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Comparative Study on Sensory Analysis of Banana Fig Prepared from Three Varieties

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ABSTRACT

A study was conducted in the laboratory of Post Harvest Technology of Horticultural Crops, Bidhan Chandra Krishi Viswavidyalaya, Mohanpur regarding sensory analysis of dehydrated banana (banana fig) prepared three varieties of banana namely Martaman, Grand Naine and Sinduri Harichal with two concentration of potassium metabisulphite (KMS) to prevent discolouration and prolong shelf life. Periodical analysis for sensory characteristics for taste, colour and overall acceptability was done at 15 days interval during the storage period of 2 months to determine the best variety treatment for the preparation of banana fig. During the storage study, the highest score for taste, colour and overall acceptability was observed in V1T1 (Giant Governor+ blanching). Since the product has good sensory characteristics for 2 months, further research work may be carried out to further extend the shelf life of banana fig from locally available banana varieties to increase farmer income and reduce post harvest loss.

Key Words: Colour, Grand Naine, Martaman, Sensory analysis, Sinduri Harichal, Taste.

INTRODUCTION

Banana (*Musa paradisiaca* L.) is a tropical, herbaceous, monocotyledonous and monocarpic fruit crop. India is the largest producer of banana contributing 25 per cent to the global production. The fruit has a very short postharvest shelf life because of its highly perishable nature because of the climacteric nature. They are the fourth most important global food commodities harvested after rice, wheat and corn. Vast majority are small-scale farmers growing crops either for home consumption or for local market. Banana grown for export account for little more than 10 per cent production (Horry *et al*, 1996). Virtually, all banana varieties may be either eaten raw when ripe, or cooked when either ripe or green. Cultural preferences govern the choices made. In India rate of consumption is around 12.7kg/cal/year (FAO, 2000).

Banana fig is a dehydrated form of fruit which is obtained by ripening of immature or mature marketable and unmarketable banana. This is generally prepared by peeling, disinfection and dehydration. It is highly nutritious and will help in nutritional security by providing all the nutrients from banana in the concentrated form. Bananas can be processed in various ways so that it can be stored for longer periods and utilised for other purposes. The expected demand by 2025 in area is 9 lakh hectares, 90 MT production with 45t/ha productivity (Jeyabaskaran and Mustaffa, 2010). Taking into consideration the high loss after harvest, a study was carried out to prepare fig from ripe banana from locally available three varieties.

MATERIALS AND METHODS

Three banana varieties in ripe stage were collected from the Horticultural Research station, Mondouri, West Bengal and preparation of banana fig was carried out in the Department of Post Harvest Technology of Horticultural Crops, Bidhan Chandra Krishi Viswavidyalaya, Mohanpur, 2011 following the steps stated below:

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Selection of mature and ripe banana

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Washing in tap water

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Blanching in hot water for 2min

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Cooling in tap water

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Peeling

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Steeping in 1% potassium metabisulphite (KMS) for 3 min

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Halving each finger

↓

Spread on trays

↓

Dried at 55-60° C till it becomes non sticky

↓

Sweating

↓

Packed in plastic pack

↓

Store in cool dry place

Treatment combination

V1T1- Giant Governor (blanched), V1T2- Giant Governor (control)

V2T1-Sinduri Harichal (blanched), V2T2- Sinduri Harichal (control)

V3T1- Martaman (blanched), V3T2- Martaman (control)

Sensory evaluation

The rating scales of sensory evaluation were defined so that specific characteristics of a product were rated separately, and this was examined so that most important characteristics will account for a large part of total score. The figs after drying were examined on the day of preparation and after 15 d interval for two months by a panel of 5 judges using 9 Point Hedonic scale having score for taste, colour and overall acceptability. The scores were recorded against each sample in the following categories (Rangana, 1996). The application of sensory analysis has as a principle to detect differences in the analysed products to identify differences in the analysed products to identify differences in the intensity of certain attributes (Araujo *et al,* 2012). The data obtained were statistically analysed by factorial completely randomised design to calculate the sum error means (S. Em.) and decide the critical difference (CD) at 5%.

Scoring for taste, colour and overall acceptability of processed banana products

Degree of preference	Score
Like Extremely	9
Like very much	8
Like moderately	7
Like slightly	6
Neither like nor dislike	5
Dislike slightly	4
Dislike moderately	3
Dislike very much	2
Dislike extremely	1

RESULTS AND DISCUSSION

Colour

The product with the highest score for acceptability was in the order of V1T2 (Giant Governor+ no blanching), on the day of preparation while at the end of observation day it was in the order of V1T1 (Giant Governor +blanch). Unexpectedly there was an increase in the colour acceptability of the product with the passage of the storage time while the product with the least change in colour for two months storage was seen in V1T2 (Giant Governor+ no blanching) statistically considered better than the others (Table 1). Change in colour

Table 1. Changes in colour of banana fig during storage.

