

GENETIC VARIABILITY STUDIED FOR QUANTITATIVE TRAITS IN CHICKPEA

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ABSTRACT

Twenty-six genetically diverse genotypes of chickpea were studied for genotypic and phenotypic variability, heritability and genetic advance in 12 quantitative traits including seed yield per plant. Pods per plant exhibited highest amount of genetic variability followed by secondary branches per plant, seed yield per plant, 100-seed weight, seeds per pod, plant height and biological yield per plant. Pods per plant also expressed highest heritability and expected genetic advance.

In quantitative traits a breeder is primarily interested in genotypic variability because it decides response to selection. The present investigation was therefore, undertaken to estimate genetic variability and response to selection in twenty-six genetically diverse genotypes of chickpea.

Twenty-six genetically diverse genotypes of chickpea were evaluated in a randomized block design with three replications. Each plot consisted of 4 rows of 4m length. Row to row and plant to plant distances were maintained at 30

and 10cm respectively. The observations were recorded on ten random plants from each plot for days to initial flowering, days to 50% flowering, days to maturity, plant height (cm), primary branches/plant, secondary branches/plant, pods/plant, seeds/pod, 100-seed weight (g), biological yield per plant (g), harvest index (%) and seed yield per plant (g). The coefficients of variability were calculated following Burton and Davane (1953). Heritability and genetic advance under selection for these characters were estimated according to Lush (1949).

Table 1. Mean, Range, genotypic (GCV) and phenotypic (PCV) variability, heritability (h^2) and expected genetic advance (EGA) for different characters in chickpea.

Character	Mean	Range	GCV	PCV	h^2 (%)	EGA (% of mean)
Days to initial flowering	81.72	69.00-87.67	6.62	6.81	94.31	10.82
Days to 50% flowering	88.81	76.33-94.00	5.78	7.30	62.57	8.36
Days to maturity	144.28	141.67-146.33	0.37	1.45	6.55	0.28
Plant height (cm)	49.62	39.00-60.97	11.35	13.56	69.98	9.70
Primary branches/plant	2.96	2.23-3.60	8.75	16.14	29.38	0.29
Secondary branches/plant	19.89	8.57-31.33	22.90	24.43	87.86	8.79
Pods per plant	73.08	38.57-105.30	23.47	24.25	93.69	34.21
Seeds per pod	1.55	1.13-1.93	11.88	16.18	53.94	0.28
100-seed weight (g)	19.75	13.74-26.70	16.04	16.88	90.27	6.20
Biological yield per plant (g)	32.28	23.75-39.83	10.67	14.25	56.03	5.31
Harvest index (%)	52.20	39.09-66.05	9.81	16.68	34.58	6.20
Yield per plant (g)	16.90	10.55-23.46	18.29	20.72	77.96	5.62

The estimates of mean, range, genotypic and phenotypic coefficients of variability, heritability and expected genetic advance for all the traits are presented in Table 1. Results revealed that coefficients of phenotypic variability

were always higher than their corresponding genotypic variability indicating the presence of environment component. Pods per plant exhibited highest genotypic coefficient of variability followed by secondary branches per plant, seed

yield per plant, 100-seed weight, seed per pod, plant height and biological yield per plant. Similarly pods per plant also expressed highest heritability followed by 100-seed weight, secondary branches per plant, seed yield per plant, plant height biological yield per plant and seed per pod. It was interesting to note that pods per plant expressed highest genotypic coefficient of variability as well as highest heritability and expected genetic advance indicated the presence of additive effect for this trait. Therefore a high

genetic gain can be anticipated by applying selection pressure on this character. The moderate genetic gain of plant height, secondary branches per plant, 100-seed weight, harvest index and seed yield per plant with high to moderate heritability indicated that selection for these traits is likely to bring about considerable improvement in chickpea. Similar were the findings of Samal and Jagdev (1989); Arora (1991, 92) and Arora and Jeena (1998) for different characters in chickpea.

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