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Estimation of genetic variability, heritability and genetic advance for yield and quality traits in Cauliflower (*Brassica oleracea* var. *botrytis* L.)

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Abstract

The present study was conducted to assess genetic variability, heritability and genetic advance as a percentage of mean for nineteen yield contributing and quality traits in cauliflower genotypes. Analysis of variance revealed highly significant differences among the genotypes for all the traits studied, indicating the existence of substantial genetic variability within the experimental material. The phenotypic coefficient of variation (PCV) was consistently higher than the genotypic coefficient of variation (GCV) for all characters, suggesting the influence of environmental factors on trait expression. High estimates of GCV and PCV were recorded for net curd weight (25.82% and 26.29%, respectively) and curd yield per plot (25.82% and 26.47%, respectively), reflecting a wide range of genetic variation for these economically important traits. Moderate levels of variability were observed for harvest index, gross plant weight, stalk width and ascorbic acid content. High broad-sense heritability was exhibited by chlorophyll content (95.87%), net curd weight (96.45%), ascorbic acid content (95.21%), curd yield per plot (95.16%), stalk width (89.84%), harvest index (88.19%) and gross plant weight (87.37%). Furthermore, high heritability coupled with high genetic advance as a percentage of mean was observed for net curd weight (96.45% and 52.24%), curd yield per plot (95.16% and 51.88%), harvest index (88.19% and 31.54%), gross plant weight (87.37% and 27.89%), stalk width (89.84% and 25.43%), and ascorbic acid content (95.21% and 21.07%).

Keywords: Genetic variability, heritability, genetic advance, coefficient of variation and germplasm evaluation

Introduction

Cauliflower (*Brassica oleracea* var. *botrytis* L.) is one of the most economically important cole crops belonging to the family Brassicaceae (formerly Cruciferae). It is a diploid species with a chromosome number of $2n = 2x = 18$ and represents the monogenomic 'C' genome with a basic chromosome number of $n = 9$ (Thamburaj and Singh, 2001) [12]. The name "cauliflower" is derived from the Latin words *caulis*, meaning stem and *floris*, meaning flower, which aptly describe the morphological nature of its edible portion. The edible part, known as the curd is a compact, fleshy, pre-floral apical meristem representing an intermediate stage between vegetative and reproductive growth. It accounts for nearly 45 per cent of the total plant biomass (Rai and Yadav, 2005) [9]. Owing to its rich nutritional composition, cauliflower serves as an excellent source of carbohydrates, proteins, dietary fibre, vitamins, antioxidants and essential minerals, making it an important component of a balanced human diet (Avantika and Singh, 2025) [1].

Cauliflower is believed to have originated in the Mediterranean region, with *Brassica cretica* considered its probable wild progenitor. The crop was introduced into India by Jemson in 1822 through Cornish types imported from England, followed by the introduction of temperate types from Germany and the Netherlands. Subsequent natural and artificial hybridization between European and Cornish forms led to the evolution of tropical Indian cauliflower, a distinct group well adapted to the warm and humid agro-climatic conditions of the Indian subcontinent. Today, cauliflower is cultivated successfully under temperate, subtropical and tropical environments owing to its wide adaptability. Optimum vegetative growth occurs at approximately 23°C, while temperatures ranging from 17–20 °C are favourable during the later stages of growth. Depending

on the varietal group, curd initiation and development require temperatures between 5 °C and 28–30 °C (Kanwar, 2023) [6]. Furthermore, the predominance of protogyny and sporophyte self-incompatibility promotes cross-pollination, resulting in considerable genetic diversity that offers immense scope for varietal improvement through selection and breeding.

India ranks among the leading producers of cauliflower globally, with major cultivation concentrated in states such as West Bengal, Bihar, Maharashtra and Uttar Pradesh. The crop plays a significant role in vegetable production, nutritional security and farmers' livelihoods. However, considerable variation in yield and quality traits exists across different agro-climatic regions due to the combined influence of genetic makeup and environmental conditions. This variability highlights the need for systematic evaluation of available germplasm to identify superior genotypes possessing desirable agronomic, yield and quality attributes suited to specific agro-climatic regions.

