Diseases Caused by Fungi and Fungus-Like Organisms

First Report of *Fusarium solani* Causing Stem Canker of *Acer negundo* in China

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Acer negundo L. (Boxelder) is native to North America. Over the past 100 years, *A. negundo* was introduced into China for landscaping purposes. In September 2018, a severe canker causing foliar wilting and dieback was found on the twigs of 12-year-old *A. negundo* plants grown in a nursery in Xuzhou, Jiangsu Province. Almost 90% of the twigs (2.31 ± 0.96 cm) on the trees were infected; the center was beige, and the outer ring was black brown. The bark became desiccated and cracked in the later stage of the pathogenetic process. With the death of the twigs, the xylem and phloem tissues became dark brown, which affected the commercial value of the trees. To determine the pathogen, 20 twig samples with typical symptoms were disinfected with 75% alcohol, and 5 × 5-mm sections of the tissue were cut from joints of diseased and healthy tissues (visually healthy) with a sterilized scalpel, surface sterilized for 45 s in 75% alcohol, soaked for 90 s in 1.5% NaClO, rinsed in sterilized water, and dried. Small cut tissues were placed on potato dextrose agar (PDA) at 25°C for 5 days. Pure cultures were obtained by monospore isolation. Fungal isolates morphologically similar to *Fusarium* were consistently obtained (Leslie and Summerell 2006). A representative sample, An-4, was placed on PDA and incubated as described above. On PDA, An-4 produced white flocculent mycelium, and the reverse of the colony was pale yellow. Two types of conidia were observed. The macroconidia were slightly curved, sickle-shaped, with a constricted membrane. Septation is the division into parts by a septum: the condition of being septate. There are one to three septa, forming two to four septations per conidium. The size of macroconidia were 13.38 to 41.04 × 3.62 to 6.64 μm. The microconidia were elliptical,

single or paired, and 7.85 to 13.20 × 2.90 to 6.12 μm in size. DNA was extracted from the mycelium of the isolate by the cetyltrimethylammonium bromide method (Gawel and Jarret 1991) and amplified through polymerase chain reaction with DNA-directed RNA polymerase subunit 2 (Rpb2) and translation elongation factor-1α (tef-1α) using gene primers 5f2/7cr (Liu et al. 1999; Sung et al. 2007) and EF-1Ha /EF-2Tb (O'Donnell et al. 1998). The sequences submitted to GenBank (accession nos. MT635138 for Rpb2 and MT635139 for tef-1α) showed high similarity with BLAST sequences of *Fusarium solani* (Rpb2, MF467488.1 [99.79%]; tef-1, KP143718.1 [99.6%]). Three 2-year-old *A. negundo* seedlings were chosen for the pathogenicity test (stem diameters of 1 cm). The wound was stabbed with a syringe needle, and cotton was placed upon it. A pipette was used to transfer 300 μl of suspension of An-4 (1 × 10⁶ conidia/ml) into the cotton, which was then wrapped with parafilm. Controls were treated with sterile water. The experiment was repeated five times. A typical canker feature of an oval brown scab was observed on inoculated twigs about 10 days after inoculation, resulting in necrosis. Then, the lateral branch crown desiccated and died, like the process observed in the field. No symptoms appeared in the controls. *F. solani* was reisolated from all the infected tissues of the inoculated twigs and identified as previously described, thus fulfilling Koch's postulates. *F. solani* has been reported to cause stem canker of English walnut (Mulero-Aparicio et al. 2019) and *Tectona grandis* (Huang et al. 2017). To our knowledge, this is the first report of *F. solani* causing stem canker of *A. negundo* in China, which seriously threatens the economic and ornamental value of *A. negundo* and should be highly assessed.

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