

Genetic variability, heritability and genetic advance in cowpea [*Vigna unguiculata* (L.) Walp]

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ABSTRACT

Twenty diverse genotypes of vegetable type cowpea [*Vigna unguiculata* (L.) Walp] were evaluated where during phenotypic coefficient of variation was greater than genotypic coefficient of variation or weight, number of cluster per plant, diameter of pod and number of seeds per pod manifested high heritability coupled with low genotypic coefficient of variation and genetic advance indicated that simultaneous improvement in vegetable cowpea can not be made accordingly only characters plant height and number of leaves per plant with moderate heritability and high genetic advance world contribution to yield improvement in cowpea.

Key words : Genetic variability, Heritability, Genetic advance, Cowpea.

Cowpea [*Vigna unguiculata* (L.) walp] is an important vegetable crop, which is gaining popularity among the farmers due to various uses such as food, fodder, vegetable and organic manure for soil fertility restoration as well as its ability to grow well throughout the year. Nature and magnitude of variability and heritability alongwith genetic advance help in selecting elite genotypes from the population. Yield improvement in this crop would be achieved by developing new superior varieties which is feasible by altering the genetic variation for most of the traits under study. Genotypic and phenotypic coefficient of variation is useful in detecting the amount of variability present in the available genotype. Heritability and genetic advance further help in determining the influence of environment in expression of the character and the extent to which improvement is possible after selection (Robinson *et al.*, 1949). The present study was under taken to investigate the extent of genetic variability heritability and genetic advance for the improvement of yield and yield contributing characters.

MATERIALS AND METHODS

Twenty genotypes of vegetable cowpea were sown during *kharif* season 2005-06 at Research Farm of College of Horticulture, Dr. Panjabrao Deshmukh Krishi Vidyapeeth, Akola. The experiment was laid out at spacing of 45 cm x 30 cm in a randomized block design

with three replications. All the recommended agronomic packages of practices were followed to raise healthy crop. Data were recorded on ten competitive plants selected randomly in all treatments of each replication on various quantitative characters. Analysis of variance was calculated as per method suggested by Panse and Sukhatame (1985). The phenotypic and genotypic coefficient of variation (PCV, GCV) was estimated as per Burton (1952). Heritability in a broad sense and genetic advance were computed according to Johnson *et al.* (1955).

RESULTS AND DISCUSSION

The analysis of variance (Table 1) indicated highly significant difference among twenty genotypes for all the fourteen quantitative characters under study. This indicates that the genotypic which were used for study have sufficient amount of variation for all the characters and hence selection will be very effective. Maximum range of mean values was observed for plant height followed by number of leaves per plant and green pod yield per plant. The minimum range of mean values was recorded for diameter of pod. In general the phenotypic coefficient of variation was higher than the genotypic coefficient of variation for all the characters (Table 2). Wide range of coefficient of variations were observed for plant height, number of leaves per plant followed by green pod yield, seed yield per plant, leaf area per plant, pod length and 100 seed weight at phenotypic and genotypic level respectively, indicating high level of variability in these characters and ample scope for effective improvement.