



MORPHOLOGICAL CHARACTERIZATION OF INDIGENOUS MANGO (*MANGIFERA INDICA* L.) CULTIVARS OF COASTAL DISTRICTS IN ANDHRA PRADESH, INDIA

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Abstract

Characterization of mango cultivars using morphological characters has been successfully used for selection of improved cultivars for breeding programs. The study was conducted at Horticultural research station, Venkataramannagudem for evaluating the variability of mango cultivars to conserve the elite ones and to identify the superior genotypes based on fruit characters for future crop improvement. Thirty four mango cultivars were characterized using morphological fruit characters in subsequent years from 2012-14 to know the genetic diversity in mango. The cultivars Sora Mamidi, Kowsuri Pasand and Elamandala appeared to be promising donors for fruit yield which showed maximum fruit weight and pulp weight but the cultivars Panukula Mamidi, Hyder, Nuzividu Rasalu, Suvarnarekha Navaneetham, Nalla Rasalu, Chinnarasam, Panchadara Kalasa and Cherukurasam have optimum fruit size weighing 3-4 fruits/kg. The cultivars Elamandala and Banganapalli-2 reported maximum fruit skin thickness which can be used as a source for better keeping quality of mango fruits. Minimum peel weight and peel percent were recorded in Tella Gulabi. The cultivars Banglora-1, Tella Gulabi, Suvarnarekha, Chinnarasam, Elamandala, Nuzividu Rasalu and Imam Pasand recorded optimum edible to non-edible ratio. The cultivars Nuzividu Tiyya Mamidi and Tella Gulabi recorded minimum stone weight. These identified cultivars may be good donors in future hybridization programme to evolve superior varieties.

Key words : Characterization, mango, morphological and variability.

Introduction

Mango (*Mangifera indica* L.) is an important member of the family Anacardiaceae in order Sapindales and is the most important fruit crop in India having a great cultural, socio-economic and religious significance since ancient times. It is said to be originated in the Indo-Burma (Myanmar) region, by virtue of its excellent flavor, delicious taste, attractive color, delicious fruit quality with richness in vitamins and minerals, accessibility to common man, liking by the masses, mango has been assigned the status of the 'King of the fruits' in the tropical world and it is the 'National Fruit of India'. In India, mango ranks

first in terms of area with 2.50 million ha, second in respect of production with 18.00 million tonnes and with a productivity of 7.2 million tonnes/ha, while Andhra Pradesh ranks second in terms of area and production with 0.30 million ha, and 2.70 million tonnes respectively, and with a productivity of 9.0 million tonnes/ha (NHB, 2013). Andhra Pradesh is considered as a centre of diversity for mango with a rich diversity of named local cultivars and unnamed local land races. Mango is considered to be an allopolyploid, most probably amphidiploid and outbreeding species having chromosome number $2n=40$ (Mukherjee, 1950). It is highly heterozygous as performance varies with the climate which resulted in a high level of genetic diversity. Further,

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confusion exists in the nomenclature of mangoes due to different local names for the same variety. Knowledge of the magnitude of genetic variation among the land races of fruit characteristics is important for development of new varieties of mango with improved quality is the engine of market demand. As fruit is the most important classification and portrayal character, the objective of the study was to evaluate morphological fruit characters of mango cultivars and to isolate and identify the superior genotypes for future breeding programmes.

Materials and Methods

The present study was conducted to study the performance of mango cultivars of coastal districts in Andhra Pradesh at Horticultural Research Station, Venkataramannagudem during the subsequent years from 2012 to 2014. A well-planned germplasm collection survey based on diversity richness was conducted in coastal districts of Andhra Pradesh, which includes Horticultural Research Station and private owned mango orchards. Random sampling strategy was followed for collection of samples. Three plants in each cultivar were taken as sample size. Five fruits of each cultivar were taken per replication for evaluating morphological fruit characters. The experimental material consists of 34 indigenous mango cultivars and variants within them obtained from the coastal districts of Andhra Pradesh, India.

