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Organoleptic evaluation of jam prepared from organically grown papaya cv. Arka prabhat

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Abstract

An experiment was conducted to study the quality and shelf life of jam prepared from organically grown papaya cv. Arka prabhat. The maximum score for colour (7.76), flavour (7.40), taste (7.80) and overall acceptability (7.65) was recorded in jam prepared from fruits of plants applied with FYM 100% RDN. Overall acceptability was decreased with increase in storage period in all the treatments. The jam prepared from papaya can be stored upto 90 days under ambient conditions without any considerable loss in quality.

Keywords: Organoleptic evaluation, jam prepared, organically grown papaya cv. Arka prabhat

Introduction

Papaya (*Carica papaya* L.) belongs to the family Caricaceae and is one of the important fruit crops of tropical and subtropical regions of the world. Papaya fruit is rapidly becoming an important commodity worldwide, both as fresh fruit and as processed product [1]. It is a cheap source of vitamins (A, C and E) and minerals (Mg and K). The mature fruits being utilized in the preparation of candy and tutti fruity. Ripe fruits are also used in the preparation of ready-to-serve papaya juice, jam and for table purpose.

Various products such as canned fruits, frozen slices, beverages, fruit leather, fruit bar, fruit jam are developed from fruits for value addition which are inherently perishable in nature [2, 3]. Several types of fruit bars have been developed using different fruits, singly or in combination the ripe fruits are highly perishable. Hence, processing of these fruits into value added products with increased shelf life is important. There is a need to reduce the post-harvest losses and improve the availability through the recommended pre and post-harvest treatments and value addition in papaya.

Materials & Methods

The present investigation was conducted in the College farm and Department of Fruit Science at College of Horticulture, Venkataramannagudem, Andhra Pradesh during the year 2015. The design for the experiment was Randomized Block Design (RBD) having 8 treatments replicated thrice. Treatments were randomly allocated in each replication. The seeds of papaya cv. Arka Prabhat hybrid were procured from Indian Institute of Horticultural Research, Bangalore. The treatments were comprised of T₁ . FYM 100% RDN, T₂. Vermicompost 100% RDN, T₃ . Neem cake 100% RDN, T₄ . Sheep manure 100% RDN, T₅. FYM 50% RDN + Vermicompost 50% RDN, T₆. FYM 50% RDN + Neem cake 50% RDN, T₇. FYM 50% RDN + Sheep manure 50% RDN and T₈- 100% RDF. The fully ripe papaya fruits were selected for preparation of papaya jam. The fruits were washed with clean water and peeled with a peeler. The fruits were cut longitudinally and the seeds were removed. The pulp was homogenised in a mixer. The pulp was cooked after addition of sugar at the rate of 750g of sugar per 1kg of pulp and added 0.2 per cent of citric acid to the pulp. The pulp was cooked by continuous stirring till the end point (68°Brix through refractometer) was reached [4]. Then, it was allowed to cool and stored in sterilized glass bottles for storage studies.

The organoleptic or the sensory evaluation of papaya fruit was carried out by a panel of 5 semi-trained judges following hedonic rating system for characters like colour, flavor and taste as per the score (9-1) described below. The average of all the above characters was calculated and expressed as overall acceptance or palatability rating. 9 = Like extremely, 8 = Like very much, 7 = Like moderately, 6 = Like slightly, 5 = Neither like nor dislike, 4 = Dislike slightly, 3 = Dislike moderately, 2 = Dislike very much, 1 = Dislike extremely.

Result & Discussion**Colour**

The data pertaining to colour of papaya jam (table1) revealed significant differences between the product prepared from the fruits of plants as affected by different organic manures and days of storage. The maximum colour score of 7.76 was recorded in papaya jam prepared from fruits of plants applied with FYM 100% RDN followed by FYM 50% RDN + sheep manure 50% RDN (7.56) and sheep manure 100% RDN (7.51) whereas minimum colour score of 6.12 in 100% RDF. The highest colour score of 8.55 was recorded on 1st day of storage and minimum of 6.12 on 90th day of storage. The interaction effects were found to be non significant.

The colour score was decreased gradually during the period of storage and might be due to oxidation and chemical reactions leads to formation of brown pigments resulted in loss of desirable colour. Similar findings were reported in kiwi [5] and in mango [6] during storage of jam.

Flavour

The data pertaining to flavour of papaya jam revealed significant differences between the product prepared from the fruits of plants as affected by different organic manures and days of storage (table 1). The maximum score for flavour of 7.40 was recorded in papaya jam prepared from fruits of plants applied with FYM 100% RDN followed by vermicompost 100% RDN (7.20), sheep manure 100% RDN (7.15) and FYM 50% RDN + sheep manure 50% RDN (7.10) whereas minimum score for flavour of 6.60 was recorded in 100% RDF. The highest score for flavour of 8.31 was recorded on 1st day of storage and the lowest score for flavour of 5.54 was recorded on 90th day of storage. The interactions were found to be non significant.

