First report of tomato spotted wilt orthotospovirus infection of tamarillo in China

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Received: 7 March 2021 / Accepted: 15 April 2021 / Published online: 26 April 2021
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Keywords TSWV · Tamarillo · Yunnan

Tamarillo (*Solanum betaceum*), previously known as “tree tomato”, a semi-woody evergreen shrub native to temperate regions of South America, is now cultivated in Colombia, Ecuador, New Zealand, Australia, USA, central Africa, India, and provinces of Yunnan and Tibet in China (Villegas et al. 2017). In 2017, symptoms of foliar yellowing, ring spot and vein distortion were observed on two tamarillo plants in Kunming, Yunnan Province. The diseased leaves were initially pooled into one sample and sent to Vazyme Biotech Co., Ltd (Nanjing, China) for total RNA extraction and NGS RNA-Seq sequencing on the Illumina HiSeq X-ten platform with PE150 bp. A total of 65,174,180 paired-end reads were obtained by the CLC Genomic Workbench 9.5 (QIAGEN) analyzing and 115,106 contigs (200 to 30,229 bp) were generated by *de novo* assembly. Blast search in GenBank virus database revealed that tomato spotted wilt orthotospovirus (TSWV) may be the tamarillo pathogen for three larger contigs 8909 nt, 4765 nt and 2970 nt in length (GenBank accession numbers: MW404243, MW404244 and MW404245), shared the highest nucleotide sequence identities of 99% with TSWV, i.e., to segment L (MN833247), segment M (MN870627) and segment S (HQ402595), respectively. To verify the presence of TSWV in the field plants, total nucleic acids were extracted from the two original samples using a CTAB-based method (Li et al. 2008) and used as templates in RT-PCR, in which a specific primer pair TSWVdF (TGATAAGTAGAT

AGAGAGCAAGC) and TSWVdR (TGAAGTGATAGC TCATGGACC) was designed according to the TSWV 4765 nt contig from NGS. An amplicon of approximately 504 bp was obtained from both of the tamarillo samples, and one of them, YKM-SFQ1, was selected for cloning and sequencing. BLAST search of the obtained sequence (MW143065) revealed that it shared the highest identity of 99.01% with the segment M of TSWV from China (MG878874). The two samples were also tested by dot-blot ELISA using antisera against TSWV. Both of the samples reacted with the TSWV antibody and further confirmed that TSWV was the causal agent of the diseased tamarillo. To our knowledge, this is the first report of natural infection of TSWV in tamarillo in China.

Declarations

Ethical statement This article does not contain any studies with human participants or animals.

Conflict of interest All authors declare that they have no conflict of interests.

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