S. no.	Name of the Cultivar
1	Banganapalli – 1
2	Banganapalli – 2
3	Banganapalli - 3
4	Banglora - 1
5	Banglora - 2
6	Baramasi
7	Cherukurasam
8	Chinnarasam
9	Chinna Suvarnarekha
10	Elamandala
11	Hyder
12	Imampasand
13	Jalal
14	Jehangir
15	Kolanka Goa
16	Kottapalli Kobbari
17	Kowsuri Pasand
18	Nalla Andrews
19	Nalla Rasalu
20	Navaneetam
21	Nuzividu Tiyya Mamidi
22	Nuzividu Rasalu

S. no.	Name of the Cultivar
23	Panchadara Kalasa
24	Pandurivari Mamidi
25	Paparao Goa
26	Peddarasam
27	Panukula Mamidi
28	Royal Special
29	Rajamanu
30	Sora Mamidi
31	Suvarnarekha
32	Tella Gulabi
33	Tella Rasalu
34	Rajamamidi

All the morphological observations were taken as per the International Plant Genetic Resources Institute (IPGRI), Rome, Italy descriptor for mango (IPGRI, 2006).

Results and Discussion

A wide range of variability in respect of various fruit characters *viz.*, fruit length, diameter, weight, peel thickness, peel weight, stone weight and edible to non-edible ratio was observed. The fruits of Sora Mamidi exhibited the biggest fruit having fruit weight of 1395.45g, whereas the cultivar Banglora-2 exhibited the smallest fruit with the average fruit weight of 131.43g. The average fruit weight of mango cultivars studied in the present investigation was ranged from 131.43 g to 1395.45 g with a mean fruit weight of 400.74 g (table 1). The mango fruit weight ranging from 250 to 400 g is universally accepted as best quality mango. According to the observations of the present study, the cultivars Panukula Mamidi, Hyder, Nuzividu Rasalu, Suvarnarekha Navaneetham, Nalla Rasalu, Chinnarasam, Panchadara Kalasa and Cherukurasam have optimum fruit weight ranging from 265.87 g to 382.4 g, which weighs 3-4 fruits/kg. Thus, these cultivars may be rated as superior most according to the universal acceptance norms of top quality. The results were in accordance with Dinesh (2004) in range of fruit weight (202.8 g to 1014.4 g) and with respect to fruit weight of mango cv. Sora Mamidi which weighed more than 1000 g. However, the difference in fruit weight might be due to difference in climatic conditions and also due to genetic behavior of the genotype.

The data collected regarding fruit size (length and diameter) had shown a wide variation (table 1). The maximum fruit length was recorded in Sora Mamidi (17.56 cm) which was on par with Banglora-1 (17.15 cm) while, minimum fruit length was recorded in Nuzividu Tiyya

Table 1 : Mean performance of mango cultivars for fruit morphological characters.

