

Studies on sensory qualities during processing and storability of jamun juice

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SUMMARY : An experiment was conducted to evaluate the sensory qualities of jamun juice in pure and pasteurized form at ambient and cool temperature during the academic year 2009-2010 in post-harvest technology and analytical laboratory at University Department of Horticulture, Dr. Panjabrao Deshmukh Krishi Vidyapeeth, Akola. The experiment comprised of two storage conditions (ambient and cool temperature) and six treatment *i.e.* pure juice, pure juice + 250ppm sodium benzoate, pure juice + 350ppm sodium benzoate, pasteurization of juice (temp 80 ± 5 °C), pasteurization + 250 ppm sodium benzoate, pasteurization + 350 ppm sodium benzoate. From the findings it was observed that, the values for sensory parameters of both pure and pasteurized juice decreased continuously with the advancement of storage period. The colour and flavour of juice stored at room temperature deteriorated at faster rate while taste changed slightly. The samples without any preservative treatment (Pure and Pasteurized juice + ambient temperature) were spoiled after 60th days of storage period, while remaining samples were found to be acceptable up to end of experimental period irrespective of both the storage conditions.

KEY WORDS : Sensory qualities, Processing, Storability

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Jamun [*Syzygium cumini* L.] is an evergreen tropical tree in the flowering plant belongs to family Myrtaceae. Though this fruit is considered as a minor fruit crop because of its high nutritional value and excellent processing qualities. Jamun juice is used to cure the diabetes disease effectively. It is also useful against bleeding piles, correcting liver disorders, jaundice, kidney stone, asthma, blood pressure, (Wealth of India 1954; Joshi 2001). Though there is a maximum availability of raw material or fruit harvested per year. It cannot be utilized consumed or processed due to lack of processing techniques and technical knowhow. Jamun being a highly perishable and short shelf-life fruit it deteriorates at very faster rate if proper

post-harvest handling practices and processing techniques are not adopted. The storage life of jamun fruit is restricted to only 24 hrs at room temperature and 12 days at cool temp. *i.e.* (3 to 4°C) and (85 to 95% R.H.) (Ramanjan Ya, 1985). Considering the mass fruit production from the increasing plantation in coming days, proper post-harvest handling practices for increasing its shelf-life and processing techniques need to be explored. Hence, the present investigation was under taken on sensory qualities during processing and storability of jamun juice.

EXPERIMENTAL METHODS

The experiment was conducted in Post Harvest Technology Laboratory, at University Department of Horticulture, Dr. Panjabrao Deshmukh Krishi Vidyapeeth, Akola during 2009-2010. There were 12 treatment combinations comprising of two storage conditions (B₁-Ambient temperature, B₂-Cool temperature) and six treatments (A₁-pure juice, A₂ - pure juice + 250 ppm sodium benzoate, A₃ pure juice + 350 ppm

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sodium benzoate, A₄ pasteurized juice, A₅ pasteurized juice + 250 ppm sodium benzoate, A₆-pasteurized juice + 350 ppm sodium benzoate) arranged in a FCRD with three replications. Fully ripe and uniform sized fruits of jamun were brought to the laboratory. Unripe, diseased, damaged and off type fruits were strictly discarded. The selected fruits were thoroughly washed with clean tap water to remove dirt and dusts particles adhered to the pericarp of the fruit and then allowed to dried for removal of excess moisture from the fruit surface. After washing in water, the fruits were wiped dry and preliminary trials of juice extraction were conducted on small basis. Fruits were crushed with hands without damaging the seeds. The pulp without seeds was heated to 70°C and was passed through a fine muslin cloth. Then according to given treatment combinations, the extracted juice were pasteurized at 85 °C and filled in pre-sterilized 200 ml glass bottles by adding sodium benzoate as a preservative at 250 and 350 ppm concentration. For each treatment 5 bottles were prepared and kept separately at ambient and cool temperature. During the storage period, both pure as well as pasteurized juices were analyzed for sensory qualities every after 20 days of interval till the juice get spoil.

EXPERIMENTAL FINDINGS AND ANALYSIS

The experimental findings of the present study have been presented in the following sub heads:

Sensory ratings of colour, flavour and taste :

Sensory rating of stored and preserved jamun juice for colour, flavour and taste was done at every 20 days of interval by panel of five judges including female judge, using hedonic as measuring scale. Data regarding the effect of storage conditions, treatments and their combination on sensory rating are presented in Table 1. At the time of preparation, all samples of jamun juice scored maximum ratings.

The sensory ratings recorded at 20th day of storage showed that, the treatment combination A₃B₂ (pure juice + 350 ppm sodium benzoate + cool temperature) secured maximum average score (8.1) While minimum score (7.6) was noticed in combination A₁B₁ *i.e.* control.

On 40th day of storage, in combination A₆B₂ (pasteurization + 350 ppm sodium benzoate + cool temperature) recorded maximum average score of (8.0). The minimum score (7.1) was recorded in combination A₁B₁ (pure juice+ ambient temperature) in respect of all the sensory parameters.

