

Turkish Journal of Botany

Turkish Journal

of

Botany

Nuclear and non-nuclear interactions in F_1 hybrid populations of three *Solanum* species in the subgenus *Leptostemonum*, section *Melongena* (Solanaceae)

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Abstract: Reciprocal crosses involving *Solanum gilo* Raddi, *S. anguivi* Lam. and *S. macrocarpon* L., subg. *Leptostemonum* (Dunal) Bitter sect. *Melongena* Dunal were produced in order to assess inherent nuclear and non-nuclear influences on hybrid fitness, the extent of genomic change, and species compatibility. Hybrids expressed intermediacy and overlaps in leaf, petiole, petal, and plant height dimensions. Maternal influence was dominant in growth habit, leaf shape and texture, flower colour, and fruit size, while paternal control was limited to fruit colour in *Solanum gilo* × *S. macrocarpon*. Pollen viability was reduced from 97.3%-86.5% in parents to 53.8%-20.5% in hybrids. *S. gilo* × *S. macrocarpon* produced single-flowered inflorescence, whereas the reciprocal *S. macrocarpon* × *S. gilo* developed the ability to perennate, indicating the heterogeneity of the parental genome. Fruits of the hybrids were intermediate or smaller, and had fewer seeds. They were wrinkled in *S. gilo* × *S. macrocarpon*, with many aborted seeds. Meiosis was irregular, with few laggards, and isolated uni- and bivalent chromosomes associated with foreign genes in the parent species. Conversely, multivalent and chromosome clumps revealed the extent of homogenization of the parental genomes and species affinity. The maternal genome exerted profound influence on hybrid phenotype and fitness, and should inform and direct future hybridization efforts.

Key words: Genotype, hybrid fitness, hybridization, maternal-paternal influence, meiosis, *Solanum*

Turk. J. Bot., **33**, (2009), 243-255.

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