S. no.	Name of the cultivar	Fruit length (cm)			Fruit diameter (cm)			Fruit weight (g)		
		2013	2014	Mean	2013	2014	Mean	2013	2014	Mean
1	Banganapalli – 1	11.16	11.87	11.51	8.53	8.77	8.65	449.93	451.79	450.86
2	Banganapalli – 2	11.29	10.88	11.09	8.33	7.99	8.16	451.07	453.39	452.23
3	Banganapalli – 3	9.78	9.79	9.78	7.37	7.36	7.36	228.63	228.62	228.63
4	Banglora – 1	17.73	16.57	17.15	8.49	8.68	8.58	728.40	719.57	723.98
5	Banglora – 2	9.95	9.30	9.63	4.19	4.76	4.47	130.60	132.25	131.43
6	Baramasi	7.64	7.36	7.50	7.16	8.24	7.70	248.17	215.57	231.87
7	Cherukurasam	10.17	12.30	11.23	7.17	7.17	7.17	389.27	375.57	382.42
8	Chinnarasam	11.45	11.07	11.26	7.75	7.51	7.63	366.40	356.57	361.48
9	Chinna Suvarnakha	9.08	8.94	9.01	6.74	6.62	6.68	226.73	216.33	221.53
10	Elamandala	12.37	11.86	12.12	10.64	10.66	10.65	788.30	796.00	792.15
11	Hyder	8.69	8.93	8.81	6.66	6.42	6.54	267.60	274.40	271.00
12	Imampasand	11.38	12.22	11.80	8.82	8.53	8.68	492.40	495.13	493.77
13	Jalal	14.50	15.42	14.96	8.42	8.03	8.23	626.27	645.01	635.64
14	Jehangir	11.96	13.08	12.52	9.75	10.00	9.87	680.33	709.20	694.77
15	Kolanka Goa	11.15	11.91	11.53	7.85	8.44	8.15	415.30	428.63	421.97
16	Kottapalli Kobbari	9.23	9.63	9.43	6.26	6.77	6.52	222.50	220.40	221.45
17	Kowsuri Pasand	16.80	15.95	16.38	12.47	11.93	12.20	1074.10	1062.50	1068.30
18	Nalla Andrews	10.37	9.75	10.06	8.69	9.19	8.94	422.77	402.67	412.72
19	Nalla Rasalu	11.03	11.05	11.04	7.36	7.39	7.37	354.03	364.80	359.42
20	Navaneetam	8.74	9.71	9.23	7.82	7.44	7.63	332.13	354.80	343.47
21	Nuzividu Tiyya Mamidi	6.15	5.72	5.93	4.72	4.72	4.72	151.23	146.27	148.75
22	Nuzividu Rasalu	10.30	10.41	10.36	6.93	7.24	7.08	322.93	305.50	314.22
23	Panchadara Kalasa	9.20	9.85	9.53	7.21	7.21	7.21	366.37	370.27	368.32
24	Pandurivari Mamidi	8.19	7.77	7.98	5.67	6.07	5.87	145.60	157.90	151.75
25	Paparao Goa	10.47	10.97	10.72	8.45	7.97	8.21	389.07	388.87	388.97
26	Peddarasam	13.18	12.67	12.92	8.26	8.50	8.38	487.67	492.43	490.05
27	Panukula Mamidi	8.80	9.07	8.93	7.65	7.90	7.78	266.10	265.63	265.87
28	Royal Special	7.09	6.81	6.95	6.64	6.68	6.66	145.46	155.52	150.49
29	Rajamanu	9.97	8.97	9.47	5.97	6.31	6.14	148.53	146.53	147.53
30	Sora Mamidi	17.50	17.62	17.56	12.13	11.79	11.96	1387.43	1403.47	1395.45
31	Suvarnakha	10.46	10.77	10.61	7.00	6.60	6.80	323.23	344.70	333.97
32	Tella Gulabi	7.27	7.08	7.17	5.88	5.98	5.93	143.27	138.27	140.77
33	Tella Rasalu	8.60	8.05	8.33	6.66	6.71	6.69	195.90	178.43	187.17
34	Rajamamidi	10.30	10.08	10.19	6.90	6.70	6.80	244.60	240.80	242.70
	Mean	10.65	10.69	10.67	7.66	7.71	7.69	400.36	401.11	400.74
	SEm±			0.34			0.20			7.82
	C.D 5%			0.95			0.56			21.83
	C.D 1%			1.25			0.73			28.81

Mamidi (5.93 cm). Maximum fruit diameter was recorded in Kowsuri Pasand (12.20 cm), which was on par with Sora Mamidi (11.96 cm) while, minimum fruit diameter was recorded in Banglora- 2 (4.47 cm), which was on par with Nuzividu Tiyya Mamidi (4.72 cm). Results of fruit size were found in agreement with previous research findings of Simi (2006) in mango, who reported the range of fruit length from 4.4 cm to 18.1 cm and the

range of fruit diameter from 3.90 cm to 12.00 cm.

The maximum fruit skin thickness was recorded in Elamandala (2.05 mm) followed by Banganapalli-2, Chinna Suvarnakha and Hyder (1.80 mm) while, the minimum fruit skin thickness was recorded in Banglora-2 (0.37 mm). The results presented in table 2 revealed that mean fruit skin thickness was 1.00 mm, while it ranged from 0.37 mm to 2.05 mm. The results are in

Table 2 : Mean performance of mango cultivars for peel characters.

