Diseases Caused by Fungi and Fungus-Like Organisms

First Report of Postharvest Fruit Rot on Passion Fruit (*Passiflora edulis*) Caused by *Lasiodiplodia theobromae* in Mainland China

W. Zhang,[†] X. L. Niu, and J. Y. Yang

Lingnan Normal University, Zhanjiang, 524048, China

W. Zhang and X. L. Niu contributed equally to this work.

Funding: This research was financially supported by the National Nature Science Foundation of Guangdong Province (2020A1515010238), the Key Platform and Research Projects of Education Department of Guangdong Province (2019KZDXM06), and the Overseas Scholarship Program for Elite Young and Middle-aged Teachers of Lingnan Normal University. Plant Dis. 105:1198, 2021; published online as <https://doi.org/10.1094/PDIS-06-20-1346-PDN>. Accepted for publication 25 October 2020.

As an economically important tropical and subtropical fruit crop, passion fruit (*Passiflora edulis* Sims) is widely planted in many provinces of southern China. In April 2017, postharvest fruit rot was observed on 15 to 25% of passion fruit in several fruit markets of Zhanjiang City in Guangdong Province. Initial disease symptoms on infected fruit were irregular, brown, water-soaked lesions, which enlarged into large black and sunken patches. Lesions were usually covered with an abundance of little black dots (pycnidia) and black-gray hyphae. For pathogen isolation, 15 symptomatic fruit were randomly collected from three local markets. Fourteen single-spore fungal isolates with similar morphology were isolated from the infected tissues. Two isolates (ZW 49-1 and ZW 50-1) were randomly selected to further study. The colonies on potato dextrose agar (PDA) were initially greyish-white and became dark gray with age. Abundant globular and irregular pycnidia were observed after incubation at 25°C for 3 weeks. The conidia of the fungus were initially hyaline, unicellular, apex rounded, thick-walled, and ellipsoid, becoming dark brown, bicellular with longitudinal striations at maturity, $26.4 \pm 2.5 \times 13.4 \pm 1.2 \mu\text{m}$ ($n = 50$). The morphology of the fungus resembled *Lasiodiplodia*

theobromae (Pat.) Griff. & Maubl. (Phillips et al. 2013). To confirm species identification, the partial internal transcribed spacer (ITS) region of rDNA, translation elongation factor- α (EF1- α), and β -tubulin (TUB) gene were amplified from genomic DNA of the two isolates with the ITS1/ITS4, EF1-688F/EF1-986R, and Bt2a/Bt2b primers, respectively (Alves et al. 2008; Glass and Donaldson 1995; White et al. 1990). Based on BLASTn analysis, the ITS (MT644473, MT644474), EF1- α (MT649210, MT649211), and TUB (MT649212, MT649213) sequences of both isolates had 100, 99, and 100% similarity to the *L. theobromae* CBS 164.96 ex-type sequences in the NCBI database (AY640255, AY640258, and KU887532, respectively) (Phillips et al. 2013). For the pathogenicity test, asymptomatic passion fruit were previously disinfested in 0.5% sodium hypochlorite and superficially wounded with a sterile needle. Five-millimeter-diameter plugs with mycelia taken from 5-day-old PDA colonies were placed on the wounds. Sterile PDA plugs were used as negative controls. Each treatment had five replicates, and the test was repeated twice. Fruit were maintained in plastic boxes to keep at 25°C for 1 week. One week after inoculation, gray mycelia had covered a majority of the fruit surface and caused a black, sunken rot. The inoculated fungus was reisolated and confirmed as *L. theobromae* by morphological characteristics. The mock-inoculated fruit remained asymptomatic. The occurrence of fruit rot on passion fruit caused by *L. theobromae* was reported in Taiwan, China, recently (Huang et al. 2019). To our knowledge, this is the first report of *L. theobromae* causing postharvest fruit rot on passion fruit in the Chinese mainland.

References:

- Alves, A., et al. 2008. Fungal Divers. 23:1.
- Glass, N. L., and Donaldson, G. 1995. Appl. Environ. Microbiol. 61:1323.
- Huang, C. W., et al. 2019. J. Taiwan Agric. Res. 68:333.
- Phillips, A. J. L., et al. 2013. Stud. Mycol. 76:51.
- White, T. J., et al. 1990. Page 315 in: PCR Protocols: A Guide to Methods and Applications. Academic Press, San Diego, CA.

The author(s) declare no conflict of interest.

e-Xtra

Keywords: tropical plants, pathogen detection, fruit

[†]Indicates the corresponding author.

E-mail: W. Zhang; ldzw1987@163.com