



## Evaluation of flowering and fruiting attributes of different mango cultivars in the Chhattisgarh plain under rainfed condition

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### ABSTRACT

The current study was carried out during 2020-21, in Horticulture Research Farm, Department of Fruit Science, College of Agriculture, IGKV, Raipur, (C.G.) India to find out the flowering and fruiting behavior of fruits of various mango cultivars. Maximum total number of flowers was found in Neeleshwari (1,980.97 panicle<sup>-1</sup>), male and hermaphrodite flowers were maximum (1323.37 and 657.593, respectively), percentage of male and hermaphrodite flowers per panicles was maximum in Chhattisgarh Nandiraj (88.56% and 48.40%, respectively) and sex ratio was highest in Chhattisgarh Nandiraj (7.76). The maximum number of fruit set at a mustard stage, number of fruit set at marble stage, and number of fruit harvesting per panicles was estimated in Neeleshwari (80.04, 32.96 and 10.33, respectively). Fruit set percentage was maximum in Baramasi (0.83%) as well as minimum fruit drop was in Baramasi (85.37%) and maximum fruit retention at harvest was counted in Baramasi (14.62%).

**Keyword:** Flowers, sex ratio, panicles, male and hermaphrodite flowers, floral biology, fruiting

Mango (*Mangifera indica* L; Anacardiaceae) is most important fruit crop in all tropical areas in India known as “king of fruits” because of delicious quality of its fruit, which is rich in vitamins and minerals. It is the richest source of vitamin A (4800 IU/100g). Good mango varieties contain around 20 °B of total soluble solids. The acid content of ripe dessert fruit varies from 0.2 to 0.5% and the protein content is about 1%. The energy value per 100 g edible pulp of mango is 60 kCal. Mango cultivation in India was 2.291 million hectares with a production of around 20.444 million tonnes. In India, the highest mango producing state is Uttar Pradesh, producing 4.54 million tonnes from a 265.82 thousand hectare area (NHB 2019-20). The first indication of the initiation of the flower bud is in the internal structure of the bud. Flowering time is, therefore, closely linked with the time of flower bud differentiation which varies with variety and the area where it is grown. In case Chhattisgarh, flower bud differences during December to February in commercially grown varieties. Flower buds in mango start emerging in January and continue to do so till February under north Indian conditions and early as November or usually during December in south India. The mango inflorescence (or panicle) varying widely in length from 15 cm to 60 cm bears mainly two types of flowers -male and hermaphrodite. Trees can produce a few to thousands flowers per panicles depending on genotype and environmental condition. A number in perfect (hermaphrodite) flowers per panicle varies from year

to year, depending on the location of the panicle in the tree, and by cultivar ranging from < I to > 75% . Higher the number of perfect flowers better is the chance for getting higher fruit set per panicle. Our main objective in doing research on this is to find out the character associated in it. So it should be easy to plan its evolution in the coming years recording to flower behaviour in plant and yield.

The present study was carried out during 2020-21 on ten to twenty-year-old mango plants planted at spacing of 10m × 10m at the Horticulture Research Farm, Department of Fruit Science, College of Agriculture, IGKV, Raipur, (C.G.) India. The plants selected in the orchard were maintained under uniform cultural practise (disk harrow ploughing, check basin irrigation, use of Imidacloprid to control hopper and mealy bug, as observed). The trees’ growth habits were observed directly in the field, according to the previously proposed descriptors (IPGRI, Rome, Italy, 2006).

Varieties selected were Aamin, Sunderja, Amrapali, Mallika, Totapari, Krishnabhog, Sundri, Kurkkun, Baramasi, Neeleshwari, Kesar, C.G.Nandiraj and Indira Nayan. Thirteen varieties were treated with Randomized Block Design. Their three replications were based on experimental material. Total number of flowers per panicle, number of male flowers per panicle, number of hermaphrodite flowers per panicle, per cent of male and hermaphrodite flowers per panicle, sex ratio, number of fruit set at mustard stage, number of fruit set at marble stage, number of fruit harvesting per panicles, number

Short Communication

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**Table 1 : Flowering characteristics of different mango cultivars of Chhattisgarh plain grown under rainfed condition**

Varieties	Total No. of flowers panicle <sup>-1</sup>	Number of male flowers panicle <sup>-1</sup>	Number of hermaphrodite flowers panicle <sup>-1</sup>	Per cent of male flowers panicle <sup>-1</sup>	Per cent of hermaphrodite flowers panicle <sup>-1</sup>	Sex ratio
Aamin	434.937	270.897	164.04	62.27	37.00	1.651
Sunderja	840.253	586.88	253.373	69.885	30.115	2.345
Amrapali	1260.97	873.633	387.333	69.28	30.72	2.256
Mallika	1033.44	763.883	269.557	73.911	26.089	2.834
Totapari	1760.89	1207.85	553.04	68.217	31.783	2.185
Krishnabhog	395.073	204.033	191.04	51.596	48.404	1.068
Sundri	1156.40	1021.90	134.50	88.368	11.632	7.603
Kurkkun	327.773	220.63	107.143	67.361	32.639	2.07
Baramasi	1037.21	647.467	389.747	62.417	37.583	1.667
Neeleshwari	1980.97	1323.37	657.593	66.797	33.203	2.014
Kesar	668.377	538.337	130.04	80.535	19.465	4.158
Chhattisgarh Nandiraj	849.890	752.667	97.223	88.566	11.434	7.76 4
InidraNayan	1,632.82	1,186.52	446 300	72.669	27.33 1	2.659
<b>C.D.</b>	<b>119.149</b>	<b>121.877</b>	<b>19.948</b>	<b>3.158</b>	<b>3.157</b>	<b>0.457</b>
<b>C.V.</b>	<b>6.83</b>	<b>9.738</b>	<b>4.046</b>	<b>2.627</b>	<b>6.402</b>	<b>8.707</b>

