

Evaluation of Guava (*Psidium guajava* L.) Germplasm Under Eastern Plateau and Hill Region

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Abstract: Guava is one of the most important fruit crops of eastern plateau and hill region. 21 genotypes of guava were evaluated for fruit quality and yield of rainy and winter season crop under this region. During rainy season, the maximum fruit weight was recorded in Chittidar (174.33g) followed by Sardar (146.00g). The fruits of Kairala Seedling recorded the maximum TSS (11.0°B) whereas the maximum titratable acidity was observed in case of Chittidar (0.41%). The cultivar Sardar accounted for the maximum ascorbic acid content of 235-mg/100gm pulp. The maximum yield (19.2 kg/plant) during rainy season was recorded in case of Sardar. During winter season, the maximum fruit weight was recorded in case of Allahabad Safeda (242.1g). The TSS ranged from 9.0°B (Harijha) to 14.0°B (Barbadose Superior). The minimum titratable acidity (0.24%) was recorded in case of Harijha, Allahabad Safeda, Kairala Seedling and Sindh. The maximum ascorbic acid content of 270mg/100 gm pulp was found in case of cultivars Sardar and Portugal (262.0mg/100gm pulp). The cultivar Spear Acid had the maximum total sugar of 6.17% during winter season. The maximum yield of winter season crop (14.6 kg/plant) was recorded in case of Barbadose Superior. Based on fruit quality and yield, the cultivars Allahabad Safeda, Sardar, Mild Fleshed, Chittidar, Mustafapur, Harijha, Behat Coconut and Barbadose Superior were found suitable for cultivation in the plateau region of Jharkhand.

INTRODUCTION

Guava (*Psidium guajava* L.) is one of the most important fruit crop grown in India. It is believed to be originated in tropical America stretching from Mexico to Peru. In India it is cultivated in an area of 154.6 thousands hectare with a total production of 1793.0 thousand MT of fruit (Anonymous 2003-04). Evaluation of guava to select a particular cultivar for certain region for recommendation is gaining important. Numerous seedling selections have gained the status of commercial cultivars of India, South East Asia, South Africa, Mexico, West Indies, Florida and Hawaii (Shigaura and Bullock, 1976) when these excel most other guava cultivars in term of productivity and physico-chemical characters. Maintenance of superior genotypes in respect of fruit and other characters for further crop improvement programme is essential. The soil and climatic conditions of eastern plateau and hill agro-climatic zone offer suitable condition for successful cultivation of guava. The ease in cultivation and precociousness of guava under this

condition makes it a suitable option for increasing the paddy equivalent yield of agriculture production system existing in this low soil fertility zone. Keeping the above point in view, the present investigation was undertaken to evaluate guava germplasm on aspect of nutritive quality and acceptability under subtropical sub humid climate of Chotanagpur.

MATERIALS AND METHODS

The experiment was conducted at Horticulture and Agro Forestry Research Program (ICAR Research Complex for Eastern Region) at Ranchi under Indian Council of Agricultural Research Complex for Eastern Region, Patna during 2005-06. This area is situated 620 m above mean sea level (msl) and at 23° 25' N latitude and 85° 20' East longitude experiencing an average annual rainfall of 110-140 cm. High humidity (78.14 %-84.14%) and low evaporation rate (4.04 mm/day) is experienced after June which continues up to onset of winter (Singh, 1999). Soil is acidic and pH range from 5.0-6.5, which is ideal for guava cultivation.

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The important cultivars for evaluation were Chittidar, Baramasi Seedling, Mustaffapur, Surkhgudi, Barbados Superior, Harijha, Sardar, Allahabad Safeda, Barkhana, Behat Coconut, Florida Seedling, Sangam, Kairala Seedling, Apple Colour, Nasik, Spear Acid, Seed Drop, Banarasi, Mild Fleshed, Portugal and Sindh. Cultivars were evaluated both during rainy and winter season. Each cultivar represented one treatment. The experiment was laid out in randomized block design with four replications. Data were subjected to ANOVA and treatment means were separated within column by critical difference (CD) at 5%. Titratable acidity was estimated by titrating the fruit extract with 0.1 N NaOH using phenolphthalein as an indicator and expressed as per cent citric acid equivalent. The estimation of Vitamin C in fresh fruits was carried out using 2,4-6 dichlorophenol indophenol dye. Total sugar was estimated by Lane and Eynon method (Ranganna, 1977).

RESULTS AND DISCUSSION

A close perusal of Table 1, revealed that cultivar L-49 (Sardar) accounted for the maximum fruit yield (19.2kg/tree) during rainy season whereas cultivar Barbados Superior recorded the maximum fruit

yield (14.6 kg/tree) during winter season. In a different experiment conducted at Sabour, Bihar, Singh et al (2002) found that Allahabad Safeda exhibited superior yield of 72 kg and 42 kg during rainy and winter season, respectively as compared to the other germplasm. Kundu and Mitra (1994) reported that maximum yield of 5.8 kg and 44.6 kg during winter and rainy season respectively, in the laterite tract of West Bengal. In the present investigation, during rainy season, the maximum fruit weight was recorded in Chittidar (174.33g) and Allahabad Safeda (242.4 g) during rainy and winter season respectively. Tandon *et al* (1983) reported that the fruit weight of chittidar was 126.2 gm under Lucknow conditions. Singh *et al* (2002) had found that the maximum fruit weight was 224.10 g in case of Allahabad Safeda. The fruits of Kairala Seedling recorded the maximum TSS (11.0°B) in rainy season whereas in the winter season Barbados Superior recorded the TSS of 14.0 °B. Kundu *et al* (1995) found that the maximum TSS of 10.5°B in case of Allahabad Safeda. The maximum titratable acidity was observed in case of Chittidar (0.41%) during rainy season whereas; the minimum titratable acidity (0.24%) was recorded in case of Harijha, Allahabad Safeda, Kairala

