

**ANALYSIS OF COMBINING ABILITY AND  
HETEROSIS IN TOMATO (*Solanum lycopersicum*)  
USING FULL DIALLEL CROSS**

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## ABSTRACT

Combining ability and heterosis were studied in a full diallel mating design among four tomato cultivars (PH 12561, PH 12585, PH 12696 and PH 12835). The four parents and twelve hybrids as well as reference hybrid (Bhathiya) were evaluated on traits; (vegetative traits, reproductive traits, yield traits and fruit quality traits). Genetic parameters estimated by the Griffing's analysis method. Analysis of variance revealed highly significant differences among all the F<sub>1</sub> hybrid means and their respective four parental values for most of traits. The mean squares due to general combining ability (GCA) and specific combining ability (SCA) were also highly significant for most of traits. Cultivar PH 12835 was found to be the best general combiner for vegetative, reproductive and yield traits. Cultivar PH 12696 was found to be the best combiner for fruit quality traits. PH 12561 X PH 12835 F<sub>1</sub> hybrid was performed most of positive specific combining ability with increase vigor of F<sub>1</sub> over the mid parent, better parent and standard variety for the vegetative and yield traits. PH 12585 X PH 12835 F<sub>1</sub> hybrid was performed positive specific combining ability with increase vigor of F<sub>1</sub> over the mid parent, better parent and standard variety for the reproductive traits. PH 12561 X PH 12696 F<sub>1</sub> hybrid was performed positive specific combining ability with increase vigor of F<sub>1</sub> over the better parent, mid parent and standard variety for the fruit quality traits. Low to moderate narrow sense heritability was observed in vegetative, yield and fruit quality traits. Low narrow sense heritability was observed in reproductive traits.

**Keywords:** F<sub>1</sub> hybrids, General combining ability, Specific combining ability, Hybrid vigor, Heritability