



First record of *Erysiphe salmonii* causing powdery mildew on *Fraxinus ornus* in Switzerland

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In Switzerland, the manna ash (*Fraxinus ornus*) is native to the canton Ticino (<https://www.infoflora.ch>). In September and October 2020, a powdery mildew species of the genus *Erysiphe* sect. *Uncinula* was discovered in four native stands of *F. ornus* in southern Ticino. These were on the southern slope of Mt. Brè between Lugano and Gandria (ZT Myc 64438), at Mt. San Salvatore close to its summit (ZT Myc 64439), at Mt. San Giorgio close to Meride (ZT Myc 64440) and north of Morbio Inferiore (ZT Myc 64441) (ZT Myc = vouchers in fungal herbarium of ETH Zurich). In these areas, the species was found on several seedlings and mature trees and therefore the disease is considered widespread where it is found. The current distribution in Switzerland will be continuously updated on <https://swissfungi.wsl.ch/en/distribution-data/distribution-atlas.html>.

The morphological characteristics of the chasmothecia found on the leaves but rarely on the fruits of *F. ornus* fit *Erysiphe salmonii* as described and illustrated in Braun & Cook (2012) and Heluta *et al.* (2017). Mycelium was amphigenous but mainly epiphyllous. Chasmothecia were scattered and measured 80-120 µm in diameter, had 10-20 appendices, 70-130 µm long and 5-7 µm wide (to 9 µm towards the tip), which were pigmented at the base and with one septum. Apices were spirally curved. Chasmothecia had 2-5 ovoid asci measuring 50-60 × 30-50 µm with 6-8 ellipsoid ascospores per ascus, each measuring 15-20 × 7-10 µm. Conidiophores and conidia were not observed.

To confirm the morphological identification, two representative samples (ZT Myc 64438 & 64441) were investigated using molecular methods. The ITS region of nrDNA was sequenced using the *Erysiphales*-specific primer pair PMITS1/ PMITS2 (Cunnington *et al.*, 2003) following Beenken (2017). Resulting sequences were deposited in GenBank (Accession Nos. MW265934 and MW265935). An NCBI BLAST search confirmed the identification of the Swiss powdery mildew samples as *E. salmonii*. Both

sequences showed 100% identity to sequences of *E. salmonii* found on *Fraxinus mandshurica* in Japan (LC028981), on *F. rhynchophylla* in South Korea (MH880101-02) and on *F. chinensis* in China (MT919716). *Erysiphe salmonii* originated from East Asia (Braun & Cook 2012). Heluta *et al.* (2017) detected *E. salmonii* on *Fraxinus excelsior* and *F. pennsylvanica* in Ukraine and this was the only record for Europe up to now. Interestingly, the ITS sequences (LC259500 and LC259502) of their samples differ in one base pair from those from Switzerland. In Switzerland, the species was only found on *F. ornus* but not on *F. excelsior* trees grow in the sampled areas. However, further work is necessary to determine the significance of this finding.

References

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Figure 1



Figure 2



Figure 3



Figure 4



Figure 5

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