The effectiveness of any crop improvement programme largely depends on the extent of genetic variability available within the breeding material. The estimation of genetic parameters such as genotypic coefficient of variation (GCV), phenotypic coefficient of variation (PCV), heritability and genetic advance provides valuable information on the nature and magnitude of variability, the relative contribution of genetic and environmental factors and the inheritance of economically important traits (Johnson *et al.*, 1955) [5]. High heritability coupled with high genetic advance as a percentage of the mean generally indicates the predominance of additive gene action and suggests that selection for such traits is likely to be effective. Despite the economic importance of cauliflower, information on the genetic variability and inheritance of yield and quality traits under the agro-climatic conditions of eastern Uttar Pradesh remains limited. Therefore, the present investigation was undertaken to assess the extent of genetic variability, estimate heritability (broad sense) and genetic advance as a percentage of the mean for important yield and quality traits in diverse cauliflower genotypes, with the objective of identifying superior traits and genotypes that can be effectively utilized in future breeding programmes.

Materials and Methods

The present investigation was conducted during the *Rabi* season 2024-25 at the Main Experimental Station, Department of Vegetable Science, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya, Uttar Pradesh. The experimental material comprising cauliflower genotypes was evaluated in a Randomized Complete Block Design (RCBD) with three replications. Each genotype was planted in a plot measuring 3.0m × 4.5m, maintaining a spacing of 60 cm between rows and 45cm between plants. Observations were recorded on nineteen yield and quality traits, namely days to curd initiation, days to curd maturity, plant height (cm), leaf length (cm), leaf width (cm), number of leaves per plant, stalk length (cm), stalk width (cm), curd polar diameter (cm), curd equatorial diameter (cm), total soluble solids (°Brix), ascorbic acid content (mg/100 g), dry matter content (%), moisture content (%), chlorophyll content (mg/g), net curd weight (g), gross plant weight (g), harvest index (%) and curd yield per plot (kg). Data for each trait were recorded from five randomly selected plants in each genotype within each replication. The mean value for each trait was calculated by averaging observations from the five sampled plants.

Statistical analysis was performed using analysis of variance (ANOVA) following the procedure described by Panse and Sukhatme (2000) [8] to determine the significance of differences

among genotypes. The genotypic coefficient of variation (GCV) and phenotypic coefficient of variation (PCV) were estimated according to the method of Burton and DeVane (1953) [2]. Broad-sense heritability (h^2_{bs}) was computed following Hanson *et al.* (1956) [4], while genetic advance (GA) and genetic advance as per cent of mean were calculated using the methodology proposed by Johnson *et al.* (1955) [5]. These genetic parameters were used to assess the magnitude of variability and the effectiveness of selection for yield and quality traits in cauliflower.

Results and Discussion

The analysis of variance (Table.1) revealed highly significant differences among the genotypes for all nineteen traits studied, indicating the presence of substantial genetic variability in the experimental material. The significant variation observed among the genotypes suggests considerable scope for effective selection and genetic improvement of curd yield and its associated traits in cauliflower.

The mean sum of squares due to treatments (Table. 2) was highly significant for all the characters, confirming the existence of considerable variability among the genotypes for the traits under investigation. Days to curd initiation varied from 54.67 days in NDC-24-14 to 76.07 days in NDC-24-15, with an overall mean of 66.75 days. Days to curd maturity ranged from 19.37 days (NDC-24-8) to 30.00 days (NDC-24-6), with a mean of 23.69 days. Plant height at curd initiation ranged from 40.00 cm (NDC-24-26) to 60.47 cm (NDC-24-18), averaging 51.94 cm. Leaf length varied between 22.13 cm (NDC-24-26) and 36.87 cm (NDC-24-20), while leaf width ranged from 14.43 cm (NDC-24-29) to 23.44 cm (NDC-24-6), with mean values of 30.04 cm and 19.47 cm, respectively. The number of leaves per plant ranged from 16.90 in NDC-24-14 to 24.27 in NDC-24-12, with an average of 20.93 leaves per plant. Stalk length varied from 5.53 cm (NDC-24-18) to 8.70 cm (NDC-24-22), whereas stalk width ranged from 3.52 cm (NDC-24-11) to 5.53 cm (NDC-24-29), with mean values of 6.89 cm and 4.33 cm, respectively. Curd polar diameter ranged from 8.33 cm (NDC-24-2) to 11.97 cm (NDC-24-24), while curd equatorial diameter varied from 9.68 cm (NDC-24-19) to 13.54 cm (NDC-24-24), with average values of 9.87 cm and 11.52 cm, respectively. Total soluble solids (TSS) ranged from 4.53 °Brix in NDC-24-8 to 6.33 °Brix in NDC-24-24, with a mean of 5.60 °Brix. Ascorbic acid content ranged from 35.30 mg/100 g (NDC-24-30) to 50.17 mg/100 g (NDC-24-27), averaging 40.67 mg/100 g. Dry matter content varied between 12.39% (NDC-24-19) and 14.33% (NDC-24-6), while moisture content ranged from 85.67% (NDC-24-6) to 87.61% (NDC-24-19), with mean values of 13.46% and 86.54%, respectively. Chlorophyll content ranged from 0.97 mg g⁻¹ (NDC-24-1) to 1.13 mg g⁻¹ (NDC-24-7), with an average of 1.06 mg g⁻¹. Net curd weight varied from 202.51 g (NDC-24-7) to 480.35 g (NDC-24-9), with a mean of 307.50 g, whereas gross plant weight ranged from 546.67 g (NDC-24-7) to 1006.67 g (NDC-24-9), averaging 736.20 g. Harvest index varied from 28.37% (NDC-24-27) to 63.37% (NDC-24-18), with a mean of 41.53%. Curd yield per plot ranged from 10.42 kg (NDC-24-29) to 24.45 kg (NDC-24-9), with an overall mean of 15.41 kg.

