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VARIABILITY PARAMETERS IN CORIANDER (*CORIANDRUM SATIVUM* L.)

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Different parameters were estimated to study the magnitude of genetic variability in two hundred diverse varieties/strains of coriander (*Coriandurum sativum* L.). The analysis of variance showed sufficient genetic variation among genotypes for all the twelve characters studied. Genotypic coefficient of variation, estimates of heritability and genetic gain were moderate to high for grain yield/plant, umbellets/plant, umbels/plant and 1000 seed weight, which indicated that response to selection would be very high for these yield components ultimately leading to yield improvement in this crop. However, for remaining characters medium to low coefficient of variation and low genetic gain was observed. Therefore, umbellets/plant, umbels/plant and 1000 seed weight should be given due weightage while breeding for higher seed yield.

Key words : Coriander, variability parameters, heritability, genetic gain, genotypic, phenotypic variation

Genetic variation in crop plants for characters of agronomic importance leading to the determination of complex character 'yield' forms the base, to improve grain yield per plant. The first step in any breeding programme, including the one for synthesis of ideotype, must be a quantitative assessment of the available variability in respect of the important yield contributing characters. Study of the amount of variability in different characters associated with yield and a knowledge on their heritability in relation to their contribution towards yield are the prime requisites for an efficient plant breeding programme. Practically very little systematic information is available in this crop regarding the variability parameters, however, this crop has a wide range of variability, which can be exploited for evolving high yielding varieties. Therefore, the present investigation was undertaken, with a view to ascertain the relative variability present in yield contributing characters.

MATERIALS AND METHODS

Two hundred diverse exotic and indigenous varieties/strains of coriander (*Coriandrum sativum* L.) were grown in a randomized block design with three replications at S.K.N. College, Jobner farm. Each genotype in a replication had 3 row of 3m length with 30 x 40 cm spacing. 10 competitive plants were randomly selected in each genotype for recording observations on twelve quantitative traits (Table 1). Average values of 10 randomly selected plants were used as plot means for estimating statistical parameters. The genotypic and phenotypic variances were calculated according to Panse and Sukhatme 1967. Phenotypic coefficient of variation (PCV) and genotypic coefficient of variation (GCV) were computed by the method suggested by Burton 1952. Heritability estimates as per the method of Lush 1940 and genetic advance as per the method of Johnson,Robinson and Comstock 1955 were calculated.

RESULTS AND DISCUSSION

From the analysis of variance, the mean squares due to genotypes were found highly significant for all the twelve characters studied indicating sufficient genetic variation among genotypes for all these characters. Among the characters studied, straw yield per plant showed highest genotypic and phenotypic coefficient of variations followed by grain yield per plant, umbellets per plant, umbels per plant, and thousand seed weight. The findings of Joshi *et al.* (1967) and Sevda (1980) are in agreement with the present study.

The genotypic coefficient of variation alone is, however, not helpful in determining the heritable portion of variation, for which Burton 1952 suggested that GCV along with heritability estimates would give a better idea about the efficiency of selection. In the present study heritability values (broad sense) varied from 31.88 to 86.45 per cent. The highest being for days to flowering, moderage to high heritability values were observed for all the characters except grains per umbellet, thereby indicating less environmental influence on the characters in general, hence selection for the highly heritable characters on the basis of phenotypic expression would be effective. The finding is an agreement with Mathur *et al.* (1971) and Jain and Dubey (1972).

Even though heritability estimates provide useful indication of the relative value of selection based on phenotypic expression, Johnson *et al.* (1955) suggested that heritability and genetic advance when calculated together are more useful in predicting the resultant effect of selection. Gandhi *et al.* (1964) suggested that high genetic gain alongwith high heritability is the most effective for selection in any crop for future improvement. genetic advance value in the present investigation were observed low for all the twelve characters. Whereas, heritability showed by these characters was moderate to high. It indicates that the expression of the characters was more subjected to non-

Table 1. Range, mean, variances, coefficient of variation, heritability and genetic advance in coriander (*Coriandrum sativum* L.)

Characters	Range	Mean ± SE	Variance		Coefficient of vanation		Herita-bility (Broad sense)	Genetic advance	Genetic gain(%)
			Genotypic	Phenotypic	Genotypic	Phenotypic			
Plant height (cm)	11.80-86.10	40.16±6.19	81.95	139.49	22.54	29.41	58.75	14.29	35.58
Number of primary branches	1.40-8.60	4.33±0.72	0.59	1.36	17.70	26.97	43.07	1.03	23.79
Number of effective branches	1.10-8.40	3.90±0.78	0.58	1.48	19.47	31.20	38.92	0.98	25.13
Days to flowering	65.00-118.00	83.72±0.85	77.92	90.12	10.54	11.34	86.45	16.91	20.20
Days to maturity	112.00-145.00	123.78±3.10	44.37	58.76	5.38	6.19	75.51	11.92	9.63
Unbels/plant	3.20-39.30	10.10±3.13	12.41	27.10	34.89	51.55	45.80	4.91	48.61
Umbellets/plant	7.10-177.80	37.00±13.05	202.85	458.49	38.49	57.87	44.24	19.52	52.76
Grains/umbellete	1.70-11.80	4.67±0.91	0.58	1.83	16.33	28.93	31.88	0.89	19.06
Thousand Seed Weight(g)	5.00-22.15	12.84±1.37	10.57	13.38	25.32	28.49	79.01	5.95	46.34
Straw yield/plant(g)	0.19-7.79	1.79±0.83	0.94	1.98	54.03	78.50	47.38	1.37	76.54
Grain yield/plant(g)	0.10-5.93	1.33±0.60	0.33	0.88	43.10	70.40	37.48	0.72	54.15
Harvest Index(%)	8.93-84.80	43.99±7.90	61.59	155.13	17.84	28.32	39.70	10.19	23.16

heritable component of variability thus, these traits have little value in selection programme. The higher genetic gain showed by straw yield per plant, grain yield per plant, umbellets per plant, unbels per plant and thousand seed weight, with higher heritability values. Panse (1957) ascribed this situation due to additive gene effects. Therefore, it appears that selection for these characters should be effective and satisfactory for practical purposes. The remaining characters showed moderate heritability alongwith moderate to low genetic gain. Earlier findings of Mathur *et al.* (1971), Jain and Dubey (1972) and Sevda (1980) are in good agreement with those of the present study except umbellets per plant.

Genotypic coefficient of variation and heritability determines the component of heritable variation while the genetic gain determines the extent of its stability under selection. All these genetic parameters should be considered together for an effective improvement of different traits. The results of present investigation state that genetic coefficient of variation, heritability values and genetic gain were moderate to high for straw yield per plant, grain yield per plant, umbellets per plant, umbels per plant and thousand seed weight. It indicates as such response to selection can be stable and quite suitable for practical purpose. Thus, these characters should be given due importance while breeding for higher seed yield. The remaining characters showed medium to low genotypic coefficient of variation, medium to high heritability and low genetic gain. Hence, these characters will not respond to straight selection.

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