S. no.	Name of the cultivar	Fruit skin thickness (mm)			Peel weight (g)			Peel per cent (%)		
		2013	2014	Mean	2013	2014	Mean	2013	2014	Mean
1	Banganapalli – 1	1.20	1.20	1.20	60.03	60.33	60.18	13.34	13.35	13.35
2	Banganapalli – 2	1.77	1.83	1.80	62.44	64.45	63.44	13.84	14.22	14.03
3	Banganapalli - 3	0.63	0.73	0.68	30.73	33.32	32.02	13.47	14.57	14.02
4	Banglora – 1	0.43	0.43	0.43	91.03	90.09	90.56	12.50	12.52	12.51
5	Banglora – 2	0.35	0.40	0.37	13.69	14.24	13.97	10.48	10.77	10.62
6	Baramasi	0.80	0.80	0.80	35.57	30.10	32.84	14.32	14.00	14.16
7	Cherukurasam	1.50	1.43	1.47	54.99	52.85	53.92	14.13	14.08	14.10
8	Chinnarasam	0.50	0.40	0.45	36.98	34.66	35.82	10.09	9.76	9.93
9	Chinna Suvarnarekha	1.80	1.80	1.80	32.85	31.99	32.42	14.47	14.78	14.63
10	Elamandala	2.00	2.10	2.05	100.25	103.31	101.78	12.71	12.98	12.84
11	Hyder	1.80	1.80	1.80	41.32	42.96	42.14	15.44	15.65	15.55
12	Imampasand	0.87	0.90	0.88	53.00	52.70	52.85	10.77	10.64	10.70
13	Jalal	0.67	0.70	0.68	41.32	42.96	42.14	11.90	12.28	12.09
14	Jehangir	1.10	1.03	1.07	41.32	42.96	42.14	15.05	14.61	14.83
15	Kolanka Goa	0.87	0.90	0.88	42.18	41.60	41.89	10.15	9.70	9.93
16	Kottapalli Kobbari	0.57	0.60	0.58	31.84	30.98	31.41	14.33	14.06	14.19
17	Kowsuri Pasand	0.60	0.60	0.60	111.51	108.71	110.11	10.38	10.24	10.31
18	Nalla Andrews	0.43	0.37	0.40	50.88	49.57	50.22	12.04	12.31	12.17
19	Nalla Rasalu	0.80	0.80	0.80	51.85	53.46	52.65	14.65	14.65	14.65
20	Navaneetam	0.67	0.73	0.70	34.61	37.03	35.82	10.41	10.44	10.42
21	Nuzividu Tiyya Mamidi	0.73	0.80	0.77	22.36	21.15	21.76	14.78	14.47	14.62
22	Nuzividu Rasalu	0.50	0.50	0.50	26.07	24.17	25.12	8.07	7.92	8.00
23	Panchadara Kalasa	1.40	1.33	1.37	45.04	45.14	45.09	12.29	12.18	12.23
24	Pandurivari Mamidi	0.47	0.50	0.48	18.59	19.46	19.02	12.80	12.43	12.61
25	Paparao Goa	1.27	1.23	1.25	46.74	44.29	45.52	12.03	11.40	11.71
26	Peddarasam	1.30	1.37	1.33	71.39	71.48	71.43	14.64	14.51	14.57
27	Panukula Mamidi	1.47	1.50	1.48	41.27	41.36	41.31	15.51	15.57	15.54
28	Royal Special	0.47	0.50	0.48	22.76	25.21	23.99	15.64	15.87	15.76
29	Rajamanu	1.77	1.80	1.78	20.06	21.04	20.55	13.50	14.35	13.93
30	Sora Mamidi	0.60	0.60	0.60	117.91	116.33	117.12	8.49	8.29	8.39
31	Suvarnarekha	1.47	1.37	1.42	31.77	34.92	33.35	9.81	10.17	9.99
32	Tella Gulabi	0.57	0.57	0.57	11.51	10.27	10.89	8.03	7.44	7.73
33	Tella Rasalu	0.40	0.40	0.40	26.34	23.88	25.11	13.44	13.39	13.42
34	Rajamamidi	0.60	0.50	0.55	36.04	35.41	35.72	14.70	14.70	14.70
	Mean	1.00	1.00	1.00	45.77	45.66	45.72	12.59	12.60	12.60
	SEm±			0.00			1.22			0.27
	C.D 5%			0.01			3.40			0.76
	C.D 1%			0.01			4.49			1.00

agreement with Simi (2006), who reported similar range of fruit skin thickness from 0.60 mm to 2.00 mm in mango.

The data in table 2 showed that the cultivar Tella Gulabi recorded minimum peel weight of 10.89 g while, the cultivar Sora Mamidi recorded maximum peel weight of 117.12 g. Minimum peel per cent was recorded in Tella Gulabi (7.73%) which was on par with Nuzividu Rasalu (8.00%) while, maximum peel per cent was

observed in Royal Special (15.76 %) which was on par with Hyder (15.55%) and Panukula Mamidi (15.54%). The results are in accordance with Dinesh (2004) in mango.