The estimates of genotypic coefficient of variation (GCV) and phenotypic coefficient of variation (PCV) for all nineteen traits are presented in Table 3. In general, PCV values were slightly higher than the corresponding GCV values for all characters, indicating that environmental factors had a relatively small influence on the expression of these traits. High estimates (>20%) of both GCV and PCV were recorded for net curd weight (25.82% and 26.29%, respectively) and curd yield per plot (25.82% and

26.47%, respectively), indicating the existence of substantial genetic variability for these economically important traits. Similar results were reported by Chittora and Singh (2015) [3], Sharma *et al.* (2018) [10], and Kumar *et al.* (2020) [7]. Moderate GCV and PCV values (10–20%) were observed for harvest index, gross plant weight, stalk width, ascorbic acid content and days to curd maturity, suggesting moderate genetic variability and good scope for improvement through selection. Comparable findings were also reported by Chittora and Singh (2015) [3] and Sharma *et al.* (2018) [10]. The remaining characters, namely leaf length, leaf width, stalk length, curd equatorial diameter, curd polar diameter, number of leaves per plant, plant height, days to curd initiation, total soluble solids, chlorophyll content, dry matter content, and moisture content, exhibited low GCV and PCV estimates (<10%), indicating comparatively narrow genetic variability. Similar observations were reported by Kumar *et al.* (2020) [7] and Singh *et al.* (2022) [11].

The estimates of broad-sense heritability and genetic advance are also presented in Table 3. Broad-sense heritability ranged from 53.96% for days to curd initiation to 96.45% for net curd weight. High heritability (>80%) was recorded for net curd weight (96.45%), chlorophyll content (95.87%), ascorbic acid content (95.21%), curd yield per plot (95.16%), stalk width (89.84%), harvest index (88.19%), gross plant weight (87.37%), and curd equatorial diameter (81.71%), indicating that these traits were predominantly governed by genetic factors with relatively less environmental influence. Similar findings were reported by Chittora and Singh (2015) [3], Sharma *et al.* (2018) [10], and Kumar *et al.* (2020) [7]. Moderate heritability (60–80%) was observed for stalk length, curd polar diameter, total soluble solids, days to curd maturity, leaf length, leaf width, and number of leaves per plant, whereas comparatively lower heritability estimates were recorded for dry matter content, moisture content, plant height, and days to curd initiation, suggesting greater environmental influence on these characters.

Genetic advance as per cent of mean ranged from 0.91% for moisture content to 52.24% for net curd weight. High genetic advance (>20%) was observed for net curd weight (52.24%), curd yield per plot (51.88%), harvest index (31.54%), gross plant weight (27.89%), stalk width (25.43%), and ascorbic acid content (21.07%), indicating that substantial improvement in these traits could be achieved through direct selection. Moderate genetic

advance (10–20%) was recorded for leaf length, stalk length, leaf width, curd equatorial diameter, curd polar diameter, number of leaves per plant, total soluble solids, plant height, and days to curd initiation, whereas chlorophyll content, dry matter content, and moisture content exhibited relatively low genetic advance values. The simultaneous occurrence of high heritability coupled with high genetic advance as per cent of mean for net curd weight, curd yield per plot, harvest index, gross plant weight, stalk width, and ascorbic acid content suggests the predominance of additive gene action in the inheritance of these traits. Therefore, direct phenotypic selection for these characters is expected to be highly effective in improving curd yield and quality in cauliflower. Similar findings have been reported by Chittora and Singh (2015) [3], Sharma *et al.* (2018) [10], Kumar *et al.* (2020) [7], and Singh *et al.* (2022) [11]. Hence, these traits may be considered reliable selection criteria in breeding programmes aimed at developing high-yielding and superior-quality cauliflower genotypes.

