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Genetic architecture of yield and its components in sesame

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SUMMARY
The material comprised of six generations of two crosses namely BS 6-1-1/Co 1 and BS 6-1-1/SVPR 1. Among the parents, SVPR 1 was found to be good performer for seed yield per plant, number of branches per plant and earliness, similarly BS 6-1-1 for earliness, number of capsules per plant and number of seeds per capsule. The hybrid BS 6-1-1/SVPR 1 exhibited high *per se* performances for seed yield per plant, number of seeds per capsule and earliness. From generation mean analysis, most of the important yield contributing traits as well as yield *per se* itself are governed by predominantly dominant gene action followed by additive ×dominance interaction effect. For improving such traits, a recurrent selection technique followed by selection at later generation is suggested.

Key words : Sesame, Scaling test, Genetic architecture.

Sesame (*Sesamum indicum L.*) is one of the important and oil yielding crops. Characters like seed yield are complex in inheritance; improvement of the character is possible only through the improvement of other component characters. However, the studies on the genetic improvement of this crop are very limited. Hence attempts were made for the improvement of this crop by studying the genetic architecture of this crop through generation mean analysis.

MATERIALS AND METHODS

The six generations namely P_1, P_2, F_1, F_2, B_1 and B_2 of two crosses namely, BS 6-1-1×SVPR 1 were raised in RBD with three replications. Each replication consisted of 3 rows of parent, 3 rows of F_1, 12 rows of F_2 and 6 rows of B_1 and B_2 were grown adopting a spacing of 30cm between rows and 20 cm between the plants in the row. 45 plants in P_1, P_2 and F_1 generations,180 plants in F_2 generation, 90 plants in each of B_1 and B_2 generations were observed for both the crosses in all replications. The biometrical techniques to detect and estimate the additive (d), dominance(h) and genetic interactions viz, additive × additive (i), additive × dominance(j), dominance × dominance(l), from six generations have been described by Mather (1949), and Mather and Jinks (1971).

RESULTS AND DISCUSSION

The prime objective of hybridization between any two parents is to combine the desirable characters dispersed among them to compensate deficiencies found in one parent by the other. The progenies of these crosses will throw all possible combinations to promote yield. Therefore, the parents selected should inherit the characters to their progenies. The choice of parent was based on the general principle that the parents under selection should have a high *per se* performance for the desirable traits for a systematic breeding programme, it is necessary to identify the parents which can be the exploited for Genetic improvement through hybrid progenies. For which , the breeders are in absolute need of high mean value which is considered as a main criterion for effective selection for ever along with a thorough understanding of the genetic potential underlying in the expression of the character.

Among the parents studied in the present investigation, SVPR 1 showed promise for seed yield per plant, number of branches per plant and earliness similarly BS 6-1-1 for earliness, number of capsules per plant and number of seeds per capsule. Another thing, forwarding the F_1 by mean basis is necessary. F_1 of BS 6-1-1×SVPR 1 showed high seed yield per plant by number of branches and number of seeds per capsule.

To test the adequacy of the additive- dominance model, the following scales viz, A, B, C and D were estimated (Table 1) using the means and variances of the six generations available (Mather 1949). Since the scaling test indicated the inadequacy of additive- dominance model in some cases, the model was extended to additive, dominance and interaction (six parameter model). The perfect fit solution given by Mather and Jinks (1971) was adopted to estimate the epistatic effects viz, additive × additive (i), additive × dominance (j), and dominance ×

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