

STUDIES ON COMBINING ABILITY IN OKRA [*Abelmoschus esculentus* (L.) Moench]

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ABSTRACT

An experiment on Okra [*Abelmoschus esculentus* (L.) Moench] was conducted during the year 2003-2004. The hybrid and combining ability ANOVA revealed highly significant progeny variances. The mean squares due to general combining ability and specific combining ability were significant for all the characters except for the fruit diameter, fruit weight and hundred seed weight in case of GCA and days to 50% flowering, fruit diameter, number of ridges per fruit, fruit weight and hundred seed weight in case of SCA. VRO-6 for plant height and yield per plant, IIVR-10 for number of leaves and number of ridges per fruit, VRO-5 for days to 50% flowering and number of fruits per plant and Pusa Sawani for fruit weight were found good general combiners. Among crosses Pusa A-4 X Pusa Sawani for plant height, Parbhani Kranti x VRO-6 for plant spread, Pusa A-4 X IIVR-10 for number of leaves and number of fruits per plant, Arka Anamika X IIVR-10 for days to 50% flowering, Pusa A-4 X VRO-5 for fruit length, Parbhani kranti x VRO-4 for fruit diameter and hundred seed weight, Pusa Sawani x IIVR-10 for number of ridges per fruit, Pusa A-4 X VRO-6 for fruit weight and yield per plant and Punjab Padmini x Arka Anamika for number of seeds per fruits were the best specific combiners.

Keywords: Okra, Diallel cross, GCA, SCA, Yield

Exploitation of hybrid vigor is an important and efficient breeding approach in crop improvement. The breeding value of individual genotypes becomes one of the significant criteria for the selection of suitable potential lines to be used as parents in the development of desirable hybrids. Performance of hybrids depends on the extent of genetic variation as well as genetic divergence among such parents. Combining ability is one of the important means for selecting desirable parents and crosses since high yielding genotypes may necessarily transmit its superiority in cross combinations. Amongst several methods to study the combining ability, diallel analysis helps in evaluating a large number of genotypes. This analysis provides information about the GCA of parents and SCA of the hybrids and is also helpful in estimating the various types of gene action. On view of the fact that the combining ability analysis would help to achieve this objective efforts were made to develop diallel F_1 hybrids for high yield using the technique proposed by model 1 and methods 2 of Griffing (1956).

MATERIALS AND METHODS

The investigation on Okra was carried out during rainy-summer season of 2003 - 04. The ten genotypes namely Pusa A-4, Punjab Padmini, Pusa Makhmali, Pusa Sawani, Parbhani Kranti, Arka Anamika, VRO-4, VRO-

5, VRO-6 and IIVR-10 and their 45 F_1 hybrids along with one standard check Parbhani Kranti comprised the material for present study. Twelve traits under investigation were included in the study. Using a size of 5m x 0.60m as single rows of each genotype study accommodating 10 plants spaced 45 cm within rows the experiment was laid out in a randomized block design (RBD) with three replications. All other recommended and required cultural practices were followed for raising a healthy crop. Crossing technique was carried out with hand emasculation and pollination. For recording various growth and yield characters five randomly selected plants were observed. The mean values of various characters for each genotype were used in diallel analysis for the estimation of combining ability variances and effects using model 1 and methods 2 of Griffing (1956).

RESULTS AND DISCUSSION

Analysis of variance for combining ability for twelve characters in okra is presented in Table 1. All the characters showed positive and highly significant values except days to 50% flowering, fruit diameter, number of ridges/fruit, fruit weight and hundred seed weight. The combining ability variance revealed that both additive and non-additive genetic variances were important for all the characters under study. However, preponderance of non-additive genetic variance was seen for all the characters except for days to 50% flowering, number of ridges per