Diseases Caused by Fungi and Fungus-Like Organisms

First Report of *Curvularia gladioli* Causing Leaf Spots on *Gladiolus gandavensis* in China

J. X. Zhang,¹ H. F. Shen,¹ X. M. Pu,¹ Q. Y. Yang,¹ D. Y. Sun,¹ B. R. Lin,^{1*} Y. Q. Zhang,² and F. Z. Wang²

¹Key Laboratory of New Techniques for Plant Protection in Guangdong, Institute of Plant Protection, Guangdong Academy of Agricultural Sciences, Guangzhou 510640, China

²Jiangmen Tianhe Agricultural Service Company Limited, Jiangmen 529222, China

Funding: Funding was provided by the Construction Project of Modern Agricultural Science and Technology Innovation Alliance of Guangdong Province, China (2020KJ112), and the Natural Science Foundation of Guangdong Province (2015A030312002). Plant Dis. 105:3753, 2021; published online as <https://doi.org/10.1094/PDIS-01-21-0016-PDN>. Accepted for publication 5 May 2021.

Gladiolus (*Gladiolus gandavensis* Van Houtte) is a perennial plant in the family Iridaceae, which shows sword-shaped leaves and spikes of brilliantly colored irregular flowers arising from corms. It is one of the most important fresh cut flowers and is widely cultivated worldwide, including in China. In September 2020, white pinpoints were first observed on gladiolus leaves in Jiangmen City, Guangdong Province, China. The white spots eventually turned brown. The lesions then developed into oval to circular spots, which were surrounded with an obvious yellow halo. The spots expanded and coalesced, causing leaf blight. These symptoms were observed on approximately 10% of gladiolus plants in fields measuring ca. 70 ha. Symptomatic leaves were sampled from fields, surface sterilized in 75% ethanol for 30 s, submerged in a 2% NaOCl solution for 10 min, and rinsed three times with sterile water. The samples were then cut into pieces (5 × 5 mm) and incubated for 4 days on potato dextrose agar (PDA) at 25°C. A representative fungal colony was subcultured onto new PDA and grown for another 7 days, and its mycelium appeared to be grayish-black and villiform. This strain was named as Cg_TS. Its conidiophores were simple, septate, cylindrical in shape, and moderate brown in color. They occurred singly or in groups. They were straight or slightly flexuous and ranged in size from 57.0 to 80.0 µm × 4.0 to

8.0 µm. Conidia were 3-distoseptate and curved at the third cell from the base. The third cell was swollen to one side and larger than other cells. These conidia ranged in size from 23.5 to 32.0 µm × 11.5 to 16.0 µm. These morphological characteristics were consistent with the description of *Curvularia gladioli* Boerema & Hamers (Boerema and Hamers 1989). Using primer pair ITS1 and ITS4, PCR was applied to amplify the internal transcribed spacer (ITS) region of rDNA. This sequence (GenBank accession no. MW426196.1) was subjected to BLAST in GenBank, suggesting that it was most similar to *C. gladioli* sequences LT631345.1 and HG778987.1, both with 99.49% similarity. To fulfill Koch's postulates, healthy 2-month-old gladiolus plants were used for pathogenicity testing, and the leaves were wounded by pressing slightly with a pipette tip. Mycelium disks (3 mm diameter) were applied onto wounded leaves of 10 plants. Another 10 healthy plants were inoculated with PDA disks that served as controls. Inoculated samples were placed in a greenhouse at 25°C and 90% relative humidity. After 3 days, brown leaf spots appeared on all of pathogen-inoculated leaves. The symptoms were consistent with those initially observed and *C. gladioli* was reisolated from the symptomatic tissue. Identification was confirmed by morphological observation and ITS sequencing. Control leaves remained symptomless. The *curvularia* fungus was firstly reported on gladiolus in Florida in 1947 and spread globally via infected corms (Torres et al. 2015). It was also reported to cause leaf spots on gladiolus in Brazil in 2013 (Torres et al. 2013). Although *C. gladioli* had been recorded as a *Curvularia* species occurring in China (Zhang et al. 2006), it was not reported to cause leaf spots on gladiolus in Guangdong Province or elsewhere in China. To our knowledge, this is the first report of *C. gladioli* causing leaf spots on gladiolus in China. Identification of this pathogen will help develop diagnostic methods for corms and seedlings and may lead to the development of appropriate chemical management strategies.

References:

- Boerema, G. H., and Hamers, M. E. C. 1989. Neth. J. Plant Pathol. 95:1.
- Torres, D. P., et al. 2013. Plant Dis. 97:847.
- Torres, D. P., et al. 2015. Trop. Plant Pathol. 40:382.
- Zhang, M., et al. 2006. J. Henan Agric. Univ. 40:524. (In Chinese).

The author(s) declare no conflict of interest.

e-Xtra

Keywords: fungi, ornamentals, etiology

*Indicates the corresponding author.
B. R. Lin; linbr@126.com