Title:
3109- Morpho-anatomical and microbiological analysis of kiwifruit roots with KVDS symptoms

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Abstract body text:
Italy, one of the largest producers of kiwifruit in the world, has lost 10% of its production in recent years because of the spread of the Kiwifruit Vine Decline Syndrome (KVDS), whose symptoms are often associated to water stagnation and root asphyxia, resulting in root rot. In 2020, an experimental trial was started in a kiwifruit orchard affected by KVDS in Latina (Central Italy) to investigate the causes and to suggest solutions to counter this physiopathy. Root samples from healthy plants were collected and compared with samples taken from plants affected by KVDS. Macroscopically, the roots affected by KVDS were rotting, showing a loss of rhizodermis and cortical parenchyma. Microscopic analysis revealed damage to the root system with tissue breakdown and decomposition, flaking of the rhizodermis, cortical area with a clear loss of cell turgor, initial decay of the stele and evident detachment of the cortex from the central conducting tissues. In combination with light microscopy, the isolation of fungi from the rhizodermis of roots with symptoms of decay and death. Total DNA extracted from the pure colonies was amplified and sequenced, and the nucleotide sequences were compared with those present in the GeneBank database through BLAST analysis, allowing the identification of three abundant fungi: Ilyonectria vredenhoekensis, Fusarium oxysporum and Paraphaeosphaeria michotii. Antimicrobial assays for controlling the above-isolated fungi were carried out using Beauveria pseudobassiana and Bacillus amyloliquefaciens. Both the antagonist fungi had a higher contrasting effect against Ilyonectria vredenhoekensis and Paraphaeosphaeria michotii, whereas only a moderate effect was observed against Fusarium oxysporum. Results revealed that KVDS roots present severe alterations in their morpho-anatomical structure and associated microorganisms, compromising their functionality and with implications for plant growth and productivity.

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