Diseases Caused by Fungi and Fungus-Like Organisms

First Report of Blackleg Disease Caused by *Epicoccum sorghinum* on Lavender (*Lavandula stoechas*) in China

Chun-Yan Gu,^{1,2,3} Rui Pan,^{1,2,3,4} Muhammad Abid,^{1,5} Hao-Yu Zang,^{1,2,3} Xue Yang,^{1,2,3,†} and Yu Chen^{1,6,7,†}

¹Institute of Plant Protection and Agro-products Safety, Anhui Academy of Agricultural Sciences, Hefei 230031, China

²Scientific Observing and Experimental Station of Crop Pests in Hefei, Ministry of Agriculture, China

³Laboratory of Quality and Safety Risk Assessment for Agro-Products, Hefei, Ministry of Agriculture, China

⁴Key Laboratory of Genetic Improvement and Ecophysiology of Horticultural Crop, Anhui Province (Institute of Horticulture, Anhui Academy of Agricultural Sciences), Hefei 230031, China

⁵Department of Plant Pathology, Faculty of Agricultural Sciences and Technology, Bahauddin Zakariya University, Multan 60800, Pakistan

⁶Key Laboratory of Integrated Crop Pest Management of Anhui Province, School of Plant Protection, Anhui Agricultural University, Hefei 230036, China

⁷Key Laboratory of Biology and Sustainable Management of Plant Diseases and Pests of Anhui Higher Education Institutes, School of Plant Protection, Anhui Agricultural University, Hefei 230036, China

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Lavender (*Lavandula angustifolia* Mill) is an ornamental plant and grown worldwide for its aromatic and pharmacological qualities. In June 2020, the symptoms of blackleg disease on lavender plants were observed, with more than 50% incidence in Chaohu city (117°38'19.12"N, 31°47'18.94"W) of Anhui Province, China. The disease symptoms progressed from stem wilt and necrosis to prolonged necrosis and bending of leaves, and all infected lavender plants died eventually. Ten necrotic stem lesions were collected from 10 independent plants for the isolation of pathogen. All samples were washed in 70% ethanol for 1 min, rinsed twice in sterile distilled water, and

placed on water agar (WA) plates containing 30 mg/liter of kanamycin. All 16 fungal isolates were transferred onto potato dextrose agar (PDA) and incubated at 26°C for 5 days, and all fungal colonies were isolated consistently, which produced reddish-gray mycelium at 26°C with a 12-h photoperiod on PDA medium. They developed black pycnidia with abundant hyaline, unicellular, oval shaped conidia (4.5 to 5.9 × 2.1 to 2.5 μm) after 14 days. DNA was extracted (10-day-old culture) using the Fungal DNA Mini Kit (Omega Bio-tek, China), according to the manufacturer's protocol. The internal transcribed spacer (ITS), beta-tubulin (*β-tub*), and translation elongation factor 1-*α* (*tefl-α*) genes of three isolates were amplified using the primers ITS1/ITS4 (White et al. 1990), Bt2a/Bt2b (Glass and Donaldson 1995), and EF1-728F/EF1-986R (Carbone and Kohn 1999), respectively. The ITS (MT883331), *β-tub* (MT896891), and *tefl-α* (MT874165) genes were sequenced and analyzed through BLASTn. The ITS sequence showed 99.81% homology with *Epicoccum sorghinum* (GenBank accession no. MK020690.1). The *β-tub* and *tefl-α* showed 100% homology with *E. sorghinum* (GenBank accessions MN554062.1 and MN512426.1, respectively). To complete Koch's postulates, pathogenicity tests were performed by spraying the fungal spore suspension (1 × 10⁵ CFU/ml) prepared from 14-day-old cultures onto needle-wounded stems of 1-year-old potted healthy *L. angustifolia* plants. Healthy plants sprayed with sterilized water onto needle-wounded stems served as a negative control. Wilting and stem necrosis were observed 5 days after inoculation and incubation in a growth chamber at 26°C, with a 12-h photoperiod. All fungal-infected plants died after 10 days, whereas the control plants remained healthy. The fungus was reisolated from the lesions of the inoculated plants and verified. Based on morphological characteristics, sequence analysis, and pathogenicity testing, the pathogen was identified as *E. sorghinum*. The pathogen has been observed previously on many plants such as tea (Bao et al. 2019) and taro (Liu et al. 2018) in China. To our knowledge, this is the first report of *E. sorghinum* causing blackleg disease of lavender in China and worldwide.

References:

- Bao, X. T., et al. 2019. Plant Dis. 103:3282.
- Carbone, I., and Kohn, L. M. 1999. Mycologia 91:553.
- Glass, N. L., and Donaldson, G. C. 1995. Appl. Environ. Microbiol. 61:1323.
- Liu, P. Q., et al. 2018. Plant Dis. 102:682.
- White, T. J., et al. 1990. Page 315 in: PCR Protocols: A Guide to Methods and Applications. Academic Press, San Diego, CA.

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[†]Indicates the corresponding authors.

X. Yang; yangxue2121@163.com, and Y. Chen; chenyu66891@sina.com