

Association between heterosis and genetic distance based on morphological traits and SSR markers in *Cicer* species

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Association between heterosis and genetic distance based on morphological and molecular data has been widely studied in vegetables and in many economically important plant species. Results have suggested that molecular divergence has been a good predictor for hybrid performance. The objectives of this study were: (i) to estimate the heterosis and heterobeltiosis of hybrids for yield and yield components; (ii) to measure the genetic distance among *C. arietinum*, *C. echinospermum* and *C. reticulatum* based on morphological traits and SSR markers, and (iii) to investigate correlations between heterosis of hybrids and genetic distances of the parents. Three *Cicer* species including two accessions (AWC 603 and AWC 613) of *C. reticulatum*, one accession (AWC 304) of *C. echinospermum* and three accessions of the cultivated chickpea (*C. arietinum*), two accessions (CA 2969 and Mexican white) of '*macrosperma*' and one accession (ICC 4969) of '*microsperma*' chickpea were crossed. Genetic distance among *Cicer* species was detected using SSR markers and morphological traits. A significant correlation between the genetic distance of *Cicer* species and heterosis of the hybrids for yield and yield components was found. The performance of the hybrids for yield and yield components was higher in interspecific crosses than those of intraspecific crosses. To obtain better hybrids, heterosis prediction can be used for reduction of time, cost and effort.