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Short Communication

GENOTYPIC AND PHENOTYPIC VARIABILITY IN DAHLIA (*DAHLIA VARIABILIS*)

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The present study was undertaken to find out the extent of genetic variability by determining the magnitude of genotypic coefficient of variation, heritability estimates and genetic advance of the nine quantitative characters in dahlia. Twenty three dahlia varieties were evaluated at IARI Regional Station, Katrain, Kullu Valley during gladiolus growing season (April to November 1988 and 1989) in RBD replicated thrice, using the variety Avalanche as control. Seven plants per replication were planted providing an area of 75 × 60 cm per plant, whereas data were recorded on 5 plants per replication for the characters mentioned in Table 1. Standard statistical procedures were adopted for the calculation of genetical constants as described by Burton, 1952; Burton and De Vane (1953), Keller and Linkens (1955), Kneebone (1958) and Frakes *et al.* (1961). Heritability in broad sense was calculated according to formula suggested by Hanson *et al.* (1956). Genetic advance was calculated by the formula as suggested by Lush (1949) and Johnson *et al.* (1955) with 5 per cent selection intensity. The data were analysed with the aid of the computer at IASRI, New Delhi.

The differences among the varieties were significant for all the characters. There was a wide sense of phenotypic variability for all these characters. Significant treatment differences were discernible at 1 per cent level. The estimates of phenotypic (σ^2 ph, genotypic σ^2 g) and error (σ^2 e/N) variances of varietal means (Table 1) indicated the variances to be high for flowers per plant, flower weight and shoots. The gcv ranged from 4.23 for flower diameter to 27.57 for flowers per plant (Table 1). The highest gcv was observed for flowers per plant followed by shoots per plant and spread. The components with low gcv were flower diameter, days to first flower and durability of one flower. Heritability in broad sense ranged from 54.15 per cent for days to first flower to 98.60 per cent for flower diameter. Most of the characters

possessed high heritability. The important ones being flower weight, length of floral stalk, flowers per plant, durability of one flower, and shoots per plant. High heritability estimates were helpful in making selection of superior genotypes on the basis of phenotypic performance of quantitative characters.

Table 1. Phenotypic and environmental variability and estimates of genotypic coefficient of variation, heritability and genetic advance in dahlia

	Characters	Range	mean	σ^2ph	σ^2g	σ^2e	gcv	Herit-ability	Genetic adva-nce as % of mean
1.	Plant height	72.6-148.4	11.13	19.01	16.84	2.17	8.81	78.49	34.17
2.	Shoots/plant	1.0-4.33	2.04	40.51	36.73	3.78	17.08	82.21	1.40
3.	Days to Ist flower	102.6-129.7	114.41	7.83	5.76	2.07	5.30	54.15	1.00
4.	Durability of one flower	5.13-9.40	7.72	16.03	14.94	1.09	5.82	86.82	2.22
5.	Flowers/plant	12.3-147.1	52.06	78.01	72.98	5.03	27.57	87.51	73.23
6.	Flower diameter	4.6-21.8	13.84	35.75	35.50	0.25	4.23	98.60	10.05
7.	Length of floral stalk	12.3-30.6	21.48	26.36	24.78	1.48	8.97	88.41	10.31
8.	Flower weight	3.5-49.0	24.59	59.47	59.00	0.47	7.49	98.41	29.65
9.	Plant spread	36.11-99.9	68.23	25.99	23.63	2.36	10.83	82.63	30.19

The estimates of genetic advance expressed as percentage of mean showed a wide range from 1.00 for days to first flower to 73.23 for flowers per plant. Thus the highest genetic advance was expressed by flowers per plant followed by plant height, plant spread and flower weight. Durability of one flower and shoots per plant showed lower estimates, and the percentage of genetic advance was poorest for days to first flower. However, Johnson *et al.* (1955) reported that heritability estimates along with genetic gain is more useful than the heritability value alone in predicting the resultant effect for selecting the best individual.

Flower weight and flowers per plant had very high genetic advance together with high heritability, which indicates that high heritability obtained in these characters is probably due to additive gene effects (Panse, 1957). Durability of one flower and shoots per plant possessed high heritability but low genetic advance indicating that high heritability for these characters may likely be due to non-additive gene action (Panse, 1957). Selection of individual plants for flowers per plant, flower diameter and flower weight might therefore be effective.

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