5	10	5	10	6.2	Like Slightly
2	0.75	0.25	75	10	50	5	10	5	10	7.3	Like moderately
3	0.50	0.50	75	10	50	5	10	5	10	8.7	Like Very Much
CD at 5%										0.7	

* Score 7 and above are acceptable

Result reveal that recipe No. 3 which contains 0.5 kg aonla pulp and 0.5 kg tomato pulp with 75g sugar, 10g salt, 50g onion 5g garlic, 10g ginger, 5g red chillies and 10 hot spice was found to be the most ideal for preparation of the sauce. The sauce, Prepared form pure aonla pulp had lower organoleptic score and the prepared product was not acceptable. The increase in acceptability score might be due to the increased liking for tomato colour and flavour in the product. The addition of tomato pulp, less then 50per cent or no addition of tomato pulp, reduced the organoleptic score of the sauce. Recipes for fruit based sauce have also been standardized by Lal *et al.*, (1988) [4] and Srivastava and Kumar (1944).

Studies on qualitative changes during storage of aonla sauce reveal that ascorbic acid content decreased continuously with the storage period (Table 2) About 50 Per cent of vitamin c,

was lost after 8 months of storage. Retention of vitamin c, after 12 months of storage was 31.7 per cent. Reduction in ascorbic acid content could be due to oxidation which results in formation of dehydro ascorbic acid. Information pertaining to the lose of ascorbic acid form fruit sauce during storage is not available in literature. However, reduction in many other fruit products during storage has been reported by many workers (Ram, 1984, Ashrat, 1987, and kumar, 1990) [7, 1, 3]. Results reveal that total phenols in terms of gallic acid increased during storage (Table-2). Sastry *et al.*, (1958) [10] reported that tannin content of fruit known as gallotanic acid yields gallic acid on hydrolysis, hence an increase in total phenols as gallic acid might be due to hydrolysis, of gallotanic acid during storage, increase in total phenols during storage of other fruit products have also been observed by many workers (Patel, *et al.*, 1978 and sethi, 1980) [6, 11].

Table 2: Qualitative changes during ambient storage of aonla based sauce

Storage period (months)	Ascorbic acid (mg/100g)	Total phenols (mg/100g)	Browning (O.D.)	Organoleptic quality (Score)*
0	112.35	421.31	0.113	8.84
1	109.09	438.29	0.128	8.82
2	102.75	510.33	0.145	8.78
3	99.98	612.76	0.161	8.72
4	95.96	646.47	0.175	8.60
5	89.65	672.32	0.216	8.48
6	83.33	709.50	0.275	8.40
7	75.78	808.50	0.276	8.28
8	66.67	829.77	0.287	8.20
9	50.31	848.92	0.298	7.88
10	51.26	864.89	0.304	7.52
11	43.01	905.31	0.326	7.40
12	35.71	946.79	0.357	7.12

* Score 7 and above are acceptable

Aprogressive increase in browning of aonla based sauce was observed with the storage period (Table-2). This could be mainly due to the non-enzymic reaction such as organic acid with sugar Stadman (1948) [14] reported that decline in ascorbic acid content of fruit product during storage may be one of the possible reasons for browning of the product. in browning has also been reported in papaya jam (kumar, 1990) [3], and litchi beverage (Singh and Singh, 1994) [12].

Organoleptic quality determines the storage stability of the product. in the present finding. There was gradual decrease in organoleptic score of aonla sauce during ambient storage (Table 2). practically little or no change in organoleptic score was noticed upto 7months or storage while acceptable quality was maintained even upto 12 months of storage. There are many factors which determine the role in inducing certain bio-chemical changes in product, which leads to the development of brown pigments or discolouration and masking of original colour and flavour of the product. thus lose in organoleptic quality and storage stability of sauce after certain period is obvious. Report on reduction in organoleptic score with storage period of fruit sauce is not available. However, reduction in acceptability with the storage period has been observed in phalsa beverage

(Khurdiya and Anand, 1981) [2] litchi beverage (singh and singh, 1994) [12], papaya jam (kumar, 1990) [3] and bael toffee (Roy and singh, 1979) [8].

References

1. Ashraf SM. Studies on post-harvest technology of Jamun (*Syzygium cuminili* Skeel) fruit. Ph. D. Thesis, N.D. Univ. of Agri & Techology, Faizabad, 1987.
2. Khurdiya DS, Anand JC. Effect of storage temperature on quality of phalsa beverage. J Fd. Sci & Tech., 1981; 18:160
3. Kumar S. Studies on post harvest technology of papaya (*Carica papaya* L.) fruit. Ph.D. thesis, N.D. Univ. of Agri. & Technology, Faizabad, 1990.
4. Lal G, Siddappa GS, Tondon GL. Preservation of fruits and vegetables, I.C.A.R., New Delhi, 1988.
5. Larmond E. Laboratory methods for sensory Evaluation of Food. Communication Branch, Agriculture, Ottawa, Canada, 1982.
6. Patel JD, Venkatramu K, Subbarao MS. Changes in phenolics during storage of wine, Indian Fd. Pack. 1978; 32:34-35.

7. Ram B. Studies on processing and preservation of aonla fruit beverage, M.Sc. (Ag.) Thesis, N.D. Univ. of Agri. & Technology, Faizabad, 1984.
8. Roy SK, Singh RN. Studies on utilization of bael fruit (*Aegle marmelos* Correa) for processing IV. Storage studies of bael fruit products. Indian Fd. Pack. 1979; 33(6):3-9.
9. Ranganna S. Hand book of Analysis and quality control for fruit and vegetable products, Tata McGraw-Hill Pub. Co. Ltd., New Delhi, 1986.
10. Sastry MV, Siddappa GS, Lal G. Chemical and microbial analysis of some important canned preserves. Indian J Hort. 1958; 15:26
11. Sethi V. Studies on preparation and storage of Some semi dry Preserve (Murrabba). Ph.D. Thesis., I.A.R.I., New Delhi, 1980.
12. Singh P, Singh IS. Physico-chemical changes during storage of litchi (*Litchi chinensis*) beverages. Indian J Agri. Sci. 1994; 64:168-170.
13. Srivastava RP, Kumar S. Fruit and vegetable preservation-principles and practices. International book Distributing Co., Lucknow, 1994.
14. Stadman ER. Non-enzymatic browning in fruit products. III. Effect of storage temperature on browning. Adv. Fd. Res. 1948; 1:325-72.
15. Swan T, Hills VE. The Phenolic constituents of prunus domestic Quantitative analysis of phenolic constituents. J Sci. Agri. 1959; 10:63-78.