First record of *Erysiphe corylacearum* on *Corylus avellana* in Switzerland and in central Europe

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From July to November 2019, a previously unseen powdery mildew disease was found repeatedly on *Corylus avellana* (hazelnut) in the canton of Ticino in Switzerland. It occurred on leaves of *C. avellana* shrubs growing in hedges and deciduous forests dominated by *Castanea sativa* at six locations north of the city of Lugano around Sonvico, at altitudes ranging from 510 to 700 m.

Morphological examination revealed small, white, effuse, amphigenous mycelial patches of 0.5-2 cm in diameter (Fig. 1). The ellipsoid to doliform conidia (30-35 × 15-23 µm) were produced singly. They were mainly found in July and became rare in autumn. In contrast, the gregarious chasmothecia were common throughout the observation time. They measured 80-120 µm in diameter, had up to 14 appendices (60-100 µm long) with multiple dichotomously branched tips, and contained 2-5 obvoid ascii (40-60 × 30-50 µm) with up to 8 ellipsoid ascospores (14-20 × 7-14 µm) (Fig. 2). These characters correspond to the description of *E. corylacearum* in Braun & Cook (2012).

The morphological identification was confirmed by sequencing the ITS-region of rDNA using three samples and performing a phylogenetic analysis as described inBeenken (2017). PCR was done with the Erysiphales-specific primer pair PMITS1/PMITS2 (Cunnington et al., 2003) to eliminate co-amplification of the fungus *Ampelomyces quisqualis* that parasitises *E. corylacearum*, as preliminary molecular and microscopic investigations on the Swiss material had shown. Obtained sequences were deposited in GenBank (Accession Nos. MN822721-MN822723). Voucher specimens were deposited in the fungal herbarium of ETH Zurich (ZT Myc 59971-ZT Myc 59973).

The molecular phylogenetic analysis showed that the Swiss strains had identical ITS sequences to those of *E. corylacearum* from Azerbaijan, Georgia, Iran and Turkey and differed only in a few base pairs from those from China, Iran and Japan (Fig. 3). *Erysiphe corylacearum* is native to east Asia and has been reported from USA (Ohio) and Canada but until now it has been unknown from central Europe (Braun & Cook 2012). Recently, Heluta et al. (2019) reported its occurrence on *C. avellana* from Ukraine, but without molecular validation. The species has been reported as an invasive pathogen from hazelnut orchards in Turkey, Iran and Georgia where it caused serious damage (Arzanlou et al., 2018, Meparishvili et al., 2019). Despite active searching for *E. corylacearum* in Switzerland, it has not yet been found outside the one small area in the canton of Ticino. The pathogen differs from the native hazelnut powdery mildew *Phyllumactinia guttata*, with which it sometimes co-occurs, by forming mycelia on the upper leaf surface and having smaller chasmothecia with branched appendices.

**References**


5. Heluta VP, Makarenko NV, Al-Maali GA, 2019. First records of *Erysiphe corylacearum* (*Erysiphales, Ascomycota*) on *Corylus avellana* in Ukraine. *Ukrainian Botanical Journal* 76, 252-259. [http://dx.doi.org/10.15407/ukrbiotj76.03.252](http://dx.doi.org/10.15407/ukrbiotj76.03.252)