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Report

First Report of Grape Root Rot Caused by *Roesleria subterranea* in South Tyrol

Erstnachweis der durch *Roesleria subterranea* verursachten Traubenwurzelfäule in Südtirol

Prima segnalazione di marciume della vite causato da *Roesleria subterranea* in Alto Adige

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In April 2023, declining grapevines were observed in a twenty years old vineyard (*Vitis vinifera* cv. *Lagrein*) in the province of Bolzano. Affected vines were stunted with shortened internodes and yellow leaves; others had dead cordons or were entirely dead. The grower reported that vines were losing vigour and collapsing. Several symptomatic vines showed signs of root decay. Infected plants were usually found in groups and were patchy within the vineyard.

At the level of the roots, the diagnosis was not as easy as with other root pathogens. In fact, the root was not easy to pull out from the ground, did not appear rotten and there were no signs of fungal mycelium present. This could erroneously suggest that the problem was not root rot. The only useful clue that it was a fungal infection was the presence of mazaedia (distinctive fruiting bodies) below the soil line (Fig.1). Mazaedia are stalked apothecia with spores, produced in evanescent asci in dried masses similar to the mazaediate lichens. The mazaedia were approximately 7 mm in length with grey, hemispherical heads. Ascospores were uniseriate, lens-shaped and septate across the broadest plane, hyaline or light green (Fig.2). The fungus was cultured from ascospores on potato dextrose agar (PDA) at 22 ℃ for seven days. A fluffy, mycelial mass was produced with a green pigment in the centre of the colony. No spores were produced (Fig.3).

DNA was extracted, and the internal transcribed spacer (ITS) region was amplified by using the primers ITS5 (5'-GGAAGTAAAAGTCGTAACAAGG-3') and ITS4 (5'-TCCTCCGCTTATTGATATGC-3') [1]. Sequences obtained by PCR were blasted (NCBI Nucleotide Blast). The isolate showed 99.04% identity and an E-value of 0 to *Roesleria subterranea*-type culture CBS:407.51 (accession number MH856922.1).

Until recently, *R. subterranea* was regarded as an opportunistic secondary invader of damaged roots or weakened hosts. It is often found in deciduous trees of genera such as Malus, Pyrus, Prunus, Salix, Cydonia and Rosa. It was assumed to be a facultative parasite of grapevine (*Vitis vinifera*) and prior to the development of molecular diagnosis techniques the fungus was long confused with the morphologically very similar lichen *Sclerophora pallida* [2].

A study conducted in the German winegrowing regions where this ascomycete caused serious problems in established vineyards demonstrated that *R. subter*ranea is not a minor, but rather a primary, pathogen of grapevines and fruit trees. In this study, a pest risk analysis was carried out according to the guidelines defined by EPPO standard series PM 5/3 [3]. The results of this study show that *R. subterranea* must be considered to be a serious, primary pathogen for grapevines and fruit trees that can cause massive economic losses [4].

In fact, it was shown that the hyphae of *R. subterranea* aggregate particularly in the xylem and block the water transport vessels leading to root damage and dieback [5].

This is the first report of *R. subterranea* on grapes in Northern Italy. This fungus needs to be recognised as a potential cause of vine decline and replant problems.

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ANNEX: FIGURES

Fig. 1: Vine roots infected with *R. subterranea*. The circles indicate the presence of mazaedia.

