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DISEASE NOTE

Detection of the papaya strain of papaya ringspot virus (PRSV-P) in Paraguay

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In several Paraguay regions, papaya trees (*Carica papaya*) occur naturally in particular gardens and public spaces. Although PRSV-like symptoms have been frequently observed in papaya trees in Paraguay, no formal description of PRSV is available. In November 2020, papaya trees showing symptoms of leaf size reduction, yellow and severe mosaic, and shoe stringing, as well as ringspots on the fruits were found in Asunción Central department. To confirm that the disease is being caused by PRSV-P total RNA was extracted from two symptomatic plants using the PureLink viral RNA/DNA kit (Thermo Fisher Scientific). RT-PCR was performed using degenerate primers CIFor (5'-GGIVVIGTIGGIWSIGGIAARTCIAC -3') and CIRev (5'-ACI CCRTTYTCDATDATRTTIGTIGC -3'), which amplify a 700-bp genomic fragment within the cylindrical inclusion-coding region of most potyviral genomes (Ha et al. 2008). Obtained amplicons were purified and directly sequenced in both directions at Macrogen Inc. The consensus nucleotide sequences were obtained using the Electropherogram quality analysis program (http://asparagin.cenargen.embrapa.br/phph/). Blast analysis of resulted nucleotide sequence (GenBank accession No. MW656180) shared 96% (coverage: 100%) identity with corresponding nucleotide sequences of isolates of PRSV. An additional evidence for PRSV-P infection of these plants was made by transmission electron microscope examination of sections from symptomatic leaves, which indicated the presence of cylindrical inclusions, typical of potyvirus infection in the cytoplasm of many epidermal and parenchymal cells. Also, symptomatic papaya leaf samples were collected from several locations in the cities of Asunción (n = 2), Fernando de la Mora (n = 1) and San Lorenzo (n = 1). Central department samples were mechanically inoculated on two healthy papaya seedlings, respectively. Typical PRSV symptoms developed in all inoculated plants. Extracts of collected and inoculated symptomatic papaya leaves reacted positively in a PTA-ELISA assay using specific PRSV antiserum produced at the University of São Paulo. Two significant types of PRSV can be distinguished by host specificity, the papaya-infecting type-P (PRSV-P), which infects papaya and plants of several cucurbit species, and the non-papaya-infecting type-W, known as watermelon strain, (PRSV-W), which infects only cucurbits. The latter was recently detected infecting plants of *Cucurbita maxima* in Paraguay (Esquivel-Fariña et al. 2020). As far as we know, this is the first description of the papaya-infecting type-P of PRSV in Paraguay. A survey of papaya-producing regions is encouraged to determine the incidence, distribution, and damage induced by this virus to papaya crops in the country.

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