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Genetic Variability in Cowpea, (Vigna Unguiculata, Walp.).

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The genetic parameters viz., genotypic and phenotypic variances, genotypic coefficient of variation, heritability, expected genetic advance and genetic gain were assessed from 16 varieties of Cowpea. The varieties showed highly significant differences in mean values for all the characters studied. All the characters showed very high heritability. High genotypic coefficient of variation was observed for number of pods per plant. Number of pods and clusters per plant, recorded high genetic gain while days to maturity and plant height registered low genetic gain.

The study of different plant characters is very essential for a planned breeding programme to increase the yield and improve the plant characters. The study of different genetic parameters such as genotypic variation, heritability, genetic gain etc., give clear information as to the nature and magnitude of variations for the available plant characters. Godawat (1980) found that the grain yield per plant and number of primary branches per plant as important parameters in his study of 26 varieties of pigeon pea. Ramachandra *et al* (1980) studied 8 varieties of cowpea and found that the yield per plot had the highest genotypic coefficient of variation. Ratnaswamy *et al* (1973) also studied genetic variability in certain quantitative characters of Redgram. An attempt was made in this paper to study the variability of different quantitative characters of cowpea.

MATERIAL AND METHODS

Data were collected from 16 promising varieties of Cowpea obtained from different sources. Nine morphological and yield attributing characters were recorded from two replications during the kharif season 1980. The varieties considered for the present study are given below:

Varieties	*Duration in days*	*origin*
V 16	70	Iari, New Delhi
V 26	67	"
V 59	67	"
V 87	67	"
V 240	72	"
V 317	64	"
C 152	68	"
CG 5	65	GURDASPUR
CG 7	71	"
CG 11	66	"
CG 28	72	"
CG 69	65	"
RC 25	63	Rajasthan
S 488	70	Karnataka
HG 22	63	Hissar
Chharodi	62	Gujarat

Five plants were selected at random in each of the varieties and observations on yield per plant, plant height, number of branches, clusters and pods per plant pod length, number of grains per pod,

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100 grain weight and days to maturity were recorded and analysed statistically. Different genetic parameters were also computed based on the methods suggested by Singh and Choudhari (1977).

RESULTS AND DISCUSSION

Varietal means and the statistical analysis are presented in Table 1. Different genetic parameters are presented in Table 2. The varieties showed highly significant differences for all the 9 characters studied. This indicate that the varieties considered have sufficient amount of variation and hence selections will be very effective. All the characters showed wide range of variation. The variety V. 317 recorded highest yield of 675 grams per plot (703 kg/ha) while CG. 69 registered very poor yield of 240 grams per plot (250 kg/ha). The average yield of varieties was found to be 465 grams per plot (484 kg/ha). Number of pods per plant showed high genotypic coefficient of variation (48%) followed by number of clusters per plant (37%), whereas days to maturity showed low genotypic coefficient of variation (5%). Thus, the data revealed that the major part of total variation in number of pods and clusters per plant is due to genetic causes All the nine characters registered high heritability. The higher heritability estimates for these characters are mainly due to inheritance and are not affected by environment. More than 50% genetic gain was observed for number of pods, clusters and branches per plant and per plot yield, of which number of pods per plant had the maximum genetic gain. Very low genetic gain was recorded for days to maturity and plant height and hence these characters have significantly less genetic importance.

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TABLE I Varietal means for plant Characters in cowpea

Varieties	Per plot yield in gms.	Plant height in cm	Number of branches per plant	Number of clusters per plant	Number of pods per per plant	pod length in cm	Number of grains per pod.	100 grain weight in gms.	Days to maturity
V 16	450.0	29.33	3.6	3.6	5.9	12.385	9.62	11.50	70
V 26	572.5	33.03	2.2	3.0	5.2	10.705	10.92	11.00	67
V 59	415.0	31.00	2.0	3.5	5.9	19.250	10.38	10.00	67
V 87	455.0	39.00	2.6	4.5	7.2	12 415	11.59	10.50	67
V 240	500.0	42.20	2 4	3.4	6.0	12.795	10.43	9.00	72
V 317	675.0	35.68	4.0	7.6	10.9	11.755	10.50	11.50	64
CG 5	335.0	39.00	2.5	3.6	5.0	10.225	6.18	11.25	65
CG 7	320.0	37.23	2.8	7.3	5.9	10.065	10.89	7.50	71
CG 11	335.0	31.60	1 3	4 3	7.1	11.840	10 18	10.00	66
CG 28	500.0	36.58	2.8	5.0	5.8	11.255	8.03	7.00	72
CG 69	240.0	36.73	2.6	2.9	3.7	11.500	9.94	7.00	65
C 152	352.5	29.10	2.3	2 9	5.3	13.215	9.08	10 00	66
RC 25	647.5	27.70	2.1	4.8	10 0	10.560	9.02	8 25	63
S 488	550 0	37.98	3.0	3 3	12.4	11.710	8.37	12.50	70
HG 22	515 0	27.95	1.6	5.9	11.0	9.275	9.07	7.00	63
Chharodi	375 0	37.60	1.5	7.9	19.1	8.890	10.20	7.00	62
CD	10.8185	1.4199	0.2694	0.9068	2.7063	0.8141	0 6756	9.2573	2.5125

TABLE 2 Genetic parameters for plant characters in cowpea

Plant characters	Range	Mean	S. E	Genotypic Variance	Phenotypic Variance	Genotypic coefficient of Variation (%)	Heritability (%)	Expected Genetic advance	Genetic gain (%)
Per plot yield (g.)	240-675	464.84	3.5933	14,131.667	14,157.448	25.5	99.82	244.6629	52.63
Plant height (cm)	27.70-42.20	34.50	0.4712	20.451	20.895	13.1	97.87	9.2164	26.71
No. of Branches/Plant	1.25-4.00	2.42	0 0894	0.443	0.469	27.5	96.53	1.3466	55.64
No. of clusters/plant	2.90-7.90	4.60	0.2990	2.834	3.017	36.6	94.07	3.3635	73.12
No. of pods/plant	3.70-19.10	7.89	0.8981	14.413	16,027	48.2	98.93	7.4164	94.12
Pod length (cm)	8.89-13.22	11,18	0.2702	1.488	1.632	10.9	91.05	2.3962	21.43
No. of grains/pod	6.18-11.59	9.65	0.2242	1.736	1.836	13.7	94.52	2.6387	27.34
100 grain weight (gm)	7 80-12.50	9.44	0.0351	3.647	3.661	20.2	99.60	3.9260	41.59
Days to maturity	62-72	67.00	0.8342	9.971	11.363	4.7	87.75	6.0334	9.09