**Table 2: Fruiting characteristics of different mango cultivars of Chhattisgarh plain zone grown under rainfed condition**

Varieties	Number of fruit set at mustard stage	Number of fruit set at marble stage	Number of fruit harvesting panicle <sup>-1</sup>	Number of fruits retained at harvest	Fruit set percentage	Fruit drop percentage
Aamin	27.13	9.7	1.333	4.833	0.309	95.167
Sunderja	39.373	17.04	2.333	5.932	0.277	94.068
Amarpali	40	22.363	2	4.925	0.158	95.075
Mallika	47.333	25.363	3.667	7.605	0.352	92.395
Totapari	21.043	9.003	1.333	6.439	0.079	93.561
Krishnabhog	21.067	9.3	1.667	7.855	0.426	92.145
Sundri	31.677	22.63	2	6.236	0.173	93.764
Kurkkun	13.373	8.967	1.667	13.102	0.49	86.898
Baramasi	59.077	29.063	8.667	14.622	0.836	85.378
Neeleshwari	80.04	32.967	10.333	13.007	0.521	86.993
Kesar	14.373	9.027	2	14.608	0.297	85.392
Chhattisgarh-Nandiraj	34.557	11 297	2	5.835	0.235	94.165
InidraNayan	41.41	9.89	1	2.416	0.061	97.584
<b>C.D.</b>	<b>4.439</b>	<b>4.239</b>	<b>1.736</b>	<b>7.57</b>	<b>0.233</b>	<b>7.571</b>
<b>C.V.</b>	<b>7.236</b>	<b>15.007</b>	<b>33.289</b>	<b>54.047</b>	<b>42.423</b>	<b>4.869</b>

### Evaluation of flowering and fruiting attributes

of fruits retained at harvest, fruit set percentage, fruit drop percent and yield per trees were recorded

Total number of flowers per panicle was found from the data presented in Table 1. It was observed maximum number of flowers per panicle in Neeleshwari (1,980.97) and minimum was found in variety Kurukkan (327.77), number of male per panicle was recorded highest in Neeleshwari (1,323.37) and minimum was obtained in variety Kurukkan (220.63), number of hermaphrodite flowers per panicle was more again also in Neeleshwari (657.593) and lowest is Kurukkan (107.14). Hada and Singh (2017) observed maximum number of flowers in Langra (1839.13) while, minimum was recorded in Amrapali (954.75). Percentage of male flowers per panicles was recorded highest in Chhattisgarh Naniraj (88.56%) and lowest is Krishnabhog (51.596), percentage of hermaphrodite flower was highest is Krishnabhog (48.40%) and lowest in Chhattisgarh Nandiraj (11.43%), sex ratio was observed highest in Chhattisgarh Nandiraj (7.76) and lowest in Krishnabhog (1.06). Azam *et al.* (2018) found maximum percentage of hermaphrodite flower (73.86%) in cultivar Langra and minimum in Swarnarekha. Mandal *et al.* (2020) recorded maximum number of male flowers in Langra (705) and number of hermaphrodite flowers also highest (298) in Langra.

We did the observation of the fruit set in different stages and we have shown that data in Table 2. Number of fruit set at mustard stage was maximum in Neeleshwari (80.04) and lower in Kurukkan (13.37), number of fruit set in marble stage was recorded maximum in Neeleshwari (32.967) and lowest is Kurukkan (8.96). Number of fruit harvesting per panicle is observed maximum in Neeleshwari (10.33) and minimum number in Totapari and Aamin (1.33). Indian *et al.* (2020) reported that among the genotypes PKM 1 exhibited maximum sex ratio (1:5.43). Number of fruits retained at harvest was recorded maximum in Baramasi (14.62%) and minimum in Indira Nayan (2.41%). Fruit set percentage was maximum in Baramasi (0.83%) and lowest in Indira Nayan (0.061%). Kumar *et al.* (2018) found maximum fruit drop per cent in cv. Hemsagar, (97.70%). Fruit drop (%) was recorded maximum in

Baramasi (85.37%) following by Kesar (85.39%), Neeleshwari (86.99%) and maximum fruit dropping was noticed in Indira Nayan (97.58%). Indian *et al.* (2020) reported that highest fruit drop percentage was observed in Banganapalli (87.80 %) followed by P.K.Patti (87.04%), while it was minimum in Malpacharisi (60 %).

The study concludes that the maximum number of flowers were obtained from Neeleshwari while, maximum percentage of male and hermaphrodite flowers were recorded from Chhattisgarh Nandiraj. The variety Baramasi recorded maximum number of fruit set and minimum fruit drop.

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