

Research Article

Effect of Pulp Blending On Standardization and Acceptability of Seabuckthorn: Apricot Nectar

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Abstract

Investigations were carried out to study the effect of pulp blending on the quality and consumer acceptability of apricot nectar blended with seabuckthorn. Seabuckthorn and apricot (cv. Khantay bitter kernelled) pulps were blended in six ratios; 0 : 100, 10 : 90, 20 : 80, 30 : 70, 40 : 60 and 50 : 50. Nectars were formulated as per Food Safety Standard Act 2006 Govt. of India (20% pulp, 18% TSS, 0.30% acidity and 70 ppm potassium metabisulphite). Physico-chemical parameters TSS %, acidity %, reducing sugars %, total sugars, brix acid ratio and organoleptic scores revealed blend ratio of 40:60 from Sea buckthorn: apricot pulp acceptable for nectar formulation. Pulp blend ratio of 40:60 for seabuckthorn- apricot blended nectar with 20 percent pulp, 18 percent TSS, 0.3 percent acidity as maleic acid as per Food Safety Standard Act 2006 Govt of India has been found best for consumer consumption on the basis of organoleptic scores and physico chemical characteristics.

Keywords: Apricot; Seabuckthorn; Organoleptic Scores

Introduction

Apricot (*Prunus armeniaca* L.) of the Rosaceae family grows all over the world ranging in altitude from 150 to 4000 meters above sea level. About twenty-two selections of apricot are under cultivation in Ladakh India and based on the taste of the kernel are grouped as Narmo chuli (sweet kernelled) and Khantay chuli (bitter kernelled). Halman (sweet kernelled) and Khantay (bitter kernelled) apricots are the most important selections grown commercially in Ladakh region of the state. Halman is famous for drying purpose and Khantay is used as rootstock for all other cultivars [1]. Apricot is delicious and highly nutritious fruit containing a healthy amount of carotenoids, carbohydrates, proteins, phosphorus and niacin in comparison to majority of other common fruits [2]. Perishable nature and quarantine measures imposed on export of fresh apricots due to codling moth, restricts its use as fresh fruit to Ladakh region only. Hence, value addition of apricot is the only way out for its export from Ladakh division to other regions. Seabuckthorn (*Hippophae rhamnoides* L.) is a Himalayan

temperate fruit and belongs to the family Elaeagnaceae. It is being widely grown in China, Russia, Britain, Germany, Finland, Romania, France, Nepal, Bhutan and Pakistan at an altitude of 2,500-4,300 meters. The fruits of seabuckthorn are known as *Tsesthalulu* in Ladakh. This is perhaps, the most commonly used plant for the purpose of fuel, fence, medicine and fruit by the local people and can be used as multipurpose plant for greening of cold arid regions of the Himalayas, including Ladakh. Fruits of seabuckthorn are rich in vitamin C, A, B, E, K and other nutrients like protein, organic acids and flavonoids. The fruit of the seabuckthorn is usually orange red in colour, having small sized berries and is a rich source of vitamin C, carotenoids and mineral matter. The fruit juice of seabuckthorn also contains substantial amount of vitamin B and vitamin K [3]. Its small, orange red coloured fruit is a store house of vitamins and important bio-active substances and its vitamin C content is 5 times higher than any other fruit or vegetable [4]. Despite its highly acidic nature and exotic flavour, seabuckthorn berries are having good potential for producing various products like ready-to-serve beverages, squash, syrup, jam and jelly. Judicious blending of seabuckthorn juice/pulp with other fruits such as

papaya, apple and oranges in different ratios could be a promising way for the processing of seabuckthorn and for minimisation of juice astringency [3]. Hence this study has been taken with the aim of developing consumer acceptable apricot-sea buckthorn blended nectar.

Materials and Methods

The investigations were carried out in the Division of Post Harvest Technology, SKUAST-Kashmir, Shalimar Srinagar India during the year 2015-16. The pulps from apricot Cv Khantay and wild sea buckthorn fruits were prepared in the laboratory, canned and stored in refrigerator for further use. Potassium Meta Bisulphate (KMS), citric acid, sugar, glass bottles, plastic cans and analytical grade chemicals used during the study were procured from local market.

Product development

Nectar was prepared as per the following specifications (Food Safety Standard Authority India Act 2006) using 20% pulp, 18% TSS, 0.3% acidity as maleic acid and 70 ppm KMS as preservative irrespective of fruit blend ratio. Seabuckthorn and apricot pulps were blended in the following ratios:

Type of Fruit	Pulp Blends					
	T ¹	T ²	T ³	T ⁴	T ⁵	T ⁶
Seabuckthorn	0	10	20	30	40	50
Apricot	100	90	80	70	60	50

Nectar was formulated after estimating total soluble solids and acidity for each blend ratio as shown in Figure 1.

