Diseases Caused by Fungi and Fungus-Like Organisms

First Report of Root Rot on *Manglietia decidua* Caused by *Calonectria ilicicola* in China

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Manglietia decidua (Magnoliaceae) is a class I endangered plant in China. During 2018 to 2020, a severe root rot (about 10 to 90% disease incidence) was observed on 2-year-old seedlings in a nursery in Yichun, Jiangxi province (N27°52'20"; E114°27'46"). Symptoms started with leaves showing dehydration and chlorosis, then roots of diseased plants became black and rotted, and, in severe cases, the plants withered and died. Symptomatic root tissues were cut and dipped in a 3% hydrogen peroxide solution for 5 min, rinsed thrice with sterile water, and placed on potato glucose agar medium containing ampicillin (50 mg/liter). The plates were kept in an incubator at 25 to 28°C for 2 to 3 days in the dark. A *Calonectria*-like fungus was isolated from 100% of tissues and the colonies were feathery, moderate white aerial mycelium, surface pale brown, reverse with white outer margin, and brown inner region. The perithecia produced on carnation leaf agar were solitary, subglobose to ovoid, dark red-brown, and measured 273.8 to 427.2 × 362.6 to 628.9 μm (average 360.9 × 429.9 μm) ($n = 31$). Clavate asci contained eight spores and tapered into a long, thin stalk. Ascospores were hyaline, guttulate, straight to slightly curved with rounded ends, 36.8 to 66.1 × 4.4 to 7.3 μm (average 49.9 × 5.9 μm) ($n = 52$), 1-septate, constricted at the septum and aggregated in the upper third of the ascus. On PDA, conidia

formed on penicillate conidiophores within 10 days were hyaline, typically 1-septate but sometimes up to 3-septate, cylindrical, rounded at both ends, straight, 36.5 to 61.7 × 5.0 to 7.2 μm (average 50.7 × 6.2 μm) ($n = 48$). Isolates HML 20 and 27 were used to further confirm species identity by analysis of five loci: ITS (MZ389092 and MZ389093), ACT (MZ398252 and MZ398253), HIS3 (MZ398254 and MZ398255), TEF1-α (MZ398256 and MZ398257), and TUB2 (MZ398258 and MZ398259). NCBI BLASTn showed high sequence identity with *Calonectria ilicicola* ex-type culture CBS 190.50 (CMW 30998) (Liu et al. 2020): 100% for ITS (MT359727), TUB2 (AY725631), and HIS3 (MT335506); 99.22% for ACT (MT335036); and 99.80% for TEF1-α (MT412797). Maximum likelihood analysis and Bayesian inference based on the combined ITS, tub2, his3, and tef1 sequence using RAxML v.1.0.0 and MrBayes v. 3.2.1 software revealed that isolates HML 20 and 27 clustered together with *C. ilicicola* strains in the *C. kyotensis* species complex. Thus, the fungus was identified as *C. ilicicola* (anamorph: *Cylindrocladium parasiticum*) based on morpho-molecular criteria (Lombard et al. 2010). Pathogenicity was determined under greenhouse conditions (25 to 30°C). Two-year-old plants grown in 25-cm pots for 20 days were inoculated. Five 6-mm mycelial plugs from a 7-day culture on PDA were buried 5 cm under the soil adjacent to the unwounded taproot of each plant and the plants were watered regularly to keep the soil moisture content at about 15%. After 10 days, inoculated plants began to show chlorosis symptoms on leaves, and they collapsed within 15 to 20 days. No symptoms were observed on control plants. The same colonial fungus was successfully reisolated. *C. ilicicola* is an economically important plant pathogen worldwide, and causes diseases on species including *Arachis hypogaea*, *Cinnamomum kanehirae*, *Glycine max*, *Medicago sativa*, *Sassafras randaiense*, and *Vaccinium* spp. in China (Fei et al. 2018; Gai et al. 2017; Zhang et al. 2020). As far as we know, this is the first report of *C. ilicicola* causing root rot on *M. decidua*. At present, this disease is an important threat to the conservation of *M. decidua*.

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