Diseases Caused by Fungi and Fungus-Like Organisms

First Report of Leaf Spot Caused by *Cladosporium tenuissimum* on Panicle Hydrangea (*Hydrangea paniculata*) in China

Chenxu Li,¹ Peng Cao,¹ Chuanjiao Du,¹ Xi Xu,¹ Wensheng Xiang,^{1,2} Xiangjing Wang,^{1,†} and Junwei Zhao^{1,†}

¹Key Laboratory of Agricultural Microbiology of Heilongjiang Province, Northeast Agricultural University, Xiangfang District, Harbin, 150030, P.R. China

²State Key Laboratory for Biology of Plant Diseases and Insect Pests, Institute of Plant Protection, Chinese Academy of Agricultural Sciences, Beijing, P.R. China

Funding: Funding was provided by the China Postdoctoral Science Foundation (2018M631907). Plant Dis. 105:2240, 2021; published online as <https://doi.org/10.1094/PDIS-12-20-2640-PDN>. Accepted for publication 1 April 2021.

Panicle hydrangea (*Hydrangea paniculata*) is an ornamental flowering plant native to China and Japan. In August 2019, leaf spot symptoms with about 30% disease incidence were observed on panicle hydrangea in two grower fields (about 0.1 ha in total) of Northeast Agriculture University, China (126.72°E, 45.74°N). Symptoms initially appeared on the lower and older leaves and showed small subcircular brown spots with dark-brown edges on both sides. As the disease progressed, the necrotic spots enlarged, became irregular, and coalesced, and the infected leaf blighted in approximately 2 weeks. Panicle hydrangea leaf samples ($n = 15$) from different plants that showed spot symptoms were collected, surface sterilized with 70% ethanol for 10 s followed by 0.5% NaClO treatment for 4 min, and rinsed in sterile water three times. Thereafter, leaf samples were placed on potato dextrose agar (PDA) and incubated at 25°C for 7 days. Fifteen hyphal-tipped pure cultures were obtained. Colonies growing on PDA for 7 days were olive green to dark green, exhibited a velvet-like texture, and sometimes were radially furrowed and wrinkled. Margins varied from white gray to dark green without prominent exudates. The back of the plate showed dark green to black. Conidiophores were 180 to 600 µm long, 2.8 to 4.5 µm wide ($n = 50$), subcylindrical-filiform, straight, septate, and unbranched or rarely branched. Ramoconidia were zero to one septate,

cylindrical to clavate, smooth-walled, and 8 to 22 µm long ($n = 50$). Conidia were single-celled, lemon-shaped, smooth-walled, and 2.0 to 5.0 µm (diameter) ($n = 50$). To confirm the identity, three genomic DNA regions (internal transcribed spacer [ITS], partial translation elongation factor-1 alpha [EF], and actin [ACT]) of the representative isolate BAI-1 were amplified with primer pairs ITS1/4, EF1-728F/986R, and ACT-512F/783R, respectively (Bensch et al. 2012; Jo et al. 2018). DNA sequences of the isolate from ITS, EF, and ACT showed 99.81% (514/515 bp), 99.10% (219/221 bp), and 99.54% (216/217 bp) nucleotide identity with those of *Cladosporium tenuissimum* CBS 125995, respectively (GenBank accession nos. HM148197, HM148442, and HM148687). The sequences of isolate BAI-1 were deposited in GenBank (accession nos. MW045455, MW052465, and MW052466). To fulfill Koch's postulates, five healthy 2-year-old panicle hydrangea plants grown in pots were surface sterilized with 70% ethanol, washed twice with sterile distilled water, sprayed with a conidial suspension of strain BAI-1 (adjusted to 1×10^6 conidia/ml using a hemocytometer), and maintained in a greenhouse at 25°C and 85% relative humidity. Five plants sprayed with sterilized water served as controls. The inoculated plants showed leaf spot symptoms that were similar to those previously observed in the fields after 7 days, whereas control leaves remained healthy. The fungus was reisolated from symptomatic leaves, and its identity was confirmed by morphological and molecular methods. These experiments were repeated twice. So far, *C. tenuissimum* was reported to cause leaf spot of alfalfa (Han et al. 2019) and castor (Liu et al. 2019). To our knowledge, this is the first report of leaf spot disease in panicle hydrangea caused by *C. tenuissimum* in China. Leaf spot has a negative effect on the aesthetic value of panicle hydrangea, and this report will assist with monitoring distribution of the disease as well as developing management recommendations.

References:

- Bensch, K., et al. 2012. Stud. Mycol. 72:1.
- Han, Y. X., et al. 2019. Plant Dis. 103:1778.
- Jo, H., et al. 2018. Plant Dis. 102:1450.
- Liu, Y. L., et al. 2019. Plant Dis. 103:375.

The author(s) declare no conflict of interest.

e-Xtra

Keywords: leaf spot, *Cladosporium tenuissimum*, panicle hydrangea

[†]Indicates the corresponding authors.

X. J. Wang; wangneau2013@163.com and J. W. Zhao; guyan2080@126.com