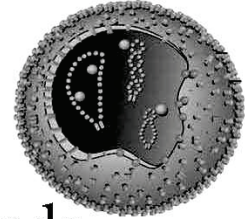


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**Tospovirus Emergence, Interspecific Reassortment and Mixed Infections in Brazil:
Advances in Breeding for Broad Spectrum Tospovirus Resistance**

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The Neotropical South America is a *Tospovirus* diversity center with many endemic species. The co-existence of different tospovirus species, alternative hosts, and vector species may allow the emergence of new species, virus reassortants, and facilitates mixed infections. Our studies demonstrated that mixed infections among tospovirus species and heterologous interaction between movement and nucleocapsid proteins may allow virus synergism, facilitating virus infection and/or evolution. However, extensive surveys in Brazil revealed that reassortants may represent rare events and/or reassortants have a low fitness in the field. The combination of high diversity and synergic interactions represent a threat for obtaining broad tospovirus resistance. In tomatoes the *Sw-5* locus is yet the best genetic source of resistance. This locus contains at least five paralogues of which *Sw-5bis* is the effective copy. Novel sources of tospovirus resistance were found in *Solanum* (section *Lycopersicon*: Solanaceae). Seven *S. peruvianum* L. accessions displayed a broad-spectrum resistance. A polymorphic amplicon was found encompassing the *Sw-5b* gene, resulting in a specific, co-dominant polymorphism. The subset of *S. peruvianum* accessions having wide spectrum resistance displayed minor *Sw-5b* gene sequence variation, thus representing distinct alleles at the *Sw-5* locus. Sources of multi-resistance to four *Tospovirus* species were also found in accessions of *S. pimpinellifolium* L.; *S. chilense* Dunal; *S. arcanum* Peralta; *S. habrochaites* Knapp; *S. corneliomuelleri* Macbr; and *S. lycopersicum* L. The introgression/incorporation of these genetic factors from these distinct *Solanum* species into elite germplasm might be useful to expand the genetic basis and to allow the selection of multi-resistant tomato lines. The relatively large number of accessions with broad-spectrum *Tospovirus* resistance in *Solanum* (*Lycopersicon*) is in sharp contrast with the current situation reported in the genus *Capsicum* where only sources of TSWV-specific resistance (*Tsw* gene) have been found so far.