The decrease in flavour of jam was recorded during storage irrespective of treatments. The loss of flavour may be due to enzymatic and biochemical changes takes place in jam during storage. The present results were in close agreement with findings in mango [6].

Table 1: Effect of organic manures on colour and flavour of papaya (*Carica papaya* L.) jam during storage under ambient condition

Treat ments	Number of days of storage															
	Colour								Flavour							
	1	15	30	45	60	75	90	Mean	1	15	30	45	60	75	90	Mean
M ₁	9.00	8.55	8.10	7.70	7.40	7.0	6.60	7.76	8.50	8.35	8.00	7.35	7.00	6.60	6.00	7.40
M ₂	8.50	8.30	7.90	7.50	7.05	6.70	6.05	7.42	8.40	8.15	7.80	7.20	6.80	6.35	5.75	7.20
M ₃	8.30	8.10	7.70	7.30	7.00	6.55	6.00	7.27	8.20	7.90	7.45	7.00	6.50	6.10	5.50	6.95
M ₄	8.75	8.30	8.00	7.50	7.05	6.70	6.30	7.51	8.30	8.10	7.80	7.20	6.75	6.30	5.60	7.15
M ₅	8.40	8.35	8.05	7.51	7.15	6.75	6.25	7.49	8.35	8.10	7.40	7.10	6.70	6.15	5.50	7.05
M ₆	8.40	8.15	7.80	7.35	6.85	6.30	5.80	7.23	8.20	7.90	7.50	7.05	6.40	6.10	5.30	6.92
M ₇	8.75	8.45	8.00	7.53	7.20	6.75	6.30	7.56	8.30	8.10	7.80	7.15	6.70	6.20	5.50	7.10
M ₈	8.35	8.10	7.55	7.00	6.55	6.20	5.70	6.12	8.25	7.80	7.00	6.50	6.00	5.55	5.15	6.60
Mean	8.55	8.28	7.88	7.42	7.03	6.61	6.12		8.31	8.05	7.59	7.06	6.60	6.16	5.54	

Factor	Colour			Flavour		
	M	D	M*D	M	D	M*D
S.Em±	0.06	0.06	0.17	0.05	0.04	0.13
C.D (0.05)	0.18	0.17	N.S	0.13	0.14	N.S

M ₁ - FYM 100% RDN	M ₅ - FYM 50% RDN + Vermicompost 50% RDN	M- Manures
M ₂ - Vermicompost 100% RDN	M ₆ - FYM 50% RDN + Neem cake 50% RDN	D- Days of storage
M ₃ - Neem cake 100% RDN	M ₇ - FYM 50% RDN + Sheep manure 50% RDN	RDN- Recommended dose of Nitrogen
M ₄ - Sheep manure 100% RDN	M ₈ - 100% RDF	RDF- Recommended dose of fertilizer

Taste

The data pertaining to taste of papaya jam revealed significant differences between the product prepared from the fruits of plants as affected by different organic manures and days of storage (table 2).

The maximum score for taste of 7.80 was recorded in papaya jam prepared from fruits of plants applied with FYM 100%

RDN followed by FYM 50% RDN + sheep manure 50% RDN (7.63), vermicompost 100% RDN (7.53) and sheep manure 100% RDN (7.52) where as minimum of 6.92 in 100% RDF. The highest score for taste of 8.61 was recorded on 1st day of storage followed by 15th day of storage (8.31) and minimum score for taste of 6.18 on 90th day of storage. The interaction effects were found to be non significant.

Table 2: Effect of organic manures on taste and overall acceptance of papaya (*Carica papaya* L.) jam during storage under ambient condition

Treat ments	Number of days of storage															
	Taste								Overall acceptance							
	1	15	30	45	60	75	90	Mean	1	15	30	45	60	75	90	Mean
M ₁	8.80	8.50	8.05	7.70	7.45	7.25	6.90	7.80	8.77	8.47	8.05	7.58	7.28	6.95	6.50	7.65
M ₂	8.40	8.25	7.90	7.50	7.25	7.00	6.45	7.53	8.43	8.23	7.87	7.40	7.03	6.68	6.08	7.39
M ₃	8.40	8.10	7.70	7.30	6.80	6.50	6.00	7.25	8.30	8.03	7.61	7.20	6.76	6.38	5.83	7.16
M ₄	8.75	8.45	8.00	7.45	7.10	6.65	6.25	7.52	8.66	8.28	7.93	7.38	6.97	6.55	6.05	7.39
M ₅	8.75	8.50	8.20	7.65	7.20	6.80	6.35	7.63	8.50	8.31	7.88	7.42	7.01	6.56	6.05	7.39
M ₆	8.55	8.25	7.80	7.40	7.00	6.55	6.00	7.36	8.38	8.10	7.70	7.26	6.75	6.31	5.70	7.17
M ₇	8.80	8.40	8.00	7.65	7.20	6.75	6.00	7.54	8.61	8.31	7.93	7.44	7.03	6.56	5.93	7.40
M ₈	8.45	8.05	7.25	6.80	6.35	6.10	5.50	6.92	8.35	7.98	7.26	6.76	6.30	5.95	5.45	6.86
Mean	8.61	8.31	7.86	7.43	7.04	6.70	6.18		8.49	8.21	7.78	7.30	6.89	6.49	5.95	

