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DISEASE NOTES

First Report of Yerba Mate Wilt Caused by *Ceratocystis fimbriata* in Brazil

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Yerba mate (*Ilex paraguariensis* St. Hil.) is a native South American tree species cultivated in Argentina, Uruguay, Brazil, and Paraguay and used to prepare a caffeine-rich infused drink called mate or chimarrão. Since 2016, up to 5% mortality of plants has been reported in commercial plantations at São Mateus do Sul and Arvorezinha in the states of Paraná (PR) and Rio Grande do Sul (RS), respectively. The death of the plants was noticed in plants of different ages after wilting of the leaves. Stem cross sections of symptomatic plants showed radial darkening. Fungal isolates were collected from internal darkened stem-base sections and grown in potato dextrose agar medium (PDA). The isolates were characterized using DNA sequencing and morphological analysis. Ten fungal colonies of a *Ceratocystis* sp. were obtained and deposited in the fungal collection of Embrapa Florestas, Colombo (PR), Brazil. These isolates produced ascomatal bases that were submerged in the agar. Bases were globose, dark, 110 to 218 µm wide, 108 to 582 µm long, and had straight necks terminating in ostiolar hyphae that were divergent, hyaline, and 18.5 to 55 µm long. Asci were not seen. Ascospores were hyaline and ovoid, with a hat-shaped 3.0 to 5.0 × 2.0 to 4.0 µm. Endoconidiophores were wider at the base and tapered toward the apex; were 20 to 59 µm long and 3 to 6 µm wide at the apex; and produced cylindrical, straight, hyaline to pale brown, aseptate conidia (8.5 to 18 × 2 to 3.7 µm). Endoconidiophore-producing doliform conidia were not seen. All isolates produced dark brown, 9 to 12 × 6 to 10 µm aleurioconidia. The internal transcribed spacer (ITS) region of ribosomal DNA and the mating type locus (MAT1-1-2) were sequenced using polymerase chain reaction products from three isolates (C1, C4, and C8) according to Ferreira et al. (2017). Phylogenetic trees were generated using maximum parsimony. Phylogenetic analyses of the DNA sequences of the ITS (accession no. MH221142) and MAT1-1-2 (MH221143) grouped the yerba mate isolates together with PM20 with 75 and 98% bootstrap support, respectively. Intraspecific relationships among *Ceratocystis fimbriata*

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ITS showed that three isolates of this study belonged to the Latin American Clade and corresponded to the PM20 MAT1-1-2 sequence (MF347680). The fungus was first reported in RS in 2003 in *Acacia mearnsii* (dos Santos and Ferreira 2003). Pathogenicity of two isolates was evaluated by inoculating (incision) the stem of 10, 6-month-old plants 2 cm above the soil surface. A PDA disk with active mycelium (12 days old) was inserted (between the bark and the wood) and the incision covered with tape. The control consisted of plants inoculated with a sterile PDA disk without fungal mycelium. The material was kept in a greenhouse for 60 days. The presence or absence of wilting symptoms was recorded during the experiment. The experiment was conducted twice. The plants started to wilt at 14 days after inoculation (DAI), when 10% of the plants showed symptoms; then, at 60 DAI, all inoculated plants were dead. *C. fimbriata* was reisolated from infected plants, fulfilling Koch's postulates. This finding contributes to understanding the diversity of this pathogen in the region where other hosts occur, such as kiwifruit. It also confirms the presence of cryptic species in RS. However, host range and interfertility studies are needed to reveal new species (Harrington et al. 2014). This is the first report of *C. fimbriata* causing wilt in yerba mate in the world.

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