Table 1: Analysis of variance (mean squares) for nineteen characters in cauliflower

S. No.	Traits	Source of variation		
		Replication	Treatments	Error
		2	30	60
1.	Days to curd initiation	1.08	79.76**	17.66
2.	Days to curd maturity	0.65	18.76**	2.09
3.	Plant height (cm)	1.05	50.24**	10.16
4.	Leaf length (cm)	0.45	30.19**	3.18
5.	Leaf width (cm)	0.09	10.79**	1.20
6.	Number of leaves per plant	0.11	9.39**	1.33
7.	Stalk length (cm)	0.026	1.464**	0.115
8.	Stalk width (cm)	0.001	0.992**	0.036
9.	Curd polar diameter (cm)	0.236	2.068**	0.168
10.	Curd equatorial diameter (cm)	0.277	2.951**	0.205
11.	Total soluble solids (°Brix)	0.001	0.395**	0.036
12.	Ascorbic acid (mg/100 g)	0.31	55.43**	0.91
13.	Dry matter content (%)	0.078	0.970**	0.195
14.	Moisture content (%)	0.058	0.966**	0.195
15.	Chlorophyll content (mg/g)	0.0020	0.0082**	0.0001
16.	Net curd weight (g)	133.22	19147.39**	231.91
17.	Gross plant weight (g)	812.25	35766.10**	1644.10
18.	Harvest index (%)	5.55	143.63**	6.14
19.	Curd yield per plot (kg)	0.09	48.27**	0.81

Table 2: Mean performance of thirty-one genotypes for nineteen characters in cauliflower

SN	Genotypes	DCI	DCM	PH (cm)	LL (cm)	LW (cm)	NLPP	SL (cm)	SW (cm)	CPD (cm)	CED (cm)	TSS (°brix)	AA (mg/100 g)	DMC (%)	MC (%)	CC (mg/g)	NCW (g)	GPW (g)	HI (%)	CYPP (kg)
1	NDC-24-1	64.13	24.50	52.53	31.53	21.67	19.93	6.10	3.60	9.19	10.80	5.53	36.50	14.14	85.86	0.98	273.17	669.70	41.51	13.90
2	NDC-24-2	67.87	22.73	49.20	25.47	20.31	18.13	6.61	4.27	8.33	10.43	5.43	40.57	13.90	86.10	1.03	258.48	615.00	40.87	12.57
3	NDC-24-3	65.63	21.27	53.73	35.07	18.93	22.07	6.57	4.51	10.10	11.76	5.80	37.03	13.47	86.53	1.04	327.59	808.35	38.61	15.61
4	NDC-24-4	73.60	20.57	49.50	28.93	21.00	17.43	6.48	3.73	8.91	10.40	5.87	38.00	13.07	86.93	1.01	340.23	754.00	45.97	17.33
5	NDC-24-5	65.00	26.40	48.13	25.87	20.63	19.30	6.17	4.30	10.26	11.94	5.27	42.53	13.77	86.23	1.04	257.49	664.73	39.53	13.14
6	NDC-24-6	57.73	30.00	47.87	26.13	23.44	21.57	5.93	4.30	11.37	11.48	5.80	45.97	14.33	85.67	1.09	341.47	760.00	43.20	16.42
7	NDC-24-7	59.47	19.60	52.13	29.97	22.33	20.73	6.50	5.20	8.53	10.40	5.94	41.07	13.30	86.70	1.13	202.51	546.67	39.35	10.76
8	NDC-24-8	72.57	19.37	49.53	31.13	19.27	20.93	6.69	3.70	10.37	10.64	4.53	38.30	14.13	85.87	1.01	275.55	758.33	36.96	14.01
9	NDC-24-9	70.80	21.47	52.40	29.37	20.13	21.86	7.63	4.57	10.37	12.20	5.53	41.00	13.55	86.45	1.09	480.35	1006.67	48.56	24.45
10	NDC-24-10	55.00	25.60	53.00	31.87	19.10	19.60	6.67	4.30	9.57	10.91	5.70	45.40	13.23	86.77	1.07	477.18	997.33	46.52	23.20
11	NDC-24-11	59.27	25.27	49.00	29.93	19.23	21.97	7.08	3.52	9.96	11.27	5.70	37.90	12.66	87.34	1.12	371.30	995.33	35.52	17.68
12	NDC-24-12	68.57	22.73	49.27	27.87	18.03	24.27	6.35	3.57	9.72	11.29	5.57	36.27	12.76	87.24	1.11	325.26	675.00	49.07	16.57
13	NDC-24-13	66.57	24.37	52.47	31.53	19.26	20.27	6.31	3.63	10.56	11.42	6.23	41.37	13.05	86.95	1.12	368.93	777.30	48.43	18.83
14	NDC-24-14	54.67	25.60	49.13	30.77	20.43	16.90	6.45	3.83	8.56	11.84	5.50	36.90	13.62	86.38	1.03	244.57	705.67	33.32	11.76
15	NDC-24-15	76.07	22.77	54.60	31.87	18.67	22.27	6.79	4.13	9.33	11.40	5.20	39.57	14.17	85.83	1.05	243.30	683.67	37.80	12.92
16	NDC-24-16	66.73	25.87	53.60	29.20	18.83	23.17	6.93	4.95	9.67	10.14	5.54	35.77	12.83	87.17	1.09	285.36	689.50	42.10	14.52
17	NDC-24-17	68.87	26.47	50.90	31.30	18.46	22.53	6.23	4.37	8.97	10.80	5.67	37.30	13.43	86.57	1.12	298.53	754.67	40.21	15.17
18	NDC-24-18	67.27	26.47	60.47	35.93	19.67	21.37	5.53	3.57	10.37	13.50	5.37	40.63	12.68	87.32	1.07	469.86	754.57	63.37	23.91
19	NDC-24-19	65.53	20.07	52.97	30.10	20.37	22.50	7.26	4.27	9.77	9.68	5.17	36.10	12.39	87.61	0.99	251.65	647.00	37.80	12.23
20	NDC-24-20	70.87	21.00	56.83	36.87	18.63	23.17	6.37	4.73	10.24	12.07	5.30	36.00	13.77	86.23	1.11	300.06	698.13	40.93	14.29

