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Short Communication

INHERITANCE OF SEED WEIGHT IN COWPEA (*VIGNA UNGUICULATA* L. WALP)

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Seed size is an important agronomic trait and a major yield component in most of the pulse crops. Large seeds are preferred by the consumer in cowpea also. There are contradictory results with regard to relative importance of additive, dominance and epistatic effects in the inheritance of seed size in a cross between large and small seeded cultivar [1].

The inheritance of seed weight in cowpea was investigated by growing the parents, F_1 F_2 and backcrosses to both the parents of a cross between ARL 25 (large seeded) and GC 2 (small seeded) parents during summer and rainy seasons of 1995 using completely randomized block design with three replications. The seed weights were recorded for five random plants from each plot for parents and F_1's 30 for F_2' and 15 for backcross generations and expressed as 100 seed weight (g). A generation mean analysis was performed using six parameter model of Jinks and Jones [2].

Partial dominance for small seed size was noticed. Predominance of F_2 was lesser than sum of variances of backcross generations ($2\ VF_2 - VBC_L - VBC_S = -1.78$ summer and –2.51 rainy season). Cavalli's [3] joint scaling test suggested the inadequacy of addive-dominance model in the inheritance of seed size in cowpea. Accordingly genetic analysis [2] indicated that additive (d) gene effects were highly significant during both summer and rainy seasons, whereas dominance (h) gene effects were significant in summer season. Among epistatic effects all the three types of interactions (i), (j) and (l) were highly significant during summer season, whereas additive × additive and additive × dominance gene effects were significant in rainy season. It could be concluded that the additive, additive × additive and additive × dominance gene effects were more important for the expression of seed weight. These results are in full agreement with earlier studies [4, 5]. Large number of genes (at least six pairs) controlled the seed size as has also been reported [4-6] who found that seed

Table 1. Genetic variances for 100 seed weight (g) in different generations of a cross between cowpea cultivar ARL 25 and GC2

Generation	d.f.	Variance	
		Summer	Rainy season
P_L	12	1.08	1.96
P_S	12	0.09	0.39
F_1 ($P_L \times P_S$)	12	0.23	0.80
F_2	87	2.71	4.48
BC_L	42	4.33	9.45
BC_S	42	2.87	2.02

Table 2. Estimates of genetic parameters in a cross between cowpea cultivar ARL 25 and GC 2

	Gene effects estimates	
	Summer	Rainy season
m	16.44** ± 1.07	10.45** ± 1.36
(d)	6.59** ± 0.14	6.70** ± 0.20
(h)	-14.04** ± 2.81	2.68 ± 3.55
(i)	-2.56* ± 1.06	2.96* ± 1.34
(j)	-5.98** ± 0.85	-4.1** ± 1.08
(l)	10.32** ± 1.79	1.53 ± 2.27

*,** = Significantly different from zero at 0.05 and 0.01 level of probability, respectively.

size was governed by six, atleast ten and eight pairs of genes, respectively. It is now obvious that seed weight is governed by several genes acting additively but influence of dominance and epistatic effects cannot be ruled out. Therefore, intermating of select in early segregating generations is suggested for simultaneous exploitation of both fixable and non- fixable gene effects and to break undesirable recombinations to maintain sufficient genetic variability in the population.

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