FOOD SCIENCE RESEARCH JOURNAL;
Volume 1 Issue 2
(October, 2010) Page : 123-126

RESEARCH ARTICLE

Accepted :*June, 2010*

Development, nutritional evaluation and hedonic acceptability of *Akha (Rubus pedunculosus)* mango jam

PURVIKA SOOD AND RAJNI MODGIL

ABSTRACT

Akha **mango jam was prepared by blending** ***akha*** **and mango in the ratio of 100:0 (Tc), 15:85 (T1), 30:70 (T2) and 45:55 (T3). The results of the study revealed that acidity increased significantly as the concentration of** ***akha*** **increased in the jam however, total sugars, reducing and non reducing sugars decreased with the increase of the concentration of** ***akha*** **in the** ***akha*** **mango jam. The analysis of vitamin C showed that vitamin C content increased with the increase of the concentration of** ***akha*** **in the** ***akha*** **mango jam. The analysis of minerals showed that with the increase in concentration of** ***akha*** **in** ***akha*** **mango jam the various minerals** ***viz.,*** **calcium, phosphorus, sodium, potassium and iron increased significantly. The hedonic acceptability of the** ***akha*** **mango jam showed that all the formulations were acceptable by the panelist however the panelist graded the best to pure** ***akha*** **jam.**

Key words : *Rubus pedunculosus*, *Akha*, Wild fruit products, Jam

INTRODUCTION

Jam making is the most important method of preserving fruits commercially as well as in household level. A considerable quantity of jam is prepared throughout the country during various seasons. They can be a source of ready energy, vitamin C and certain minerals depending upon the fruit used. *Akha* (*Rubus pedunculosus*) belonging to family Rosaceae is an edible wild fruit with short life span and is perishable in nature. It grows in midhill and widely consumed by the rural population in hills. Besides this *akha* fruit is a good source of various nutrients like vitamins, beta- carotene and minerals. So, it is urged need that this indigenous fruit, which is not easily marketed, should be processed in to acceptable products. Moreover, there is no information regarding the utilization of this wild fruit in the development of products. So, in the present study an attempt has been made to utilize this wild fruit in the development of nutritionally supplemented mango *akha* jam.

MATERIALS AND METHODS

Procurement of sample:

The *akha* fruits (*Rubus pedunculosus*) were collected from the forest area of Palampur (H.P.) and were washed with double distilled water to remove adhering dirt and dust whereas; mango (*Mangifera indica)* was procured from the local market of Palampur H.P. The *akha* and mango fruits were converted to pulp by method as shown in Fig. 1. The pulp was filled in jars

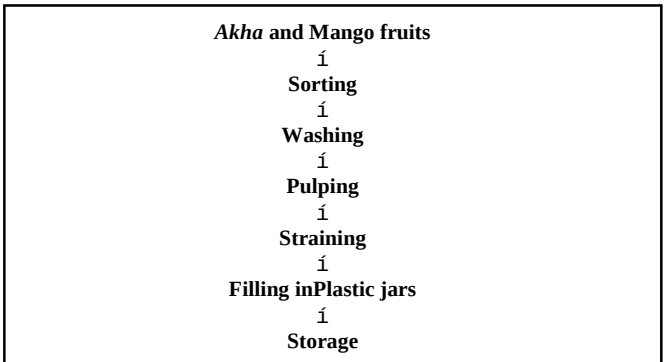

Fig. 1 : Flowsheet for preparation of *Akha* and mango pulp

Sood, Purvika and Modgil, Rajni (2010). Development, nutritional evaluation and hedonic acceptability of *Akha (Rubus pedunculosus)* mango jam, *Food Sci. Res. J.,* **1** (2) : 123-126.

and stored in deep freezer. The jam was prepared by mixing four ratios- 100:0, 15:85, 30:70, 45:55 of *akha* and mango. Jam is prepared by boiling the fruit pulp with sufficient quantity of sugar to a reasonable thick consistency, firm enough to hold the fruit tissue in place. The procedure for the preparation of jam is given in Fig. 2.

