Diseases Caused by Fungi and Fungus-Like Organisms

First Report of Mochi Tree (*Ilex integra*) Anthracnose Caused by *Colletotrichum fioriniae* in Korea

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Ilex integra, also called mochi tree, is a woody ornamental common in Asia, particularly in Korea, China, Japan, and Taiwan. Anthracnose, caused by *Colletotrichum* spp., is an economically important disease worldwide, affecting both fruit and seed quality. In April 2019, symptoms of anthracnose were observed on leaves from several mochi trees in an urban planting in Wando-gun, South Korea. Irregularly shaped, light-to-dark brown spots of 1 to 4 mm were observed on young leaves. The lesions coalesced as each spot enlarged, and flat and black fruiting bodies (acervuli) occurred on the brown lesions. Four symptomatic leaves were collected; fractions were cut from symptomatic tissue, including healthy tissue, were disinfected with 1% sodium hypochlorite and 70% ethanol, and were placed on potato dextrose agar. After dark incubation at 25°C for 7 days, two isolates were obtained; the fungal colonies appeared as white to light gray mycelium, becoming dark and orange to pink on the underside. After acervuli were produced on the plate, orange-red conidial masses erupted. Conidia observed from two isolates were hyaline, one-celled, and oblong with round to acute apices, and they measured 7 to 12 × 2 to 5 µm (mean ± SD: 9.29 ± 2.26 × 3.68 ± 1.31 µm) ($n = 30$). Genomic DNA was extracted, and multilocus sequencing was performed with one representative isolate using the internal transcribed spacer (ITS) (White et al. 1990), actin (ACT) genes, chitin synthase 1 gene (CHS-1) (Carbone and Kohn 1999), glyceraldehyde-3-phosphate dehydrogenase (GAPDH), and calmodulin (CAL) (Weir et al. 2012) and submitted. BLAST search results showed that the isolate had 100, 98.45, 99.74, 100, and 100% nucleotide sequence identity with those of *Colletotrichum fioriniae* (MT607651, MH717601, MG666441, MN895544, and MN974144), respectively

(Jamin and Mateu 2008). The five sequences were deposited in NCBI GenBank (accession nos. MT457472, MT465884, MT465885, MT465886, and MT465887), which were assigned to ITS, ACT, CHS-1, GAPDH, and CAL regions, respectively. Based on the morphology (Shivas and Tan 2009) and molecular characterization (Guerber et al. 2003), the isolate was identified as *C. fioriniae*. To confirm pathogenicity, a conidial suspension (10^6 conidia/ml) of the sequenced isolate was used to inoculate young and mature leaves of a 4-year-old mochi tree. Ten leaves of the seedling were disinfected with 70% ethanol and then were wounded with a toothpick. The conidial suspension (20 µl) was placed on the wound. The inoculated plant and control plants were tested with sterilized water and incubated at 25°C in a moist chamber. The pathogenicity test was repeated three times. Typical spots were observed on the young leaves 2 days after inoculation, whereas they were observed on the mature leaves 7 days after inoculation. Acervuli developed on both young and mature leaves 5 and 20 days after treatment, respectively. The control plants did not show symptoms, and the fungus was reisolated from the inoculated plant, thus fulfilling Koch's postulates. In Korea, *C. fioriniae* has been recorded as a pathogen of fruit (apple, eggplant, and peach), but this is the first report of the fungus causing anthracnose on mochi tree. The pathogen has been reported on leaves of a different *Ilex* species in the eastern United States (Farr and Rossman 2020). Although this new disease of *I. integra* is limited occurrence, *C. fioriniae* may be able to infect other plant species in South Korea.

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