

48. Reaction of *Solanum* (section *Lycopersicon*) germplasm to Tomato chlorosis virus (genus *Crinivirus*) and molecular mapping of virus-tolerance factors

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Outbreaks of whitefly-transmitted *Crinivirus* species (family *Closteroviridae*) have been reported in field and greenhouse-grown tomatoes (*Solanum lycopersicum* L.) around the world. Two *Crinivirus* are reported infecting tomatoes: *Tomato chlorosis virus* (ToCV) and *Tomato infectious chlorosis virus* (TICV). ToCV has been so far the only viral species reported causing yield and quality losses in field and greenhouse-grown tomatoes in Brazil and Uruguay. In the present work, a collection of accessions comprising commercial hybrids, breeding lines and wild species was evaluated for ToCV reaction with natural exposure to the viruliferous whitefly vectors under open field (Brazil) and greenhouse conditions (Brazil and Uruguay). A selected group of genotypes was inoculated at seedling stage using viruliferous whitefly adults. Evaluation of the germplasm to ToCV was conducted based upon a grade system varying from 1 (no symptoms) to 4 (highly susceptible). The presence of systemic ToCV infection was evaluated via RT-PCR. High levels of field tolerance were observed in both countries in a subgroup of tomato breeding lines and wild species accessions, including some *S. lycopersicum* accessions. However, the tolerance levels of the majority of these sources were reduced after early (seedling) exposure to viruliferous vectors. Stable and plant age-independent sources of high-tolerance were identified only in *S. habrochaites* and *S. peruvianum* accessions. Six populations (P₁, P₂, F₁, BCP₁, BCP₂ and F₂) derived from contrasting *S. lycopersicum* lines were virus-inoculated and used for phenotypic characterization aiming to study the inheritance as well as to identify molecular markers associated with the ToCV tolerance. The search for molecular markers was initially carried out via bulked segregant analysis. The sequence characterization of the polymorphic amplicons will allow the localization of the region(s) carrying ToCV-tolerance factor(s) in the tomato reference genome. Our results indicated that the development of tomato breeding lines with tolerance to criniviruses is a feasible breeding objective. Stable high-tolerance to ToCV could be incorporated into elite germplasm from both commercial and wild *Solanum* section *Lycopersicon* sources.