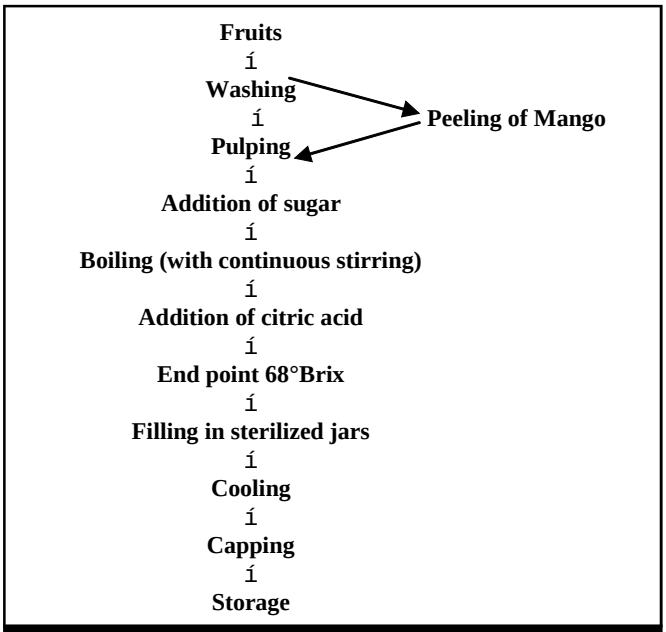

Fig. 2 : Flowsheet for preparation of Jam

Chemical parameters:

The various nutritional parameters analyzed were Total Soluble Solids (TSS) using Hand refractometer, titrable acidity was done using method described in AOAC (1990). Reducing, non reducing and total sugars were determined by Lane's and Eyon's method following Rangana (1995). Vitamin C was estimated by titration method using 2, 6-dichlorophenol indophenol dye following Rangana (1995). The various minerals were analyzed by digesting 1 g sample with diacid mixture and then filtering the content through Whatman filter paper no.1. The volume was made 100 ml. using double distilled water. Sodium, potassium and iron were determined using atomic absorption spectrophotometer, calcium by flame photometer Mediflame, 127 and phosphorus following Chen *et al*. (1956)

Sensory evaluation:

Sensory evaluation depends upon the responses by different sense organs as eyes, taste buds of tongue and olfactory lobes of the nostril. Here, the method suggested by Gould (1978) was adopted. Thirty judges were selected at random giving due consideration to age and sex. Each panel member was asked to evaluate the jam with respect to colour, flavour and taste on the prescribed form and overall acceptability was calculated by taking mean of colour, flavour and taste.

Statistical analysis:

The data obtained were subjected to statistical analysis of variance in a completely randomized design (Sendecor and Cochran, 1994).

RESULTS AND DISCUSSION

The glance at Table 1 shows the various nutritional parameters of the jam. As is clear from the Table, a significant (P=0.05) increase in the acidity was observed by the addition of *akha* to the *akha* mango jam and hence TSS: acid ratio decrease significantly as the changes in Brix acid ratio are dependent on the changes in TSS and acidity value of jam. The increase in acidity is due to

Table 1 : Nutritional evaluation of *Akha* mango jam*

Attribute	Tc (100:0)	T_1 (15:85)	T_2 (30:70)	T_3 (45:55)	CD ($P \leq 0.05$)
Acidity (% as citric acid)	0.47	0.38	0.51	0.64	0.71
TSS: acid ratio	144.68	178.94	133.33	106.25	0.21
Total sugars (%)	67.69	66.91	66.70	65.91	0.19
Reducing sugar (%)	31.40	31.84	31.48	31.26	0.13
Non-reducing sugar (%)	36.38	36.11	36.26	35.77	0.16
Vitamin C (mg/ 100g)	6.60	7.88	9.51	11.89	0.62
Calcium (mg/ 100g)	30.31	20.54	22.12	24.62	0.29
Phosphorus (mg/ 100g)	19.50	14.50	18.0	18.11	0.15
Sodium (mg/ 100g)	3.78	4.48	4.84	5.16	0.14
Potassium (mg/ 100g)	16.30	12.32	13.67	14.99	0.13
Iron (mg/ 100g)	2.5	1.17	1.46	1.74	0.79

*Data presented are average of triplicate determinations

Table 2 : Organoleptic evaluation of *Akha* mango jam

Attribute	Tc (100:0)	T_1 (15:85)	T_2 (30:70)	T_3 (45:55)	C.D. (P=0.05)
Colour	8.10	7.70	7.40	7.20	0.58
Flavour	8.20	7.90	7.50	7.50	0.51
Taste	8.40	8.20	8.10	7.90	NS
Overall Acceptability	8.20	7.80	7.60	7.40	0.35

