Evaluation of Mid-Season Cauliflower (Brassica oleracea var. Botrytis L.) Genotypes for Curd Yield and Yield Attributing Characters Under Chhattisgarh Plains

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ABSTRACT
An experiment was conducted at Research and Instructional Farm of Department of Horticulture, Indira Gandhi Krishi Vishwavidyalaya, Raipur (C.G.) during the rabi season of 2016-2017 with an objective to find out cauliflower genotypes suitable for Chhattisgarh plains. The experiment was laid out in randomized block design in three replications with ten genotypes of cauliflower. Observations in respect of yield and growth parameters were recorded on five competitive random plants from each replication. According to mean performance of the cauliflower genotypes in respect to curd yield per hectare, 2016/CAUMHYB-10 (243.29 q/ha) was found significantly superior than the other genotypes evaluated.

Keywords Cauliflower, genotypes, yield, characters

Cauliflower (Brassica oleracea var. botrytis L.) locally known as poohogbhi is one of the most popular cole crops in India and abroad because of its yield potential and high nutritive value. Cauliflower is highly thermo-sensitive crop requiring different genotypes for commercial cultivation at different periods of the year. Accordingly in Northern India, cauliflower is classified into four maturity groups (Singh et al., 1975), viz., I –maturing from late August to early November, II - maturing from mid November to early December, III - maturing from mid December to early January and IV – maturing from mid January to early March. First three groups are the Indian cauliflowers which are early maturing annual types, tolerant to high temperature and humid conditions and have originated from winter types like Cornish or by inter-crossing of Cornish and other European types. Maturity Group IV is called ‘Snowball’ varieties or the summer cauliflower of Europe and has been developed from Erfurts and Alpha types. India is the second largest producer of cauliflower in the world. Area under cauliflower in India is 434 thousand hectare with production of 8573 thousand metric tonnes and productivity is 19.8 tonnes/ha. (Anon., 2016). West Bengal is leading state in area and production of cauliflower. In Chhattisgarh area under cauliflower is 22637 ha. and production is 422124 Mt. with productivity of 18.65 MT. (Anon., 2016). In Chhattisgarh there is a good possibility for crop improvement work in cauliflower. Due to its good taste it is preferred by rural and urban people of Chhattisgarh but the little knowledge regarding crop improvement programme restricts the farmers to earn maximum benefit. Therefore, knowledge of correlation of characters may prove highly useful in an objective selection of desired traits. A wide range of variability provides a great scope for improving yield of cauliflower through a systematic and planned selection programme for one or more direct or indirect yield components. Thus, to obtain rational higher yields the standings on the association of characters with curd yield and other horticultural traits themselves is essential. This study was conducted to evaluate the performance of cauliflower genotypes during rabi season.

MATERIAL AND METHODS
The present study was conducted at Research and Instructional Farm, Department of Horticulture, Indira Gandhi Krishi Vishwavidyalaya, Raipur (C.G.) during the rabi season of 2016-2017. The experimental material comprised of ten genotypes (2016/CAUMHYB-1, 2016/CAUMHYB-2, 2016/CAUMHYB-3, 2016/CAUMHYB-4, 2016/CAUMHYB-5, 2016/CAUMHYB-6, 2016/CAUMHYB-8, 2016/CAUMHYB-9, 2016/CAUMHYB-10, 2016/CAUMVAR-6 ) of cauliflower and the experiment was laid out in a randomized block design with three replications at the spacing of 60 cm between rows and 50 cm between plants to plant. A plot size of 3.0 m x 2.5 m was kept for each genotype. All the recommended cultural practices were taken to grow a healthy crop. Data were recorded on five randomly selected plants for nineteen characters viz., no. of leaves, stalk length (cm.), curd width (cm.), curd length (cm.), gross plant weight (g), marketable curd weight (g), net curd weight (g), marketable curd yield (kg.), days to 50% curd form., days to maturity, harvest index ( % ), curd index (cm.²), leaf length (cm.), leaf width (cm.) leaves attached to curd, days to first harvest for earl., Curd yield/plot (kg.) duration of crop (sowing to last harvest), curd yield (q/ha.). The data were statistically analysed as per the model by Panse and Sukhatme (1984).

RESULT AND DISCUSSION
The mean values of different growth parameters with respect to genotypes are presented in table 1. Wide range of variation was found for no. of leaves, stalk length (cm.), curd width (cm.), curd length (cm.), gross plant weight (g), marketable curd weight (g), marketable curd yield (kg.), days to 50% curd form., days to maturity, harvest index ( % ), curd index (cm.²), leaf length (cm.), leaf width (cm.) leaves attached to curd, days to first harvest for earl., Curd yield/plot (kg.) duration of crop (sowing to last harvest), curd yield (q/ha.).