21	NDC-24-21	68.33	25.00	48.03	28.00	20.33	22.17	7.23	3.83	9.43	10.08	5.63	41.37	13.30	86.70	1.01	251.94	645.33	39.76	12.83
22	NDC-24-22	70.87	23.83	52.07	28.17	18.40	20.80	8.70	4.17	10.74	12.63	5.47	47.43	12.60	87.40	1.10	426.21	867.67	50.12	21.75
23	NDC-24-23	66.47	26.80	52.70	28.27	19.13	20.20	7.74	4.13	10.37	11.75	5.47	49.03	14.33	85.67	1.09	321.20	722.33	42.77	15.44
24	NDC-24-24	72.20	23.13	60.23	34.40	21.80	21.20	8.13	4.33	11.97	13.54	6.33	45.43	12.77	87.23	0.97	302.26	711.67	45.10	16.05
25	NDC-24-25	68.33	24.20	52.20	28.47	17.53	21.90	7.03	5.20	10.10	11.70	5.67	41.30	13.50	86.50	0.97	277.37	740.03	38.14	14.11
26	NDC-24-26	67.13	22.57	40.00	22.13	15.37	19.43	6.60	5.00	9.83	12.86	5.43	47.27	14.27	85.73	0.98	208.94	617.33	34.42	10.63
27	NDC-24-27	62.67	22.03	50.63	28.43	16.84	22.80	7.89	4.13	8.93	11.03	5.83	50.17	13.40	86.60	1.07	204.82	735.00	28.37	10.43
28	NDC-24-28	70.53	23.63	59.20	31.27	19.76	18.23	7.67	5.03	10.88	13.12	5.20	36.37	14.30	85.70	1.13	276.88	702.33	38.33	13.46
29	NDC-24-29	68.80	22.80	49.77	27.73	14.43	19.67	7.40	5.53	10.57	12.04	5.90	38.90	13.70	86.30	1.12	218.74	656.33	31.75	10.42
30	NDC-24-30	67.40	26.73	50.87	29.60	19.63	20.30	7.35	4.60	9.53	12.42	6.33	35.30	13.53	86.47	1.10	231.66	650.67	36.26	11.80
31	Pusa Synthetic	70.33	21.60	57.13	34.00	22.06	22.27	7.10	5.37	9.44	11.67	5.73	44.17	13.30	86.70	1.09	419.64	811.93	52.74	21.41
	Mean	66.75	23.69	51.94	30.04	19.47	20.93	6.89	4.33	9.87	11.52	5.60	40.67	13.46	86.54	1.06	307.50	736.20	41.53	15.41
	Min	54.67	19.37	40.00	22.13	14.43	16.90	5.53	3.52	8.33	9.68	4.53	35.30	12.39	85.67	0.97	202.51	546.67	28.37	10.42
	Max	76.07	30.00	60.47	36.87	23.44	24.27	8.70	5.53	11.97	13.54	6.33	50.17	14.33	87.61	1.13	480.35	1006.67	63.37	24.45
	SE(d) ±	3.43	1.18	2.60	1.46	0.89	0.94	0.28	0.16	0.34	0.37	0.16	0.78	0.36	0.36	0.01	12.43	33.11	2.02	0.73
	C.D. at 5%	6.88	2.37	5.22	2.92	1.79	1.89	0.56	0.31	0.67	0.74	0.31	1.57	0.72	0.72	0.02	24.93	66.39	4.06	1.47
	C.V. (1%)	6.30	6.10	6.14	5.94	5.62	5.51	4.92	4.38	4.16	3.93	3.41	2.35	3.28	0.51	1.03	4.95	5.51	5.97	5.82