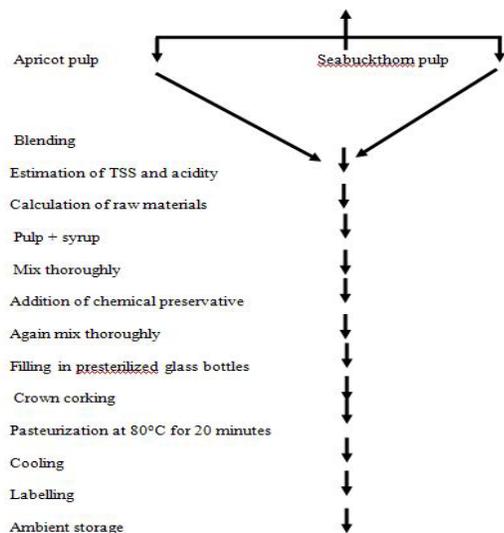


Figure 1: Preparation of Nectar.

Physico chemical characteristics

Percent total soluble solids, titrable acidity as maleic acid, total and reducing sugars, Vitamin C and non enzymatic browning in fresh fruit samples as well as in the product were determined as per the methods prescribed by Rangana, 1986 [5]. Total carotenoids and tannins by the method of Arya 1981 and AOAC 1984 [6] respectively. Specific gravity of the samples was determined using pycnometer method and the turbidity (NTU) of the product by digital turbidity meter (Model 331 E).

Sensory evaluation

Sensory quality attributes such as colour, flavour and overall acceptability of the nectar were evaluated by semi-trained panel of 10 members drawn from scholars and staff members of Division of Post Harvest Technology, SKUAST-K, Shalimar. The panellists were provided with coded samples of nectar and were requested to note their sensory responses on the basis colour, flavour and overall acceptability on 5-point hedonic scale as 5= Excellent, 4= Very good, 3= Good, 2= fair and 1= Poor.

Statistical analysis

Statistical analysis of the data collected for different parameters during the investigations was subjected to analysis of variance using completely randomized design with three replications [7].

Results and Discussion

The physico-chemical characteristics of pulp of apricot cv. Khantay are indicated in Table-1. Apricot recorded pulp yield (76 %), total soluble solids(17%), total and reducing sugars (11.73 and 6.64%), acidity as maleic acid (1.14%), vitamin C (8.50 mg/100 g), total carotenoids (1.05 mg/100 g) and tannins (0.085% tannic acid) where seabuckthorn had pulp yield (68.2%), total soluble solids (9.80%), total sugar (6.70%), reducing sugars (1.13%), acidity (2.52% as maleic acid), vitamin C (105. 80 mg/100 g), total carotenoids (5.40 mg/100g) and tannin (0.54% tannic acid) respectively. Variation in values may be attributed to the varietal differences and the influence of various agro-climatic factors on the above mentioned parameters. Higher yield of pulp and TSS in apricots compared to seabuckthorn is because of the differences in size of fruits and percent acidities.

Parameters	Apricot	Seabuckthorn
Pulp yield (%)	76.00	68.20
Total soluble solids (%)	17.00	9.80
Acidity (% maleic acid)	1.14	2.52
Total sugars (%)	11.73	6.70
Reducing sugars (%)	6.64	1.13
Vitamin C (mg/100g)	8.50	105.80
Total carotenoids (mg/100g)	1.05	5.40
Tannins (% tannic acid)	0.085	0.54

Table 1: Physico- chemical characteristics of apricot cv. Khantay and Seabuckthorn.

