



Genetic analysis of NaCl tolerance in tomato

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ABSTRACT. We attempted to find the suitable parents for the development of tomato hybrids for high salt soils by exploiting combining ability, gene action and heterosis. Six salt-tolerant and three salt-intolerant genotypes, along with their 18 F1 crosses, were evaluated at seedling stage under 10 and 15 dS/m (NaCl) salinity stress, compared to the control level of salinity. The experiment was laid out based on a two-way complete randomized design factorial arrangement with two replications; data on root and shoot length, fresh and dry weights, leaf

area, plant length, Na^+ , K^+ and K^+/Na^+ concentrations were recorded. There was significant variation within genotypes, lines, testers, crosses, and line \times tester interaction for all plant characters studied under normal and two salinity levels. Estimates of combining ability indicated that under low (10 dS/m) and high (15 dS/m) salinities, line BL1176 and tester LO2875 showed significant GCA effects for most of the traits studied. The cross-combinations 6233 \times LO2875, CLN2498A \times LO2875 and BL1176 \times 17902 showed highest SCA values for most of the characters under 10 and 15 dS/m, respectively. Potence ratio showed that under low and high salinities, all the traits showed over dominant type of gene action except leaf area and K^+ concentration (in 10 dS/m) and shoot length, and leaf area (in 15 dS/m). The highest heterosis for most of the parameters was observed in cross-combinations BL1176 \times LO2875 and CLN2498A \times LO2875.

Key words: Salinity; Tomato; Seedlings; Line x tester analysis; Combining ability; Heterosis