



First report of tomato spotted wilt virus in *Argyranthemum frutescens* in China

Yan Liang¹ · Chen-Qing Yuan¹ · Li-Fang Li¹

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Argyranthemum frutescens, a member of Asteraceae family, is a popular ornamental plant grown in public parks. In December 2018, 5% to 10% of plants, grown in a glasshouse in Shunyi District, Beijing, China, showed virus-like symptoms, such as yellowing, mottling and internode shortening. Leaves collected from six symptomatic plants were tested for several common viruses that infect ornamental plants including cucumber mosaic virus (CMV), tobacco mosaic virus (TMV), tomato spotted wilt virus (TSWV), and Impatiens necrotic spot virus (INSV) by DAS-ELISA (Agdia). Among the naturally infected *A. frutescens* plants, only TSWV was detected while CMV, TMV and INSV were not. To further confirm the TSWV infection, RT-PCR was performed using the following specific primers (Yin et al. 2013; TSWV-L-F: 5'-ACTGCCATAGGACTTTTGACC-3', TSWV-L-R: 5'-ACGGCTCTATAGGAGAGGTC-3'; TSWV-M-F: 5'-AGGGCTAGTGATGCTTACAG-3', TSWV-M-R: 5'-TCACAATTGCCCTGAGTTC-3') designed to amplify portions of TSWV genome segments. As a result, 680 bp, 863 bp and 650 bp products of the TSWV L RNA, M RNA and S RNA genome segments, respectively, were detected from all diseased samples, which were then cloned and sequenced. BLASTn analyses revealed that the partial RdRp gene sequence (MK936047) of TSWV-L RNA had the highest nucleotide similarity of 94–99% with isolates from different hosts in Beijing (MK433644), Spain (KP008130), Italy (KJ575619; MH763621). The TSWV-M fragment sequences (MK936048) obtained from GenBank database showed a 96%–99% similarity with isolates from different hosts in South Korea (KC261948; KC261963) and Spain (KP008133; AY744493). The TSWV-S fragment (MK693040) was 97%–99% identical to that of tomato and

pepper isolates from Spain (AY744479–80; DQ376184–85), pepper isolates from Italy (DQ915946; HQ839729–30), and various plants isolates from USA (KU179513–15; AY744468–75). At the amino acid level, RdRp protein (L RNA) showed 100% identity with the same Beijing isolate (QED87911). Glycoprotein precursor protein (M RNA) was 99% identical to a South Korea isolate (AGM53757). Nucleocapsid protein (S RNA) showed a 99% similarity with a Spain isolate (AAU95401). TSWV is one of the top ten plant viruses which leads to huge economic losses (Rybicki 2015) and although it is known to infect other hosts in China hosts it was not previously reported in *A. frutescens*. To our knowledge, this is the first report of TSWV infections in *A. frutescens* in China.

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✉ Li-Fang Li
371094901@qq.com

¹ Beijing Florascape Co., Ltd., Beijing, China