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Correlation and path coefficient analysis in chickpea (*Cicer arietinum* L.)

SHIV PRAKASH SINGH
Department of Plant Breeding, G. B. Pant University of Agriculture and Technology, PANTNAGAR (U.A.) INDIA
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SUMMARY
Correlation and path analysis are important tools for getting appropriate informations regarding inter-relationship among different characters for effective selection programme. In 45 diverse genotypes of chickpea (*Cicer arietinum*. L.), the genotypic correlations were higher than the corresponding ones. Seed yield had highly significant positive correlation with biological yield per plant, pods per plant, harvest-index and secondary branches per plant. Biological yield per plant and pods per plant had highly significant correlation with seed yield and its direct effect was very strong. Pods per plant, harvest index, 100 seed-mass and secondary branches per plant were indirect contributory component. Therefore, due emphasis may be given on these characters for selecting high yielding genotypes in chickpea.

Key words : Correlation, Path analysis, Chickpea.

Estimates of genetic association along with the phenotypic correlations not only display a clear picture of the extent of inherent association but also indicate that how much of phenotypically expressed correlation is influenced by environment. Seed yield is a complex character and has no genes controlling it but is a final product of basic characters called yield components. When many components (variables) are in study of correlation, indirect associations become complex and important. In such cases path coefficient analysis helps to find out direct and indirect causes of association (Wright 1921). Hence, a study was conducted to find out the association of yield contributing characters with seed yield and the direct and indirect effects of characters on seed yield through path coefficient analysis.

MATERIALS AND METHODS

Forty-five genotypes of chickpea were grown in a randomized block design with three replications at the Crop Research Centre, G.B. Pant University of Agriculture and Technology, Pant Nagar. The seeds were sown during Rabi under late sown (29th of November) conditions. The experimental plot of each genotype constituted of four rows of four metres long. Row to row and plant to plant distance was maintained at 30 and 10 cm. respectively. All recommended package of practices were followed during the crop season. Observations for days to fifty percent flowering, days to maturity and reproductive period were recorded on plot basis. The observations for remaining characters i.e. plant height at maturity, primary branches per plant, secondary branches per plant, pods per plant, seeds per pod, 100 seed-mass, biological yield per plant, harvest index and seed yield per plant were recorded on a sample of 5 random plants from each plot. The mean values of the selected plants were used for statistical analysis. The phenotypic and genotypic correlations were worked out among different characters according to Craxton and Cowden (1964). Path analysis (Dewey and Lu, 1952) was done to establish a cause and effect relationship

RESULTS AND DISCUSSION

The genotypic correlations were, in general, higher than their corresponding phenotypic correlations (Table 1). This was due to modified effect of environment on character association at genetic level (Nandapuri *et al.*, 1973). Seed yield per plant showed highly significant positive correlation with biological yield, pods per plant, harvest-index and secondary branches per plant. These results were similar to those of earlier workers. Jivani and Yadvendra (1988) observed positive correlation between yield with pods per plant, harvest-index and branches per plant. Tripathi and Arora (1991) reported that seed yield was positively associated with biological yield, number of pods per plant,harvest- index and secondary branches per plant.Sandhu *et al.*(1991) reported a high positive relationship of yield with pods per plant and secondary branches per plant. Harvest-index expressed negative correlation with plant height and biological yield. These results are in conformity with Mandal and Bahl (1983). Biological yield per plant was significantly and positively correlated with pods per plant and secondary branches per plant as the findings of Tripathi & Arora (1991). The association between 100