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Evaluation of Exotic Introductions of Cauliflower (*Brassica oleracea* var *botrytis* L.) for Yield and Quality Traits

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Abstract

Fifteen exotic lines of temperate cauliflower introduced from Center for Genetic Resources, the Netherlands, excluding CCS-06-08 (local check), were evaluated in randomized block design (RBD) with three replications during 2007—08. The plant frame ranged from 66.67 cm in CGN 11098 to 132.17 cm in CGN 11090. Genotypes/lines showed a wide range for stalk length i. e. 5.56 cm in CGN 11089 to 9.50 cm in CCS-06-08 (local check). CGN 11089 showed the desired (minimum) stalk length which was statistically at par with CGN 11090 (5.89 cm), CGN 11097 (5.89 cm), CGN 11078 (5.61 cm), CGN 13966 (6.11 cm) and CGN 11086 (6.17 cm). Net curd weight for different treatments under study ranged from 505.56 g (CGN 11098) to 788.89 g (CGN 13966). CGN 13966 showed maximum net weight which was statistically at par with CGN 11090 (766.67 g), CGN 11072 (727.78 g) and CGN 11074 (713.89 g). Range for harvest index was 44.45% in CGN 07130 to 54.87% in CGN 14020. The entries were also screened for quality traits viz. riceyness, leafiness, curd color and blanching habit. None of the treatments showed leafiness and non-blanching and six treatments were ricey. The entries CGN 13966, CGN 14020, CGN 11074 and CGN 13961 were high yielding among the lot besides having good quality traits.

Key words : Cauliflower, Germplasm, Horticultural traits, Yield, Quality.

Cauliflower (*Brassica oleracea* var *botrytis* L.), a member of cole family is one of the most popular and widely grown vegetable all over the world. It has found extensive use in Indian kitchen and is used as vegetable, in curries, pickles and eaten boiled or raw as salad. Cauliflower is a rich source of vitamins, proteins and carbohydrates. Indian cauliflowers are the result of selections from the temperate cauliflowers initially introduced by Britishers during 1822. In India cauliflowers have been categorized into three different groups, namely early, mid and late. The early and mid type of cauliflowers are grown in plains and their seed production is possible there itself, the late group of cauliflowers (temperate type) are grown in mid hills and high hills and their seed production is possible in certain specified areas only. The late group (temperate type) cauliflowers are bred/selected for snow white color, compact curd, self blanching and should be free from riceyness and leafiness. Keeping these points in mind the present study was conducted for exotic introductions from Center of Genetic Resources, The Netherlands.

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Methods

The material for the present investigation comprised 15 introductions from the Center of Genetic Resources, The Netherlands, excluding CCS-06-08 (local check). The experiment was laid out in randomized block design, keeping three replications, on 18 October 2007, at a spacing of 60 × 45 cm. All the recommended cultural practices to raise a healthy crop were followed. Observations on 10 randomly selected plants were taken for different horticultural traits, namely plant frame (cm), number of leaves per plant , leaf length (cm), leaf breadth (cm), leaf size index (cm^2), stalk length (cm), gross weight (g), net curd weight (g), core length (cm) and harvest index (%). Besides , some visual observations were taken for characters viz. riceyness, leafiness, curd color and blanching habit.

Results and Discussion

The mean performance of various introductions showed a large amount of variability for different char-

Table 1. Performance of cauliflower genotypes for different horticultural characters.

