Effect on intermating in early segregating population in chickpea (*Cicer arietinum* L.)

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Abstract : An investigation was planned to compute and compare the nature and magnitude of correlations among various characters in the biparental progenies (BIP's) and the corresponding selfed generation of F_2 population derived from KWR 108 X IPC 94-19 crosses of chickpea (*Cicer arietinum* L.).The biparental population had higher magnitude of correlation co-efficients than the F_3 self's. In both the populations, association of number of pods with seed yield was high and positively significant, highlighting the facts that pods per plant is the most important yield contributing character in chickpea. The utility of biparental mating in early segregating generations like F_2 in breaking unfavourable association in chickpea is emphasised.

Key Words : Bi parental, Character, Chickpea, Yield and Correlation

Various conventional methods like pedigree, bulk population, mass selection. Single seed descent (SSD) and single pod descent (SPD) have been used in crop improvement programme in self pollinated crops like chickpea to handle large segregating population. But these approaches of crop improvement in chickpea do not provide any opportunity for reshuffling of genes. Hence, any unfavourable associations observed in early segregating generation like in F_2 are likely to persist through the filial generations. Whereas, biparental mating in early generations like F_2 help in breaking unfavourable association (Yunus and Paroda, 1982; Nematullah and Jha, 1993).The increase in chickpea productivity through breeding efforts has not been adequate because of these traditional method following hybridization. Keeping this in view, the present investigation was planned to compute and compare the nature and magnitude of correlation among various characters in the biparental progenies (Fisher, 1954) and corresponding selfed generation *viz.*, F_3.

The two genotypes KWR108 (P_1) and IPC 94-19 (P_2) were selected on the basis of their peculiar contrasting characteristic productivity related features as well as reaction to wilt. These two parents were crossed to generate F_1s during *Rabi* 2008-09. Intermating of selected plants in the F_2 of KWR 108 (P_1) and IPC 94-19 (P_2) cross were also selfed simultaneously to obtain F_3 progenies. The biparental population and its corresponding F_3 population were sown in eight rows each of 5 cm length row. The rows and plants were spaced at 30 cm and 15 cm, respectively. A single non-experimental row was grown all around the experimental area to neutralize border effect. Data were recorded on 200 plants in BIP population and on 150 plants in F_3 population for plant height (cm), primary branches, secondary branches, pods per plant, 100 seed weight (g) and seed yield per plant (g). The individual plant data were used for the statistical analysis.

A comparison of correlation co-efficient among

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Table 1 : Correlation co-efficient among different characters in Biparental and F₃population of chickpea (*Cicer arietinum* L.)

Characters	Population	Primary branches per plant	Secondary branches per plant	Pods per plant	100 seed weight	Seed yield per plant
Plant height	Bi parental	0.880**	0.622**	0.753.**	0.117	0.674**
	F₃	0.781**	0.617**	0.669**	0.016	0.665**
Primary branches per plant	Bi parental		0.801**	0.799**	0.830**	0.159*
	F₃		0.769**	0.734**	0.124	0.743**
Secondary branches per plant	Bi parental			0.901**	0.169*	0.865**
	F₃			0.878**	0.114	0.746**
Pods per plant	Bi parental				0.109	0.936**
	F₃				0.074	0.911**
100 seed weight	Bi parental					0.181*
	F₃					0.090

* and ** indicate significance of values at P=0.05 and P=0.01, respectively

characters studied within BIP population with those with in F₃ population in Table 1 revealed that correlation co-efficient in biparental population are generally of higher magnitude than in F₃ population. The increase in magnitude of correlation co-efficient would be expected if linkages were in repulsion phase (Nanda *et al.*, 1990). However, in both the populations, association of number of pod per plant with seed yield per plant was high and positively significant. This clearly reveals the fact that, number of pod per plant is the most important yield contributing character in chickpea. Therefore, in any chickpea breeding programme, selection based on number of pod per plant is certainly expected to improve the seed yield (Al-jilbouri *et al.*, 1958). It was also observed that the non-significant positive association between 100 seed weight and seed yield per plant in F₃ and between 100 seed weight and number of secondary branches per plant in F₃ got changed to positive and significant in biparental population. These results inducted that Intermating in F₂ was quite effective to break undesirable linkages. It was thus evident that the reshufflings of genes responsible for correlation amongst some characters resulted in newer recombination's which presumably were due to changes from a coupling phase to repulsion phase linkages (Bahl and Vinod, 1991; Katiyar, 2003). The present study on the impact of Intermating on association pattern in chickpea has clearly brought out its importance in altering the

association pattern involving some important components of yield to the breeder's advantages enabling him to increase the efficiency of selection for improving productivity.

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