



Prediction of industrial tomato hybrids from agronomic traits and ISSR molecular markers

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ABSTRACT. Heterosis is a highly relevant phenomenon in plant breeding. This condition is usually established in hybrids derived from crosses of highly divergent parents. The success of a breeder in obtaining heterosis is directly related to the correct identification of genetically contrasting parents. Currently, the diallel cross is the most commonly used methodology to detect contrasting parents; however, it is a time- and cost-consuming procedure. Therefore, new tools capable of performing this task quickly and accurately are required. Thus, the purpose of this study was to estimate the genetic divergence

in industrial tomato lines, based on agronomic traits, and to compare with estimates obtained using inter-simple sequence repeat (ISSR) molecular markers. The genetic divergence among 10 industrial tomato lines, based on nine morphological characters and 12 ISSR primers was analyzed. For data analysis, Pearson and Spearman correlation coefficients were calculated between the genetic dissimilarity measures estimated by Mahalanobis distance and Jaccard's coefficient of genetic dissimilarity from the heterosis estimates, combining ability, and means of important traits of industrial tomato. The ISSR markers efficiently detected contrasting parents for hybrid production in tomato. Parent RVTD-08 was indicated as the most divergent, both by molecular and morphological markers, that positively contributed to increased heterosis and by the specific combining ability in the crosses in which it participated. The genetic dissimilarity estimated by ISSR molecular markers aided the identification of the best hybrids of the experiment in terms of total fruit yield, pulp yield, and soluble solids content.

Key words: *Solanum lycopersicum*; Pre-breeding; Heterosis; Genetic diversity