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Evaluation of mango (*Mangifera indica* L.) genotypes for fruit characters and quality attributes

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Abstract

Twenty mango genotypes were evaluated for fruit characters and quality attributes at Horticultural Research Farm, Department of Horticulture, B. A. College of Agriculture, Anand Agricultural University, Anand in 2013. Wide variation was observed among the genotypes, maximum fruit yield (100.25kg) and fruit length (11.02cm) was recorded in Totapuri, whereas genotype GAMLS-2 observed maximum fruit width (7.49cm) and fruit volume (535.53cc). Fruit of Vasi Badami was the heaviest (367.67g) with pulp weight (222.48g). Minimum peel weight (16.45g) and stone weight (14.03g) was found in genotype GAMLS-34. While, maximum pulp: stone ratio (11.88) was observed in Amrutang. Maximum TSS (22.15%) and reducing sugar (8.96%) was noticed in Dashehari, whereas minimum acidity (0.021%) was found in Amrapali. The highest non-reducing sugar (11.34%) was observed in genotype GAMLS-67 whereas, maximum total sugar (18.05%) was found in genotype GAMLS-30.

Keywords: Evaluation, Mango genotypes, Fruit characters, Quality attributes

1. Introduction

Mango (*Mangifera indica* L.) is known as "King of fruits". It is national fruit of India because of its excellent flavour, delicious taste, delicate fragrance and attractive colour. The numerous varieties cultivated in this country having diversity of flavour, taste and nutritive quality and vary with the variations in environment (Jagmohan and Bhutani, 1989)^[4]. The information on genetic divergence is very useful for explorer, geneticists and breeders to conduct studies concerning germplasm collection, genetic erosion and use of accessions in breeding programmes (Dhillon *et al.*, 2007)^[2]. A large number of mango cultivars are being grown in Gujarat, out of them all the genotypes do not meet the requirements of an ideal commercial cultivar for consumer acceptability and to get greater remuneration. Hence, it is becomes imperative to study the performance of different leading genotypes under middle Gujarat conditions. Keeping above facts in view, a study was carried out to study the variability present in germplasm.

Materials and methods

An experiment on pre-established mango orchard at Horticultural Research Farm, Department of Horticulture, B. A. College of Agriculture, Anand Agricultural University, Anand during year 2013.

Evaluation was carried out for twenty mango genotypes *viz.* Amrapali, Amrutang, Dashehari, Kesar, Langra, Maddrash Haphus, Mallika, Nilesan, Neelphanso, Ratna, Sonpari, Totapuri, Vanraj, Vasi Badami, GAMLS-2, GAMLS-29, GAMLS-30, GAMLS-34, GAMLS-67 and GAMLS-88. The experiment was laid out in Randomized Block Design with two replications using individual tree plant in each genotype. Performance of each genotype was evaluated for fruit characters and quality attributes.

For fruit characters, five uniform and fully ripened fruits of each genotype were selected. Fruit length of five randomly selected fruits from each tree was measured with the help of a standard still scale whereas, width of fruits was measured with the help of vernier caliper and average was computed and expressed in centimeter. Volume of fruit was estimated by water displacement method. The pulp was extracted manually and the stone clean thoroughly then pulp, peel and stone were weighed on electronic balance and pulp: stone ratio was calculated. Total soluble solid was determined with the help of hand refractometer (ranging from 0-32° Brix).

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Acidity was determined by alkali titration method (Ranganna, 1979) [8] and results were expressed in term of percentage. Sugar (reducing and non-reducing) were estimated by the

titrimetric method of Lane and Eynon as described by Ranganna (1979) [8]

Table 1: Fruit characteristics of mango genotypes

Sr. No.	Genotypes	Fruit yield (Kg/tree)	Fruit length (cm)	Fruit width (cm)	Fruit volume (cc)	Fruit weight (g)	Pulp Weight (g)	Peel Weight (g)	Stone Weight (g)	Pulp: Stone ratio
1	Amrapali	43.75	8.59	5.44	169.87	142.21	123.03	21.90	23.95	5.14
2	Amrutang	59.50	9.91	5.50	352.21	233.74	187.38	25.23	15.79	11.88
3	Dashehari	95.50	8.09	4.41	209.10	169.48	106.58	22.57	21.76	4.91
4	GAMLS-2	16.25	9.62	7.49	535.53	228.42	137.60	27.48	28.76	4.79
5	GAMLS-29	82.25	3.96	3.71	149.50	166.79	103.53	21.68	15.50	6.68
6	GAMLS-30	15.50	6.33	5.10	160.47	210.85	137.68	36.39	32.60	4.22
7	GAMLS-34	44.25	8.25	4.24	208.03	145.80	96.63	16.45	14.03	6.90
8	GAMLS-67	28.50	9.80	6.52	296.99	241.94	128.18	38.15	39.01	3.29
9	GAMLS-88	37.50	6.43	4.21	151.57	156.59	68.93	41.03	21.63	3.19
10	Kesar	96.50	8.11	4.58	285.63	184.75	88.30	37.53	26.47	3.34
11	Langra	38.25	8.92	4.91	474.80	231.20	145.70	27.85	30.02	4.85
12	Madrashi Haphus	52.50	7.14	3.64	382.20	163.55	109.82	21.08	29.65	3.71
13	Mallika	48.00	10.31	5.68	420.13	289.33	181.99	42.55	24.05	7.57
14	Nileshan	16.75	7.52	5.20	172.03	180.80	112.95	38.95	23.40	4.83
15	Nilphanso	34.75	7.61	4.65	199.78	153.33	106.35	18.33	23.83	4.47
16	Ratna	35.50	7.27	5.24	264.71	292.75	188.88	35.65	48.80	3.89
17	Sonpari	43.50	7.36	5.20	182.95	248.78	156.58	37.50	41.48	3.78
18	Totapuri	100.25	11.02	5.92	412.60	271.42	192.03	43.48	30.79	6.24
19	Vanraj	33.25	7.07	5.26	376.60	262.58	201.32	27.27	25.42	7.93
20	Vasi Badami	95.75	10.91	5.23	368.18	367.67	222.48	77.25	56.63	3.93
	CD (P=0.05)	11.17	0.72	0.50	25.27	28.67	14.39	5.07	3.03	0.60

