

# POTENTIALITY OF SOME TRADITIONAL MANGO CULTIVARS OF WEST BENGAL

**SHUVADEEP HALDER**

Department of Fruit Science, Faculty of Horticulture,  
Bidhan Chandra Krishi Viswavidyalaya, Mohanpur, Nadia - 741 252, W.B.  
e-mail: shuvadeep.halder@gmail.com

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**\*Corresponding author**

## ABSTRACT

The predominant mango growing districts in West Bengal are Maldah, Murshidabad, Nadia and North 24-Parganas. Among them Murshidabad alone is known to have about 125 cultivars, but unfortunately very few of them viz. Himsagar, Langra, Fazli, Gopalbhog, Lakham bhog, Rani pasand, Amrapali etc, are commercially exploited. Keeping this in view ten cultivars were studied for their physical, chemical properties and yield for their commercial exploitation in mango industry and also for breeding work. Considering fruit quality cultivar champa and Panja Pasand are having more TSS, sugar and vit c content than Himsagar. In case of yield cultivar Champa gives a moderate yield but Panja Pasand gives higher yield than Himsagar. Though the Cultivar Kohitur is a poor yielder but higher weight, pulp percentage and good fruit quality carries a great historical value of West Bengal. The West Bengal Government has already claimed GI tag for it and in Kolkata market they are selling at Rs.1500-2000/ piece. Other cultivars Rani Pasand and Jahanara are good in fruit quality as well as giving a handsome yield. So, the cultivars like- Champa, Panja Pasand, Rani Pasand and Jahanara have great potentiality for commercial exploitation as well as table variety.

## INTRODUCTION

Mango (*Mangifera indica* L.), the most prestigious and prime member of the family Anacardiaceae is cultivated in more than 100 countries at both tropical and subtropical areas, especially in Asia (Berardini *et al.*, 2005). India is the homeland of about 1000 varieties but only a handful of them viz., Dashehari, Langra, Chausa, Safeda, Totapuri, Fazli, Alphonso, Bombay Green, Banganapalli and Neelum are grown commercially. India is leading mango growing country which shares more than 54.2% of the global production. Every state has its own varieties. West Bengal occupying about 97.93 thousand hectares which is more than 60% of total area under fruits cultivated in this state. The predominant mango growing districts in West Bengal are Malda, Murshidabad, Nadia and North 24-Parganas. Among them Murshidabad alone is known to have about 125 cultivars, but unfortunately very few of them viz. Himsagar, Langra, Fazli, Gopalbhog, Lakhambhog, Ranipasand, Amrapali etc are commercially exploited. Being a big league among the fruit crops and in spite of its unique contribution in the national horticultural economy, mango improvement has not received the importance as it deserves. The knowledge on physico-chemical parameters of different cultivars of mango fruit is prerequisites for the selection of desirable cultivar which may be acceptable for further utilization in respect of table, processing and commercial importance. Similar work for fruit quality and performance was also done by Mishra *et al.*, 2014 and Gill *et al.*, 2015. Some of these varieties have already been described by several workers (Sadhu and Bose, 1982, Ghosh *et al.*, 1985, Kundu

and Ghosh, 1992). But a huge number of traditional superior cultivars still remain confined to the orchards of few individuals only. As a result, these cultivars are not gaining popularity. Variations in physico-chemical characters were recorded earlier among various mango cultivars by Begum *et al.* (2014). The characteristics of each variety vary widely and the ultimate quality of mangoes depends largely on the selection of suitable variety by Begum *et al.* (2013c). Keeping this in view ten cultivars were studied for their physical, chemical properties and yield for their commercial exploitation in mango industry and also for breeding work.

## MATERIALS AND METHODS

The experiment was carried out during 2018-19. At the fully ripening stage, 10 mango fruits of each cultivar free from any pest-disease attack were collected from local farmers for recording different observations. There are ten numbers of cultivars like Peyarafuli, Lazzat Bax, Kohitur, Chandan Kosha, Champa, Jahanara, Rani Pasand, Bimbli, Panja Pasand and Himsagar. Fruit weight and peel weight were taken using electronic (digital) balance. Fruit size (length and diameter) was measured by slide calipers. The total soluble solids (TSS) were recorded with the help of a hand refractometer. The sugars, acidity and ascorbic acid content of fruit were estimated by following the standard methods (AOAC, 2006). Similar work for fruit quality and performance was also done by Mishra *et al.*, 2014 and Gill *et al.*, 2015.  $\beta$ -carotene was calculated as reference of Davies, 1976. All the results is compared with the most famous and commercial variety of West Bengal, Himsagar.