Physico-chemical characteristic of seabuckthorn-apricot blended pulp

The physico-chemical characteristics of different seabuckthorn

and apricot pulp blends are indicated in Table-2. Blend ratio 10 : 90 (seabuckthorn : apricot) had a total soluble solid of 15.9 per cent, acidity (1.14% maleic acid), reducing sugar (6.09%) total sugar (10.56%) and Brix : acid ratio (13.92). Blend ratio 20 : 80 (seabuckthorn : apricot) contained total soluble solids of 15.6 per cent, acidity (1.37% maleic acid), reducing sugar (5.54%), total sugars (10.03%) and Brix : acid (11.36). In case of blend ratio 30 : 70 (seabuckthorn : apricot) total soluble solids were recorded 15.3 per cent, acidity (1.40% maleic acid), reducing sugar (5.04%), total sugar (9.39%) and Brix: acid (10.87). Blend ratio 40 : 60 (seabuckthorn : apricot) showed total soluble solids (14.9%), acidity (1.42% maleic acid), reducing sugar (5.02%), total sugar (9.34%) and Brix : acid (10.47). Blend ratio 50 : 50 (seabuckthorn : apricot) had total soluble solids (14.5%), acidity (1.68% maleic acid), reducing sugars (4.28%), total sugar (9.21%) and Brix : acid (8.65). with increase in seabuckthorn pulp ratio in the blend, acidity increased where as all other parameters decreased significantly due to higher astringency in seabuckthorn pulp.

S. No.	Blend ratio (pulp)		T.S.S. (%)	Acidity (% maleic acid)	Brix acid ratio	Reducing sugars (%)	Total sugars (%)
	Seabuckthorn	Apricot					
1	0	100	17.0	1.14	14.92	6.64	11.73
2	10	90	15.9	1.14	13.92	6.09	10.56
3	20	80	15.6	1.37	11.36	5.54	10.03
4	30	70	15.3	1.40	10.87	5.04	9.39
5	40	60	14.9	1.42	10.47	5.02	9.34
6	50	50	14.5	1.68	8.68	4.28	9.21

CD at 5%: TSS= 0.415 Acidity = 0.017 Reducing sugar = 0.321 Total sugar = 0.029

Table 2: Physico-chemical characteristics of seabuckthorn- apricot blended pulps.

Organoleptic quality of seabuckthorn- apricot blended nectar

Organoleptic scores for colour, flavour and overall acceptability of nectars prepared from different blend ratio, are indicated in Table-3. Nectar developed from T5 (40% seabuckthorn and 60% apricot) recorded maximum score of 4.5 each for colour, flavour and overall acceptability on 5- point hedonic scale whereas, T1 (0% seabuckthorn and 100% apricot) recorded least score of 2.00 for colour and 3 each for flavour and overall acceptability. Statistically, there was significant difference amongst the blended nectars in terms of organoleptic qualities. Blend ratio of 40:60 recorded least tartness and astringency.

Blend ratio (seabuckthorn : apricot)	Colour scores	Flavour scores	Overall acceptability scores
0 : 100	2.00	3.00	3.00
10 : 90	2.50	3.00	3.00
20 : 80	3.50	4.00	3.50
30 : 70	3.50	4.00	4.00
40 : 60	4.50	4.50	4.50
50 : 50	4.50	3.50	3.00
CD at 5%	0.63	0.57	0.51

Table 3: Organoleptic qualities of seabuckthorn apricot blended nectar.

Pulp blend ratio of 40:60 for seabuckthorn- apricot blended nectar with 20 percent pulp, 18 percent TSS, 0.3 percent acidity as maleic acid as per Food Safety Standard Act 2006 Govt of India has been found best for consumer consumption on the basis of organoleptic scores and physico chemical characteristics.

References

1. Mir MS (1991) Study on vegetative propagation of Apricot (*Prunus armeniaca* L.) under the cold arid conditions of Ladakh region. M.Sc. (Ag.). Thesis, Sher-e-Kashmir University of Agricultural Sciences and Technology (Jammu and Kashmir): 1-2.
2. Rathore DS (1991) Apricot. In: Mitra SK, Bose TK, (ed.). Temperate Fruits, Horticulture and Allied Publishers, Calcutta 700020, India. Pg No: 279-281.
3. Chauhan AS, Rekha MN, Ramteke RS, Eipeson WE (2003) Seabuckthorn (*Hippophae rhamnoides* Lin.) Berries: Harnessing its Potential for Processing. Journal of Food Science and Technology 40: 349-356.
4. Rongsen Lu (1992) Seabuckthorn-A multipurpose plant specie for fragile mountains. ICIMOD Occasional Paper, Kathmandu, Nepal 20 : 62
5. Rangana S (1986) Handbook of Analysis and Quality Control for Fruits and Vegetable Products. (2nd edition), Tata McGraw Hill Publishing Co., Ltd, New Delhi.
6. AOAC (1984) Official methods of Analysis. (15th edition), Association of Official Analytical Chemists, Washington DC.
7. Gomez KA, Gomez AA (1984) Statistical Procedures for Agricultural Research. (2nd edition), John Wiley and Sons, New York. Pg No: 173.