

Short Communication

Screening of banana varieties for making flour

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Abstract

An experiment on screening of different banana (*Musa paradisiaca* 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. The domestic varieties V₁ (Rasthali), V₂ (Saba), V₃ (Bluggoe), V₄ (Rajapuri), V₅ (Chandraballi), V₆ (Udhyam) and V₇ (Grand Naine) were used as treatments in CRD with three repetitions. The nutritional value viz. titratable acidity (%), ascorbic acid (mg/100gm), starch (%), T.S.S. (°Brix), total sugar (%) were also determined. The titratable acidity of flour was found lower in Grand Naine, while higher in the Bluggoe variety. Ascorbic acid was found to be significantly higher in Udhyam, while lower in the Chandrabali variety. In respect to T.S.S., starch and total sugar content, the maximum was found in Grand Naine, while the lowest was found in the Saba variety. Moisture was found to be significantly higher in Grand Naine, while the lowest moisture content was found in the Chandrabali variety.

Keywords: Rasthali, Saba, Bluggoe, Rajapuri, Chandraballi, Udhyam, Grand Naine, *Musa paradisiaca* L., India.

Introduction

Banana (*Musa paradisiaca* L.) is the largest produced and consumed amongst all fruit 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 [1]. In Gujarat state the banana crop occupies 60900 ha area with annual production of 35, 71,600 MT [1].

Banana flour contains a high percentage of starch, hence it is used for the formulation of nutritious weaning mixes and supplementary food [2]. Most important use is in baby food. "Soyamusa" is a plantain baby food which is a mixture of 60% plantain flour, 32% soybean grit, 8% sugar, with vitamins and minerals added to improve the taste. High quality cakes and biscuits are formulated from wheat-plantain composite using up to 80:20 (w/w) % 60:40(w/w) ratios of wheat plantain flour substitution for bread and biscuits, respectively [3].

Many improved national and international varieties such as Rasthali, Rajapuri, Chandrabali (Red), Saba, Bluggoe, Grand Naine etc. are under trial at the Fruit Research Station; Gandevi, (Navsari). Modern micropropagation techniques have led to widespread cultivation of bananas and wider access to more varieties. Concurrent with this development, there has been little or no work on the suitability of these varieties for processing into various value-added foodstuffs. It is therefore proposed to conduct research on varietal evaluation of banana for flour making.

Materials and Methods

Full three quarter level [4] fruit were taken and washed and then steamed (Krauss Maffei, Munich, Germany) at $1\text{kg}/\text{cm}^2(100-115^{\circ}\text{C})$ for 7min. The fruit were then removed from the steam and weighed to determine the pulp to peel ratio. The bananas were then sliced (A. Stephan, U. Sohne and Weser, Germany). The slices were dried in a hot air dryer (Armstrong Smith, Pvt. Ltd., India) with drying temperature maintained between $60-65^{\circ}\text{C}$. Then flour was made by grinding of these dried slices. Thus, the banana flour was prepared and packed in polyethylene bags which were stored for further observation. The same process was carried out three times for each variety as per experimental design and repetition of treatment.

Chemical analysis

Chemical composition of the banana flour prepared from Rasthali, Saba, Bluggoe, Rajapuri, Chandrabali, Udhyam and Grand Naine varieties were determined. The total sugar, starch, titratable acid, ascorbic acid, T.S.S. and moisture were analysed as per the method described by Ranganna, [5].

Results and Discussion

It was revealed from the statistically analyzed data of all biochemical constituents in the banana flour made from different varieties that they were found to be significantly significant and these are shown in Table 1. The maximum (1.88%) titratable acidity was found in V_3 (Bluggoe) variety which was on par with V_1 (Rasthali) and V_4 (Rajapuri) varieties. The lowest (1.73%) acidity was found in the flour of V_7 (Grand Naine) variety. This is mostly due to the varietal characteristics. Among all the flours of banana varieties under study V_6 (Udhyam) variety was found to have a significantly higher (7.69 mg/100g) AA content, followed by V_7 (Grand Naine) variety. The lowest (6.22 mg/100 g) AA content was observed under V_5 (Chandrabali). The variety V_7 (Grand Naine) recorded the highest (65.85%) starch content and was significantly superior to the rest of the banana varieties, followed by V_6 (Udhyam) variety, while the lowest (60.79%) was recorded in V_2 (Saba) variety. In the case of TSS V_7 (Grand Naine) variety significantly gave the highest (5.75°Brix) value for T.S.S. content, followed by V_6 (Udhyam) variety. The lowest (5.10°Brix) was found in V_2 (Saba) variety. This was due to the fruit pulp varietal character. It is apparent from the table that total sugar was significantly

higher (2.88%) in V₇ (Grand Naine) variety, while V₆ (Udhyam) stood second. The lowest (1.9%) level of total sugar was found in V₂ (Saba) variety. This may be due to the genetic character and status of the varieties. The maximum moisture (9.73%) was found in V₇ (Grand Naine) variety which was followed by V₃ (Bluggoe) variety. The lowest moisture content (8.28%) was found in V₅ (Chandrabali) variety.

Table 1. Nutritional composition of banana flour.

Treatments/ Varieties		Acidity (%)	Ascorbic acid (mg/100gm)	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

Conclusion

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

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