## RESULTS AND DISCUSSION

The variations in fruit length, fruit diameter, fruit weight and peel weight, pulp percentage and yield was recorded in the selected cultivars (Table 1). The fruit length was ranged from 7.76 cm to 11.32 cm. The maximum fruit length was recorded in Kohitur (11.32 cm) followed by Bimbli (9.42 cm) and Lazzat Bax(8.88cm) while, minimum fruit length was recorded in Rani Pasand (7.76 cm) followed by Peyarafuli (7.78 cm). Out of 10 cultivars, 4 cultivars recorded relatively higher fruit length compared to overall mean fruit length (8.73 cm). Similar results have been reported by Begum *et al.* (2013c), Begum *et al.* (2014), Naz *et al.* (2014) and Galal *et al.* (2017). The fruit diameter was differed significantly with a mean of 6.04 cm while, the fruit diameter was ranged from 3.53 cm to 8.22 cm among the cultivars studied. Maximum fruit diameter was recorded in Kohitur (8.22 cm) followed by Bimbli (7.27 cm) while, minimum fruit diameter was recorded in Panja Pasand (3.53 cm) followed by Lazzat Bax (5.52). Out of 10 cultivars, 4 cultivars recorded relatively greater fruit diameter compared to overall mean fruit diameter. Similar results were reported by Begum *et al.* (2013c) , Begum *et al.* (2014), Naz *et al.* (2014) and Galal *et al.* (2017). The fruit weight was ranged from 130 g to 400 g with a mean fruit weight of 198.9 g. Maximum fruit weight was recorded in Kohitur (400 g) followed by Bimbli (245 g) while, minimum fruit weight was recorded in Lazzat Bax (130 g) followed by Rani Pasand (150 g). Out of 10

cultivars, 4 cultivars recorded relatively greater fruit weight compared to overall mean fruit weight. These results were conformity with that reports given by Begum *et al.* (2013c), Begum *et al.* (2014), Naz *et al.* (2014) , Vieccelli *et al.* (2016) , Kheshin *et al.* (2016) and Galal *et al.* (2017) . Pulp percentage recorded a mean value of 68.79% ranging from 55.68% to 87.79%. Minimum pulp percentage was recorded in Peyarafuli (55.68%) followed by LazzatBax (59.93%) while, maximum pulp percentage was recorded in Kohitur (87.79%) followed by Bimbli (75.87%) and Champa(74.23%). Out of ten cultivars, four cultivars recorded relatively higher pulp percentage compared to overall mean pulp percentage. These results were conformity with that reports given by Kheshin *et al.* (2016).The yield of mango varied widely with a minimum yield in Kohitur(74.63 kg/plant) and maximum yield in Panja Pasand (596 kg/plant). Higher yield was also recorded in Himsagar (570 kg/plant) and Jahanara (560kg/plant). Out of ten cultivars, four cultivars recorded relatively higher yield compared to overall mean yield. These results are similar to those reported earlier by Gunjate *et al.* (2003) and Nath *et al.* (2007).

Table No 2 revealed that highest TSS was observed in cultivar Champa (20.20°Brix) and Panja Pasand (20.20°Brix) followed by Peyarafuli (19.20°Brix) and Rani Pasand (19.20°Brix). Lowest TSS was observed in cultivar Jahanara (15.23° Brix) followed by Lazzat Bax (15.30°Brix). Out of 10 cultivars, 6 cultivars recorded relatively greater TSS compared to overall mean TSS (18.02°Brix). Similar results were reported by Begum

**Table 1 : Physical characteristics of different Traditional mango cultivars**

Variety	Fruit length (cm)	Fruit diameter (cm)	Fruit weight (g)	Pulp percentage (%)	Yield (kg/tree)
Peyarafuli	7.78	5.75	155	55.68	255
Lazzat Bax	8.88	5.52	130	59.93	310
Kohitur	11.32	8.22	400	87.79	74.63
Chandan Kosha	8.05	6.02	151	67.75	216.67
Champa	8.75	5.83	170	74.23	326.67
Jahanara	8.63	5.63	160	67.55	560
Rani Pasand	7.76	6.24	150	63.19	433
Bimbli	9.42	7.27	245	75.87	306
PanjaPasand	8.1	3.53	200	62.65	596
Himsagar	8.7	6.42	228	73.28	570
Mean	8.73	6.04	198.9	68.79	364.79
S.E.	0.01	0.04	10.74	0.4	5.99
C.D (5%)	0.03	0.13	32.15	1.19	17.96

**Table 2 : Bio-chemical characteristics of different Traditional mango cultivars**

Variety	TSS(°brix)	Total sugar (%)	Reducing sugar (%)	Non reducing sugar (%)	Titrateable acidity (%)	β <sup>2</sup> -Carotene (mg/100g)	Ascorbic acid(mg /100g)
Peyarafuli	19.2	16.24	4.92	10.75	0.21	0.42	13.6
LazzatBax	15.3	10.02	4.32	5.41	0.25	0.76	13.6
Kohitur	17.2	14.33	5.09	8.78	0.28	0.38	10.2
Chandan Kosha	18.73	15.02	4.8	9.7	0.17	2.28	42.5
Champa	20.2	18.24	6.36	11.29	0.23	0.95	71.4
Jahanara	15.23	13.97	5.23	8.3	0.28	0.37	18.7
Rani Pasand	19.2	15.81	5.36	9.93	0.18	1.14	6.8
Bimbli	16.36	11.13	5.51	5.34	0.28	0.52	8.5
PanjaPasand	20.2	16.24	4.11	11.52	0.37	0.82	5.9
Himsagar	18.54	12.47	3.05	9.42	0.07	1.28	41.56
Mean	18.02	14.34	4.87	9.04	0.23	0.89	23.27
S.E.	0.06	0.31	0.01	0.02	0.05	0.04	0.1
C.V. (5%)	0.2	0.95	0.02	0.07	0.16	0.14	0.32

