Quantitative Genetic Study in Treated and Untreated Diallel Populations of Cowpea (*Vigna unguilulata* (L.) Walp)

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Name of Student	*Major Guide*
M. R. Naik	A. R. Pathak

Department of Plant Breeding and Genetics
C. P. College of Agriculture, Sardar Krushinagar

The present investigation was carried-out with a view to estimate and compare the genetic parameters heterosis over mid and better parents, general and specific combining ability and nature of gene action in treated and untreated populations for eleven traits. Seven diverse genotypes of cowpea were crossed in half diallel fashion. Simultaneously, the seven parents and 21 F_1's were irradiated with 30 KR X-rays.

The mean range and variances were higher in F_1M_1 as compared to F_1 except seeds per pod. The irradiation treatment to F_1's resulted in to increased variation in both F_1M_1 and F_2M_2 generations as compared to the corresponding F_1 and F_2 generations therefore increasing the scope for selection. Such an approach could prove beneficial in terms of labour and time to isolate desired genotypes.

Under treated conditions, promising hybrids were, GC 8926 x 8968, Pusa Phalguni x GC 8930, GC 8930 x GC 8968, Pusa Phalguni x GC 8963 and GC 8926 x GC 8963. Whereas, under untreated conditions, Pusa Phalguni x GC 8968 and GC 8930 x GC 8968 were promising ones. These all heterotic hybrids had high sca effects for yield and its components. For yield heterosis the component traits were, branches per plant, pods per plant and cluster per plant in treated and seeds per pod in untreated condition.

The gca effects was altered due to irradiation for days to 50 per cent flowering in parent GC-2. In Pusa Phalguni protein content turnedout to be poor combiner due to irradiation treatment. By and large the X-ray treatment to F_1's had an enhancing effect on gca effects of parents.

In fact the two modes of inducing polygenic variability, hybridization and mutation could be combined profitably for generating more variability for better scope of selection.