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Genetic variability assessed in Coriander (*Coriandrum sativum* L.) over years under environmental conditions of South Eastern Rajasthan (*Hadoti* Region)

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Abstract

Genetic variability was assessed over three consecutive years period i.e., 2007-08 to 2009-10 in 15 coriander genotype representing the local germplasm collection of Hadoti region of Rajasthan (One of the major seed coriander producing region of the country) maintained at ARS, Kota. The analysis was based on the performance of the crop for three consecutive years at ARS, Kota (Raj.). The analysis of pooled data indicated highly significant differences among the genotypes. The highest GCV was found for number of umbels per plant while the least GCV was found for days to 50 per cent flowering followed by days to maturity and plant height. Low estimates of heritability were recorded for seed yield, days to 50 per cent flowering and plant height, showing strong environmental effect on expression. High to moderate heritability coupled with high genetic advance as percent of mean was recorded for number of primary branches and number of umbels per plant.

Key words : Coriander, variability

Coriander is an important seed spice crop of Apiaceae family having a wide medicinal importance. India is the biggest producer, consumer and exporter of coriander in the world. In Rajasthan, the Zone-V representing South eastern region known as *Hadoti* (comprising of districts *viz.,* Kota, Bundi, Baran, Jhalawar) covers approximately 98 percent of the state area under coriander cultivation. In the zone, both high yielding varieties and local material are being cultivated by farmers. The quality of local material is having high demand in the market due to its pleasant aroma owing to its comparatively high essential oil content. This local material is a good source of genetic variability mainly for essential oil and yield. Keeping this in view, a set of genotype representing the local material of *Hadoti* region was evaluated to know the extent of genetic variability present in coriander.

The experimental material for the present investigation comprising of 15 genotypes was laid out in randomized block design with three replications during *Rabi* 2007 – 08 to 2009 – 10 at ARS, Kota. Each genotype was accommodated in eight rows of 4m length with row to row and plant to plant spacing of 30 and 10 cm, respectively. The observations were recorded on five randomly selected plants in each plot in each replication for all the characters in all the environments. The data for days to 50 percent flowering and days to maturity were recorded on plot basis. Variability parameters were computed following Burton (1) & Johnson *et al*. (3).

The present study was aimed to know the extent of genetic variation expressed for major agro-morphological traits in coriander genotypes locally adapted to the *Hadoti* region which is having very congenial environmental conditions for seed coriander commercial cultivation. Pooled analysis of variance was used to estimate the genetic variability parameters (Table 1). The highest GCV was found for number of umbels per plant while the least GCV was found for days to 50 per cent flowering followed by days to maturity and plant height. This may be due to a narrow genetic base of the local material of Kota zone for these traits which is characterized by medium stature, early flowering and early maturity by 10-15 days as compared to the other leafy type material. The difference between GCV and PCV was highest for seed yield followed by number of umbels per plant and number of umbellet per plant; these traits are complex in nature and are strongly influenced by environment. The least difference between GCV and PCV was observed for days to 50 per cent flowering, it may be due to strong adaptability of the local lines to the environmental conditions of Kota zone as they have evolved in this region since a very long time and have got adapted to the prevailing environmental conditions. Heritability was found to be high for number of

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Table 1. Pooled analysis for variability parameters, heritability and genetic advance in coriander

Source	Days to 50% Flowering	Plant Height (cm)	No. of Primary Branches	No. of Secondary Branches	No. of Umbels per Plant	No. of Umbellets per Plant	Days to Maturity	Test Weight (g)	Yield kg/ha	Essential Oil Content (%)
Mean	59.54	86.32	3.39	4.95	17.37	59.62	103	11.05	1166.17	0.31
Range	55.83-65	76.6-94.06	2.76-4.2	5.96-8.32	13.96-26.2	49.63-73.37	100-112.67	8.46-12.45	849-1481.33	0.16-0.41
GCV	3.12	8.56	28.16	21.74	34.49	21.14	7.02	13.88	13.90	17.13
PCV	6.0	14.64	32.50	29.69	47.0	33.22	11.11	22.47	27.97	25.82
h^2	0.27	0.34	0.75	0.53	0.53	0.40	0.39	0.38	0.24	0.44
GA	1.99	8.9	1.74	1.62	9.06	16.52	9.43	1.95	166.01	0.07
GAM	3.35	10.32	50.26	32.79	52.13	27.72	9.15	17.67	14.23	23.41

primary branches, number of secondary branches and number of umbels per plant, whereas it was moderate for essential oil, number of umbellets per plant, days to maturity and seed weight. Low estimates of heritability were recorded for seed yield, days to 50 per cent flowering and plant height. This shows strong environmental effect on these two traits. Genetic advance as percent of mean was high for number of primary branches and number of umbels per plant. These traits are said to have strong positive association with yield and, therefore, should be considered for effective selections. Similar finding were observed by Jain *et al*. (3) and Singh *et al*. (4). The results shows that there is ample scope for genetic improvement in coriander population collected from *Hadoti* region of Rajasthan following a planned recurrent selection scheme.

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