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## **DEVELOPMENT AND STANDARDIZATION OF BER-PINEAPPLE JAM**

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### **ABSTRACT**

Indian ber (*Zizphus mauritiana Lam*) is one of the most important fruit crops, grown in the tropical, sub-tropical and arid regions belonging to the family Rhamnaceae. It is popularly known as jujube. The investigation on standardization of ber-pineapple jams were conducted during the year 2011-2012 in the Department of Home science, SVU college of sciences, Sri Venkateswara University Chittoor district, Tirupati, Andhra Pradesh. Three different proportions were carried out with different ratios of ber to pineapple pulp. The prepared ber-pineapple jams were filled into glass jars by sealing cap tightly and stored at ambient temperature. All the samples were subjected to sensory evaluation to determine their acceptability, using 5 point hedonic scale rating method. Based on the scores of sensory evaluation the composition of the product was standardized. Maximum scores for organoleptic characters like colour and appearance, taste, flavour and overall acceptability was recorded.

**Key Words:** *Ber, Pineapple, Jam, Standardization and Sensory Evaluation*

### **INTRODUCTION**

Indian ber is mainly valued for its sweet, sour and delicious fruits. In India the ripe ber fruits are mostly consumed raw, but are sometimes stewed. The ripe fruit is of great medicinal value and supports blood pressure lowering, aids stomach and diarrhoea infection, cures sore throat and regulates excess bile secretion. The pulp of the ber fruits is of most importance in relation to nutrition. Pareek (1983) recorded fresh, mature with 81-97% pulp and the amino acids asparagine, aspartic acid, glycine, glutamic acid, serine and threonine are found in the pulp (Bal, 1981a) but not many analyses or comparisons have been made. FAO and WHO recommendation (FAO, 1974) that the daily intake for an adult man should be 30mg, illustrates the value of ber pulp in the diet. Ripe fruits provide 20.9 k calories per 100g of pulp (Singh *et al.*, 1973a) and about 70 IU vitamin A/100g and  $\beta$ -carotene ranges from 75 to more than 80mg/100g (Bal *et al.*, 1978). Desiccation damage in ber is caused by high cuticular transpiration, which is reported to be associated with high levels of fatty acids and low levels of aldehydes and alcohols in the wax cuticle rather than with the thickness of the cuticle and wax itself (Rao *et al.*, 1981). Pineapple (*Ananas comosus*), a tropical plant with edible multiple fruit, is the most economically important plant belonging to Bromeliaceae family. Pineapple is mainly valued for its pleasant taste and flavor. Pineapple fruit is a good source of Bromelain, a digestive enzyme with biological functions i.e., a non toxic compound have a number of potential therapeutic applications, including treatment of trauma, inflammation, autoimmune diseases, enhancement of immune response, and malignant disorders (Maurer, 2001 and Orsini, 2006). Jams are most popular fruit preserves (or) conserve is the product prepared from whole fruit, pieces of fruit, fruit pulp or fruit puree and with or without fruit juice or concentrated. Fruit juice as optimal ingredients and mixed with carbohydrate sweetener, with (or) without water and processed to a suitable consistency" (Ranganna, 1977). Underutilized fruits can be preserved in these forms so that the consumption of these fruits can be improved. The present study was designed to prepare a blend jam with Ber and pineapple.

### **MATERIALS AND METHODS**

The standardization of Ber-pineapple jam was carried out in the Department of Home Science, SVU College of Sciences, Sri Venkateswara University, Tirupati-517502, Chittoor(dt), Andhra Pradesh during

## Research Article

the year 2011-2012. A commercially important cultivar Umran (a variety of Ber) was used for the study. Fruits of uniform colour, size and shape, ripe (neither over ripe or under ripe) were selected, free from any blemishes, cuts, damages and infestation. Fruits were washed in clean tap water to remove extraneous matter such as dirt, dust and pesticide residues. The fruits were trimmed in order to remove the inedible portion. The fruit pieces were blanched in hot water at a temperature of 60°C for 5 minutes to stabilize the colour, to deactivate the enzymes and to soften the fruit pieces. After blanching the fruit pieces were subjected to pulping in a blender without any addition of water.

