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DISEASE NOTES

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First Report of Tomato Chlorosis Virus Infecting *Tectona grandis* Associated With Infestation of *Bemisia tabaci* Mediterranean in Central Brazil

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The commercial production of teak (*Tectona grandis* L. f., family Lamiaceae) has been increasing in Brazil due to the adaptation of this timber species to the predominant environmental conditions. Symptoms of interveinal yellowing in older leaves similar to that induced by species of the genus *Crinivirus* (family *Closteroviridae*) were observed (≈90% incidence) in 100-day-old teak seedlings in one orchard in Brasília–DF in 2018. Moreover, a severe whitefly infestation was observed in association with these symptomatic plants. Fifteen leaf samples collected at random from distinct symptomatic plants were tested for the presence of tomato chlorosis virus (ToCV) and tomato infectious chlorosis virus (TICV), two criniviruses reported infecting a wide range of crops in Brazil (Fonseca et al. 2016). Leaf samples from asymptomatic teak plants (*n* = 10) were also collected and employed as negative controls. Total RNA extraction was performed using TRIzol reagent (Thermo Fisher

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assays were conducted using the universal primer pair HS-11/HS-12 (which amplifies a 587-bp RNA-2 segment encompassing the HSP70h protein gene), followed by a nested-PCR performed with the primer pair ToCV- (ToC-5/ToC-6) and TICV-specific primers (TIC-3/TIC-4) (**Dovas et al. 2002**). All 15 symptomatic teak samples were positive only for ToCV (≈463-bp amplicons). PCR product from one randomly selected sample was directly sequenced. The obtained sequence (GenBank MH688047) displayed 99.7% identity with the equivalent sequence of a tomato-infecting ToCV isolate reported in Brazil (EU868927). Five symptomatic samples were also positive in dot-blot hybridization assays using a coat protein-derived RNA probe (436-nt fragment of RNA-2; primers MA-380/MA-381) (**Fortes et al. 2012**) labeled with digoxigenin (DIG)-11-UTP and with the chemiluminescent substrate CDP Star kit (Roche Diagnostics). Total DNA extraction and PCR assays were also conducted using pooled (three pools of *n* = 10 each) whitefly samples collected on symptomatic teak plants. A segment of the mitochondrial cytochrome oxidase I gene (mtCOI) was amplified using the specific primers C1-J-2195-FW and L2-N-3014- RV (**Simon et al. 1994**), yielding ≈860 bp amplicons. Direct sequencing of three amplicons obtained from the whitefly samples (MH688048) indicated high identity (99%) to *B. tabaci* Mediterranean (MED) species (= Q biotype). ToCV-transmission assays were performed using *B. tabaci* MED adults. Thirty viruliferous whiteflies derived from healthy whiteflies fed on ToCV-infected teak plants were confined in separated cages with healthy teak (*n* = 6) and tomato cv. Santa Clara (*n* = 6) seedlings. Aviruliferous whiteflies were also confined to healthy teak (*n* = 6) and tomato (*n* = 6) plants (negative controls). After 72 h, the whiteflies were eliminated by insecticide spraying. Thirty days after the feeding access period, only teak and tomato plants exposed to viruliferous *B. tabaci* MED exhibited crinivirus-like symptoms and were positive to ToCV in RT-PCR assays. To our knowledge, this is the first report of *T. grandis* as a host of ToCV as well as the first report of virus infection in this woody plant in Brazil. The introduction of *B. tabaci* MED into southern Brazil was recently reported (**de Moraes et al. 2017**). Our results also confirm the presence of *B. tabaci* MED in central Brazil and its association with ToCV infection of *T. grandis* seedlings. Although expressing overall mild symptoms, the potential negative effects of ToCV in teak plants need to be investigated in more detail.

The author(s) declare no conflict of interest.

Funding: Conselho Nacional de Desenvolvimento Científico e Tecnológico, Coordenação de Aperfeiçoamento de Pessoal de Nível Superior.

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