Diseases Caused by Fungi and Fungus-Like Organisms

First Report of *Colletotrichum chrysophilum* Causing Cassava Anthracnose in Brazil

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Plant Dis. 105:1196, 2021; published online as <https://doi.org/10.1094/PDIS-09-20-1925-PDN>. Accepted for publication 15 November 2020.

Cassava (*Manihot esculenta* Crantz) has significant socioeconomic relevance in Brazil and other developing countries, as one of the main sources of carbohydrates for human and animal consumption (Oliveira et al. 2016). Among the cassava crop diseases, anthracnose is one of the main limiting factors for production and may be caused by species like *Colletotrichum plurivorum*, *C. karstii*, *C. fructicola*, and *C. siamense* (Bragança et al. 2016; Liu et al. 2019; Oliveira et al. 2016; Sangpueak et al. 2018). In 2019, we visited commercial cassava fields in 15 municipalities in the states of Pará and Tocantins. One hundred samples were collected from plants that exhibited typical foliar anthracnose symptoms. Lesions were dark brown spots of different sizes and irregular borders covering about 32% of foliar area. Symptomatic tissues were superficially disinfected, plated onto potato dextrose agar medium, and incubated at 25 ± 2°C for 7 days. A total of 56 isolates were used for morphological identification. Colonies were white and gray at the top and dark gray in the bottom with sector formation. Conidia were hyaline, cylindrical, and aseptate, 10.04 to 17.83 × 3.29 to 5.75 µm. These phenotypical characteristics were similar to those of *Colletotrichum gloeosporioides* sensu lato species (Weir et al. 2012). Genomic DNA was extracted from two representative isolates (UFT/Coll69

and UFT/Coll82), and the APN2/MAT-IGS, DNA lyase (Apn2), and glyceraldehyde-3-phosphate dehydrogenase-IGS (GAP2-IG) intergenic spacers were amplified and sequenced. The nucleotide sequences were deposited in GenBank (accession nos. MT409462, MT396231, MT759633, MT396239, MT396232, and MT800846). BLASTn showed 99 to 100% similarity with *Colletotrichum chrysophilum*. Maximum likelihood phylogenetic analysis grouped the isolates in the *C. chrysophilum* clade, with a high bootstrap value (98%). Based on phenotypical characteristics and the phylogenetic analysis, the isolates associated with *M. esculenta* anthracnose were identified as *C. chrysophilum*, with a frequency of 6.67% among *Colletotrichum* isolated from cassava leaves. Pathogenicity testing of representative isolates was carried out in three plants, three leaves per plant. Unwounded leaves were inoculated by spraying conidial suspension at 10⁶ conidia/ml. Plants were placed in a humid chamber at 25°C for 10 days. The negative control was represented by plants inoculated with sterile distilled water. Two days after inoculation, all inoculated leaves showed typical anthracnose symptoms. No symptoms were observed on the negative control. Colonies similar to *C. chrysophilum* were reisolated from the symptomatic cassava leaves, fulfilling Koch's postulates. *C. chrysophilum* was reported causing anthracnose in cashew (Veloso et al. 2018) and banana (Vieira et al. 2017) in Brazil. To our knowledge, this is the first report of *C. chrysophilum* causing cassava anthracnose worldwide.

References:

- Bragança, C. A. D., et al. 2016. Plant Dis. 100:857.
Liu, X., et al. 2019. J. Phytopathol. 167:1.
Oliveira, S. A. S., et al. 2016. Plant Dis. 100:2171.
Sangpueak, R., et al. 2018. J. Phytopathol. 166:129.
Veloso, J. S., et al. 2018. Fungal Biol. 122:677.
Vieira, W. A. S., et al. 2017. Mycologia 109:912.
Weir, B. S., et al. 2012. Stud. Mycol. 73:115.

The author(s) declare no conflict of interest.

Keywords: phylogenetic analysis, *Colletotrichum chrysophilum*, *Manihot esculenta*, anthracnose

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