

Studies on genetic variability, heritability and genetic advance in chickpea (*Cicer arietinum* L.) under different environments

SANJAY K. THAKUR* AND ANIL SIROHI¹

C.S.K. Himachal Pradesh Krishi Vishwavidyalaya, Research and Extension Centre, BERTHIN (H.P.) INDIA

ABSTRACT

Fifty three genotypes of chickpea (*Cicer arietinum* L.) were evaluated for yield and nine other economic traits during *rabi* 2000-01 and *rabi* 2001-02 at the CSK HPKV, Research and Extension Centre, Berthin. The study revealed considerable genetic variability among the genotypes for all the traits. Genotypic and phenotypic coefficients of variation were more or less similar for all the characters. Phenotypic and genotypic coefficients of variation were high for seed yield per plant, biological yield per plant, pods per plant and 100-seed weight. High heritability coupled with high expected genetic advance was observed for seed yield per plant, biological yield per plant, 100-seed weight, pods per plant and plant height revealed the preponderance of additive gene effects in the expression of these traits. High estimate of heritability with low to moderate genetic advance observed for seeds per pod, days to 50 per cent flowering and days to 75 per cent maturity on the other hand revealed the importance of dominance and epistatic effects in the inheritance of these traits.

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

INTRODUCTION

India is a premier chickpea growing country covering about 60 per cent of the world area and production. This pulse crop occupies an indispensable place in our daily diet as a source of protein, fits well in cropping systems and is insensitive to drought. Presence of sufficient genetic variability is a prerequisite to formulate breeding programme aimed at improvement in yield and other characters. Further, the knowledge of nature and magnitude of variability is of utmost importance. Keeping this in view, the present investigation was undertaken to assess the variation, heritability and genetic advance in chickpea, over two different environmental conditions (*rabi* 2000-01 and *rabi* 2001-02).

MATERIALS AND METHODS

The present investigation comprised of 53 genetically diverse true breeding genotypes of chickpea (*Cicer arietinum* L.) procured from different sources. The experiment was carried out at the CSK HPKV, Research and Extension Centre Berthin, District Bilaspur, Himachal

Pradesh (31°12'30" to 31°35'30" N latitude and 76°23'45" to 76°55'40" E longitude, 625 meters above mean sea level) for two consecutive years *i.e.* *rabi* 2000-01 (environment I) and *rabi* 2001-02 (environment II). The experimental trial was laid out in randomized complete block design with three replications under rainfed conditions. Each plot comprised of 2 rows of 2.0 m length spaced 30 cm apart with plant to plant spacing of 10 cm. Data on the basis of five randomly taken competitive plants were recorded in each environment on seed yield per plant (g), biological yield per plant (g), plant height (cm), pods per plant, seeds per pod, primary branches per plant, 100-seed weight (g), harvest index (%) while data on days to 50 per cent flowering and days to 75 per cent maturity were recorded on plot basis. The analysis was done as per Panse and Sukhatme (1985), Burton and De Vane (1953) and Johnson *et al.* (1955).

RESULTS AND DISCUSSION

Analysis of variance of the individual as well as combined over environments (Table 1) revealed significant differences among the genotypes for all the characters studied. High amount of genetic variability for many of these traits has also been reported by Mandal and Bahl (1983) and Dahiya *et al.* (1983). Combined analysis over environments revealed significant differences between

* Author for correspondence, Present Address :
C.S.K.H.P.K.V., Hill Agril. Research and Extension Centre,
Dhaulakuan, SIRMAUR (H.P.) INDIA

¹ S.V.B.P. University of Ag. & Technology, MEERUT (U.P.) INDIA