Table 1
Fruit Quality and Yield of Guava Germplasm during Rainy and Winter Season in 2005-06

Genotype	Rainy season					Winter season							
	Fruit weight (g)	TSS (°B)	Titratable acidity (%)	Ascorbic acid (mg/100g)	Total sugar content (%)	Yield (kg/plant)	Fruit weight (g)	TSS (°B)	Titratable acidity (%)	Ascorbic acid (mg/100g)	Total sugar content (%)	Yield (kg/plant)	Total yield (kg/plant)
Chittidar	174.33	8.0	0.41	137.50	3.17	8.33	195.54	12.2	0.31	176.4	3.71	16.4	24.73
Baramasi Seedling	122.00	8.4	0.14	100.00	4.29	12.70	180.60	11.0	0.33	162.0	5.50	4.9	17.6
Mutafapur	68.00	10.6	0.19	125.00	3.81	15.90	111.80	10.8	0.31	170.5	4.27	8.9	24.8
Surkhgudi	93.33	10.2	0.12	135.00	3.92	13.90	199.60	11.8	0.28	183.6	4.14	5.4	19.3
Barbados Superior	102.33	10.0	0.14	132.50	4.07	8.40	230.4	14.0	0.28	176.4	4.82	14.6	23
Harijha	73.66	9.0	0.11	177.50	4.23	15.70	160.9	9.0	0.24	215.8	4.55	8.9	24.6
Sardar	146.00	10.0	0.22	235.00	3.71	19.20	193.0	12.0	0.35	270.0	3.82	6.4	25.6
Allahabad Safeda	95.00	10.0	0.12	156.00	3.92	16.40	242.4	11.8	0.24	172.0	4.17	11.4	27.8
Barkana	61.66	8.0	0.14	170.00	3.31	5.60	169.7	12.0	0.26	216.0	5.0	12.9	18.5
Behat Coconut	80.33	8.0	0.14	185.00	3.52	13.80	167.2	12.8	0.34	232.0	4.1	9.4	23.2
Florida Seedling	63.00	10.0	0.14	220.00	3.32	9.60	153.1	10.0	0.28	228.0	3.50	9.1	18.7
Sangam	63.66	10.4	0.14	145.00	3.66	11.70	130.5	12.4	0.35	150.0	4.78	10.9	22.6
Kairala Seedling	79.66	11.0	0.21	162.50	3.66	9.30	173.6	10.2	0.24	180.0	4.14	5.1	14.4
Apple colour	94.66	9.8	0.14	155.00	4.58	12.00	165.0	9.80	0.40	198.00	4.78	8.2	20.2
Nasik	113.66	10.0	0.14	132.50	3.45	10.20	180.0	10.5	0.28	252.0	3.66	10.8	21
Spear acid	80.33	9.2	0.13	155.00	3.92	9.80	157.8	11.2	0.38	176.4	6.17	9.2	19
Seed drop	122.33	10.2	0.14	65.00	4.42	7.50	198.50	10.5	0.46	172.8	4.91	6.5	14
Banarasi	56.33	10.0	0.17	160.00	3.25	8.50	110.60	11.8	0.34	188.4	4.25	7.2	15.7
Mild Fleshed	73.66	11.0	0.10	175.00	3.76	14.60	125.80	10.8	0.31	210.0	5.50	11.6	26.2
Portugal	121.54	10.8	0.25	205.00	4.12	11.00	177.50	11.2	0.35	262.0	4.40	6.1	17.1
Sindh	108.32	10.5	0.20	198.50	3.85	11.50	162.40	10.5	0.24	234.0	4.23	8.2	19.7
CD at 5%	29.84	NS	NS	22.8	0.160	4.98	31.24	NS	NS	14.5	0.164	3.61	

Seedling and Sindh during winter. In rainy season the maximum ascorbic acid content was found in case of cultivar Sardar (235mg/100g pulp). Similar result was found in winter season when the maximum ascorbic acid was found in cultivars Sardar (270mg/100g pulp) and Portugal (262.0 mg/100g pulp). In a different study, Tandon *et al.* (1983) found that Behat Coconut accounted for the maximum ascorbic acid of 295.7 mg/100gm. Singh *et al.* (1995) reported that the maximum vitamin C was found in case of cultivar Superior in winter season. The highest total sugar was found in case of genotype Spear Acid (6.17%) during winter whereas the cultivar Chittidar accounted for the minimum total sugar of 3.17 per cent during rainy season. Singh *et al.* (2002) reported that the maximum total sugar of 9.13% was found in case of cultivar Allahabad Safeda during winter season at Sabour Bihar condition.

Hence, based on fruit weight, TSS and total yield, the cultivars Allahabad Safeda, Sardar, Mild Fleshed, Chittidar, Mustafapur, Harijha, Behat Coconut and Barbados Superior were found suitable for cultivation in the plateau region of Jharkhand.

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