et al. (2014) and Galal et al. (2017). Highest per cent of total sugars were recorded in the cultivar Champa (18.24%) followed by Peyarafuli (16.24%) and Panja Pasand (16.24%). Lowest per cent of total sugars were recorded in the cultivars, Lazzat Bax (10.02%) followed by Bimbli (11.13%). The highest reducing sugar content was found in the cultivar Champa (6.36%) followed by Bimbli (5.51%). The lowest reducing sugar content was found in Himsagar (3.05%) followed by Panja Pasand (4.11%). Out of 10 cultivars, 6 cultivars recorded relatively maximum reducing sugars compared to overall mean reducing sugars (4.87%). Similar observations were reported by Simi (2006) in mango. Maximum non-reducing sugar content was found in Panja Pasand (11.52%) followed by Champa (11.29%). Minimum non-reducing sugar content was found in Bimbli (5.34%) followed by Lazzat Bax (5.41%). The cultivar Panja Pasand recorded the highest titratable acidity (0.37%) followed by Kohitur, Jahanara and Bimbli with the reading 0.28% while, the cultivar Himsagar (0.07%) recorded the lowest titratable acidity, followed by Chandan Kosha (0.17%). Five cultivars recorded relatively greater titratable acidity compared to overall mean titratable acidity (0.23%) among the sixteen cultivars. Similar results were reported by Mitra et al. (2000), Rathor (2005) and Galal et al. (2017). Maximum  $\beta$ -carotene content was noticed in Chandan Kosha (2.28 mg/100g) followed by Himsagar (1.28 mg/100g) while, minimum  $\beta$ -carotene content was noticed in Jahanara (0.37 mg/100g) followed by Kohitur (0.38 mg/100g). Similar result was earlier reported by K. Venkateswarlu. et al. (2014). Rathor (2005) and Naz et al. (2014). The highest ascorbic

The fruit length was ranged from 7.76 cm to 11.32 cm. The maximum fruit length was recorded in Kohitur (11.32 cm) followed by Bimbli (9.42 cm) and Lazzat Bax (8.88 cm) while, minimum fruit length was recorded in Rani Pasand (7.76 cm) followed by Peyarafuli (7.78 cm). Out of 10 cultivars, 4 cultivars recorded relatively higher fruit length compared to overall mean fruit length (8.73 cm). Similar results have been reported by Begum et al. (2013c), Begum et al. (2014), Naz et al. (2014) and Galal et al. (2017). The fruit diameter was differed significantly with a mean of 6.04 cm while, the fruit diameter was ranged from 3.53 cm to 8.22 cm among the cultivars studied. Maximum fruit diameter was recorded in Kohitur (8.22 cm) followed by Bimbli (7.27 cm) while, minimum fruit diameter was recorded in Panja Pasand (3.53 cm) followed by Lazzat Bax (5.52). Out of 10 cultivars, 4 cultivars recorded relatively greater fruit diameter compared to overall mean fruit diameter. Similar results were reported by Begum et al. (2013c), Begum et al. (2014), Naz et al. (2014) and Galal et al. (2017). The fruit weight was ranged from 130 g to 400 g with a mean fruit weight of 198.9 g. Maximum fruit weight was recorded in Kohitur (400 g) followed by Bimbli (245 g) while, minimum fruit weight was recorded in Lazzat Bax (130 g) followed by Rani Pasand (150 g). Out of 10 cultivars, 4 cultivars recorded relatively greater fruit weight compared to overall mean fruit weight. These results were conformity with that reports given by Begum et al. (2013c), Begum et al. (2014), Naz et al. (2014), ViCELLI et al. (2016), Kheshin et al. (2016) and Galal et al. (2017). Pulp percentage recorded a mean value of 68.79% ranging from 55.68% to 87.79%. Minimum pulp percentage was recorded in Peyarafuli (55.68%) followed by LazzatBax

(59.93%) while, maximum pulp percentage was recorded in Kohitur (87.79%) followed by Bimbli (75.87%) and Champa (74.23%). Out of ten cultivars, four cultivars recorded relatively higher pulp percentage compared to overall mean pulp percentage. These results were conformity with that reports given by Kheshin et al. (2016). The yield of mango varied widely with a minimum yield in Kohitur (74.63 kg/plant) and maximum yield in Panja Pasand (596 kg/plant). Higher yield was also recorded in Himsagar (570 kg/plant) and Jahanara (560 kg/plant). Out of ten cultivars, four cultivars recorded relatively higher yield compared to overall mean yield. These results are similar to those reported earlier by Gunjate et al. (2003) and Nath et al. (2007).

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