Factor	Taste			Overall acceptance		
	M	D	M*D	M	D	M*D
SEm±	0.05	0.05	0.14	0.04	0.04	0.11
C.D (0.05)	0.15	0.14	N.S	0.12	0.15	N.S

M ₁ - FYM 100% RDN	M ₅ - FYM 50% RDN + Vermicompost 50% RDN	M- Manures
M ₂ - Vermicompost 100% RDN	M ₆ - FYM 50% RDN + Neem cake 50% RDN	D- Days of storage
M ₃ - Neem cake 100% RDN	M ₇ - FYM 50% RDN + Sheep manure 50% RDN	RDN- Recommended dose of Nitrogen
M ₄ - Sheep manure 100% RDN	M ₈ - 100% RDF	RDF- Recommended dose of fertilizer

Overall acceptance

The data pertaining to overall acceptance of papaya jam revealed significant differences between the product prepared from the fruits of plants as affected by different organic manures and days of storage (table 2).

The maximum overall acceptance score of 7.65 was recorded in papaya jam prepared from fruits of plants applied with FYM 100% RDN followed by vermicompost 100% RDN (7.39), sheep manure 100% RDN (7.39), FYM 50% RDN + vermicompost 50% RDN (7.39) and FYM 50% RDN + sheep manure 50% RDN (7.40) where as minimum score of 6.86 was recorded in 100% RDF. The highest overall acceptance score of 8.49 was recorded on 1st day of storage followed by 15th day of storage (8.21) and minimum of 5.95 on 90th day of storage. The interactions were found to be non significant.

The acceptability of jam decreased gradually as storage period increased and might be due to decrease in colour, flavour and

taste attributes. The loss of colour and flavour may be due to enzymatic and bio-chemical changes take place in jam during storage [6]. Similar findings were reported by in kiwi [5] and in papaya jam during storage [7].

Shelf life (days)

The data pertaining to shelf life of papaya jam revealed that significant differences between the jam prepared from the fruits of plants as affected by different organic manures was presented in fig 1.

The maximum shelf life of 79.53 days was recorded in papaya jam prepared from fruits of plants applied with FYM 100% RDN and minimum of 74.25 days in 100% RDF. The shelf life was determined based on the overall acceptability of the product. These findings were in accordance with the mixed fruit jam [8, 9, 10] and in ber jam [11].

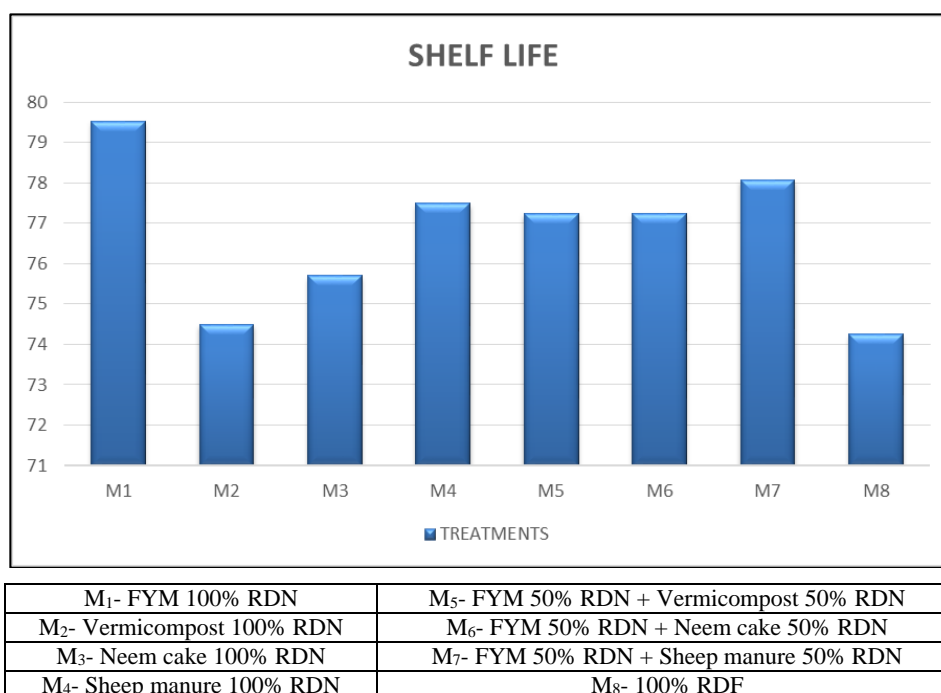


Fig 1: Effect of organic manures on shelf life (days) of papaya (*Carica papaya* L.) jam during storage under ambient condition

Conclusion

The jam prepared from the fruits of plants applied with FYM 100% RDN recorded maximum score for colour, flavour, taste and overall acceptability. The jam remained accepted for 90 days of storage at ambient condition.

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