Table 2: Quality attributes of mango genotypes.

Sr. No.	Genotypes	TSS (%)	Acidity (%)	Reducing Sugar (%)	Non reducing Sugar (%)	Total sugar (%)
1	Amrapali	18.70	0.21	5.09	10.05	15.14
2	Amrutang	17.75	0.32	7.08	8.02	15.09
3	Dashehari	22.15	0.28	8.96	7.09	16.05
4	GAMLS-2	12.10	0.23	5.15	7.35	12.50
5	GAMLS-29	15.85	0.37	4.68	8.83	13.50
6	GAMLS-30	12.00	0.51	6.90	11.15	18.05
7	GAMLS-34	18.85	0.63	4.35	7.73	12.08
8	GAMLS-67	15.65	0.24	3.60	11.34	14.94
9	GAMLS-88	20.65	0.35	6.79	6.40	13.19
10	Kesar	17.25	0.29	7.03	8.77	15.80
11	Langra	19.40	0.35	6.28	8.26	14.65
12	Madrashi Haphus	14.25	0.35	6.18	10.00	16.18
13	Mallika	21.05	0.31	4.62	9.04	13.66
14	Nileshan	14.30	0.32	5.98	7.40	13.38
15	Nilphanso	16.25	0.28	5.30	7.13	12.43
16	Ratna	16.45	0.49	7.23	7.43	14.65
17	Sonpari	18.40	0.32	6.73	8.85	15.58
18	Totapuri	14.00	0.33	4.68	10.60	15.28
19	Vanraj	18.75	0.28	3.07	9.95	13.02
20	Vasi Badami	14.90	0.23	7.83	8.40	16.23
	CD (P=0.05)	0.86	0.07	0.81	0.75	1.47

Result and discussion

The result presented in Table 1 revealed that genotype Totapuri recorded the maximum fruit length (11.02 cm) and yield (100.25 kg) followed by Kesar (96.50 kg), Vasi Badami (95.75 kg) and Dashehari (95.50). Maximum fruit width and fruit volume (7.49 cm and 535.53 cc, respectively) was observed in GAMLS-2. While, the highest fruit weight and pulp weight (367.67 and 222.48 g, respectively) was recorded in Vasi Badami, whereas minimum peel weight and stone weight (16.45 and 14.03 g, respectively) was found in genotype Amrutang. The cultivar Amrutang, showed its superiority for pulp: stone ratio (11.88). Such type of variability among fruit characters of different mango

genotypes was also reported by Patel (2002) [7], Singh and Singh (2004) [10], Singh *et al.* (2010) [9], Bakshi *et al.* (2013) [11] and Mishra *et al.* (2014) [6].

For qualitative attributes Dashehari cultivar recorded significantly, the highest total soluble solids and reducing sugar content (22.15 and 8.96 %, respectively). These findings are in accordance with Hoda *et al.* (2003) [3]. The fruit of Amrapalli cultivar contain minimum acidity (0.21 %). Whereas, GAMLS-34 was recorded the highest acidity (0.63 %). Among all the genotypes, GAMLS-67 showed maximum non reducing sugar (11.34%) followed by GAMLS-30 (11.15 %) and Totapuri (10.60 %). The maximum total sugar was recorded in GAMLS-30 (18.05 %), whereas, minimum total

sugar content was recorded in GAMLS-34 (12.08 %). Similar varietal difference in fruit quality attributes in mango also observed by Singh and Singh (2004)^[10], Kevadiya (2006)^[5], Singh *et al.* (2010)^[9] and Mishra *et al.* (2014)^[6].

Based on the present results, it can be concluded that the fruit characters and quality attributes showed significant variation among the mango genotypes. Totapuri, Vasi Badami and Amrutang were found promising for yield parameters while for quality attributes, genotypes Amrapali and Dashehari were found the best.

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