Diseases Caused by Fungi and Fungus-Like Organisms

First Report of *Paraphoma chrysanthemicola* Causing Crown and Leaf Rot of *Atractylodes lancea* in China

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Atractylodes lancea is an important traditional Chinese medicinal plant whose rhizome is used for treating complaints such as rheumatic diseases, digestive disorders, night blindness, and influenza. Jiangsu Province is the optimal cultivation location for high-quality *A. lancea* rhizomes. Since June 2019, symptoms of crown rot and leaf rot were observed in about 10 to 20% of the *A. lancea* in a plantation (31° 36' 1" N, 119° 6' 40" W) in Lishui, Jiangsu, China. Lesions occurred on the stem near the soil line and on the leaves. Disease incidence reached approximately 80 to 90% by September 2021 and resulted in severe loss of rhizome and seed yields. For pathogen isolation, 10 samples of symptomatic stem segments and 10 diseased leaves were collected, surface-sterilized using 5% NaClO solution, rinsed with sterile water, cut into 0.5 to 2 cm segments, plated onto potato dextrose agar (PDA), and incubated at 30°C in darkness. Pure cultures of four isolates showing morphological characteristics of *Paraphoma* spp. were obtained, identified as a single *P. chrysanthemicola* strain, and named LSL3f2. Newly formed colonies initially consisted of white mycelia; 5-day-old colonies developed a layer of whitish gray mycelia with a gray underside. Twenty-day-old colonies had

white mycelium along the margin with a faint yellow inner circular part with irregular radial furrows, and the reverse side looked caramel and russet. Pycnidia were subglobose (diameter: 5 to 15 µm). Unicellular, bicellular, or strings of globose or subglobose chlamydospores developed from hyphal cells. The internal transcribed spacer (ITS) region and large subunit-28S of LSL3f2 were cloned using primers ITS1/ITS4 and LR0R/LR7 (Aveskamp et al. 2010; Li et al. 2013) and deposited in GenBank (OK559658 and OK598973, respectively). BLASTn search and phylogenetic analysis showed the highest identity between LSL3f2 and *P. chrysanthemicola* sequences and confirmed LSL3f2 as *P. chrysanthemicola*. Koch's postulates were completed using 1-month-old, vegetatively propagated *A. lancea* plantlets growing on autoclaved vermiculite and peat mixture at 26°C with a light/dark cycle of 12/12 h. Each plantlet was inoculated with 5 ml of conidial suspension in water (1×10^8 cfu/ml) by applying to soil close to the plantlet, with sterile water used as a mock control ($n = 10$). By 20 days postinoculation, inoculated plantlets showed a range of disease symptoms consistent with those observed in infested fields. Pathogenicity was additionally confirmed using detached leaves inoculated with a colonized agar plug of LSL3f2 or an uninoculated control comparison (diameter = 5 mm) and incubated at 26°C in the dark. Five to 7 days postinoculation, detached leaves showed leaf rot symptoms including lesions, yellowing, and withering consistent with those in infested fields, while control leaves remained healthy ($n = 10$). The pathogen was reisolated from the diseased plantlets and detached leaves, in both cases demonstrating the micromorphological characteristics of LSL3f2. *P. chrysanthemicola* has been reported to cause leaf and crown rot on other plants, such as *Tanacetum cinerariifolium* (Moslemi et al. 2018), and leaf spot on *A. japonica* (Ge et al. 2016). However, this is the first report of *P. chrysanthemicola* causing crown and leaf rot on *A. lancea* in China.

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