inherited acidity present in *akha* fruit pulp. Utsun and Tossun (1998) recorded per cent acidity in 19 samples of jam (6samples of sour cherry jam, 5 of strawberry jam, 4 of apricot and 4 of rose hip jam) in the range of 0.17-0.87 per cent, however, Anita (2007) reported similar result in mango- whey jam. Similar Table 1 shows that the total sugars, reducing sugars and non-reducing sugars decreased significantly as the concentration of *akha* increased in the jam. This decrease might be due to the increase in the *akha* content in jam and as the concentration of *akha* increased sugar content decreased because these fruits were low in sugar. Saklani (2005) reported a significant increase in the total sugar content with the increase in the concentration of plum in seabuckthorn and thus give credence to present investigation. The vitamin C content increased significantly (P=0.05) with the addition of *akha* to the mango pulp. As is clear from the Table 1, a significantly (P=0.05) higher value for vitamin C was observed in T_3 (11.89 mg/100g) and lowest in Tc (6.60 mg/100g). This might be due to higher content of ascorbic acid in *akha* fruits. According to Srivastava (1998) and Kaur (2005) also blending helps in improving the nutritional composition of the products.

The data pertaining to the mineral content of the jam are shown in Table 1. As is clear from the table that various minerals like calcium, phosphorus, sodium, potassium and iron increased significantly as the concentration of *akha* increased in *akha* mango jam with the highest value for the pure *akha* jam. This increase in the mineral content might have been due to addition of *akha*, which contained higher amount of minerals as compared to the mango and thus increased the mineral content of the jam.

The data in regards to the organoleptic evaluation of jam are given in Table 2. Jams prepared from *akha* mango were evaluated for their sensory quality attributes *viz.*, colour, flavour, taste and overall acceptability. The score for the various parameters like colour, flavour, taste and overall acceptability were in the range of 7.20- 8.40 with highest score observed for Tc and lowest scores observed for T_3, however all the formulations were in the range of good on the scale. This decrease of acceptability might have been due to the non-liking of the flavour, taste and colour of the jam by the panel members as the concentration of the blending increased in the product. However, Saklani (2005) reported that blending with plum helps in improving the acceptability of seabuckthorn jam.

Conclusion:

The results have indicated that there was increase in the acidity, vitamin C and mineral content of the *akha* mango jam as the concentration of *akha* increased in the jam. Moreover, the organoleptic evaluation of the jam showed that the panelist graded the pure *akha* jam as best however all other formulations were also acceptable. So, it can be concluded that this fruit with immense chemical and nutritional properties can be added to the dietary system. The bright colour, attractive flavour, texture and taste of this fruit can be utilized for development of various value added products of acceptable quality and good nutritional either alone or by blending to top the food, nutrition and economic potential of this underutilized and neglected wild fruit.

REFERENCES

Anita (2007). Nutritional quality of products prepared from locally available mango (*Mangifera indica*) supplemented with whey, M.Sc. Thesis. C.S.K. Himachal Pradesh Krishi Vishvidyalya, Palampur (H.P.).

AOAC. (1990). Approved methods of association of official analytical chemists, Washington, D.C., U.S.A.

Chen, P.S., Tosibora, T.Y. and Warner, H. (1956). Micro determination of phosphorus, *Analytical Chem.*, **28**: 1756-1759.

Gould, W.A. (1978). *Food quality assurance*, The AVI Publishing Company Inc. West port, Connecticut.

Kaur, K. (2005). Development and evaluation of chayote (*Sechium edule*) based food products. M.Sc. Thesis. CSK Himachal Pradesh Krishi Vishvavidyalya,Palampur (H.P.).

Rangana, S. (1995). *Handbook of Analysis and quality control for fruits and vegetable products*, 3rd Ed., Tata McGraw-Hill Publishing Company Limited, New Delhi.

Saklani, S. (2005). *Development and evaluation of food products of Seabuckthorn*, M.Sc. Thesis. CSK Himachal Pradesh Krishi Vishvidyalya. Palampur (H.P.).

Sendecor, W. and Cochran, W.G. (1994). *Statistical methods*, 6th Ed. Oxford and IBH Publication. New Delhi,

Srivastava, J.S. (1998). Comparative study of RTS drink prepared from Dashehari and Baganpalli mangoes, *Indian Food Packer,* **52**: 38-41.

Utsun, N.S. and Tossun, I. (1998). A research on composition of various jam samples, *Gida,* **23**(2): 125-131.

Address for correspondence :
PURVIKA SOOD
Department of Food Science and Nutrition,
College of Home Science,
C.S.K. Himachal Pradesh Krishi Vishvavidyalaya
PALAMPUR (H.P.) INDIA

Authors' affiliations :
RAJNI MODGIL
Department of Food Science and Nutrition,
College of Home Science,
C.S.K. Himachal Pradesh Krishi Vishvavidyalaya
PALAMPUR (H.P.) INDIA
E.mail : purvika_sood@rediffmail.com