

Studies on heterosis and combining ability for growth parameters in okra [*Abelmoschus esculentus* (L.) Moench]

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Accepted : Feb., 2008

ABSTRACT

Line x tester analysis was carried out with the objectives of identifying good combiners and to assess the magnitude of heterosis for growth characters. Maximum heterosis over better parent and standard parent in desirable direction were 33.24 per cent (KAO59 x KAO63) and 32.35 per cent (KAO62 x KAO63) for plant height at 60 days after sowing (DAS); 20.98 per cent (KAO62 x KAO66) and 29.06 per cent (KAO62 x KAO63) for number of leaves at 45 DAS; 35.19 per cent and 35.18 per cent (KAO61 x KAO01) for number of leaves at 60 DAS ; -18.18 per cent and -16.13 per cent (KAO11 x KAO66) for internodal length ; 18.10 per cent (KAO65 x KAO66) and 25.69 per cent (KAO62 x KAO63) for number of branches per plant and 20.33 per cent and 24.35 per cent (KAO62XKAO63 and KAO58XKAO63) for number of nodes on main stem. The cross KAO62 x KAO63 for plant height at 60 DAS and number of leaves at 45 and 60 DAS ; KAO14 x KAO01 for internodal length ; KAO65 x KAO66 and KAO62 x KAO63 for number of branches ; KAO62 x KAO63, KAO64 x KAO01 and KAO59 x KAO63 for number of nodes on main stem were identified as good specific combiners. The parents KAO59 and KAO63 for plant height at 60 DAS; KAO62 and KAO63 for number of leaves at 45 DAS; KAO61 for number of leaves at 60 DAS; KAO11 for internodal length, KAO62 and KAO63 for number of branches per plant and KAO62, KAO63 and KAO58 for number of nodes on main stem were identified as good general combiners. Non additive gene action was predominant for number of leaves at 45 and 60 DAS, internodal length and number of branches per plant.

Key words : Combining ability, Growth parameters, Heterosis, Okra.

Okra commonly known as bhendi in India is grown for its tender fruits in tropics, subtropics and warmer parts of temperate regions. The yield potential of okra in India is 9.9 t/ha (Anonymous, 2003) which is very low due to poor yielding varieties and high incidence of pests and diseases. Heterosis breeding has been recognized widely in vegetable crops to achieve a quantum jump in yield and productivity. Further, F_1 hybrids occupy less than 10 per cent of total area under okra cultivation in India. Jaiprakashnarayan and Mulge (2004) reported strong association between growth (plant height, number of leaves and number of nodes on main stem) and total yield per plant. Hence, an attempt has been made to ascertain the extent of heterosis and combining ability effects for growth parameters in okra. This study will help to develop higher heterotic F_1 hybrids and increase in area under F_1 hybrids of okra.

MATERIALS AND METHODS

The materials for the present study comprised of 14 lines as female parents and 3 testers as male parents and

these were crossed in all possible combinations to obtain 42 F_1 hybrids. The parental genotypes and 42 F_1 hybrids were grown in randomized block design with three replications at spacing of 60 x 30 cm apart. Data were recorded in eight randomly selected plants in each F_1 s and parents for growth parameters. The observations were subjected to line x tester analysis. Heterosis was estimated over the better and standard parental values. The genotype Arka Anamika (KAO01) was selected as the standard parent, since it is the commercial popular variety widely grown in Karnataka.

RESULTS AND DISCUSSION

Majority of the crosses exhibited positive and significant heterosis over better parent (35 crosses) and standard parent (34 crosses) for plant height at 60 days after sowing. The maximum heterosis was observed in cross KAO59 x KAO66 (33.24%) over better parent and in cross KAO62 x KAO63 (32.55%) over standard parent (Table 1). The parents involved in the cross KAO62 x KAO63 had positive and significant gca effects (Table 3) and the cross also exhibited positive and significant sca effects (Table 4). The GCA: SCA ratio is almost equal (1:1.13) and hence, indicates the predominance of both