

Evaluation of banana (*Musa paradisia L.*) varieties for flour making

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SUMMARY : An experiment on evaluation of different banana (*Musa paradisiacal L.*) varieties for banana flour making was carried out at the Post Graduate and Post Harvest Laboratory, Department of Horticulture, N. M. College of Agriculture and ASPEE College of Horticulture and Forestry, Navsari Agricultural University, Navsari during the month of January to June 2010. Keeping the varieties V₁ (Rasthali), V₂ (Saba), V₃ (Bluggoe), V₄ (Rajapuri) V₅ (Chandraballi) V₆ (Udhyam) and V₇ (Grand Naine) as treatments in CRD with three repetitions. The nutritional value *viz.*, titratable acidity (per cent), ascorbic acid (mg/100g), starch (per cent), T.S.S. (°Brix), total sugar (per cent) was carried out. The titratable acidity of flour was found lower in Grand Naine while higher in Bluggoe variety. While ascorbic acid was significantly maximum in Udhyam while lower in Chandrabali variety. In respect to T.S.S., starch and total sugar content, it was found maximum in Grand Naine and lowest in Saba variety. In other hand moisture was found significantly maximum in Grand Naine while the lowest in Chandrabali variety.

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Banana (*Musa paradisiaca L.*) is the largest produced and maximum consumed amongst the fruits cultivated in India. It is known as the as “apple of paradise” and “poor man’s apple”. It is highly nutritive and very delicious. It ranks third in area after mango and citrus. In India, annual production of banana is 262.17 lakh tones from an area of 7.09 lakh hectares. (Anonymous, 2010). In Gujarat state the banana crop occupies 60900 ha area with annual production of 35, 71,600 MT (Anonymous, 2010).

Banana flour contains high per cent of starch hence it is used for the formulation of nutritious weaning mixes and supplementary foods (Ogazi *et al.*, 2000). Most important use in the baby food.

“Soyamusa” a plantain baby food which is a mixture of 60 per cent plantain flour, 32 per cent soyabean grit, 8 per cent sugar, vitamin and mineral added to improve the

taste. High quality cakes and biscuits could be formulated from wheat-plantain composite using up to 80:20 (w/w) per cent, 60:40(w/w) ratios of wheat plantain flour substitution for bread and biscuits, respectively (Horsfall *et al.*, 2007).

Many improved national and international varieties such as Rasthali, Rajapuri, Chandraballi (Red), Saba, Bluggoe, Grand Naine etc are under trial at Fruit Research Station; Gandevi, (Navsari). Moreover, banana is cultivated on largest scale in our country also because of commercialization of micropropagation of banana cultivation further enhanced its area and production. Which needs to evaluate product processing of banana in our country. It is, therefore, proposed to conduct research on varietal evaluation of banana for flour making.

EXPERIMENTAL METHODS

Full three quarter level (Thompson and Burden, 1995) fruits were taken and washed and then steamed (Krauss Maffei, munchen Germany) at 1kg/cm²(100-115°C) for 7min. Then fruits were removed from steam and then weighed to determine the pulp to peel ratio. Then bananas were sliced by slicer (A Stephan, U.Sohne, Weser, Germany). The slices were dried in hot air dryer (Armstrong Smith, PVT Ltd., India) with drying temperature maintained

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Table 1 : Nutritional composition of banana flour

Treatments	Acidity (%)	Ascorbic acid (mg/100g)	Total soluble solids (%)	Starch (%)	Total sugar (%)	Moisture (%)
V ₁ Rasthali	1.87	6.52	5.29	64.12	2.53	8.77
V ₂ Saba	1.84	7.32	5.10	60.79	1.9	8.62
V ₃ Bluggoe	1.88	7.42	5.14	62.34	1.97	9.52
V ₄ Rajapuri	1.85	6.75	5.24	63.78	2.38	9.27
V ₅ Chandrabali	1.78	6.22	5.19	63.08	2.21	8.28
V ₆ Udhyam	1.83	7.69	5.57	64.38	2.78	8.42
V ₇ Grand Naine	1.73	7.51	5.75	65.85	2.88	9.73
S.Em.±	0.010	0.019	0.008	0.008	0.010	0.010
C.D. at 5 %	0.03	0.06	0.02	0.02	0.03	0.03
CV %	0.484	0.475	0.22	0.065	0.43	0.21

between 60-65°C. Then flour was made by grinding of these dried slices. Thus, the banana flour prepared and packed in the polyethylene bag which was stored for further observations (Anonymous, 2000). The same process was carried out three times for each variety as per experimental design and repetition of treatment.

Chemical analysis :

Chemical composition of banana flour prepared from Rasthali, Saba, Bluggoe, Rajapuri, Chandrabali, Udhyam and Grand Naine varieties were determined. The total sugar, starch, titratable acidity, ascorbic acid, T.S.S., Moisture were analysed as per the Ranganna (1986).

EXPERIMENTAL FINDINGS AND ANALYSIS

It was manifested from the presentation of statistically analyzed data of all biochemical constituents in the banana flour made from different varieties were found statistically significant. The maximum (1.88 per cent) titratable acidity was found in V₃ (Bluggoe) variety which was at par with V₁ (Rasthali) and V₄ (Rajapuri) varieties. While lowest (1.73 per cent) acidity was found in flour of V₇ (Grand Naine) variety.

It is mostly due to the varietal characters. Among all the flour of banana varieties under study V₆ (Udhyam) variety was found to be significantly maximum (7.69 mg/100g) AA content which was followed by V₇ (Grand Naine) variety. While lowest (6.22 mg/100 g) AA content was observed under V₅ (Chandrabali). The variety V₇ (Grand Naine) recorded the highest (65.85 per cent) starch content, and was significantly superior to rest of the banana variety followed by V₆ (Udhyam) variety, while lowest (60.79 per cent) was recorded in V₂ (Saba) variety. In case of TSS V₇ (Grand Naine) variety significantly gave highest (5.75 °Brix) value of T.S.S. content followed by V₆ (Udhyam) variety. While the lowest (5.10 °Brix) was

found in V₂ (Saba) variety. It due to fruit pulp varietal character. It is apparent from the table that total sugar was significantly highest (2.88 per cent) in V₇ (Grand Naine) variety, while V₆ (Udhyam) stood second. While the lowest (1.9 per cent) level of total sugar was found in V₂ (Saba) variety. It might be due to the genetic character and status of the varieties. The maximum moisture (9.73 per cent) was found in V₇ (Grand Naine) variety which was followed by V₃ (Bluggoe) variety. While the lowest moisture content was (8.28 per cent) found in V₅ (Chandrabali) variety.

Conclusion:

The banana flour was made from different varieties, viz., Rasthali, Saba, Bluggoe, Rajapuri, Chandrabali, Udhyam and Grand Naine and evaluated in respect of nutritional quality. Titratable acidity of was found lower in Grand Naine while higher in Bluggoe variety. Ascorbic acid was significantly maximum in Udhyam while lower in Chandrabali variety. In respect to T.S.S., starch and total sugar content, it was found significantly highest in Grand Naine and lowest in Saba variety. However, moisture was found significantly maximum in Grand Naine while the lowest in Chandrabali variety.

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