At 60th day of evaluation, significant differences in sensory score were recorded, minimum score was recorded in A₁B₁ (6.0) combination with the good sensory qualities, maximum average score was noticed in treatment combination A₆B₂ (pasteurization + 350 ppm sodium benzoate + cool temperature) (7.9).

After 60th day of storage initiation of spoilage of juice samples in treatment combination A₁B₁ *i.e.* control and A₄B₁

Table 1: Effect of storage conditions on sensory characteristics of jamun juice during storage

Treatments	0 days			20 days			40 days			60 days			80 days					
	Colour	Flavour	Taste	Average	Colour	Flavour	Taste	Average	Colour	Flavour	Taste	Average	Colour	Flavour	Taste	Average		
	A ₁ B ₁	8.5	8.2	7.8	8.1	3.0	7.6	7.4	7.6	7.4	7.1	7.0	7.1	5.9	6.0	6.1	6.0	00
A ₂ B ₁	8.5	8.2	7.8	8.1	3.2	7.8	7.7	7.9	7.9	7.2	7.3	7.4	7.6	7.0	7.1	7.2	7.3	6.9
A ₃ B ₁	8.5	8.2	7.8	8.1	3.2	7.8	7.6	7.8	8.1	7.3	7.6	7.6	7.8	7.1	7.2	7.3	7.5	7.1
A ₄ B ₁	8.5	8.2	7.8	8.1	3.1	7.7	7.5	7.7	7.5	7.2	7.2	7.3	7.0	6.9	6.7	6.8	00	00
A ₅ B ₁	8.5	8.2	7.8	8.1	3.2	7.7	7.7	7.8	8.1	7.3	7.6	7.6	7.8	7.1	7.2	7.3	7.6	7.0
A ₆ B ₁	8.5	8.2	7.8	8.1	3.3	7.8	7.8	7.9	8.2	7.2	7.3	7.5	7.9	7.2	7.3	7.4	7.8	7.1
A ₁ B ₂	8.5	8.2	7.8	8.1	3.3	7.9	7.7	7.9	8.2	7.7	7.6	7.8	8.1	7.6	7.4	7.7	7.9	7.4
A ₂ B ₂	8.5	8.2	7.8	8.1	3.4	8.0	7.8	8.0	8.3	7.8	7.7	7.9	8.2	7.6	7.5	7.7	8.0	7.5
A ₃ B ₂	8.5	8.2	7.8	8.1	3.4	8.1	7.8	8.1	8.3	7.9	7.7	7.9	8.2	7.8	7.4	7.8	8.1	7.5
A ₄ B ₂	8.5	8.2	7.8	8.1	3.3	7.9	7.6	7.9	8.2	7.2	7.6	7.8	8.1	7.7	7.3	7.7	8.0	7.2
A ₅ B ₂	8.5	8.2	7.8	8.1	3.4	8.0	7.7	8.0	8.2	7.9	7.6	7.9	8.2	7.7	7.5	7.8	8.0	7.3
A ₆ B ₂	8.5	8.2	7.8	8.1	3.4	8.1	7.8	8.1	8.3	7.9	7.8	8.0	8.3	7.8	7.6	7.9	8.1	7.4

(pasteurization + ambient temperature) was started and get spoiled. After 20 days of interval on 80th day of storage, maximum sensory qualities was found in combinations A₆B₂ with the average score rated (7.7), while sensory qualities were noted in combination A₂B₁ with minimum score (6.9).

It is evident from the Table 1 that, sensory qualities of juice decreased continuously with the advancement of storage period. More decreasing trend was noticed in the juice samples stored at ambient temperature than cool temperature. Sensory quality like colour of the juice showed proponent results stored at room temperature during storage with the degradation of the colouring pigment anthocyanin, while cool storage temperature showed stabilizing effect on the sensory quality like colour of the juice during storage. Similarly flavour of the juice samples stored at ambient storage condition showed more decreasing trend during storage. The juice stored at cool temperature retained more flavour.

The data regarding changes in taste score for jamun juice

during storage indicate that the taste score decreased continuously throughout the storage period. The overall score for taste of the juice was low due to high acidity. The taste deterioration was observed more in juice stored at ambient temperature than at refrigerated temperature. This might be due to degradation of volatile substance and flavour constituents during storage temperature also plays an important role in inducing certain biochemical changes in the samples which leads to discolouration and decrease in flavour score of the sample.

In present investigation, combination effect of storage conditions and treatment levels showed significant differences in sensory rating of the stored juice. The colour of benzoate preserved juice was rated higher as compared to the preserved one, but as regards flavour and taste pasteurized juice was preferred with good rating over pure juice. It was found from present study that, combination A₆B₂ showed maximum retention of sensory qualities for colour, flavour and taste and found consumer acceptability up to the end of storage period.

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