The route of Tomato Spotted Wilt Virus inside the thrips body in relation to transmission efficiency

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Abstract: The route of T*omato spotted wilt tospovirus* (TSWV) in the body of its vectors, *Frankliniella occidentalis* and *Thrips tabaci* (Thysanoptera: Thripidae), was studied during the development of the thrips. The virus presence was related to the transmission efficiency. An *F. occidentalis* population from Mango in Israel, and a *T. tabaci* population from Greece were used. The rate of transmission was determined by allowing inoculation access feeding of adults on *Emilia sonchifolia* leaf disks. First instar larvae acquired the BR-01 TSWV isolate from mechanically infected *Datura stramonium* plants for 24 h, starting immediately when they hatched from eggs. Thrips were dissected at intervals of 24 h after the acquisition access period (AAP), and assayed by the whole mount immuno-fluorescent staining technique to record/monitor infection of the gut and salivary glands by TSWV. Polyclonal antibodies against the TSWV nucleocapsid protein were used in all assays. The virus was initially detected in the proximal midgut (MG1) and foregut regions. Later, the virus was also detected in the second and third midgut (MG2 and MG3) regions and salivary glands. A good match was found in both thrips populations between the percentages of the second instar larvae and adults with at least one infected salivary gland, and the percentage of transmitting adults. These results support the theory, that the virus must reach the salivary glands of the thrips during its larval stage in order to be transmittable by larvae and adults.