



First report of resistance breaking strain of *Tomato spotted wilt virus* (*Tospovirus*; *Bunyaviridae*) on resistant sweetpepper cultivars in Turkey

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Tomato spotted wilt virus (TSWV) is one of the most devastating viruses worldwide on *Capsicum* peppers (*Capsicum annuum*). The virus is very common on sweet pepper and tomato in Samsun province of Turkey. The use of *Capsicum* pepper cultivars possessing the *Tsw* resistance gene is the most efficient method to control the virus in pepper crops. In 2013, a greenhouse-grown sweet pepper variety known to be resistant to TSWV showed typical virus-like symptoms in Carsamba district of Samsun province, which is one of the most important *Capsicum* pepper growing areas of Turkey. Samples were collected and tested using virus-specific polyclonal antiserum by DAS-ELISA. All *Capsicum* pepper samples were positive for TSWV, but negative for *Impatiens necrotic spot virus*, *Tomato chlorotic spot virus*, *Cucumber mosaic virus*, *Tobacco mosaic virus*, *Tomato mosaic virus*, *Pepper mild mottle virus*, *Potato virus Y* and *Alfalfa mosaic virus*.

The virus was isolated and propagated on *C. annuum* plants and used in mechanical inoculation of TSWV-resistant *C. chinense* (Accession No. PI159236), 10 different commercial TSWV-resistant *Capsicum* pepper cultivars and susceptible control *C. annuum* cv. Yolo Wonder plants (10 replicates of each). Resistant plants showed no necrotic spots on inoculated leaves, but systemic symptoms appeared four to seven days after sap-inoculation on non-inoculated leaves. The plants of resistant pepper cultivars and PI159236 displayed systemic symptoms similar to those of susceptible sweet pepper cv. Yolo Wonder. Interestingly, the mean absorbance values at 405 nm of PI159236 plants and resistant cultivars were higher than those of susceptible control plants in DAS-ELISA. RT-PCR was conducted to amplify the complete nucleocapsid gene (N) of TSWV isolate (SC3-RB) using gene-specific primers (Maiss *et al.*, 1991). A PCR product of 809 bp was sequenced and deposited in GenBank (Accession No. KM379141). Nucleotide comparison of the nucleocapsid gene of the isolate SC3-RB with homologue sequences of TSWV isolates in GenBank showed 99% and 97% identity with the other resistance breaking isolates from *Capsicum* pepper such as P170RB (DQ431238) in Italy and RB (AY598831) from Spain, respectively. Resistance-breaking strains of TSWV on *Capsicum* pepper have previously been reported in Louisiana

state of the USA (Hobbs *et al.*, 1994), Italy (Roggero *et al.*, 2002), Spain (Margaria *et al.*, 2004), Australia (Sharman & Persley, 2006) and Hungary (Gabor *et al.*, 2012). The current study showed that the isolate SC3-RB was able to overcome the *Tsw* resistance gene on sweet pepper both in field and laboratory conditions. To our knowledge this is the first report of resistance breaking TSWV strain on sweet pepper in Turkey.

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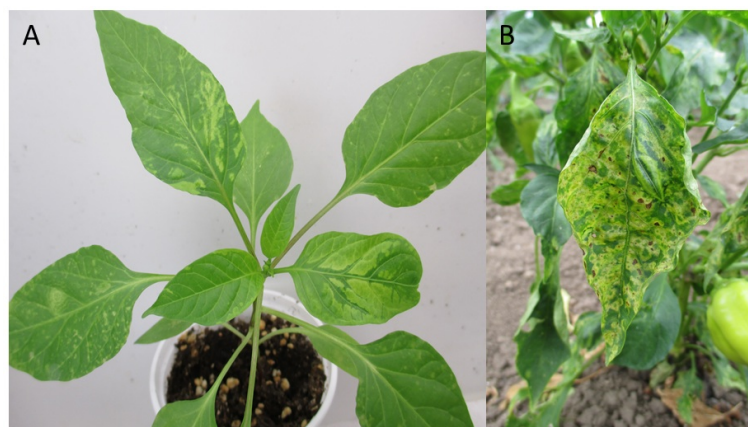


Figure 1

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