Treatment	Days of storage				
	0	15	30	45	60
V1	7.25	7.20	7.15	7.08	7.05
V2	6.75	6.70	6.60	6.43	6.40
V3	6.95	6.88	6.85	6.80	6.80
S.Em(±)	0.035	0.041	0.029	0.033	0.031
CD at 5%	0.103	0.123	0.086	0.098	0.093
T1	7.00	6.92	6.90	6.85	6.82
T2	6.97	6.93	6.83	6.68	6.68
S.Em(±)	0.008	0.002	0.008	0.011	0.011
CD at 5%	0.024	0.007	0.023	0.032	0.033
V1T1	7.50	7.40	7.40	7.30	7.30
V1T2	7.00	7.00	6.90	6.85	6.80
V2T1	6.50	6.40	6.40	6.35	6.30
V2T2	7.00	7.00	6.80	6.50	6.50
V3T1	7.00	6.95	6.90	6.90	6.85
V3T2	6.90	6.80	6.80	6.70	6.75
S.Em(±)	0.087	0.075	0.071	0.097	0.098
CD at 5%	0.258	0.222	0.212	0.289	0.292

of dehydrated banana during storage may be corelated with the finding of Edith *et al* (2020). Change in colour may be due to loss of volatiles by evaporation while many compounds may be formed from lipogenase activity, breakdown of sugars, carotenoids co oxidation and Maillard reaction processes (Thakur *et al,* 1996).

Taste

With the progress of time, there was decrease in the taste acceptability of all the products (Table 2). On the day of preparation, V1T1(Giant Governor +blanch) showed maximum score till the end of observation period. The least change in taste during the storage were found in V1T1(Giant Governor +blanch) and V3T1 (Martaman+blanched) which can be considered as the better samples than the others.

Overall Acceptability

On the first day of preparation, the decreasing trend of overall acceptability among the samples can be grouped as V1T1(Giant Governor +blanch), V1T2(Giant Governor+ no blanching), V2T1(Sinduri Harichal+ blanched), V3T1(Martaman+blanched), V3T2 (Martaman + no blanching), V2T2 (Giant Governor+ no blanching) while on the end of 60th day, it followed as V1T1 (Giant Governor +blanch) V1T2(Giant Governor+ no blanching), V2T1(Sinduri Harichal+ blanched), V3T1(Martaman+blanched), V2T2(Giant Governor + no blanching), V3T2 (Martaman + no blanching) in Table 3. According to statistical analysis, the least change in storage was found in V3T1 (Martaman+blanched), which can be considered as the best one compare to others. With storage, there was a decrease in all the sensory parameters except for colour without any sign of spoilage after a storage period of two months like in the findings of Marwaha *et al* (2008).

CONCLUSION

The sample with maximum overall acceptability

Table 2. Changes in taste of banana fig during storage.

Treatment	Days of storage				
	0	15	30	45	60
V1	6.01	7.35	7.15	7.00	6.85
V2	5.35	6.60	6.25	6.30	6.05
V3	5.78	7.15	7.05	7.00	6.95
S.Em(±)	0.054	0.032	0.023	0.043	0.065
CD at 5%	0.159	0.096	0.069	0.128	0.194
T1	5.70	7.37	7.17	7.10	6.97
T2	5.72	6.70	6.47	6.43	6.27
S.Em(±)	0.004	0.012	0.051	0.069	0.046
CD at 5%	0.012	0.037	0.152	0.205	0.136
V1T1	6.00	8.00	7.80	7.50	7.50
V1T2	6.02	6.70	6.50	6.50	6.20
V2T1	5.33	6.80	6.50	6.60	6.30
V2T2	5.36	6.40	6.00	6.00	5.80
V3T1	5.77	7.30	7.20	7.20	7.10
V3T2	5.79	7.00	6.90	6.80	6.80
S.Em(±)	0.077	0.096	0.076	0.099	0.069
CD at 5%	0.227	0.284	0.226	0.293	0.205

Table 3. Changes in overall acceptability during storage.

Treatment	Days of storage				
	0	15	30	45	60
V1	7.90	7.79	7.68	7.63	7.59
V2	7.15	7.11	7.08	7.06	7.02
V3	7.20	7.13	7.10	6.99	6.93
S.Em(±)	0.032	0.023	0.032	0.013	0.016
CD at 5%	0.094	0.069	0.096	0.039	0.047
T1	7.60	7.52	7.49	7.46	7.42
T2	7.23	7.16	7.08	6.99	6.93
S.Em(±)	0.015	0.031	0.023	0.012	0.014
CD at 5%	0.044	0.094	0.069	0.037	0.042
V1T1	8.00	7.87	7.85	7.80	7.78
V1T2	7.80	7.70	7.50	7.45	7.40
V2T1	7.50	7.44	7.41	7.40	7.33
V2T2	6.80	6.77	6.75	6.71	6.70
V3T1	7.30	7.25	7.20	7.18	7.15
V3T2	7.10	7.00	7.00	6.80	6.70
S.Em(±)	0.080	0.066	0.064	0.096	0.066
CD at 5%	0.237	0.195	0.189	0.286	0.196

was V1T1(Giant Governor+blanch) followed by V1T2 (Giant Governor+ no blanching) considering all the sensory parameters. Among the three varieties, Giant Governor proved to be the best for fig preparation with storage life of two months. Dehydrated banana samples with least change in taste, colour and overall acceptability were V3T1 (Martaman+blanched) and V2T2 (Sinduri Harichal + no blanching), V1T2 (Giant Governor+ no blanching), V2T2 (Giant Governor+ no blanching) respectively. There was not much difference of blanching action since the product is sticky and dark in colour and highest score goes to the variety Sinduri Harichal for banana fig preparation among the three varieties considered. All the products remained stable without any spoilage for two months, and so further studies may be done for longer period to see the feasibility of extension of shelf life of banana fig with good sensory score in other indigenous varieties of banana to prevent post harvest losses as well as increase the income of the farmer through value addition of banana.

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