Diseases Caused by Fungi and Fungus-Like Organisms

First Report of *Alternaria alternata* Causing Alternaria Brown Spot on *Aralia elata* in China

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Aralia elata (Miq.) Seem is a woody plant belonging to the Araliaceae family. It widely grows in China, Japan, Korea, and Russia and is used as a food and medicinal plant (Wang et al. 2014). In September 2018 and 2019, Alternaria brown spot symptoms were observed in Heilongjiang province, with disease incidence of 70 to 80% and yield loss of 30%. These small, circular or irregular, light brown, necrotic spots were found on both the upper and lower surfaces of the leaves. Infected leaf tissue samples were washed three times with sterilized water before disinfection with 0.5% NaClO for 1 min and placed on PDA at 25°C for 7 days. Colonies were initially grayish-white and then turned light brown and grayish-black with a white border. The underside of the colonies was olivaceous black with several rings. Hyphae were effused, branched-septate, golden-brown. Conidiophores were

unbranched, straight, septate, 65 (30 to 115) × 4 (3 to 7) µm. Conidia were borne in long chains, obpyriform, 25 (10 to 40) × 14 (8 to 20) µm. The colony characteristics were consistent with those known for *Alternaria alternata* (Simmons 2007). The ITS, *gpd*, *Alt-a1*, and *tef1* gene regions were amplified using primer pairs ITS1/ITS4, *gpd1/gpd 2*, *Alt-for/Alt-rev*, and EF1-728F/EF1-986R, respectively (Nishikawa and Nakashima 2015; Woudenberg et al. 2014). The sequences were deposited in GenBank: MN636331 (ITS), MT012958 (*gpd*), MT140362 (*Alt-a1*), and MT133312 (*tef1*). Phylogenetic analysis with the ITS, *gpd*, *Alt-a1*, and *tef1* gene regions and 13 known strains belonging to *Alternaria* section revealed that the acquired sequence formed a distinct clade with *A. alternata* strain CBS 106.24 with 100% bootstrap values. Pathogenicity tests were conducted by spraying 10 healthy seedlings of *A. elata* with a 10⁵ conidia/ml spore suspension. After 10 days of incubation, the inoculated seedlings developed identical leaf spot symptoms to those observed in the field, whereas no symptoms were developed on the control seedlings. Therefore, the fungus was identified as *A. alternata*. *A. alternata* has a wide host range, including *Ficus microcarpa*, *Bruguiera gymnorhiza*, and jujube (Bai et al. 2015; Lin et al. 2015; Yao et al. 2015). This is the first report of *A. alternata* causing Alternaria brown spot on *A. elata*.

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