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NEW DISEASE REPORT

First report of powdery mildew caused by *Podosphaera xanthii* on New Guinea impatiens in Korea

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From August to November 2020, a previously unseen powdery mildew disease was encountered repeatedly on New Guinea impatiens (*Impatiens hawkeri*, syn. *Impatiens* 'New Guinea' hybrid) in Uijeongbu, Korea. It occurred on plants growing in partial shade along high buildings or walls, but not on those planted in sunny gardens. Symptoms included white, effuse, amphigenous mycelial patches on leaves and stems, reducing the aesthetic value of plants (Fig. 1).

Microscopic examination of freshly collected leaves revealed the following morphological characteristics: upright conidiophores (110–210 × 10–12 μm) producing 2 to 5 catenescent conidia, and ellipsoid to doliiform conidia (26–38 × 16–22 μm) containing conspicuous fibrosin bodies. In autumn, scattered chasmothecia were found on leaves, mainly on the lower surface (Figs. 2–3). These measured 80–100 μm in diameter, had mycelioid appendages, and contained a single ascus with 8 ellipsoid to ovoid ascospores (16–20 × 12–16 μm) (Fig. 4). These characteristics were consistent with the description of *Podosphaera xanthii* in Braun & Cook (2012).

To confirm the morphology-based determination, genomic DNA was extracted from a representative specimen (KUS-F32140, Korea University herbarium, Seoul, Korea). PCR products were amplified using the primer sets ITS1F/PM6 for the internal transcribed spacer (ITS) and PM3/TW14 for the large subunit (LSU) of rDNA (Takamatsu & Kano, 2001). The sequences obtained in this study (GenBank Accession Nos. MW750225 (ITS) and MW750226 (LSU)) were compared with other sequences in GenBank using BLASTn. The analysis showed 100% identity with other *P. xanthii* sequences (e.g., AB462799, AB462803 for ITS, and MT919354, LC371331 for LSU) and neighbour-joining analysis of ITS sequences placed the Korean isolate in a well-supported clade with the reference sequences of *P. xanthii* (Fig. 5).



FIGURE 1 Powdery mildew colonies caused by *Podosphaera xanthii* on adaxial leaf surface of *Impatiens hawkeri*.

Podosphaera (previously *Sphaerotheca*) powdery mildews on *Impatiens* spp. have been previously assigned to *P. balsaminae* (Braun & Cook, 2012; Farr & Rossman, 2021). However, *P. balsaminae* was shown to be limited to the Asian materials of *Podosphaera* on *I. noli-tangere* (Ito & Takamatsu, 2010). The remainder of *Podosphaera* powdery mildews on

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FIGURE 2 Powdery mildew colonies caused by *Podosphaera xanthii* on abaxial leaf surface of *Impatiens hawkeri*.



FIGURE 3 Chasmothecia of *Podosphaera xanthii*.

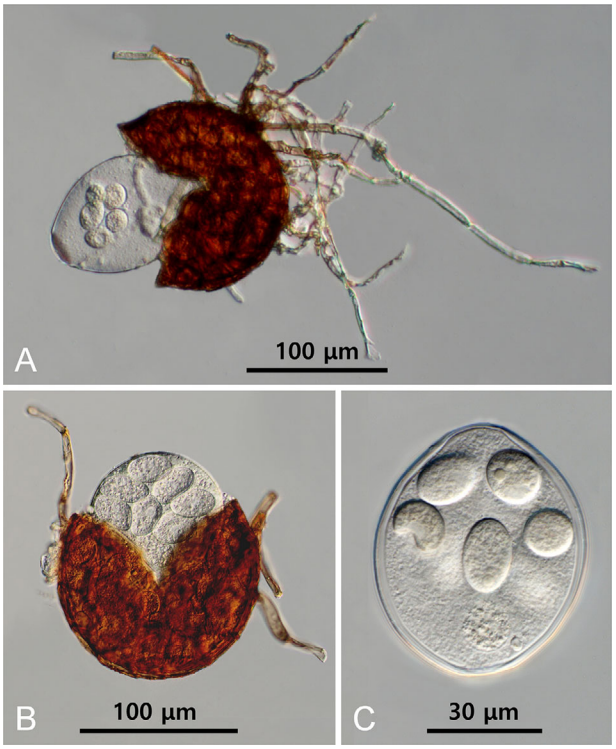


FIGURE 4 *Podosphaera xanthii* found on *Impatiens hawkeri*.
A: Chasmothecium with one ascus and mycelioid appendages.
B: Chasmothecium with one ascus containing mature ascospores.
C: Ascus containing eight ascospores.

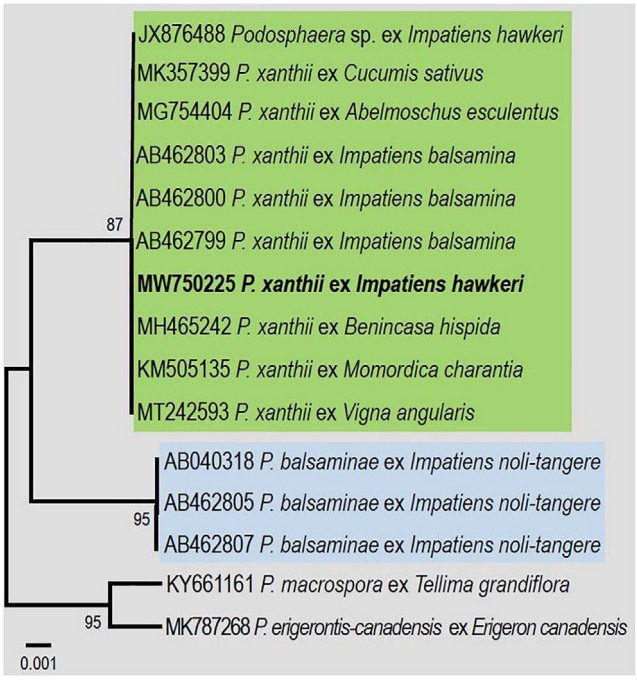


FIGURE 5 Neighbour-joining tree based on internal transcribed spacer sequences of *Podosphaera xanthii* and other *Podosphaera* spp. retrieved from GenBank. The isolate obtained in this study is shown in bold.

Impatiens spp. were proved to belong to or were tentatively assigned to the *P. xanthii* complex (Braun & Cook, 2012).

Podosphaera powdery mildews on New Guinea impatiens seem to be uncommon considering the world-wide cultivation of the host as a potted and garden plant. Previously, Wolcan (2004) recorded *P. balsaminae* on *I. hawkeri* from Argentina, and Garibaldi et al. (2012) recorded *Podospahera* sp. on *I. hawkeri* from Italy. We prove here that the earlier collection from Italy also represents *P. xanthii* (Figure 5). To our knowledge, this is the first confirmed report of powdery mildew caused by *P. xanthii* on New Guinea impatiens. This finding could be useful for the breeding programme of *Impatiens* spp. and future plantings of New Guinea impatiens in gardens.

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