First report of powdery mildew caused by *Podosphaera xanthii* on *Matricaria chamomilla* in Korea

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Matricaria chamomilla L. (Asteraceae), known as German chamomile, is popular in Korea for medicinal and ornamental purposes. During September and October 2019, powdery mildew symptoms on the leaves and stems of *M. chamomilla* were observed on 50% of 300 plants surveyed at an herb garden in Namyangju (37°35'29"N 127°13'52"E), Korea. Conidiophores were cylindrical, 110–190 × 10–12 µm and produced conidia in chains. Conidia were ellipsoid-ovoid to doliform, 28–40 × 18–23 µm, and contained conspicuous fibrosin bodies. Dark brown chasmothecia were gregarious, partly embedded in the hyphal mat, spherical, and 85–100 µm in diameter. Appendages were hyphoid, 1–4-septate, and brown but paler upwards. Each chasmothecium contained a single ascus. Asci were sessile, 8-spored, and 54–70 × 48–56 µm. Ascospores were oval to subglobose, and 14–18 × 12–15 µm. These characteristics were consistent with those of *Podosphaera xanthii* (Castagne) U. Braun & Shishkoff (Braun and Cook 2012). To confirm the morphological identification, rDNA was extracted from the reference isolate KUS-F31455 deposited at Korea University Herbarium. PCR products were amplified using the primers ITS1F and PM6 for the internal transcribed spacer (ITS) region, and PM3 and TW14 for the large subunit (LSU) region of the rDNA. The sequences were deposited in GenBank (Accession Nos. OK161015 for ITS, OK161017 for LSU). A Blastn search using ITS and LSU sequences showed

99.33 to 100% similarity with *P. xanthii* (e.g., MF663781, MG657015 for ITS; MT826247, MT919354 for LSU). Several species of *Podosphaera* on *Matricaria* spp. have been recorded from Europe, North America, Egypt, and Japan (Farr and Rossman 2021). Recently, ITS sequence of a powdery mildew on *M. chamomilla* in Iran (MF663781) clustered with *P. xanthii* (Khodaparast 2016). To our knowledge, this is the first report of powdery mildew disease associated with *P. xanthii* on *M. chamomilla* in Korea.

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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 declare no conflict of interest.

References

- Braun U, Cook RTA (2012) Taxonomic manual of the Erysiphales (Powdery Mildews), CBS Biodiversity Series No. 11. CBS, Utrecht, The Netherlands
- Farr DF, Rossman AY (2021) Fungal Databases, U.S. National Fungus Collections, ARS, USDA. Accessed September 16 2021
- Khodaparast SA (2016) Molecular identification of some anamorphic powdery mildews (Erysiphales) in Guilan province, north of Iran. *Mycologia Iranica* 3:127–133

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