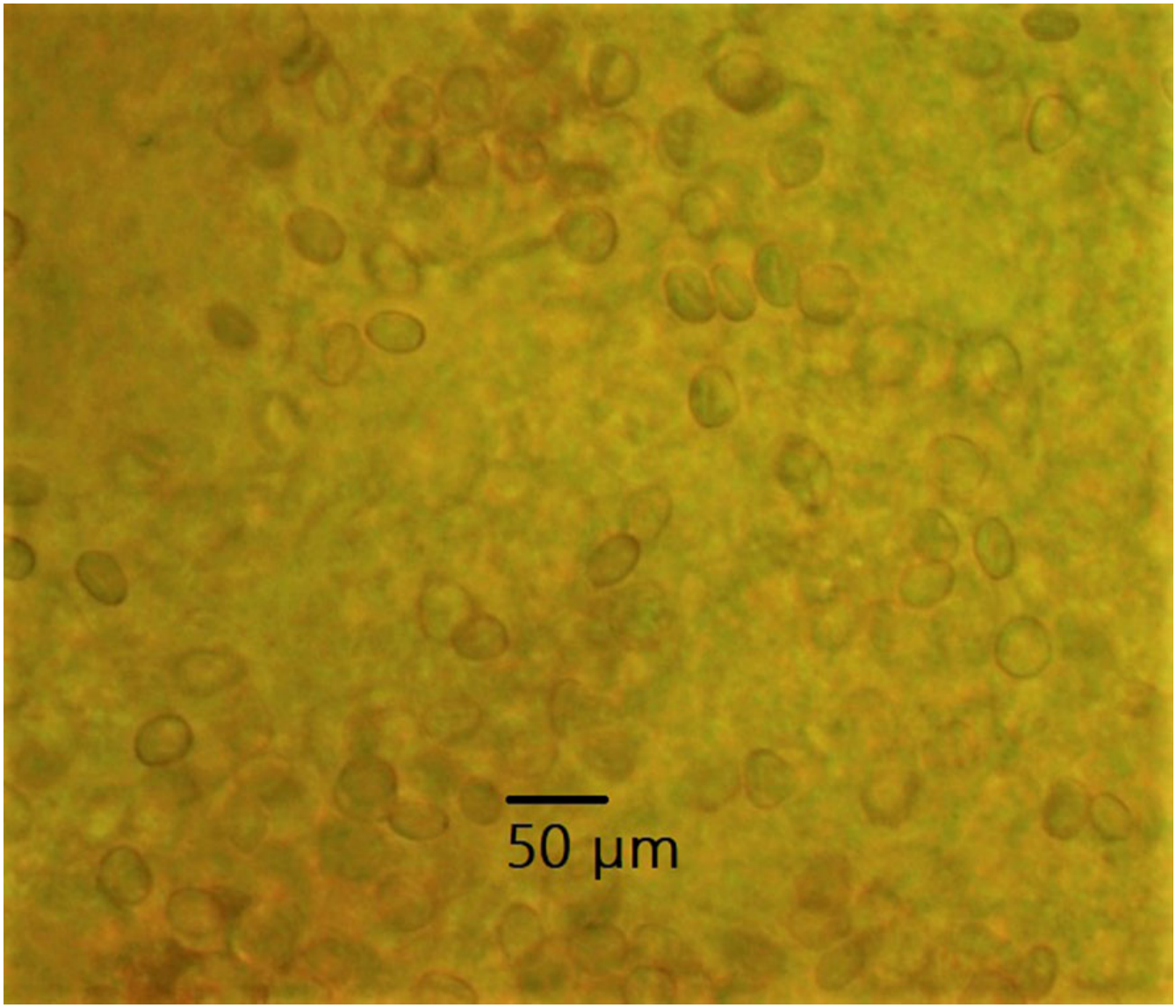

Fig. 2: Ascospores of *R. subterranea.*

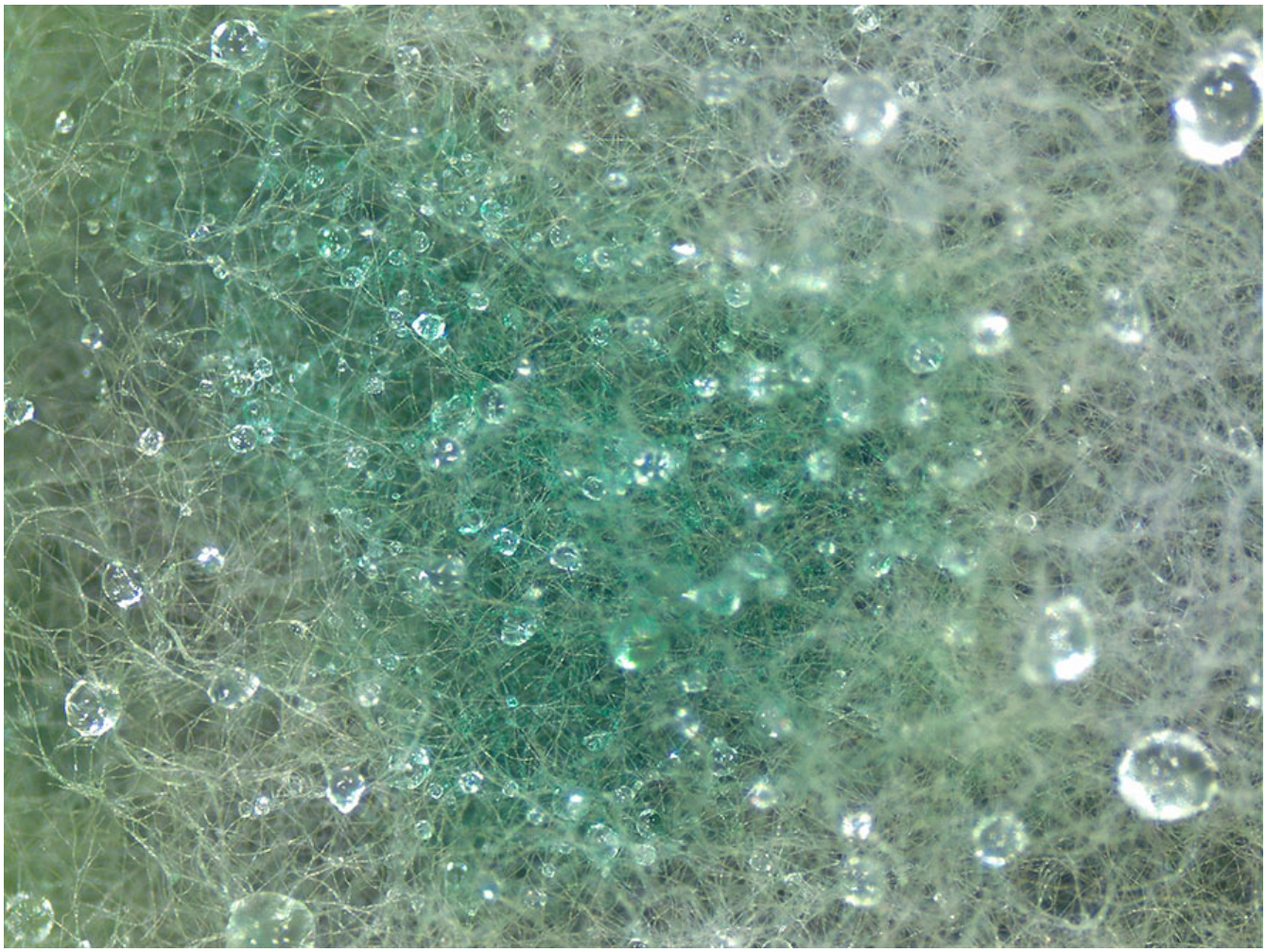

Fig. 3: In vitro growth of *R. subterranea.*