

## Genetic Variability in Some Quantitative Characters of *Sesamum*

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The heritability, genotypic co-efficient of variation, phenotypic co-efficient of variation and genetic advance as per centage of mean were assessed from 30 varieties of *Sesamum*. The varieties showed highly significant differences in mean values for all the characters studied during the two seasons. All the plant characters except 'grain yield per plant' and 'total number of capsules per plant' showed very high heritability. The genotypic and phenotypic co-efficients of variation were very low for 'capsule length'. A high genetic advance was noticed in respect of 'height at which first capsule formed', 'number of primary branches' and 'the number of secondary branches'.

*Sesamum* is a popular oil seed crop of India with a wide range of variability which can be exploited for the development of new economic varieties. Generally it is believed that quantitative characters contributing to yield are much influenced by environment. Hence determination of magnitude and nature of genotypic and environmental variations present in the plant characters is necessary. Therefore in the present study, estimates of genetic parameters viz. heritability in broad sense, genotypic co-efficient of variation, phenotypic co-efficient of variation and genetic advance as per centage of mean were worked out, and the results discussed.

### MATERIAL AND METHODS

Field experiment was carried out in summer 1976 and Monsoon 1976, seasons at Tamil Nadu Agricultural University Farm, Coimbatore. Thirty

varieties of *Sesamum* from the germplasm collections were taken up for the biometrial study are given below.

Varieties	Duration in days	Origin
2726	72	Uttar Pradesh
2572	83	Rajasthan
TMV1	88	Tamil Nadu
951	94	West Bengal
TMV2	96	Tamil Nadu
2795	100	Tamil Nadu
2141	82	Canada
50-1-6-10	83	KRR2 (Gama rays)
TMV3	88	Tamil Nadu
2602	95	Rajasthan
2789	97	Gujarat
M-3-2	100	Bihar
2575	82	Rajasthan
1074	86	USA
1006	92	Andhra Pradesh
2887	85	Andhra Pradesh
2320	83	Mexico
933	88	West Bengal
NP6	95	IARI New Delhi
Sel R	97	(IRRI) Phillipines
KRR 2	100	Tamil Nadu
2554	96	Rajasthan
2579	97	Rajasthan
KRR1	100	Tamil Nadu
2582	82	Rajasthan
2182	86	Madhya Pradesh
968	92	Burma
3047	96	Utter Pradesh
3049	100	Utter Pradesh
1075	101	U.S.A.

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Randomised complete Block Design was adopted in three replications in both the seasons. Five plants were selected at random and observations were recorded on, plant height (cm), height at which first capsule is formed (cm), number of capsules in the main stem, total number of capsules per plant, number of primary branches per plant, number of secondary branches per plant, capsule length (cm), capsule breadth (mm), capsule thickness (mm), thousand seed weight (g) and seed yield per plant (g).

Estimates of genotypic and phenotypic co-efficients of variation according to Burton (1951), heritability in broad sense according to Burton (1951), heritability in broad sense according to Johnson *et al.* (1955) and genetic advance according to Lush (1949) were worked out.

## RESULTS AND DISCUSSION

Mean, range, heritability in broad sense, phenotypic and genotypic co-efficients of variation and genetic advance as percentage of mean are presented in Table. The varieties showed highly significant differences for all the characters studied in both seasons. From range it was found that all the eleven characters varied widely in gross variation. All the plant characters except grain yield per plant and total number of capsules per plant showed very high heritability. Debral and Molkar (1971) also found that capsules per plant, capsule length,

number of seeds per capsule, yield per capsule, yield per plant and thousand seed weights were highly heritable. The lowest heritability estimate for grain yield per plant for both seasons and total number of capsules per plant indicate that these characters are influenced by environment. Sanjeevaiah and Joshi (1974) have found that environment had little effect on plant height, number of capsules, nodes on the main branch and number of branches.

Shukla and Verma (1976) have found that the genotypic co-efficient of variability was low while heritability was high for the characters, number of days to 50 per cent flowering, number of primary branches and number of capsules per main branch. In the present study capsule length showed very low genotypic and phenotypic co-efficients of variation during summer 1976 and Monsoon 1976. Eventhough this character was highly heritable, due to low co-efficient of variation, the lowest genetic advance was exhibited. A high genetic advance was noticed in respect of height at which first capsule formed, number of secondary branches and number of primary branches. Johnson *et al.* (1955) observed that the genetic gain will be low when there is non-additive gene effects whereas genetic advance will be high when there is additive gene action. The high heritability accompanied by high genetic advance in respect of 'height at which first capsule formed, number of primary

TABLE Mean, Range, Heritability, Genotypic and Phenotypic Coefficients of Variation and Genetic Advance as percentage of Mean for Eleven Characters in Sesamum.

Character	MEAN		RANGE	Heritability (in percent)		Genotypic CV (in percent)		Phenotypic CV (in percent)		Genetic Advance as % of mean		
	Summer 1976	Monsoon 1976		Summer 1976	Monsoon 1976	Summer 1976	Monsoon 1976	Summer 1976	Monsoon 1976	Summer 1976	Monsoon 1976	
Plant height (cm)	73.1	86.1	40.0-113.4	56.0-117.8	92.4	91.8	19.6	14.8	20.4	15.4	38.9	29.2
Height at which 1st capsule is formed (cm)	24.9	28.7	8.0-57.4	9.0-55.6	96.0	96.2	42.3	41.3	43.2	42.0	85.4	83.7
No. of capsules in main stem	23.0	20.8	9.0-56.0	10.0-41.0	83.9	92.6	26.8	21.2	29.3	29.3	50.7	55.9
Total No. of capsules per plant	57.0	50.1	21.0-157.0	25.0-109.0	75.1	81.0	29.4	28.2	33.9	31.3	52.4	52.3
No. of primary branches	5.0	3.0	0.-11.0	0-7	98.1	96.4	55.6	52.0	56.2	53.0	113.5	105.2
No. of secondary branches	2.0	2.0	0-10.0	0-5	88.9	87.0	83.2	74.4	88.3	79.8	161.6	142.9
Capsule length (cm)	2.6	2.7	2.2-3.3	2.3-3.2	94.5	80.3	9.2	5.9	9.5	6.6	18.5	10.9
Capsule Breadth (mm)	8.2	8.3	6.5-11.0	6.3-12.3	78.0	97.3	11.8	15.2	13.4	14.4	21.5	30.9
Capsule thickness (in mm)	6.8	6.7	5.1-11.0	4.7-10.7	86.2	99.2	21.0	23.9	22.6	24.0	40.2	49.1
1000 grain wt. (gm)	2.5	2.9	1.56-3.38	2.1-3.8	85.7	91.0	11.5	11.0	12.4	11.5	22.0	21.6
Grain yield/plant (gm)	6.1	6.3	2.0-14.7	8.0-15.2	75.9	72.6	30.3	25.7	34.7	30.2	54.5	45.2

branches, number of secondary branches indicate that most likely the heritability is due to additive gene effects and mass selection for such traits should be practiced.

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