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GENETIC VARIABILITY FOR SOME QUANTITATIVE TRAITS IN COWPEA*

Cowpea (*Vigna unguiculata* (L.) Walk) is a popular pulse crop and is widely adapted to varying soil and climatic conditions. Thus its cultivation has been popular in most of the tropical and sub-tropical countries of the world. Crop improvement largely depends on the magnitude of the genetic variability and the extent to which the desirable characters are heritable. Therefore, the present investigations on a collection of 50 types of cowpea was taken up to explore the genetic variability by determining the magnitude of genetic coefficient of variation, heritability estimates and genetic advance for different quantitative characters. Fifty types of cowpea, with diverse geographical back-ground were chosen from the germplasm maintained at the Agricultural College and Research Institute, Coimbatore. These were grown in a randomized block design with 3 replications. Each type was raised in a single row plot of 3 m length spaced at 60 cm apart and plants were placed at 45 cm apart in each row. Five plants were selected at random in each type and observations were recorded on nine characters (vide Table 1). Various genetical parameters were computed following the methods of Lush (1940), Burton (1952) and Johnson, *et al* (1955). Range, mean and estimates of various genetic parameters are presented in Table-1. The differences among the varieties were significant for all the characters and all of them had wide range of variation except number of seeds per pod, indicating the scope for selection of desirable types. High genotypic variances were recorded for all the characters and were further confirmed by high genotypic coefficient of variability (GCV) values. The genetic coefficient of variation ranged from 81.58 (pod number) to 30.48 (seeds per pod). Number of clusters, pod number and hundred seed weight also recorded high GCV estimates, which is in conformity with the earlier findings of Singh and Mehndiratta (1969) and Trehan, *et al* (1970). Seeds per pod recorded the lowest GCV.

In the present study, heritability values ranged from 68.35 per cent for branches to 98.92 per cent for seed weight. Thus high heritability values have been observed for all the traits. Singh and Mehndiratta (1969) also reported high heritabiiity estimates for all these traits in cowpea. Greater improvement of the characters can be expected according to Burton (1952) as both GCV and heritability estimates are very high.

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Table 1

Genetic parameters for nine characters in cowpea

Characters	Range	Mean	Variance		G. C. V.	Herita-bility %	Genetic advances	G.A. as % of mean
			Pheno-typic	Geno-typic				
Plant height (cm)	36.53-73.26	55.76	643.57	535.34	41.49	83.18	43.47	77.95
Branches	2.00- 5.20	3.09	2.87	1.96	45.30	68.35	2.39	77.34
Clusters	4.00-17.66	9.01	49.19	43.66	73.36	88.76	12.83	142.39
Pod number	7.06-32.66	14.55	130.40	140.93	81.58	93.69	23.68	162.48
Pod length (cm)	10.75-23.24	14.74	50.32	57.42	46.74	94.22	13.78	93.48
Seeds/Pod	8.41-15.66	12.76	20.87	15.11	30.48	72.41	6.81	53.36
Pod yield (g)	12.65-35.09	21.16	153.04	136.19	55.15	88.98	22.68	107.18
100 seed wt (g)	5.61-17.41	10.52	30.16	29.83	51.90	98.92	11.19	106.36
Seed yield (g)	7.85-24.58	14.76	87.67	79.75	60.50	90.96	17.55	118.90

High genetic advance was recorded in respect of pod number, cluster number, seed yield, pod yield and seed weight. Number of branches and number of seeds per pod exhibited high heritability and low genetic advance. Johnson, *et al* (1955) in their studies with soybean have reported that heritability estimates along with high genetic advance is more useful than the heritability value in predicting the improvement through selection. In the present study pod number cluster number, seed yield, pod yield and 100 seed weight had high heritability coupled with high genetic advance, which indicates that high heritability obtained in these characters is probably due to additive gene effects while number of branches and number of seeds per pod had high heritability due to non-additive (dominance and epistasis) gene effects (Panse, 1957). From the study of various genetic parameters, it may thus be concluded that individual plant selections for pod number, cluster number, seed yield, pod yield and 100 seed weight would be satisfactorily effective.

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സംഗ്രഹം

കോയമ്പത്തൂർ കാർഷികകോളേജിൽ മഴയെമാത്രം ആശ്രയിച്ചുള്ള പരിതസ്ഥിതിയിൽ 50 മാമ്പയർ ഇനങ്ങളുടെ ബാഹ്യരൂപീയ വിചരണം പഠന വിധേയമാക്കി.

കരു കായ്ക്കുള്ളിലെ വിത്തകളുടെ എണ്ണം fflwl.ajgg എല്ലാ സ്വഭാവങ്ങളിലും വിപുലമായ ബാഹ്യരൂപ വിചരണം ദൃശ്യമായി. കായ്കലകളുടെ എണ്ണം, കായ്കളുടെ എണ്ണം, 100 വിത്തുകളുടെ ഭാരം എന്നീ സ്വഭാവങ്ങളിൽ മറ്റു സ്വഭാവങ്ങളെ അപേക്ഷിച്ച് ഉയർന്ന ജീനന്രൂപീയ വിചാരണ ഗുണാങ്കം ദൃശ്യമായി. 100 വിത്തുക്കളുടെ തൂക്കം, ഒരു ചെടിയിലെ ശാഖകളുടെ എണ്ണം എന്നീ സ്വഭാവങ്ങളിൽ വംശാഗതത്വ ആകലനങ്ങൾ (വിപുലാടിസ്ഥാനത്തിൽ) യഥാക്രമം ഏറ്റവും കൂടിയും കുറഞ്ഞും കാണപ്പെട്ടു. കായ്ളുടെ എണ്ണം, കലകളുടെ എണ്ണം, വിത്ത് വിളവ്, കായ്വിളവ്, 100 വിത്തുകളുടെ തൂക്കം എന്നീ സ്വഭാവങ്ങളിൽ ജനിതക മുന്നേറ്റം ഏറ്റവും കൂടുതലായി കണ്ടു.

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