

Genetic analysis of a few traits in tomato (*Lycopersicon esculentum* L.)**Authors:**

**Maath AL-Abdaly M,  
Omar Muslah  
ALmohammedi H and  
Hussian Awad Adday**

**Institution:**

Department of Horticulture,  
College of Agriculture,  
University of Anbar,  
Iraq.

**Corresponding author:**

**Maath AL-Abdaly M**

**ABSTRACT:**

A full diallel was established in 2015 at Abu-Ghraib region to determine heterosis, the effect of general, specific and reciprocal combining of ability (GCA, SCA and RCA) respectively, for the growth and yield components in five lines (HA-1001, HA-1004, HA1006, HA-1007 and HA-1015) of tomato (*Lycopersicon esculentum* L.). The results showed that the hybrid (4×5) gave the highest heterosis value for fruit yield per plant (111.03%). The same hybrid gave the greatest mean for same character (5.93kg.), whereas, their reciprocal hybrid (5×1) has possessed the highest heterosis. Results of genetic analysis showed that MSgca, MSsca and MSrca were significantly differences in all the studied traits. The parent 2 (HA-1004) revealed as the best general combiner for each plant height and number of leaves per plant (13,97), while the parent (HA-1007) was the best general combiner for a number of fruits per plant (6.38), whereas, the parent (HA-1015) was the best general combiner for fruit weight (8.29). The diallel cross (2×5) was (4×2) the best SCA effect for plant height and leaves number and the cross (1×5) was the best SCA for the fruit number per plant (19-54) fruit yield per plant (1.39) and cross (2×4) was the best SCA for the fruit weight (17.78). The reciprocal cross (5×4) was found to be the best specific combiner effect for plant height (40.5) fruit number per plant (56.34) leaves number per plant (26.53) and fruit yield per plant (2.04). The ratio of  $\delta 2gca/\delta 2sca$  for diallel crosses and  $\delta 2gca/\delta 2rca$  for reciprocal crosses was less than one for all studied traits except the ratio of  $\delta 2gca/\delta 2rca$  were more than one for fruit weight (1.19) and fruit length (2.90). The values of  $\delta 2D$  were more than that  $\delta 2A$  for all traits except for fruit length the  $\delta 2A$  was more that  $\delta 2D$ , and this effect the exceeded one for the value of average degree of dominance for all studied traits in both diallel and reciprocal crosses except fruit weight and length which were less than one in reciprocal crosses. This showed that all the studied traits for diallel crosses and for most reciprocal crosses were under over dominance of gene action.

**Keywords:**

Tomato, Genetic analysis, Combining ability.