



First report of powdery mildew of *Helianthus tuberosus* caused by *Golovinomyces ambrosiae* in Slovenia

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During the summer and autumn of 2017, several hundred plants of *Helianthus tuberosus* growing wild in a roadside near Zbilje (46°09'24"N 14°25'10"E), Slovenia, were found infected with a powdery mildew. Conidiophores were erect, measured 90–145 × 10–12 µm, and produced conidia in chains with sinuate outline. Conidia were hyaline, ellipsoid to barrel-shaped, measured 22–44 × 14–20 µm, and devoid of distinct fibrosin bodies. Germ tubes were produced at the perihilar position of conidia. Chasmothecia were not observed during our survey. To confirm the identity, ITS regions of rDNA extracted from representative isolate IHPS-F49 were amplified using the primers ITS1F/ITS4 and sequenced (GenBank accession No. MG704839). A GenBank BLAST search revealed 99 to 100% similarity to *Golovinomyces ambrosiae* from voucher specimens of *H. tuberosus* AB769419 (MUMH:942), AB769420 (MUMH:2477) and *H. annuus* (KM657962). Based on morphological characteristics and molecular analysis, the fungus was identified as *G. ambrosiae* (Schwein.) U. Braun & R.T.A. Cook (Braun and Cook 2012). *Helianthus tuberosus* has been recorded as a host plant of *G. ambrosiae* in North America, South America (Argentina), Asia (China,

Korea), and several countries in Europe, but not in Slovenia. Formerly, a *Sphaerotheca* powdery mildew was recorded on *H. tuberosus* in Yugoslavia (Rankovic and Comic 1997). To our knowledge, this is the first report of powdery mildew caused by *G. ambrosiae* on *H. tuberosus* in Slovenia. This report will be useful for managing *H. tuberosus* that has been known as noxious invasive weed in Europe. Voucher specimens are available in the phytopathological herbarium of the Slovenian Institute of Hop Research and Brewing (IHPS-F49) and the Korea University herbarium (KUS-F29977).

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