Diseases Caused by Fungi and Fungus-Like Organisms

First Report of Blight on *Fritillaria thunbergii* Caused by *Fusarium oxysporum* in Zhejiang Province, China

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Fritillaria thunbergii Miq. (Zhe beimu) is one of the oldest known homeopathic traditional folk medicinal plants in Zhejiang Province, China. The bulbs are medicinally important, as they cure coughs, inflammation, gastric ulcers, hypertension, diarrhea, and bronchitis (Nile et al. 2021). In April of 2018 and 2019, symptoms of blight on *F. thunbergii* were observed with an incidence of 20 to 25% in Cixi city, Zhejiang Province. At the early stage of this disease, the stalk turned brown, and the whole bulb rotted within a few days. Symptomatic bulbs were cut into small pieces (1.0 × 1.0 cm) and disinfected successively by submersion in 75% ethanol for 30 s and 1% NaClO for 30 s under aseptic conditions. After rinsing with sterile water three times and air drying, segments were placed on potato dextrose agar (PDA). After incubation at 28°C for 7 days in the dark, the observed hyphae were white and fluffy and spread from the middle to the whole plate. Macroconidia were falciform with zero to four septa and 11.0 to 39.0 × 3.0 to 5.0 μm in size. Microconidia were fusiform with zero to two septa and 4.0 to 7.0 × 2.6 to 3.0 μm in size. Based on morphological characteristics of macroconidia and

microconidia, the isolates were identified as *Fusarium oxysporum* (Lombard et al. 2019). The internal transcribed spacer (ITS) region, translation elongation factor (*EF-1α*), and RNA polymerase second largest subunit (*RPB2*) gene were amplified and sequenced using ITS1/ITS4, EF1/EF2, and 5f2/7cr primers (O'Donnell et al. 2010), respectively. BLASTn analysis of *FUSARIUM*-ID using ITS (accession no. MZ268594), *EF-1α* (accession no. MZ292517), and *RPB2* (accession no. MZ292516) showed 95.2, 100, and 99.11% identity to *F. oxysporum* species complex isolates NRRL43730, NRRL38599, and NRRL38302, respectively. Based on the morphological and molecular characteristics, the pathogen was identified as *F. oxysporum*. To verify pathogenicity, 10 healthy *F. thunbergii* plants were used for inoculation tests. One milliliter per pot of a conidial suspension (10⁶ conidia ml⁻¹) was pipetted onto the soil around the base of *F. thunbergii* plants. Ten plants, which were treated with sterile water, were used as the control. All plants were maintained in a climatic chamber (26 ± 1°C, 70 to 80% relative humidity, and a photoperiod of 16:8 [L: D] h). Seven days later, all inoculated plants showed typical symptoms of blight identical to those observed in the fields. Control plants remained symptomless and healthy. The pathogenicity analysis was repeated three times. Pathogens reisolated from symptomatic plants were identified as *F. oxysporum* by morphological observation and sequence analysis. To our knowledge, this is the first report of blight caused by *F. oxysporum* on *F. thunbergii* in Zhejiang Province, China.

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The author(s) declare no conflict of interest.

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