Disease Note

Diseases Caused by Fungi and Fungus-Like Organisms

First Report of *Erysiphe corylacearum*, Agent of Powdery Mildew, on Hazelnut (*Corylus avellana*) in Romania

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Romania has an increasing area dedicated to hazelnut (*Corylus avellana* L.), covering 890 ha in 2019. During October 2020, powdery mildew symptoms were observed on the upper side of leaves of hazelnut 'Tonda di Giffoni' in two commercial orchards in Dudeştii Vechi, Romania. The disease was present on 70% of the trees, with at least five leaves per tree showing powdery mildew. Micromorphological examination revealed amphigenous, hyaline, branched, septate mycelial patches of 2.3 to 3.6 µm in diameter. Conidiophores measured 24 to 60 × 5 to 6 (average: 45 × 6) µm and consisted of erect, cylindrical to flexuous foot cells, followed by one to two shorter cells. Ellipsoid, ovoid to doliform conidia were produced singly, and they measured 19 to 35 × 16 to 24 (average: 28 × 19) µm. Chasmothecia were spherical, 75 to 107 (average: 88) µm in diameter. Nine to 13 straight, sometimes flexuous, appendages measured 54 to 92 (average: 66) µm in length, and they had five times dichotomous branched apices with curved tips. Each chasmothecium contained three to five ellipsoid, ovoid to subglobose asci measuring 41 to 58 × 29 to 55 µm (average: 52 × 43) µm. The asci contained four to eight ascospores measuring 13 to 24 × 11 to 15 (average: 18 × 14) µm. Morphological identification was confirmed by sequencing the ITS region of rDNA using two isolates from leaves, stored as frozen mycelium at –20°C. PCR was performed with Erysiphales-specific primer pair PMITS1/PMITS2 (Cunnington et al. 2003). The obtained sequences were deposited in GenBank (accession nos. MW423075 and MW423076). BLAST analysis of both sequences showed 100% identity to ITS rDNA sequences of *Erysiphe corylacearum* from Azerbaijan (Abasova et al. 2018; accession no. LC270863), Turkey (Sezer et al. 2017; KY082910), Switzerland (Beenken et al. 2020; MN82272), Iran (Arzanlou et al. 2018; MH047243), and Italy (Mezzalama et al. 2021; MW045425), and 99% identity from Georgia (Meparishvili et al. 2019; MK157199). The sequences showed a low similarity (83%) to *Phyllactinia guttata* (accession no. AB080558). Pathogenicity was verified on 1-year-old plants of *C. avellana* 'Tonda di Giffoni', which were artificially inoculated with a conidial suspension from infected leaves (n = 25). Inoculated plants were incubated at 20 to 28°C and 70 to 80% relative humidity. White mycelium appeared on the upper surface of the leaves at 8 to 10 days after inoculation. No symptoms were found on control plants sprayed with sterile water. The fungus present on inoculated leaves was morphologically identical to the original isolates from field-diseased plants. *E. corylacearum* is native to East Asia and was previously reported in Japan on wild species of *Corylus* (Takamatsu et al. 2015; accession no. LC009928). The pathogen is most likely spread into Europe from east to west of Europe (Heluta et al. 2019), through the Caucasus, starting from Turkey, Azerbaijan, Georgia, and Iran. *P. guttata* was considered the only causal agent of powdery mildew on hazelnut in most countries, including Romania (Braun 1995). Differently from *P. guttata*, which generally develops a mycelium on the underside of leaves, *E. corylacearum* grows with a white mycelium on the upper side of the leaves. Recently, *E. corylacearum* on *C. avellana* was reported also in Ukraine (Heluta et al. 2019), from which it could have moved to Romania. Crop protection strategy on hazelnut should be revised according to the new pathogen occurrence.

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