

SHORT COMMUNICATION

Genetic Variability and Heritability in Cowpea [*Vigna unguiculata* (L.) Walp.]**Ramesh Kumar*, RS Sangwan and Surender Singh****

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The nature and magnitude of genetic variability was studied for grain yield and its related traits in 72 diverse genotypes of cowpea. Considerable amount of genotypic and phenotypic coefficient of variation was observed for all characters. Moderate to high heritability coupled with high genetic advance as per cent of mean and genetic coefficient of variation was observed in respect of plant height, pod length, 100-seed weight, grain yield per plant, number of branches and number of pods per plant indicated that these characters were under control of additive gene or non-environmental effects and could be dependable for grain improvement in cowpea.

Key Words: Genetic variability, Heritability, Cowpea, Yield components

Cowpea [*Vigna unguiculata* (L.)Walp.] is an important grain legume. Its quick growth has made cowpea essential components of sustainable agriculture in marginal lands and dry regions of the tropics, where rainfall is scanty and soils are sandy with little organic matter. If early maturing varieties are grown as pure crop with required inputs, cowpea has potential of yielding as high as cereals on productivity per day basis. To improve grain yield, information on genetic variability for different characters is necessary. Hence, the present study was undertaken to estimate genetic variability, heritability and genetic advance.

The present study was carried out with 72 diverse genotypes of cowpea obtained from different sources. The experiment was conducted at Research Farm of CCS Haryana Agricultural University, Hisar during *Kharif*1997 in Randomized Block Design with three replications. Each genotypes was planted in 4 m row plot, keeping inter row spacing of 90 cm and intra row spacing of 20

cm. Observations were recorded on five competitive plants from each plot for nine characters (Table 1). The data were statistically analysed to estimate genotypic and phenotypic coefficient of variation (Burton, 1952), heritability (broad sense) by Hanson *et al.* (1956) and genetic advance.

Analysis of variance showed that the genotypes differed significantly among themselves for all the characters under study. The phenotypic coefficients of variation (PCV) were invariably higher than their corresponding genotypic coefficient of variation (GCV) (Table1). The coefficient of variability (%) at PCV and GCV level were high for plant height, 100-seed weight and grain yield per plant. Low differences between PCV and GCV for all the characters except pods per plant, number of branches and yield per plant indicated that these characters were least influenced by environmental fluctuations. Several earlier workers in cowpea are in support of this view. Bapna and Joshi (1973) reported pod number as the maximum contributing trait to the genetic

Table 1. Mean, range, phenotypic coefficient of variation (PCV) and genotypic coefficient of variation (GCV), heritability and genetic advance (GA) in cowpea

Characters	Range	Mean	GCV (%)	PCV (%)	Heritability (%)	GA
Days to first flower	35.33-57.00	4015	9.59	10.26	87.33	18.46
Days to maturity	62.66-84.00	73.02	8.43	8.91	89.69	16.46
Plant height (cm)	44.30-263.86	104.90	35.28	35.71	97.60	71.81
Number of branches	2.53-6.86	4.56	20.83	24.91	69.94	35.89
Number of pods per plant	12.80-44.33	23.57	23.88	27.98	72.83	41.98
Pod length (mm)	9.40-28.00	14.91	22.46	22.95	95.76	45.29
Seeds per pod	9.30-17.76	12.20	12.03	13.14	83.79	22.69
100-seed weight (g)	6.23-28.60	12.52	35.01	35.58	96.78	70.95
Grain yield per plant (g)	12.97-56.07	25.15	30.23	34.86	75.22	54.03

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variability. Similarly, Pandita *et al.* (1982) opined that the seed yield had recorded a high genetic variability. In the present study, the least estimate of GCV was recorded for days to maturity followed by days to first flower. Rewale *et al.* (1995) and Thiyagarajan (1990) reported similar results in cowpea. The heritability estimates in broad sense were very high plant height, 100-seed weight, pod length, for days to maturity, days to flower and seed per pod, whereas these estimates were moderate for number of branches, number of pods per plant and grain yield per plant. Similar results were also recorded by earlier workers, *i.e.*, Thiyagarajan (1990) and Siddique and Gupta (1991). Sharma (1999) and Hazra *et al.* (1999) had also reported high genetic advance coupled with high heritability for different traits in cowpea.

High genetic advance accompanied by moderate to high heritability was recorded for plant height, 100-seed weight, yield per plant, pod length, number of pods per plant and number of branches per plant indicated the additive gene action and reliability of these characters during selection for improving seed yield in cowpea.

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