First report of powdery mildew caused by *Podosphaera astericola* on *Kalimeris incisa* in Korea

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In October 2020, *Kalimeris incisa* (Fisch.) DC. (syn. *Aster incisus* Fisch.) plants showing symptoms of powdery mildew were observed in the natural habitats of Wonju and Seoul, Korea (50% disease incidence). Thinly effuse or powdery white colonies were observed on leaves and stems. Conidiophores were upright from creeping hyphae, 120–240 × 10–12 µm and formed apically 2 to 4 immature catenate conidia. Conidia were ellipsoid-ovoid to barrel-shaped, 26–38 × 18–22 µm, and containing distinct fibrosin bodies. Chasmothecia of the fungus were not observed. For further studies, rDNA was extract from two reference specimens (KUS-F32067 and F32098; Korea University Herbarium). The PCR amplification was performed with ITS1F and PM6 primers for internal transcribed spacer (ITS) and PM3 (Takamatsu and Kano 2001) and TW14 primers for the large subunits (LSU). The resulting ITS and LSU sequences were enrolled in GenBank (Accession os. MW931848, MW931849 for ITS; MW931852, MW931853 for LSU). A BLASTn search showed high sequence similarities (>99.6%) with *Podosphaera astericola* U. Braun & S. Takam. on *Aster spathulifolius* (MF476989) for ITS and on *Aster microcephalus* var. *ovatus* (AB462779) for LSU. Morphological characteristics and molecular sequence analysis were consistent with those of *P. astericola* (Braun and Cook 2012). Pathogenicity was confirmed by dusting conidia onto leaves of three healthy *K. incisa* plants. Three non-inoculated

plants served as controls. Ten days after inoculation, inoculated plants developed mycelial patches, whereas the controls remained healthy. Although many cases of *Aster* (*Kalimeris*)-*Podosphaera* association have been reported, this is the first report of *P. astericola* on *K. incisa* in Korea and worldwide (Farr and Rossman 2021). Several commercial cultivars of *K. incisa* are sold in flower markets. Therefore, this finding has broad importance for both floriculture business and the ecological conservation of native species.

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Declarations

Informed consent The manuscript is new and not being considered elsewhere. All authors have approved the submission of this manuscript.

Conflict of interest The authors have no conflict of interest to declare.

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