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NEW DISEASE REPORT

First report of *Eremothecium coryli* on hazelnut in the Republic of Georgia

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Hazelnut (*Corylus avellana*) is one of the most important tree nut crops in the world with 585,150 metric tonnes estimated to have been produced in 2022/2023 (https://inc.nutfruit.org/wp-content/uploads/2023/05/Statistical-Yearbook-2022-2023.pdf). In the Republic of Georgia, hazelnuts are grown currently on an area of 70,000 ha, mostly concentrated in the Samegrelo region, which accounts for 3% of the world's hazelnut production.

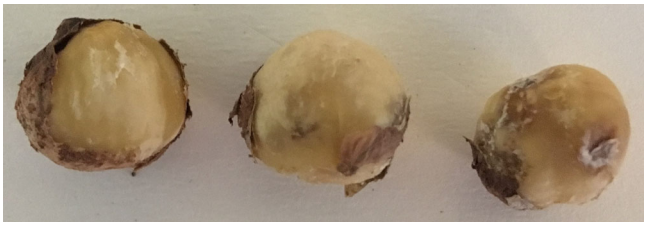

FIGURE 1 Kernel with typical symptoms of dry rot caused by *Eremothecium coryli*.

In 2019, a survey of Georgian hazelnut orchards with typical damage caused by pentatomids (*Halyomorpha halys*, *Palomena prasina*) was done. Kernels with dry rot symptoms were observed in around 10% of the crop (Figure 1). Tissue fragments obtained from the margin of lesions were disinfected in 1% sodium hypochlorite for one minute, rinsed in sterile water for one minute, dried on sterile filter paper in a laminar flow cabinet and placed onto potato dextrose agar (PDA). Numerous colonies with yeast-like morphology were obtained after seven days at 25°C. Oval or spherical, budding cells, either isolated or in short chains, were present. In addition to budding cells, many cylindrical to naviculate asci with two to eight needle-like ascospores arranged lengthwise were present. Ascospores were apiculate to fusiform, with a distinct septum at or near the centre and the upper cell slightly broader at the septum and with whip-like appendages (Figure 2).

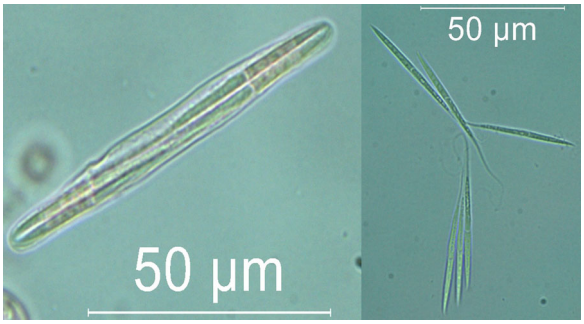

FIGURE 2 *Eremothecium coryli* isolate CREADC-F2453. Ascus with ascospores (left) and free ascospores with whip-like appendages (right) after seven days' incubation on potato dextrose agar at 25°C. Bar = 50 μm.

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Based on morphological features, the colonies were identified as *Eremothecium coryli* (Peglion) Kurtzman (Peglion, 1897). To confirm morphological identification, genomic DNA was extracted from two representative isolates (CREADC-F2453 and CREADC-F2454). The internal transcribed spacer (ITS) was amplified using the primer pair TS1F and ITS4. The sequences were submitted to GenBank (Accession nos. MW195015-MW195016). The nucleotide sequences of both isolates shared 100% identity with several *Eremothecium coryli* isolates (KY103383, KY103387, KY103388, KU853010, MH861168).

The pathogenicity of the isolates was tested by inoculating 25 μL of an ascospore suspension ($1\times10^4/\mu$L) inside the nutshell of ripe hazelnuts, after making a small hole with a sterile needle. The inoculated nuts (twenty replicates for each isolate) and ten nuts treated with sterile water only (as a control), were incubated in the dark at 25°C in a humid growth chamber for 48 hours. Twenty days after inoculation the nutshells were removed and necrotic lesions were observed on the kernels, whereas the controls remained symptomless. *Eremothecium coryli* was isolated from all inoculated kernels as described above, while no fungi were isolated from the controls thus fulfilling Koch's postulates.

Kernel spot caused by *E. coryli* has been reported in Bulgaria (Bobev *et al*., 2017), Italy (Scarpari *et al*., 2019) and recently in Iran (Hojjati *et al*., 2023). *Eremothecium coryli* has been reported to infect other important crops in the world, e.g. tomato and soya bean (Miyao *et al*., 2000; Zečević *et al*., 2022). To the best of our knowledge this is the first report of *Eremothecium coryli* as the causal agent of hazelnut dry rot in the Republic of Georgia. The presence of the disease affects the quality of nuts, thereby making them not suitable for the food industry.

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