Table 3: Estimates of mean, range, phenotypic coefficient of variation (PCV), genotypic coefficient of variation (GCV), heritability in broad sense, genetic advance (Ga) and Ga in percent of mean for nineteen characters in cauliflower germplasm

Characters	Mean	Range		GCV (%)	PCV (%)	Heritability (%)	GA% mean	% cont.
		Min.	Max.					
Days to curd initiation	66.75	54.67	76.07	6.82	9.28	53.96	10.31	5.86
Days to curd maturity	23.69	19.37	30.00	9.95	11.67	72.69	17.48	6.15
Plant height (cm)	51.94	40.00	60.47	7.04	9.34	56.81	10.93	5.63
Leaf length (cm)	30.04	22.13	36.87	9.99	11.62	73.87	17.69	7.70
Leaf width (cm)	19.47	14.43	23.44	9.18	10.77	72.74	16.14	5.15
Number of leaves per plant	20.93	16.90	24.27	7.83	9.58	66.90	13.20	5.49
Stalk length (cm)	6.89	5.53	8.70	9.74	10.91	79.66	17.90	6.87
Stalk width (cm)	4.33	3.52	5.53	13.02	13.74	89.84	25.43	6.09
Curd polar diameter (cm)	9.87	8.33	11.97	8.06	9.07	78.99	14.76	4.69
Curd equatorial diameter (cm)	11.52	9.68	13.54	8.30	9.19	81.71	15.46	5.26
Total soluble solids (°Brix)	5.60	4.53	6.33	6.18	7.05	76.68	11.14	3.68
Ascorbic acid (mg/100 g)	40.67	35.30	50.17	10.48	10.74	95.21	21.07	4.94
Dry matter content (%)	13.46	12.39	14.33	3.78	5.00	57.02	5.87	4.70
Moisture content (%)	86.54	85.67	87.61	0.59	0.78	56.86	0.91	5.03
Chlorophyll content (mg/g)	1.06	0.97	1.13	4.90	5.00	95.87	9.88	6.02
Net curd weight (g)	307.50	202.51	480.35	25.82	26.29	96.45	52.24	3.29
Gross plant weight (g)	736.20	546.67	1006.67	14.49	15.50	87.37	27.89	3.97
Harvest index (%)	41.53	28.37	63.37	16.30	17.36	88.19	31.54	4.72
Curd yield per plot (kg)	15.41	10.42	24.45	25.82	26.47	95.16	51.88	4.75

Conclusion

Among all the traits studied, the phenotypic coefficient of variation (PCV) was consistently higher than the corresponding genotypic coefficient of variation (GCV), indicating the influence of environmental factors on trait expression. However, the relatively narrow differences between PCV and GCV values for most traits suggested that the observed variability was predominantly genetic in nature. High estimates of both PCV and GCV were recorded for net curd weight and curd yield per plot, reflecting the presence of substantial genetic variability and a greater scope for improvement through selection. Furthermore, net curd weight, curd yield per plot, harvest index, gross plant weight, stalk width and ascorbic acid content exhibited high heritability coupled with high genetic advance as per cent of mean. This combination indicates the predominance of additive gene action in the inheritance of these traits and suggests that their expression is largely governed by heritable genetic factors. Therefore, direct phenotypic selection for net curd weight and curd yield per plot would be highly effective for enhancing yield potential and developing superior cauliflower genotypes.

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