Geno-types	Plant frame (cm)	No. of leaves/ plant	Leaf length (cm)	Leaf breadth (cm)	Leaf size index (cm^2)	Stalk length (cm)	Gross curd weight (g)	Net curd weight (g)	Core length (cm)	Harvest index (%)
CGN 14020	77.83	12.44	39.44	23.56	932.22	6.56	1122.22	616.67	7.83	54.87
CGN 13966	82.33	20.89	46.00	22.44	1031.67	6.11	1627.78	788.89	8.24	48.48
CGN 07131	82.39	20.00	55.11	27.11	1495.44	8.00	1411.67	677.78	9.22	47.81
CGN 13961	83.39	17.67	42.33	21.67	921.33	6.67	1305.56	677.78	8.89	51.43
CGN 11086	76.78	16.33	46.00	27.33	1255.33	6.17	1219.44	577.78	8.44	47.53
CGN 11097	74.22	20.78	48.56	21.11	1026.22	5.89	1328.33	677.78	8.44	50.80
CGN 11072	76.11	19.44	42.78	22.89	978.56	6.50	1444.44	727.78	8.80	49.53
CGN 11090	132.17	21.89	60.11	37.78	2272.67	5.89	1533.33	766.67	8.83	48.97
CGN 11089	79.78	17.44	48.44	21.33	1033.67	5.56	1391.67	661.11	7.44	47.48
CGN 11074	92.33	13.56	68.33	25.44	1748.33	6.67	1536.11	713.89	8.83	46.41
CGN 14105	83.89	18.67	53.00	22.33	1178.78	7.06	1317.22	594.44	7.89	45.09
CGN 11091	75.83	15.67	55.56	22.78	1270.00	8.28	1144.44	522.22	6.56	45.08
CGN 07130	91.22	19.89	58.67	22.56	1323.56	6.50	1372.22	611.11	9.39	44.45
CGN 11098	66.67	10.67	46.00	21.44	991.78	9.33	1127.78	505.56	8.78	44.84
CGN 11078	72.22	22.56	52.67	22.56	1189.67	5.61	1478.33	694.44	9.06	46.09
CCS-06-08 (LC)	80.50	17.40	64.70	26.21	1695.79	9.50	1400.00	650.00	9.50	46.43
CD	5.17	0.93	4.85	1.01	121.61	0.62	147.61	89.98	0.41	5.38
CV	4.71	3.95	7.22	3.15	7.41	6.96	8.24	10.42	3.69	8.51

acters (Table 1). Plant frame ranged from 66.67 cm in CGN 11098 to 132.17cm in CGN 11090. CGN 11098 was statistically superior to the whole lot, including check (CCS-06-08). Number of leaves/plant ranged from 10.67 in CGN 11098 to 22.56 in CGN 11078. Leaf size index varied from 921.33 cm^2 in CGN 13961 to 2,272.67 cm^2 in CGN 11090. CCS-06-08 showed large leaf size index i. e. 1695.79, all other treatments except CGN 11090 showed statistically lesser leaf size index than CCS-06-08. Considering minimum leaf size index as desirable character, all the treatments except CGN 11090 were superior to check (CCS-06-08). Stalk length ranged from 5.56 cm in CGN 11089 to 9.50 cm in CCS-06-08 which was statistically at par with CGN 11098 (9.33). Keeping small stalk length as desirable, CGN 11089 were superior to all except CGN 13966, CGN 11086, CGN 11090 and CGN 11078. Maximum net curd weight was observed in CGN 13966 i.e. 788.89 g and it was minimum in CGN 11098 (505.56 g). CGN 11074, CGN 11090 and CGN 11072 were statistically at par with CGN 13966 and were superior to check CCS-06-08 (650.00 g). These results are in agreement with the findings of Pal and Swarup (1), Howe and Waters (2), Aditya et al. (3), Kumar (4) and Sharma et al. (5).

Table 1 shows that introduction CGN 13966 gave smallest stalk length and highest net curd weight and was statistically superior to check (CCS-06-08). This can be included in breeding cultivars for small stalk length and higher yield. Besides, they were also observed to be superior to check for other characters. The introduction CGN 13966 gave the maximum curd weight besides having some other desirable traits.

Table 2. Performance of different cauliflower genotypes for quality characters. + Riceyness and leafiness present. – Riceyness and leafiness absent.

Geno-types	Ricey-ness	Leafi-ness	Curd color	Blanching habit
CGN 14020	–	–	Snow white	Self blanched
CGN 13966	–	–	”	”
CGN 07131	+	–	White	”
CGN 13961	–	–	”	”
CGN 11086	+	–	Snow white	”
CGN 11097	–	–	”	”
CGN 11072	+	–	White	”
CGN 11090	+	–	”	”
CGN 11089	–	–	Snow white	”
CGN 11074	–	–	Creamish white	”
CGN 14105	–	–	Snow white	”
CGN 11091	+	–	White	”
CGN 07130	–	–	Snow white	”
CGN 11098	–	–	”	”
CGN 11078	+	–	White	”
CCS-06-08 (LC)	+	–	”	Non-blanching

Visual observations showed that all the genotypes were self blanched and free from leafiness, while the check was non-blanching, but free from leafiness (Table 2). CGN 14020, CGN 13966, CGN 13961, CGN 11097, CGN 11089, CGN 11074, CGN 07130, CGN 11098 and CGN 14105 were free from riceyness. The introduction CGN 13966 with maximum net curd weight was also free from riceyness, leafiness, snow white in color and self blanched and need to be selected.

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