**Table 1: Composition of Various Samples for Standardization of the Product**

S. No	Ingredients	Sample-I	Sample-II	Sample-III
1	Black Berry Pulp (g)	80	70	60
2	Pineapple Pulp (g)	20	30	40
3	Sugar (g)	100	100	100
4	Pectin (g)	0.1	0.1	0.1

Three different samples were worked out to develop Ber-pineapple jam in laboratory. In the first sample-I the Ber pulp and pineapple pulp were taken in the ratio of 80:20. The other basic ingredients taken were sugar and commercial pectin. Sugar to the blended pulp was taken in the ratio of 1:1. Pectin was taken at the rate of 0.1%. In sample-II the Ber pulp and pineapple pulp were taken in the ratio of 70:30. The other ingredients were same as in the first sample-I. The ratio of Ber pulp to the pineapple pulp in sample-III was taken in a ratio 60:40. The other ingredients were kept same for this sample as well.

**Table 2: Sensory Evaluation of Ber Pineapple Jam of Various Samples (Scores Out Of 5.0)**

S.No	Samples	Age Group (Years)	Appearance	Colour	Flavour	Taste	Overall Acceptability
1	Sample-I 80:20	15-20	3.97	3.87	3.89	3.72	3.99
		20-25	3.56	3.62	3.56	3.60	3.80
2	Sample-II 70:30	15-20	4.08	3.90	4.21	4.52	4.60
		20-25	3.97	3.85	4.35	4.34	4.40
3	Sample-III 60:40	15-20	4.65	4.77	4.65	4.89	4.80
		20-25	4.50	4.35	4.46	4.67	4.60

**Note:** The value in the parenthesis indicates the ratio of Ber pulp to the pineapple pulp.

## RESULTS

The organoleptic evaluation of Ber-pineapple Jam was done and the data are expressed in terms of mean scores on a 5 point hedonic scale and presented in table.2. The scores with respect to appearance of Ber-pineapple Jam indicated differences between the samples in both age groups. Among the samples sample-III recorded highest score of (4.65, 4.50) followed by sample-II (4.08, 3.97) by the two age groups, whereas lowest score was observed in sample-I (3.97, 3.56). The highest score for colour was observed in Sample-I (4.77, 4.35) followed by Sample-II (3.90, 3.85). The sample-I recorded lowest score (3.87, 3.62) for colour by the two age groups. The scores with respect to flavor indicated differences between the samples. Among the samples, sample-I recorded highest score of (4.65, 4.46) followed by sample-II (4.21, 4.35). Whereas lowest score was observed in sample-I (3.89, 3.56) by the two age groups. The highest score for taste was observed in sample-III (4.89, 4.67) followed by sample-II (4.52, 4.34). The Sample-I recorded the lowest score (3.72, 3.60) for taste by the two age groups. The Sample-III (4.80, 4.60) recorded highest score for overall acceptability, whereas lowest was recorded in sample-I (3.99, 3.80) by the two age groups.

## Research Article

### Yield of Pulp:

**Table 3: The results regarding yield of pulp from whole fruit are tabulated below:**

<b>K(mg)</b>	-	27.38	-	<b>27.38</b>
<b>Mg(mg)</b>	10.7	24.4	-	<b>35.1</b>
<b>Vitamin-C (mg)</b>	63.08	32.37	-	<b>95.4</b>
<b>Fe (mg)</b>	0.41	1.79	0.155	<b>2.355</b>
<b>Ca(mg)</b>	3.3	14.8	12	<b>30.1</b>
<b>Thiamine (mg)</b>	0.016	0.148	-	<b>0.164</b>
<b>Carotene (µg)</b>	17.43	13.32	-	<b>30.75</b>
<b>Fat (g)</b>	0.24	0.074	-	<b>0.31</b>
<b>Protein (g)</b>	0.66	0.296	0.1	<b>1.056</b>
<b>CHO(g)</b>	14.11	7.99	99.4	<b>121.5</b>
<b>Energy (kcal)</b>	61.4	34.04	398	<b>493.4</b>
<b>Pulp (g)</b>	60	40	-	
<b>Amount (g)</b>	83	74	100	
<b>Ingredients</b>	Ber	Pineapple	Sugar	<b>TOTAL</b>

**Table 4: Nutritive values of final standardized product “Ber Pineapple” Jam**

<b>S. No</b>	<b>Particulars</b>	<b>Ber Fruits (g)</b>	<b>Pineapple Fruits (g)</b>
1	Initial Weight of the fruits(g)	510	610
2	Weight of the fruits after trimming and cutting(g)	440	400
3	Weight of the inedible portion(g)	70	210
4	Weight of the fruits after blanching(g)	430	390
5	Weight of pulp(g)	370	330
6	Percentage yield (%) (Per 100g of Fruit)	72.5	54.09

The data from the table revealed that 370g of pulp was obtained from 510g of whole Ber fruits. The inedible portion constituted mostly of stalks and seeds of the fruits which made up to 70g of the whole fruit. In case of pineapple, 330g of pulp was obtained from 610g of whole fruit. The inedible portion included the crown, outer skin and black eyes which resulted in maximum wastage. The percentage yield of Ber and pineapple pulp was 72.5% and 54.09% respectively. Thus, it was concluded that the yield of berry pulp was more than that of pineapple pulp comparatively.

