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Level of heterosis and its use in okra breeding

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SUMMARY
A Line X Tester analysis in okra (*Abelmoschus esculentus* L. *Moench*) was carried out with six lines and three testers, to estimate the heterosis for ten characters. All the characters studied indicated the scope for heterosis breeding in crop improvement in okra. The hybrid L_6 X T_2 (Mohanoor local X Parbhani kranti) and L_1 X T_3 (TCR 2056 X Punjab Padmini) exhibited highest heterotic value for seed yield per plant. L_6 X T_2 (Mohanoor local X Parbhani kranti) was found to be the superior hybrid among the eighteen studied.

Key words :*Okra, Heterosis breeding, Line X tester analysis, Okra Breeding*

Okra (*Abelmoschus esculentus* L. *Moench*) is important member of malvaceae and commonly known as okra in India. Though native of tropical Africa, it is a prized vegetable of India. Hybrids are very much popular in this crop and the hybrid seed production is based on hand pollination and emasculation (Dhankar and Mishra 2005). The potential use of okra seeds as a source of oil was probably first noted by Jameison and Baughman 1920, also they recognized the high protein content. Exploitation of hybrid vigour is one of the most important tools for increasing productivity. The cultivation of okra are heterozygous in constitution in spite of its adoption for self pollination. Out crossing ranging from 11.80 – 60.00 per cent has also been reported by Martin 1979. Line X tester crossing technique is one which is widely used to study the combining ability of parents to be chosen for heterosis breeding, further more; Line X Tester analysis proposed by kempthrone 1975, draw much attention to exploit hybrid vigour to increase the productivity of vegetables.

MATERIALS AND METHODS

The experiments were carried out in the Plant Breeding Farm, Department of Agriculture Botany, Faculty of Agriculture, Annamalai University. The plant materials consisted of six lines and three popular testers, the lines where TCR 2056 (L_1), TCR 2086 (L_2), TCR 852(L_3), Gobi Local (L_4) Dharmapuri Local (L_5) and Mohanoor Local (L_6). The popular testers includes, MDU-1 (T_1) Parbhani kranti (T_2) and Punjab Padmini (T_3). The testers used in these studies are well adapted to this locality. The hybrid seed production is based on hand emasculation and pollination. The six lines and three testers and the eighteen hybrids between them were planted in the field in a randomized block design with three replications. Recommended cultural practices and plant protection measures were carried out in order to maintain the crop healthy (Anon, 1993). Crossing of parents carried out in Line X Tester fashion to produce eighteen hybrids. The statistical analyses are made for heterosis and hybrid vigour.

The biometrical observations were made on randomly selected fifteen plants for parents and hybrids for recording the following metric traits viz., days to 50% flowering, plant height, number of branches per plant, capsule weight, capsule length, number of seeds per capsule, 100 seed weight, number of capsules per plant, capsule yield per plant, seed yield per plant.

RESULTS AND DISCUSSION

Analysis of variance:

The analysis of variance was carried out and the results obtained are presented in the Table 1. High and significant differences existed for all the characters in the lines and the testers. A comparison of parents with hybrids revealed significant differences for all the characters studied indicating the existence of substantial variation among the hybrids offering basis for the selection and further improvement by adapting suitable breeding procedure.

Heterosis:

Most of the hybrids recorded negative heterosis. The hybrid L_6 X T_3 recorded maximum significant negative relative heterosis (-19.04 per cent) and Heterobeltosis (-26.79 per cent) and the highest significant negative

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