The mean pulp weight of mango cultivars was 303.39 g, which ranged from 89.12 g to 1178.2 g. Significant differences were recorded in pulp weight of mango cultivars (table 3). Maximum pulp weight was recorded

Table 3 : Mean performance of mango cultivars for fruit pulp characters.

S. no.	Name of the cultivar	Pulp weight (g)			Pulp per cent (%)			Edible to non-edible ratio		
		2013	2014	Mean	2013	2014	Mean	2013	2014	Mean
1	Banganapalli – 1	337.14	337.98	337.56	74.92	74.81	74.86	2.95	2.99	2.97
2	Banganapalli – 2	330.64	328.31	329.47	73.31	72.42	72.86	2.74	2.63	2.69
3	Banganapalli - 3	161.98	161.62	161.80	70.80	70.69	70.75	2.50	2.39	2.44
4	Banglora - 1	560.47	552.51	556.49	76.95	76.78	76.86	3.31	3.33	3.32
5	Banglora - 2	88.61	89.63	89.12	67.80	67.78	67.79	2.06	2.03	2.04
6	Baramasi	180.68	157.06	168.87	72.77	72.88	72.82	2.67	2.71	2.69
7	Cherukurasam	274.82	264.93	269.88	70.60	70.55	70.57	2.38	2.39	2.39
8	Chinnarasam	287.95	277.05	282.50	78.59	77.78	78.18	3.66	3.84	3.75
9	Chinna Suvarnarekha	156.64	149.88	153.26	69.08	69.28	69.18	2.37	2.37	2.37
10	Elamandala	630.61	640.47	635.54	80.00	80.46	80.23	3.77	3.81	3.79
11	Hyder	183.91	183.86	183.88	68.73	66.98	67.86	2.15	2.07	2.11
12	Imampasand	392.39	395.36	393.88	79.70	79.85	79.78	3.90	3.99	3.94
13	Jalal	421.26	434.75	428.00	67.27	67.40	67.33	2.15	2.07	2.11
14	Jehangir	514.96	534.00	524.48	75.71	75.29	75.50	2.15	2.07	2.11
15	Kolanka Goa	339.33	351.52	345.43	81.71	82.02	81.87	4.33	4.49	4.41
16	Kottapalli Kobbari	156.52	154.65	155.58	70.33	70.17	70.25	2.44	2.44	2.44
17	Kowsuri Pasand	864.16	855.70	859.93	80.45	80.54	80.50	4.12	4.21	4.16
18	Nalla Andrews	324.51	307.78	316.15	76.77	76.44	76.60	3.34	3.22	3.28
19	Nalla Rasalu	253.72	261.09	257.40	71.67	71.58	71.63	2.51	2.45	2.48
20	Navaneetam	246.43	264.21	255.32	74.20	74.48	74.34	2.96	2.94	2.95
21	Nuzividu Tiyya Mamidi	108.13	105.19	106.66	71.50	71.92	71.71	2.45	2.53	2.49
22	Nuzividu Rasalu	255.88	241.95	248.91	79.23	79.20	79.22	3.81	3.83	3.82
23	Panchadara Kalasa	265.67	267.26	266.46	72.53	72.18	72.36	2.67	2.68	2.67
24	Pandurivari Mamidi	103.51	113.15	108.33	71.10	71.64	71.37	2.49	2.64	2.57
25	Paparao Goa	295.51	297.36	296.43	75.97	76.47	76.22	3.11	3.30	3.20
26	Peddarasam	345.09	345.24	345.17	70.77	70.11	70.44	2.42	2.35	2.38
27	Panukula Mamidi	179.16	182.34	180.75	67.33	68.64	67.99	2.10	2.14	2.12
28	Royal Special	101.59	109.17	105.38	69.83	70.18	70.01	2.29	2.26	2.27
29	Rajamanu	100.65	98.61	99.63	67.77	67.30	67.54	2.03	1.98	2.00
30	Sora Mamidi	1172.29	1184.20	1178.24	84.49	84.38	84.43	5.33	5.84	5.59
31	Suvarnarekha	254.05	270.66	262.36	78.60	78.52	78.56	3.62	3.64	3.63
32	Tella Gulabi	109.37	105.74	107.56	76.33	76.46	76.40	3.29	3.40	3.34
33	Tella Rasalu	134.53	123.04	128.79	68.67	68.94	68.80	2.24	2.25	2.25
34	Rajamamidi	177.57	174.49	176.03	72.57	72.47	72.52	2.58	2.78	2.68
	Mean	303.23	303.55	303.39	73.77	73.72	73.74	2.91	2.94	2.93
	SEm±			5.88			0.30			0.05
	C.D 5%			16.42			0.84			0.14
	C.D 1%			21.67			1.10			0.19

