THE ASIAN JOURNAL OF HORTICULTURE
Volume **7** | Issue 1 | June, 2012 | 17-20

Research Paper

Article history **:**
Received : 17.10.2011
Revised : 15.01.2012
Accepted : 08.03.2012

Combining ability studies for productivity related traits in tomato (*Lycopersicon escylentum* Mill.)

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Abstract **:** Combining ability for yield and yield related characters was studied using line x tester analysis comprising of five lines and nine testers. Analysis of variance revealed considerable amount of genetic variability among parents and their hybrids for all the characters indicating the influence of non additive gene action. The SCA variance was higher than the GCA variance for all the characters. This higher SCA variance over GCA variance indicating predominance of dominance variance. Among lines DMT-1 and among testers DMT-2 were good general combiners for yield. Among 45 hybrids studied four were found highest yielding. Among four, DMT-1 x Arka Alok recorded an estimated highest yield of 1489.9 g followed by DMT-1 x DMT-2, DM-3 x DMT-2 and DM-5 x Arka Alok.

Key words **:** Combining ability, GCA, SCA, Heterosis

How to cite this article **:** Angadi, Akshay, Dharmatti, P.R. and Angadi, Praveenkumar (2012). Combining ability studies for productivity related traits in tomato (*Lycopersicon escylentum* Mill.), *Asian J. Hort.*, **7**(1) : 17-20.

Tomato (*Lycopersicon esculentum* Mill) is an important and widely grown solanaceous vegetable crop around the world, both for fresh market and processing. It is native of Peru. It is a self-pollinated crop. It ranks second only after potato in production.. In many countries it is considered as “poor man’s orange” because of its attractive appearance and nutritive value. Tomato is an annual and short lived perennial herbaceous plant. It is a typical day neutral plant and self pollinated crop, but certain percentage of cross pollination also occurs. It is a warm season crop reasonably resistant to heat, drought and grows under wide range of soil and climatic conditions. Although tomato is a self pollinated crop, heterosis is being commercially exploited on large scale.

The combining ability analysis helps in diagnosing or identifying additive or non-additive gene action would in turn lead a breeder to select desirable parents or cross combinations that would be exploited for crop improvement. A knowledge of general combining ability (gca) and specific combining ability (sca) helps in choice of parents or hybrids and the nature of gene action acts as bases of choosing effective breeding methods. The present investigation was undertaken to identify parental combination that are likely to produce superior hybrids having highest yield.

RESEARCH METHODS

The material consists of five lines (DM-1, DM-3, DM-4, DM-5, DMT-1) were crossed with nine testers (Arka Alok, IMP-D, IMP-B, DMT-2, DS-1, L.No C-3, L.No C-4, L.No-14, L.No-36). The salient features of parents is given in Table A. The resulting 45 hybrids and 14 parents along with check were evaluated in randomized block design with two replications during *Kharif* 2010. Observations like plant height, number of branches per plant, number of clusters per plant, number of fruits per cluster, number of fruits per plant, average fruit weight and yield per plant were recorded. Plant height was recorded 60 days after transplanting. Number of clusters