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ANTAGONISM TESTS *IN VITRO* AND *IN PLANTA* AGAINST *DIPLODIA MUTILA* ASSOCIATED WITH OAK DECLINE IN SOUTHERN ITALY

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During the last decades numerous oak stands have been affected by oak decline in southern Italy. Various fungal microorganisms have been found associated with the syndrome, showing either an endophytic asymptomatic or a pathogenetic behaviour or both in succession. Among the microrganism found *Diplodia mutila* (Fr.) Mont. was often recorded.

The aim of this research was to assess the antagonistic degree of some fungal isolates belonging to *Trichoderma viride* Pers.: Fr., *Epicoccum nigrum* Link., and to *Fusarium*, *Alternaria* and *Cytospora* (teliomorph: Valsa sp.) genera, also occurring in epigeous declining oak tissues by means of antagonistic tests performed *in vitro* and *in planta* against an isolate of *D. mutila.*

In the tests *in vitro* the combination antagonist/pathogen was cultured in the same Petri dish and the growth rate and type of interaction were observed and recorded daily. In the tests *in planta* the same antagonists were inoculated together with *D. mutila* in the woody stem part of one-year- old oak seedlings belonging to *Quercus cerris* L. and *Q. pubescens* Willd. grown in a greenhouse at 24±2°C. The results were collected 10 days after inoculation, when early symptoms of infection (discoloration and twig wilting) appeared, and were repeated every 20 days. Control seedlings were inoculated only with the pathogen.

In vitro the isolates of *T. viride*, *E. nigrum* and *Fusarium* sp. demonstrated high antagonistic activity against *D. mutila*, inhibiting growth by 33%, 42% and 59%, respectively. The isolate of *Fusarium* sp. also partially overgrew the colony of *D. mutila* after an initial deadlock at a distance by the mycelium of the pathogen. The isolate of *T. viride* completely overgrew the one of *D. mutila*, whereas the tests involving both *Cytospora* sp. and *E. nigrum* revealed a mutual inhibition between the two species and *D. mutila*. *In planta* the most effective results were given by the isolate of *Fusarium* sp., which was able to reduce the area of oak tissue infected by *D. mutila* compared to controls.

If such results gain further positive confirmation, biological control against fungal pathogens involved in oak decline by using antagonistic fungi could represent a promising tool for the sustainable management of forest ecosystems against disturbing biological constraints.