The environment which is condusive for height of plant is not favourable for the development of branches but was favourable for the production of more number of capsules per plant as well as total number of capsules per plant. Since both environmental correlations as well as phenotypic correlations were positive and significant for total number of capsule per plant, phenotypic selection for number of capsule on main stem as well as total number of capsules per plant, can be improved simultaneously in plants with similar height and synchrony in flowering period. The environment which is favourable to one is also favourable to the other in the case of number of branches per plant, number of capsule on branches, number of capsule on main stem as well on branches and total number of capsules per plant. Both genotypic and phenotypic correlations were significant for number of capsules on main stem, capsule on branches and total number of capsules per plant. So, these characters can be improved simultaneously through phenotypic selection.

So, it is possible to identify a high yielding genotype to a particular environment through recombination breeding, adopting diallel selective mating as was evidenced by the positive genotypic correlations among yield components of sesamum.

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VARIABILITY, HERITABILITY AND GENETIC ADVANCE IN SESAME (SESAMUM INDICUM L.)

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ABSTRACT

Genotypic coefficient of variation, heritability and genetic advance were assessed in 50 genotypes of Sesame (**Sesamum indicum** L.). The differences between the genotypes were highly significant for all the 15 characters studied. Among the characters, number of capsules per branch had high heritability combined with high genetic advance while seed number per capsule, DMP and first capsule bearing node had high heritability with medium genetic advance. These traits are the most suitable for improvement through selection.

KEY WORDS : Sesame, Variability, Heritability, Genetic advance.

Studies on variability in *Sesamum indicum* L. have so far been carried out mostly with locally available genotypes. Such a study involving genotypes of indigenous and exotic origin will be more purposeful and effective. With this view, fifty genotypes of sesame were subjected to detailed investigation on variability, heritability and genetic advance.

MATERIALS AND METHODS

Fifty genotypes of sesame, both of indigenous and exotic origin, were grown at the School of Genetics, Tamil Nadu Agricultural University, Coimbatore during January 1986 in randomized block design with four replications. Selfed seeds of each genotype were sown with spacing of 45 cm between rows and 30 cm between plants. Five adjacent plants per replication at the middle of the row were selected in each genotype and observations were recorded on individual plants for fifteen morphological and developmental characters.

The data were subjected to statistical analysis and the various genetic parameters such as PCV, GCV, heritability and genetic advance were worked out by making use of appropriate formulae (Singh and Chaudhary, 1977 and Johnson *et al.*, 1955).

RESULTS AND DISCUSSION

Data on mean, variability, heritability and genetic advance are presented in Table 1.

The analysis of variance revealed significant differences among genotypes for all the fifteen characters studied. High phenotypic and genotypic coefficients of variation were observed for number of secondaries, number of capsules on branches, leaf area index, seed yield, DMP and number of primaries. High heritability estimates were observed for seed number per capsule, days to maturity, plant height, number of capsules on branches, first capsule bearing node and DMP. Heritability

Table 1. Phenotypic and genotypic coefficients of variation, heritability genetic and advance for fifteen characters in Sesamum indicum L.

Characters	Mean	PCV	GCV	h^2	GA	GA as per cent of mean
Plant height (cm)	67.66	14.25	13.71	92.54	18.38	27.16
Number of primaries	3.98	31.33	28.86	84.88	2.18	54.77
Number of secondaries	2.39	59.93	56.71	89.53	2.65	110.88
First capsule bearing node	3.83	24.62	23.51	91.22	1.77	46.22
Number of capsules on main stem	17.65	19.64	16.20	68.09	4.86	27.54
Number of capsules on branches	32.74	46.54	44.67	92.10	28.91	88.31
Capsule length (cm)	2.36	9.61	8.70	81.93	0.38	16.11
Seed number per capsule	64.28	23.85	23.32	95.58	30.18	46.95
1000-seed weight (g)	3.37	18.97	17.14	81.64	1.08	32.09
Days to maturity	86.70	6.78	6.56	93.70	11.35	13.09
Oil content (%)	42.08	2.87	2.45	72.63	1.81	0.04
Leaf area index	1.46	46.50	43.50	87.50	1.23	0.84
Dry matter production (g)	22.57	31.44	29.89	90.40	13.21	58.53
Harvest index	30.92	11.43	8.56	56.05	4.08	76.25
Seed yield (g)	6.02	41.76	39.35	88.78	4.59	13.19

was moderate for number of branches (primaries and secondaries), seed yield, leaf area index, DMP, capsule length and 1000-seed weight. The lowest heritability was registered by harvest index followed by capsules on main stem. The genetic advance was high for seed number per capsule and low for capsule length. Highest genetic advance expressed as percentage of mean was recorded by number of secondaries followed by number of capsules on branches and harvest index. Moderate genetic advance as percentage of mean was recorded by DMP, number of primaries, first capsule bearing node and seed number per capsule. The lowest genetic advance was recorded for oil content followed by leaf area index.

Burton (1952) suggested that the coefficient of genetic variability together with heritability estimates gave a reliable picture of genetic advance to be expected from selection. Johnson *et al.* (1955) stated that in predicting the resultant effects of selection, the genetic advance should be considered along with heritability. Measured by this yardstick, number of capsules on branches had high heritability combined with high genetic advance, while seed number per capsule, DMP and first capsule bearing node had high heritability with moderate genetic advance. Number of secondaries had medium heritability with high genetic advance while number of primaries had medium heritability and medium genetic advance.

Seed yield recorded moderate GCV, moderate h^2 and low GA which indicated that this trait could be improved through selection for other component characters. Number of secondaries, number of capsules on branches, DMP and LAI can be improved by direct selection for these traits, which consequently will contribute to improvement in seed yield.

High to moderate heritability and genetic advance were observed for capsules on branches by Rai *et al.* (1981) and Gupta and Chopra (1984), seed number per capsule by Solanki and Paliwal (1981), first capsule bearing node and number of branches by Murugesan *et al.* (1979). These findings were in agreement with the present results. The study indicated that characters such as capsules on branches, DMP, seed number per capsule, first capsule bearing node and number of branches have the preponderance of additive gene action in their expression.

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