The nutrient composition of the final standardized 100g of Ber-pineapple Jam fruit product was calculated and the values are presented in the tableNo.4. The proximate principles and the essential nutrients like Vitamin A, Vitamin C, Calcium, Potassium, Magnesium, iron, thiamine respectively nutritive values were calculated by using “The nutritive value of Indian foods” by Gopalan *et al.*, (2007).

It was found that the final product which consists of Ber pulp, pineapple pulp, and sugar as its major ingredients, the energy was 493.4 Kcal, 121.5 of carbohydrates and 1.056 of proteins and 0.31g of fat for 100g. The carotene and Vitamin C content of the Jam were 30.75 µg, 95.4 mg. The calcium and iron content in the final product was 30.1mg and 2.355mg respectively. Other micronutrients magnesium and Potassium content was found to be 35mg and 27.38mg respectively for 100g.

## DISCUSSION

Fruit preserves are preparation of fruits, vegetables and sugar often canned or sealed for long-term storage. “Jam” refers to a product made with the whole fruit, cut into pieces or crushed. The fruit is heated with water and sugar to activate the pectin in the fruit. The mixture is then put into containers. The preparation of fruit preserves today often involves adding commercial or natural pectin as a gelling agent although sugar or honey may be used as well. The use of commercial pectin was recognized since the Ber

### **Research Article**

and pineapple fruits were low in natural pectin which in turn would affect the textural properties of the finished Jam. Jams made with various types of fruits either individually or in combination are used in homes as well as restaurants and other eateries. These items are mainly consumed in urban areas. But these products are very popular in North-East region of India and consumption is increasing year after year. The ingredients used and how they are prepared determine the type of preserves; Jams, Jellies and marmalades are all examples of different styles of fruit preserves that vary based upon the ingredients used.

In the present study blended fruit Jam with combination of Ber and pineapple fruits was developed which both the fruits have significant nutritional and medicinal properties. In the present study three samples in different trials were carried out with different proportions of Ber pulp to pineapple pulp for 100g of final blended pulp. In the process of standardization of ingredients, the ratio of Ber pulp to pineapple pulp was altered and amount of sugar along with the percent commercial pectin were kept constant for the three samples.

Organoleptic scores were observed for three different samples. The data from the table no.2 reveals that the mean sensory scores for the attribute appearance of the first two samples were almost similar to each other when compared to third trial in both age groups. The mean score of third trial 4.65 and 4.50 explains its higher acceptability which was attributed to the absence of peels, specks and a very neat and uniform appearance and spreadable nature of the Jam. It can be attributed to the more amount of pineapple pulp which was used in the third trial. In case of sensory attribute colour, the mean sensory scores of first two trials were very near to each other when compared to the sample-III in both the age groups. The mean score of Sample-III 4.77 and 4.35 explains the preference which was attributed to the pleasant yellowish brown colour. The colour was very much influenced by the pineapple pulp which was used in comparatively more in Sample-III. The other two samples used more amount of Ber pulp which dominated the colour of the final product. Similarly to above sensory attributes, the mean score for flavor of the third sample dominated the other two samples during the sensory evaluation of the product. The highest mean scores were taken as a mark of desirability which may be due to the tangy and pleasant aroma of pineapple pulp used in more quantity in the third sample. The mean scores of both the age groups were almost similar to each other. The less mean scores of the first two samples were due to dominating strong characteristic flavor of Ber pulp. The mean scores of third sample for taste subsequently dominated the other two trials which is denoted by higher sensory mean scores of third sample in case of both the age groups taken as a mark of desirability which may be due to the sweet tangy and fresh juicy taste of pineapple and Ber fruits respectively. The taste of pineapple dominated the final product in the third sample which in turn affected the final scores of the panel members. Therefore the overall acceptability mean scores were again more for the third sample rather than the first two samples which can be attributed to the comprehensive role played by the individual sensory characteristics in the final acceptance of the product. As the third sample gained highest scores against the other two formulations, for all the attributes i.e., colour, flavor, taste, appearance because it was desired by the panel members.

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**Research Article**

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