Mean of no. of leaves ranged from 17.07 (2016/CAUMHYB-10) to 21.20 (2016/CAUMHYB-1) with overall mean of 18.78. The maximum no. of leaves was noted in 2016/CAUMHYB-1 (21.20) which was followed by 2016/CAUMHYB-3 (20.00), 2016/CAUMVAR-6 (19.73), 2016/CAUMHYB-2 (18.93). Mean of stalk length ranged from
9.13 cm (2016/CAUMVAR-6) to 14.62 cm (2016/CAUMHYB-8) with overall mean of 11.90 cm. The maximum stalk length was noted in 2016/CAUMHYB-8 (14.62 cm) which was followed by 2016/CAUMHYB-9 (12.57 cm), 2016/CAUMHYB-4 (12.51 cm), 2016/CAUMHYB-3 (12.27 cm).

Mean curd weight ranged from 12.80 cm (2016/CAUMVAR-6) to 16.69 cm (2016/CAUMHYB-6) with overall mean of 15.18 cm. The maximum curd width of this trait was noted in 2016/CAUMHYB-6 (16.69 cm), which was followed by 2016/CAUMHYB-9 (15.67 cm), 2016/CAUMHYB-5 (15.43 cm), 2016/CAUMHYB-8 (15.43 cm), 2016/CAUMHYB-10 (15.37 cm), 2016/CAUMHYB-3 (15.22 cm). Mean curd length ranged from 4.61 cm (2016/CAUMVAR-6) to 7.35 cm (2016/CAUMHYB-8) with overall mean of 6.29 cm. The maximum curd length was noted in 2016/CAUMHYB-8 (7.35 cm) which was followed by 2016/CAUMHYB-9 (7.06 cm), 2016/CAUMHYB-6 (6.64 cm), 2016/CAUMHYB-10 (6.62 cm), 2016/CAUMHYB-1 (6.57 cm).

Mean of gross plant weight ranged from 703.33 gm (2016/CAUMVAR-6) to 1668.33 gm (2016/CAUMHYB-6) with overall genotypes mean of 1343.00 gm. The maximum gross plant weight was observed in 2016/CAUMHYB-6 (1668.33 gm) which was followed by 2016/CAUMHYB-9 (1658.33 gm), 2016/CAUMHYB-10 (1543.33 gm), 2016/CAUMHYB-5 (1525.00 gm), 2016/CAUMHYB-3 (1481.67 gm), 2016/CAUMHYB-1 (1373.33 gm). Mean of marketable curd weight number ranged from 635.00 gm (2016/CAUMVAR-6) to 1568.33 gm (2016/CAUMHYB-9) with overall genotypes mean of 1240.13 gm. The maximum marketable curd weight was observed in 2016/CAUMHYB-9 (1568.33 gm) which was followed by 2016/CAUMHYB-1 (1275.00 gm), 2016/CAUMHYB-3 (1338.33 gm), 2016/CAUMHYB-5 (1423.33 gm), 2016/CAUMHYB-6 (1560.00 gm) and 2016/CAUMHYB-10 (1433.33 gm). Mean value for no. of leaves attached to curd was noted in 2016/CAUMHYB-9 (8.67) which was followed by 2016/CAUMHYB-7 (8.63), 2016/CAUMHYB-6, 2016/CAUMHYB-10, 2016/CAUMHYB-5, 2016/CAUMHYB-3 and 2016/CAUMHYB-6.

Higher variability for marketable yield per plant was also reported by earlier researchers (Thamburaj et al., 1980; Jamwal et al., 1992; Reddy and Varalakshmi 1995; Grey and Doyle 1996; Kumar and Korla 2001; Ahmed et al., 2003; Sharma et al., 2005; Singh et al., 2006 and Dhatt and Garg 2008).

Mean days to 50% curd formation ranged from 31.00 days (2016/CAUMVAR-6) to 50.33 days (2016/CAUMHYB-9) with overall genotypes mean of 43.23 days. The maximum day to 50% curd formation was recorded in CAUMHYB-9 (2016/50.33 days) which was followed by 2016/CAUMHYB-8, 2016/CAUMHYB-10, 2016/CAUMHYB-5, 2016/CAUMHYB-6, 2016/CAUMHYB-1 and 2016/CAUMHYB-3. Mean days to maturity was ranged from 49.33 days (2016/CAUMVAR-6) to 73.33 days (2016/CAUMHYB-9) with overall mean of 61.80 days. The maximum days to maturity was recorded in 2016/CAUMHYB-9 (73.33 days) which was followed by 2016/CAUMHYB-8, 2016/CAUMHYB-10, 2016/CAUMHYB-5, 2016/CAUMHYB-3, 2016/CAUMHYB-6.

