

Mycorrhizal Autochthonous Consortium Induced Defense-Related Mechanisms of Olive Trees against *Verticillium dahliae*

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Abstract : The present work aims to investigate the effect of arbuscular mycorrhizal fungi (AMF) in improving the olive tree resistance to *Verticillium* wilt caused by *Verticillium dahliae*. Inoculated plants with a mycorrhizal autochthonous consortium 'Rhizolive consortium' and pure strain 'Glomus irregulare' were infected after three months with *V. dahliae*. The improving of olive tree resistance was determined through disease severity, incidence, and defoliation. On the other hand, the defense mechanisms of olive plants were evaluated through lignin content, phenylalanine ammonia lyase (PAL) activity, and polyphenol content. The results revealed that both AMF significantly ($p < 0.05$) reduced disease development and the rate of defoliation in infected olive plants. Moreover, the contents of lignin were boosted after mycorrhizal inoculation in both the roots and the stems of olive plants, which remained significantly ($p < 0.001$) higher after the 90th days of *V. dahliae* inoculation. PAL activity was increased after *V. dahliae* inoculation in the stems of 'Rhizolive consortium' treatment that were 17 times higher than those in the roots of olive plants. The polyphenol content in the stems was about twice higher than those in the roots. The reduction of disease severity was accompanied by increased levels of lignin content, PAL activity, and polyphenol content, particularly in the stems of olive plants, indicating the strengthening of the olive plant immune system against *V. dahliae*.

Keywords : olive tree, Mycorrhizal autochthonous consortium, *Glomus irregulare*, *Verticillium dahliae*, defense mechanisms

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