Disease Notes

Diseases Caused by Fungi and Fungus-Like Organisms

First Report of Stem Canker of Goldenrain Tree Caused by *Lasiodiplodia theobromae* in Tennessee and the United States

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Goldenrain tree (*Koelreuteria paniculata* Laxm.) plants grown in 15-, 30-, and 45-gal containers exhibiting stem canker symptoms were found in a commercial nursery in Warren Co., Tennessee, in fall 2018. Foliar wilting, reduction in new shoot development, and dieback were also observed on the same plants in early summer 2019. Stem symptoms were dark brown or black cankers, progressing 1 m or more above the base of the stem, accompanied by internal stem necrosis. The bark was cracked in the later stage. Disease incidence was approximately 70% of 1,000 plants. Pycnidia formation was also observed on stems. Five symptomatic stem tissues were surface sterilized in 10% sodium hypochlorite for 10 min and washed three times with sterile distilled water. In total, 20 pieces of 1-cm^2 stem tissues from the margin of the dead tissue were plated on potato dextrose agar (PDA). Ten single isolates were hyphal-tip purified on PDA. The fungal colonies consistently yielded gray aerial hyphae. Irregular pycnidia and dark elliptical conidia (21 to 25 µm [average 22.95 µm; n = 40] × 12 to 16 µm [average 14.00 µm; n = 40]) with central septa and longitudinal striations were observed after 14 days of incubation at 25°C in a 12-h fluorescent light and dark cycle. To confirm pathogen identity, total DNA was extracted using the UltraClean Microbial DNA Isolation Kit (MO BIO Laboratories, Carlsbad, CA) directly from a 5-day-old culture of isolate FBG2019090 on PDA. The ribosomal DNA internal transcribed space region (ITS), beta-tubulin gene (TUB2), and translation elongation factor 1-alpha gene (eEF1a1) were amplified by PCR using the primer pairs ITS1/ITS4 (White et al. 1990), β-tubf1/β-tubf1 (McKay et al. 1999), and EF1-728F/EF2 (Carbone and Kohn 1999; O'Donnell et al. 1998), respectively. The PCR products were sequenced, and the sequences (GenBank nos. MT302844, MT434993, and MT434994) were 100.00, 99.20, and 99.78% similar to those of *Lasiodiplodia theobromae* (Pat.) Griff. and Maubl. isolates from several other hosts in multiple countries in the NCBI database (MK530063, KX120061, and MN114120, respectively). To complete Koch's postulates, ten 15-cm goldenrain tree cuttings were wounded with a 4-mm cork borer. A 4-mm mycelium agar plug from a 5-day-old culture of isolate FBG2019090 grown on PDA was placed in the wound. Wounds were covered with wet sterilized cheese cloth and wrapped with aluminum foil. Cuttings were placed inside the clear plastic containers and incubated at 25°C in a 12-h fluorescent light and dark cycle. Ten control cuttings received only a PDA plug without pathogen and were incubated in the same environment. After 2 weeks, dark brown or black necrotic lesions developed on the inoculated cuttings, and microscopic examination revealed the same pathogen morphology as the original isolate. *L. theobromae* was consistently reisolated from stem lesions. All control cuttings remained symptom-free, and *L. theobromae* was not isolated from the tissue. *L. theobromae* was reported infecting *K. bipinnata* var. *integrifoliola* in China for the first time (Tan et al. 2012). To our knowledge, this is the first report of stem canker of *K. paniculata* (goldenrain tree) caused by *L. theobromae* in Tennessee and the United States. Good sanitation practices need to be followed when removing infected plant parts in order to prevent further infection to the rest of the plants in nursery production.

References:

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