Powdery Mildew of *Pterocarya stenoptera* Caused by *Phyllactinia juglandis* in Korea

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Chinese wingnut (*Pterocarya stenoptera* DC.), belonging to the Juglandaceae, is native to Southeast China and is now widely-planted for ornamental purposes in Korea and Japan. In September 2010, powdery mildew infections were first noticed in a private garden in Suwon, Korea. The lower surfaces of the damaged leaves were covered with conidia and conidiophores of a powdery mildew fungus (Fig. 1A). Mature chasmothecia were abundantly formed by November (Fig. 1C). Voucher specimens have been deposited at Korea University, Seoul, Korea (KUS-F25487, F25618).

Detailed microscopic examination was made to identify the pathogen. Mycelia were hypophyllous, rarely epiphyllous in heavily shaded areas (Fig. 1B), thinly effused, initially forming patches, finally covering the whole lower leaf surface. Hyphal appressoria were nipple- to rod-shaped, often branched, and single or opposite in pairs. Conidiophores were unbranched, 150–280 × 6–8 μm, straight in foot-cells, producing conidia singly, followed by 2–3 cells (Figs. 1D and 1E). Conidia were obovoid to clavate, papillate at the apex, 45–72 × 18–28 μm, and devoid of distinct fibrosin bodies (Fig. 1F). Chasmothecia were scattered, 180–260 μm in diameter, blackish brown, and depressed globose. Appendages were 8–16 in number, arising around the equatorial zone of the chasmothecia, simple, acicular with a bulbous base, 26–45 μm wide at the ball, 9–12 μm wide above the ball and gradually narrower upwards, 1.2–1.6 times as long as the chasmothecial diameter, hyaline throughout, and asceptate (Fig. 1G). Penicillate cells were crowded on the upper part of the chasmothecia, 30–90 μm long, 8–20 μm wide, bifurcate or divided into 2–6 branchlets in the upper part, with filaments 20–70 μm long (Fig. 1I). Ascii were 8–20 in a chasmothecium, olivaceous brown, 60–90 × 30–40 μm, and shortly stalked. Ascospores were 2 in an ascus, oval, light brown to golden brown, 24–45 × 15.5–25 μm (Fig. 1H). The morphological characteristics fit well with the previous descriptions of *Phyllactinia juglandis* J.F. Tao & J.Z. Quin (Braun, 1987; Shin and Lee, 2002; Tao et al., 1977).

To confirm the identification of the fungus, the genomic DNA was extracted from the material of KUS-F25618. Amplification and direct sequencing of the complete internal transcribed spacer (ITS) region of rDNA were performed using the primer set ITS5 and P3 according to the modified method of Takamatsu et al. (2008). The resulting sequence was deposited in GenBank (JF460007). A BLAST search against GenBank database showed that it shares a high degree of similarity (99%) to the ITS sequences of *Phyllactinia juglandis*. To illustrate the phylogenetic placement of the causal fungus within the genus *Phyllactinia*, a neighbor-joining tree was constructed using MEGA4 (Fig. 2).

The powdery mildew diseases of *Pterocarya* spp. have been recorded to be associated with *P. juglandis* from China and Japan (Braun, 1987; Takamatsu et al., 2008; Tao et al., 1977). To our knowledge, this is the first record of *Phyllactinia* infections on *P. stenoptera* in Korea. This work also provides the first ITS sequences of *P. juglandis ex Pterocarya stenoptera* and confirms this host-parasite combination.

**References**


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