in Sora Mamidi (1178.24 g) while, minimum pulp weight was recorded in Banglora-2 (89.12 g). Similar results of maximum pulp weight were reported by Dinesh (2004) in mango cv. Sora Mamidi. The highest pulp per cent (Table 3) was recorded in Sora Mamidi (84.43%) while, the lowest pulp per cent was recorded in Jalal (67.33%) which was on par with Rajamanu (67.54%), Banglora-2 (67.79%), Hyder (67.86%), Panukula Mamidi (67.99%). Similar results of high pulp per cent were also reported

by Desai and Dhandar (2000) who showed 83.21% in mango.

The highest edible to non-edible ratio was recorded in Sora Mamidi (5.59) while, the lowest edible to non-edible ratio was observed in Rajamanu (2.00), which was on par with Banglora-2 (2.04), Hyder, Jalal and Jehangir (2.11) and Panukula Mamidi (2.12). The cultivars Banglora-1, Tella Gulabi, Suvarnarekha, Chinnarasam,

Table 4 : Mean performance of mango cultivars for stone characters.

S. no.	Name of the cultivar	Stone weight (g)			Stone per cent (%)			Pulp to stone ratio		
		2013	2014	2013	2013	2013	Mean	2013	2014	Mean
1	Banganapalli – 1	54.26	52.90	6.23	6.23	6.23	11.88	6.23	6.39	6.31
2	Banganapalli – 2	58.34	60.13	5.67	5.67	5.67	13.10	5.67	5.46	5.57
3	Banganapalli - 3	34.11	34.46	4.75	4.75	4.75	14.99	4.75	4.70	4.73
4	Banglora - 1	78.39	76.23	7.17	7.17	7.17	10.67	7.17	7.27	7.22
5	Banglora - 2	29.40	30.01	3.01	3.01	3.01	22.60	3.01	2.99	3.00
6	Baramasi	32.05	27.82	5.63	5.63	5.63	12.92	5.63	5.64	5.64
7	Cherukurasam	60.38	57.91	4.55	4.55	4.55	15.47	4.55	4.58	4.57
8	Chinnarasam	41.65	37.40	6.92	6.92	6.92	10.96	6.92	7.40	7.16
9	Chinna Suvarnarekha	33.23	31.05	4.72	4.72	4.72	14.50	4.72	4.83	4.77
10	Elamandala	67.24	64.82	9.39	9.39	9.39	8.34	9.39	9.88	9.64
11	Hyder	44.13	45.71	4.17	4.17	4.17	16.57	4.17	4.02	4.09
12	Imampasand	47.56	46.40	8.25	8.25	8.25	9.52	8.25	8.52	8.39
13	Jalal	44.13	45.71	4.17	4.17	4.17	19.46	4.17	4.02	4.09
14	Jehangir	44.13	45.71	4.17	4.17	4.17	8.69	4.17	4.02	4.09
15	Kolanka Goa	36.27	36.91	9.36	9.36	9.36	8.67	9.36	9.54	9.45
16	Kottapalli Kobbari	32.21	32.37	4.85	4.85	4.85	14.59	4.85	4.78	4.82
17	Kowsuri Pasand	98.29	94.71	8.81	8.81	8.81	9.04	8.81	9.04	8.92
18	Nalla Andrews	46.30	46.05	7.02	7.02	7.02	11.19	7.02	6.68	6.85
19	Nalla Rasalu	49.38	52.93	5.14	5.14	5.14	14.23	5.14	4.93	5.04
20	Navaneetam	48.63	52.85	5.07	5.07	5.07	14.77	5.07	5.00	5.03
21	Nuzividu Tiyya Mamidi	21.75	20.35	4.97	4.97	4.97	14.15	4.97	5.17	5.07
22	Nuzividu Rasalu	41.12	39.06	6.22	6.22	6.22	12.76	6.22	6.19	6.21
23	Panchadara Kalasa	54.83	54.75	4.85	4.85	4.85	14.88	4.85	4.88	4.87
24	Pandurivari Mamidi	23.11	23.27	4.51	4.51	4.51	15.34	4.51	4.85	4.68
25	Paparao Goa	48.13	45.90	6.16	6.16	6.16	12.08	6.16	6.49	6.32
26	Peddarasam	71.41	75.35	4.84	4.84	4.84	14.98	4.84	4.58	4.71
27	Panukula Mamidi	44.23	43.81	4.05	4.05	4.05	16.56	4.05	4.16	4.11
28	Royal Special	21.91	23.75	4.65	4.65	4.65	15.18	4.65	4.58	4.62
29	Rajamanu	29.56	28.88	3.41	3.41	3.41	19.81	3.41	3.42	3.41
30	Sora Mamidi	101.81	88.10	11.53	11.53	11.53	6.80	11.53	14.21	12.87
31	Suvarnarekha	38.53	39.34	6.60	6.60	6.60	11.67	6.60	6.88	6.74
32	Tella Gulabi	21.82	20.90	5.02	5.02	5.02	15.16	5.02	5.08	5.05
33	Tella Rasalu	33.70	30.66	3.99	3.99	3.99	17.19	3.99	4.01	4.00
34	Rajamamidi	33.00	27.37	5.37	5.37	5.37	12.43	5.37	6.38	5.88
	Mean	46.03	45.11	5.74	5.74	5.74	13.56	5.74	5.90	5.82
	SEm±						0.22			0.23
	C.D 5%						0.61			0.65
	C.D 1%						0.81			0.85

