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Study on heterosis and combining ability for earliness and yield parameters in okra (*Abelmoschus esculentus* (L.) Moench

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ABSTRACT

Line x tester analysis was carried out with the objective of identifying good combiners and to assess the magnitude of heterosis for earliness and yield parameters. Maximum heterosis over better parent and standard parent in desirable direction were –9.53 per cent and –9.05 per cent (KAO61 x KAO01) for days to first and fifty per cent flowering; 6.68 per cent and 5.19 per cent (KAO59 x KAO01 and KAO62 x KAO01) for fruit length ; 12.96 per cent (KAO58 x KAO66) and 5.11 per cent (KAO68 x KAO63) for average fruit weight; 42.55 per cent and 47.25 per cent (KAO62 x KAO63) for number of fruits per plant and 35.90 per cent and 42.07 per cent (KAO62 x KAO63) for total yield per plant, respectively. The crosses KAO67 x KAO01 for days to first and fifty per cent flowering ; KAO59 x KAO01 for fruit length; KAO64 x KAO66 and KAO68 x KAO63 for average fruit weight and KAO62 x KAO63 for number of fruits per plant and total yield per plant were identified as good specific combiners.The parents KAO61 and KAO01 for days to first and fifty per cent flowering; KAO59, KAO62 and KAO01 for fruit length; KAO58, KAO68 and KAO63 for average fruit weight and KAO63 for number of fruits per plant and total yield per plant were identified as good general combiners. Non additive gene action was predominant for days to first and fifty per cent flowering, average fruit weight and total yield per plant.

Key words : Combining ability, Heterosis, Okra,Earliness, Yield.

Okra commonly known as bhendi in India is grown for its tender fruits in tropics, subtropics and warmer parts of temperate region. The yield potential of okra is 9.9 t/ha (Anonymous, 2003) due to poor yielding varieties, hybrids and higher incidnece of pests and diseases. The importance of heterosis breeding has been recognized widely in vegetable crops particularly for achieving high productivity and resistance to pests and diseases. In developed countries like USA, Canada, Japan, Korea, Israel etc. hybrid vegetable cultivation in very common in almost all vegetables but, India is lacking much behind in this aspect. Further the F_1 hybrids occupy less than 10 per cent total area under okra cultivation in India (Anonymus, 2003). Hence, an attempt has been made to asses the extent and magnitude of heterosis and combining ability effects for earliness and yield parameters in okra.

MATERIALS AND METHODS

The materials for the present study comprised of 14 times as female parents and three 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_1s 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

Days to first and fifty per cent flowering are the indicatons of earliness and negative heterosis for these traits is desirable. Maximum and significant negative heterosis over the better parent and standard parent was observed in crosses KAO61 x KAO01 (-9.53 and –9.05%; -9.53% and -9.06%) followed by KAO61 x KAO63 (-7.85% and –6.85%; -9.82% and –8.95%) and KAO58 x KAO01 (-8.69% and –8.39%; -8.70% and –8.40%), respectively (Table 1). The parents involved in these crosses were good general combiners except KAO63 (Table 3). The GCA to SCA ratio (Table 3) was also high (1: 3.658 and 1:3.758) and hence, non-additive component of genetic variance has predominantly contributed for heterosis as also reported by Dhaukar *et al*. (1998). For fruit length, maximum heterosis over the better parent and standard parent was observed in crosses KAO69 x KAO01 and KAO62 x KAO01 (6.68% and 5.19%) followed by KAO62 x KAO63 (6.26% and