Diseases Caused by Fungi and Fungus-Like Organisms

First Report of *Colletotrichum karstii* Causing Anthracnose on Strawberry in Brazil

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Strawberry (*Fragaria × ananassa* Duch.) is one of the most important fruit crops worldwide. With increasing cultivated area in the last decades, Brazil has become the largest strawberry producer in South America. Anthracnose caused by *Colletotrichum* spp. has been considered one of the most destructive diseases in Brazil. In May 2019, irregular and circular dark brown leaf spots sometimes associated with chlorosis and petiole necrosis were observed on strawberry plants (cv. Pircinque) organically cultivated in Santa Catarina state, Brazil (27°45'40"S, 49°59'06"W). The *Colletotrichum* isolate was obtained from leaf tissue, and a monosporic culture was grown on potato dextrose agar at 25°C and a 12-h photoperiod under near ultraviolet light. Colonies at the age of 15 days showed upper surface color varying from white to orange and the reverse side grayish to orange. Conidia were hyaline, cylindrical with rounded ends, 13.9 to 9.2 × 4.2 to 6.7 µm ($\bar{x}$ = 11.3 × 5.2, n = 100). Perithecia were produced in vitro, and their diameter ranged from 265.2 to 142.5 µm ($\bar{x}$ = 198.4). Asci were 47.3 to 39.9 × 5.2 to 7.2 µm ($\bar{x}$ = 42.8 × 5.9, n = 50), and ascospores 12.6 to 8.1 × 4.3 to 2.1 µm ($\bar{x}$ = 10.3 × 2.9, n = 100). To confirm pathogenicity, 90-day-old plants of strawberry (cv. Pircinque) were inoculated by spraying a suspension of 1×10^6 conidia/ml, incubated in a moist chamber in the dark for 48 h, and then kept in a greenhouse for further 30 days. Plants sprayed with sterile distilled water served as a control. Additionally, detached leaves

were inoculated with six drops of 10 µl (1×10^6 conidia/ml) onto the abaxial surface and incubated in a moist chamber at 25°C and 12-h photoperiod for 15 days. Inoculated plants exhibited the first symptoms in both leaves and petioles at 15 days after inoculation (dai). On leaves, irregular and circular dark brown spots evolved to necrotic lesions and were frequently surrounded by chlorotic halos. On petioles, lesions were reddish-brown, elongated, and depressed. Typical anthracnose symptoms on fruits at 6 dai showed as circular, slightly sunken lesions that enlarged over time and produced an abundant orange mucilaginous mass of acervuli and conidia, and after 20 days, fruits became mummified. In the detached-leaf assay, symptoms appeared at 7 dai with the presence of circular dark brown lesions measuring 1 to 15 mm and then evolved to necrosis. The same pathogen was consistently reisolated from the inoculated leaves, petioles, and fruits and was confirmed by morphological characterization and molecular assays as described in this note. A representative isolate (MANE189) was molecularly identified using genomic regions of actin, β -tubulin, calmodulin, glyceraldehyde-3-phosphate-dehydrogenase, glutamine synthetase, and the internal transcribed spacer. Nucleotide sequences exhibited 100% homology to the typical *Colletotrichum karstii* strains (CBS:127535, CBS:128500, and ML1792) and were deposited in the GenBank database (MW396420, MW396430, MW396460, MW396440, MW396450, and MW331606). This species belongs to the *C. boninense* species complex (Damm et al. 2012) and was previously reported causing anthracnose on strawberry leaves in Taiwan (Chung et al. 2020). To our knowledge, this is the first report of *C. karstii* causing anthracnose on strawberry in Brazil. The accurate identification of the pathogen will assist in disease management and resistance breeding.

References:

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