

***Pelargonium zonate spot virus* Is Transmitted via Seed and Pollen in Tomato**

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In autumn 2007, a new disease with unknown etiology was observed in open-field tomato (*Solanum lycopersicum*) in the Lachish region of Israel. The symptoms included mild mosaic, leaf malformation, and severe stunting of the plants. The causal agent was readily transmitted mechanically from the sap of infected plants to indicator plants. Using electron microscopy, spherical particles, 25-30 nm in diameter were observed. Viral particles were purified from infected plants and cDNA was synthesized from RNA isolated from the particles. Cloning and sequencing of the cDNA showed 95% identity to RNA 3 of *Pelargonium zonate spot virus* (PZSV). The virus is transmitted mechanically to a wide host range, which on top of tomato plants includes pepper (*Capsicum annuum*), melon (*Cucumis melo*), cucumber (*Cucumis sativas*), *Nicotiana benthamiana*, *N. glutinosa*, *N. tabacum* and others. Using reverse-transcription polymerase chain reaction, PZSV was detected in both seed and pollen grains of infected tomato plants. Attempts to disinfect seed by using hydrochloric acid and trisodium phosphate failed to eliminate this PZSV detection. Seed from infected tomato plants gave rise to infected seedlings with a seed-transmission rate of PZSV of 11 to 29%. Pollen grains collected from flowers of infected plants were used to hand pollinate healthy mother tomato plants. Although none of the pollinated mother plants became infected with PZSV, 29% of the seedlings produced from seed harvested from these plants were found to be infected. This is the first demonstration that PZSV is transmitted vertically via both pollen and seed in tomato plants.