Mean value for harvest index ranged from 88.59% (2016/CAUMVAR-6) to 94.34% (2016/CAUMHYB-9) with over all mean of 91.58%. The maximum harvest index was observed in 2016/CAUMHYB-9 (94.34%) which was followed by 2016/CAUMHYB-6, 2016/CAUMHYB-5, 2016/CAUMHYB-10, 2016/CAUMHYB-1. Mean value for curd index ranged from 61.04 cm² (2016/CAUMVAR-6) to 113.81 cm² (2016/CAUMHYB-8) with overall mean of 96.93 cm². The maximum curd index was observed in 2016/CAUMHYB-8 (113.81 cm²) which was followed by 2016/CAUMHYB-6, 2016/CAUMHYB-9, 2016/CAUMHYB-10, 2016/CAUMHYB-1.

Mean value for leaf length ranged from 19.30 cm (2016/CAUMVAR-6) to 29.60 cm (2016/CAUMHYB-9) with overall mean of 26.31 cm. The maximum leaf length was observed in 2016/CAUMHYB-9 (29.60 cm) which was followed by 2016/CAUMHYB-8, 2016/CAUMHYB-2, 2016/CAUMHYB-4. Mean value for leaf width ranged from 7.67 cm (2016/CAUMVAR-6) to 11.99 cm (2016/CAUMHYB-9) with overall mean of 10.37 cm. The maximum leaf width was noted in 2016/CAUMHYB-9 (11.99 cm) which was followed by 2016/CAUMHYB-6, 2016/CAUMHYB-10, 2016/CAUMHYB-5, 2016/CAUMHYB-3, 2016/CAUMHYB-1.

Mean value for no. of leaves attached to curd was ranged from 7.27 (CAUMHYB-8) to 8.67 (2016/CAUMHYB-9) with overall mean of 8.15. The highest no. of leaves attached to curd was noted in 2016/CAUMHYB-9 (8.67) which was followed by 2016/CAUMHYB-5, 2016/CAUMHYB-6, 2016/CAUMHYB-3, 2016/CAUMVAR-6, 2016/CAUMHYB-1, 2016/CAUMHYB-10.

Mean value of days to first harvest for earliness was ranged from 53.00 days (2016/CAUMVAR-6) to 67.33 days (2016/CAUMHYB-9) with overall mean of 60.70 days. The highest to this trait was noted in 2016/CAUMHYB-9 (67.33 days) which was followed by 2016/CAUMHYB-8, 2016/CAUMHYB-5, 2016/CAUMHYB-6, 2016/CAUMHYB-9, 2016/CAUMHYB-1, 2016/CAUMHYB-10.

Mean value of days to maturity was ranged from 16.44 kg (2016/CAUMVAR-6) to 33.57 kg (2016/CAUMHYB-8) with over all mean of 27.79 kg. The maximum to this trait was observed in 2016/CAUMHYB-1 and 2016/CAUMHYB-10 with over all mean of 37.79 kg. The maximum to this trait was followed in 2016/CAUMHYB-1 and 2016/CAUMHYB-10 (33.57 kg) which was followed by 2016/CAUMHYB-4, 2016/CAUMHYB-5, 2016/CAUMHYB-6, 2016/CAUMHYB-9, 2016/CAUMHYB-3. Mean duration of crop was ranged from 74.67 days (2016/CAUMHYB-4) to 87.00 days (2016/CAUMHYB-1) with overall mean of 79.87 days. The maximum duration was noted in 2016/CAUMHYB-1 (87.00 days) followed by 2016/CAUMHYB-8, 2016/CAUMHYB-6, 2016/CAUMHYB-5.
## Table 1. Mean performances for curd yield and its components in cauliflower

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Mean (x)  
SEm±  
CD (p=0.05)  
CV (%)

(1) No. of leaves, (2) Stalk length (cm.), (3) Curd width (cm.), (4) Curd length (cm.), (5) Gross plant weight (g), (6) Marketable curd weight (g), (7) Net curd weight (g) (8) Marketable curd yield (kg), (9) Days to 50% curd form., (10) Days to maturity, (11) Harvest index (%), (12) Curd index (cm.), (13) Leaf length (cm.), (14) Leaf width (cm.), (15) Leaves attached to curd, (16) Days to first harvest for earli., (17) Curd yield/plot (kg.), (18) Duration of crop (sowing to last harvest.), (19) Curd yield (q/ha.)
The highest curd yield per plot was noted in 2016/CAUMHYB-1 and 2016/CAUMHYB-10 (243.29 q/ha) which were followed by 2016/CAUMHYB-4, 2016/CAUMHYB-5, 2016/CAUMHYB-6, 2016/CAUMHYB-9, 2016/CAUMHYB-3.

LITERATURE CITED


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