Elamandala, Nuzividu Rasalu and Imam Pasand recorded optimum edible to non-edible ratio of 3.31 to 4.00 (table 3).

Minimum stone weight (table 4) was recorded in Nuzividu Tiyya Mamidi (21.05 g) which was on par with Tella Gulabi (21.36 g), Royal Special (22.83 g), Panduruvari Mamidi (23.19 g) while, maximum stone weight was recorded in Kowsuri Pasand (96.50 g). The

mean stone per cent recorded was 13.56% while, the stone per cent ranged from 6.80 to 22.60% (table 4). Significantly minimum stone per cent was observed in Sora Mamidi (6.80%) while, maximum stone per cent was recorded in Banglora-2 (22.60%). The results are in agreement with Hameedunissa Begum *et al.* (2013) with respect to range of stone per cent which ranged from 8.60 to 23.50% in mango. The highest pulp to stone ratio

(table 4) was recorded in Sora Mamidi (12.87) followed by Elamandala (9.64) while, lowest pulp to stone ratio was recorded in Banglora- 2 (3.00). Similar variation with regard to pulp to stone ratio was earlier reported by Tripathi (2001) in mango.

Conclusion

In essence, the present study is the footstep for ripe fruit morphological characterization of indigenous mango cultivars as well as estimation of genetic diversity among them. According to the observations of the present study, the cultivars Sora Mamidi, Kowsuri Pasand and Elamandala appeared to be promising donors for fruit yield, which showed maximum fruit weight and pulp weight. The cultivars Panukula Mamidi, Hyder, Nuzividu Rasalu, Suvarnarekha Navaneetham, Nalla Rasalu, Chinnarasam, Panchadara Kalasa and Cherukurasam have optimum fruit weight of ranging from 265.87 g to 382.4 g, which weighs 3-4 fruits/kg. Thus, these cultivars may be rated as superior most according to the universal acceptance norms of top quality. The cultivars Elamandala and Banganapalli-2 reported maximum fruit skin thickness, which can be used as a source for better keeping quality of mango fruits. Minimum peel weight and peel percent were recorded in Tella Gulabi. The cultivars Banglora-1, Tella Gulabi, Suvarnarekha, Chinnarasam, Elamandala, Nuzividu Rasalu and Imam Pasand recorded optimum edible to non-edible ratio. The cultivars Nuzividu Tiyya Mamidi and Tella Gulabi recorded minimum stone weight. These identified cultivars may be good donors in future hybridization programme to evolve superior varieties.

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