



## Combining ability for yield and yield contributing characters in brinjal (*Solanum melongena* L.)

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### ABSTRACT

Combining ability analysis of a 8 X 8 diallel, excluding reciprocals was undertaken for fruit yield and yield contributing characters. Non additive gene action was noticed to be preponderant for all the traits studied. A perusal of the gca effects revealed parents MF and PLK-1 to be good combiner for the fruit yield. Hence, these parents may be used in breeding programmes aimed at the development of high yielding hybrids. Four crosses had desirable sca effects in addition to high per se performance for the trait. The hybrid MF X PLK-1, involving both good combiners for fruit yield per plant had recorded maximum fruit yield, in addition to desirable sca effects for fruit yield and early harvest. The hybrids Krishna kathi X PLK-1, MF X IAB-87, MF X Krishna Kathi, JB-19 X PLK-1 and RHRB-7-7-6-1 X IAB-87 were also found promising for yield and yield traits studied.

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**B**reeding of high yielding varieties of any crop mainly depends on the choice of parents. Joshi and Dhawan (1966) emphasized that the breeding methods for the improvement of self pollinated crops should be based on nature and magnitude of genetic variance governing the inheritance of quantitative characters. Diallel analysis is one of the precise techniques to identify parents as well as the best cross combination in the immediate generation after making the crosses. In the present investigation attempts have been made to identify best parent to be involved in producing best cross combination and nature of gene action for various characters in brinjal.

### MATERIALS AND METHODS

The present experiment was carried out at Vegetable Improvement Project, Department of Horticulture, M. P. K. V. Rahuri during *Kharif* 2006. The experiment material comprised of eight elite homozygous lines and their 28 hybrids derived from the 8 x 8 diallel mating (excluding reciprocals). The hybrids and parents were evaluated in randomized block design with three replications during June to February. The parents and F<sub>1</sub>'s were planted separately into two rows of six plants having total twelve plants each, with a spacing of 60 cm between the plants and 90 cm between the rows in each replication. The

recommended cultural practices and plant protection measures were followed as and when required for better growth and yield. Data was recorded on randomly selected five plants on the characters *viz.*, plant height, plant spread, polar and equatorial diameter of fruit, fruit size index, days to first harvest, total number of fruits per plant, fruit yield per plant and total fruit yield per hectare. The data was recorded for each entry in each replication and average values were computed. The estimates of combining ability variances and effects were obtained using method 2 of Model I (Griffing, 1956).

### RESULTS AND DISCUSSION

The analysis of variance for combining ability revealed significant mean squares due to both gca and sca for character studied, indicating the importance of both additive and non additive gene actions for these traits. Several workers had also reported similar results for fruit yield (Das and Barua, 2001; Baig and Patil, 2002), days to first picking (Vaghasiya *et al.*, 2002), plant spread (Singh *et al.*, 1991). The magnitudes of sca variances were higher than the gca variances for all the characters under study. This indicate the preponderance of non additive gene action for all the characters which is always favourable for heterosis breeding for improvement of this traits. The