Diseases Caused by Fungi and Fungus-Like Organisms

First Report of *Sclerotinia sclerotiorum* Causing Stem Canker on *Cannabis sativa* in Oregon

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In August of 2020, plants of *Cannabis sativa* L. grown in hoop houses at two farms located in Benton County, Oregon, exhibited wilting and chlorosis, followed by shoot necrosis. Symptomatic plants had dry, tan-brown lesions or cankers, often accompanied by large, round to irregular or ribbon-shaped, black sclerotia and/or profuse white mycelial growth. Lesions or cankers were observed on the stems at both the plant crown (soil) level and higher in the canopy; flower infections were not observed. Sclerotia were removed from two infected plants and placed on potato dextrose agar (PDA) at room temperature. Fast-growing, pure white, largely appressed, sterile mycelium grew radially from plated sclerotia. Hyphal tips were transferred to obtain a pure culture. Additional sclerotia, solitary and aggregate, approximately 30 to more than 50 per plate, exhibiting identical features to those observed on plant tissue, formed in culture 6 to 7 days following transfer and ranged in size from 2 to 11 mm in length or width ($n = 50$). Mycelia were aseptically harvested from cultures for DNA extraction (*Quick-DNA Plant/Seed Mini-prep Kit*, Zymo Research). Primers ITS1-F (Gardes and Bruns 1993) and ITS4 (White et al. 1990) were used to amplify the internal transcribed spacer region (ITS), and primers G3PDHfor and G3PDHrev were used to amplify the glyceraldehyde 3-phosphate dehydrogenase (G3PDH) gene (Staats et al. 2005) from a single isolate, LAS01. The ITS region from LAS01 (MW079844) shared 100 to >99% homology to several *Sclerotinia* species isolates in GenBank. The LAS01 G3PDH gene (MW082601) shared >99 and 100% homology with *Sclerotinia sclerotiorum* type specimen strains 484 (GenBank accession no. AJ705044) and 1980 (JQ036048), respectively, and only 97 and 96% sequence identity with *S. minor* (KF878364) and *S. trifoliorum* (KF878375), respectively. A phylogenetic tree (in the

supplementary materials) identifies LAS01 as *S. sclerotiorum*. To confirm pathogenicity, isolate LAS01 was grown on PDA at room temperature. After 48 h, 4-mm plugs were cut from the colony and placed mycelium-side down onto the main stems of five healthy *C. sativa* plants that had been grown for approximately 6 weeks from rooted cuttings, and secured using a minuten pin. Uncolonized PDA plugs placed on the stem of the same plants several leaf nodes away were used as controls. Plants were incubated at room temperature in a grow tent under 24-h light and 70 to 95% humidity conditions. Elongated, tan-brown lesions were observed at the inoculation sites 4 to 5 days postinoculation; stems at mock-inoculated sites remained green. After 6 days, tissue was excised from the margin of each lesion, surface sterilized with 1% NaOCl, rinsed in sterile water, and placed onto PDA. Resultant fungal growth was confirmed to be *S. sclerotiorum* based on morphology. Isolation attempts were also made from mock inoculations; no fungal growth was observed. Trials were repeated on two additional cultivars with similar results. This report is the first of *S. sclerotiorum* on *C. sativa* in Oregon; the only peer-reviewed reports that could be located for *S. sclerotiorum* on *C. sativa* in the United States were from host indices in Montana (Anonymous 1960; Shaw 1973) and references cited by McPartland (1996). *S. sclerotiorum* has been reported in Canada on hemp-type *C. sativa* (Bains et al. 2000). The economic impact of *S. sclerotiorum* on the emerging *C. sativa* industry in Oregon and the United States remains unclear.

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