

Diseases Caused by Viruses

Strongylocodon macrobotrys: New Host of Soybean Mosaic Virus in Brazil

Viviana M. Camelo-García, Arnaldo Esquivel-Fariña, Camila G. Ferro, Elliot W. Kitajima,[†] and Jorge A. M. Rezende

Departamento de Fitopatologia e Nematologia, Universidade de São Paulo, Piracicaba, Brazil

Funding: Funding was provided by Fundação de Amparo à Pesquisa do Estado de São Paulo (2017/18910-4). Plant Dis. 105:1573, 2021; published online as <https://doi.org/10.1094/PDIS-07-20-1607-PDN>. Accepted for publication 9 January 2021.

Strongylocodon macrobotrys, commonly known as the jade vine, emerald vine, or turquoise jade vine, is a species of Fabaceae native to the Philippines. The plants have blue-green inflorescences, making them one of the most admired ornamental plants in Brazil (Muniz et al. 2015). In addition, the plants contain compounds with anticancer properties (Ragasa et al. 2014). In March 2019, an adult jade plant, grown under the trellis system in an experimental area at the campus of the University of São Paulo, Piracicaba, state of São Paulo, was found showing mosaic symptoms typical of a virus infection. Preliminary examination of negatively stained leaf extracts by transmission electron microscopy detected elongated, flexuous particles like those of a potyvirus. Further observations of thin sections of symptomatic leaf tissues revealed the presence of cylindrical inclusions as well as bundles of thin, elongated, and filamentous particles, typical of potyvirus infection in epidermal, parenchymal, and vascular regions. To identify the species of the virus, total RNA was extracted from a pool of symptomatic leaves from the plant using the PureLink viral RNA/DNA kit (Thermo Fisher Scientific) and analyzed by one-step reverse transcription polymerase chain reaction (RT-PCR) using potyvirus universal primers PV1/SP6 and WCIEN-sense (Maciel et al. 2011; Mackenzie et al. 1998), which amplify a 750-bp fragment. Total RNA extracted from an asymptomatic jade vine, obtained from a florist shop, was included in the assay. PCR products at the expected size (~750-bp) were observed in the symptomatic plant but not in the asymptomatic plant. BLASTn analysis of the nucleotide sequence of the amplicon (GenBank accession no. MN970030) showed that it shares 97.9% identity with the Korean isolate WS162 of soybean mosaic virus (SMV, accession no. FJ640973). Extracts

from symptomatic leaves of the jade plant were mechanically inoculated onto leaves of healthy plants of jade vine, jack bean (*Canavalia ensiformis*), soybean cultivar NA 5909 (*Glycine max*), cowpea (*Vigna unguiculata*), and passion fruit (*Passiflora edulis* f. *flavicarpa*). One jade plant and four plants of each other species were inoculated and were monitored for symptom expression. The jade vine and jack bean plants developed mild mosaic symptoms approximately 60 and 15 days after inoculation, respectively, whereas the plants of other species were absent of any visible symptoms. Conventional RT-PCR with SMV-specific primer pairs CP-F-SMV/CP-R-SMV (Jaramillo Mesa et al. 2018) and SMV-CPf/SMV-CPr (Wang and Ghabrial 2002), which amplify fragments of 990 and 469 bp, respectively, from the CP gene of SMV, was performed. Amplicons of expected sizes were obtained from the field-infected and the mechanically inoculated plant of jade vine as well as the jack bean plants, but not from the asymptomatic jade vine and plants of other species. BLASTn analysis of nucleotide sequences of the amplicons showed that they share 96.8 and 97.6% identity, respectively, with the SMV isolate WS162. These results demonstrate that the field-symptomatic jade vine was infected with SMV, which is naturally transmitted by aphids in a nonpersistent manner and via infected soybean seeds (Hajimorad et al. 2018). The virus appears to have a narrow natural host range, and to date, it has only been reported in soybean, *Lagenaria siceraria*, *Passiflora* spp., *Pinellia ternata*, *Senna occidentalis*, and *Vigna angularis* (Almeida et al. 2002; Chakraborty et al. 2016; Hajimorad et al. 2018). To our knowledge, this is the first report of SMV in *S. macrobotrys* in the world. Further surveys are necessary to determine the incidence of the virus in ornamental jade vines and its importance as a virus reservoir for commercial soybean crops.

References:

- Almeida, A. M. R., et al. 2002. Fitopatol. Bras. 27:151.
Chakraborty, P., et al. 2016. Plant Dis. 100:1509.
Hajimorad, M. R., et al. 2018. Mol. Plant Pathol. 19:1563.
Jaramillo Mesa, H., et al. 2018. Arch. Phytopathol. Plant Prot. 51:617.
Maciel, S. C., et al. 2011. Sci. Agric. 68:687.
Mackenzie, A. M., et al. 1998. Arch. Virol. 143:903.
Muniz, F. R., et al. 2015. Ornament. Horticult. (Campinas) 21:363.
Ragasa, C. Y., et al. 2014. Pharma Chem. 6:366.
Wang, R. Y., and Ghabrial, S. A. 2002. Plant Dis. 86:1260.

The author(s) declare no conflict of interest.

e-Xtra

Keywords: jade vine, potyvirus, diagnosis

[†]Indicates the corresponding author.
E. W. Kitajima; ewkitaji@usp.br