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ABSTRACTS

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Is *Colletotrichum acutatum* a merely pathogen or a true endophyte?

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Endophytic fungi reside in internal tissues of living plants without causing any immediate overt negative effects, but may turn pathogenic during host senescence. The fungus *Colletotrichum acutatum,* is the main causal agent of olive anthracnose, however it can also persist on several other plant species without causing disease symptoms. Previous work indicated that this fungus can switch between an endophyte and pathogen lifestyle. The present study aimed to determine the antagonistic ability of endophytic fungi isolated from olive tree against these two isolates of *C. acutatum.* The endophytic fungi studied were *Penicillium commune, Penicillium roseopurpureum* isolated from cv. Cobrançosa, and *Penicillium purpurogenum, Fusarium oxysporum* and *Macrophomina phaseolina* isolated from cv. Galega. Dual cultures were carried out on PDA medium, and the internal radial fungal growth, sporulation and spore viability were evaluated. The outcome of interaction was completely different among the two *C. acutatum* isolates. All the endophytes tested exhibited highest antagonistic activity against the pathogen *C. acutatum* than to the endophyte ones. Mycelia growth of the pathogen *C. acutatum* was reduced significantly from 29 to 42%, and of the endophyte *C. acutatum* was reduced from 6 to 37%. The highest growth inhibition was displayed by the endophytes *P. commune*, *F. oxysporum* and *M. phaseolina.* Sporulation and viability of the pathogen *C. acutatum* in co-culture with endophytes have similarly reduced significantly (up to 84% and 48%, respectively). Both *P. roseopurpureum* and *P. commune* were the most inhibitory. By contrast, in co-cultures established with the endophyte *C. acutatum* only its viability was reduced significantly when compared to control (up to 75%) by *P. purpurogenum*. The results indicate that the change of *C. acutatum* from a pathogenic to a non-pathogenic lifestyle affects the interaction with other endophytes species inhabiting olive tree tissues. The outcome of these interactions could have important implications in the host plant resistance to anthracnose.

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Evaluation of endophyte mediate effects on olive tree protection against *Colletotrichum acutatum*

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Olive anthracnose, caused mostly by *Colletotrichum acutatum*, is one of the most serious diseases of olive grove, leading to significant yield losses. In olive tree, anthracnose affects flowers, fruits, leaves and twigs. The incidence of olive anthracnose (OA) depend essentiality on cultivar susceptibility. In Portugal, the cv. Cobrançosa is moderately resistant to OA whereas the cv. Galega is susceptible. TThe endophytic fungi are a group of useful microorganisms that have received considerable attention, after they were found to protect their host against abiotic and biotic stress. Therefore, the main aim of this study was to clarify potential fungal endophyte mediate effects on olive tree resistance/susceptibility to OA, under field conditions.
Fungal endophytes were isolated from leaves and twigs of healthy trees from both cultivars and identified by rDNA sequencing.
The fungal endophyte frequency and diversity were higher on the OA-susceptible cv. Galega than on the moderately resistant cv. Cobrançosa. Statistical analyses and community ordinations revealed significant differences in fungal community composition between cultivars. The majority of differences associated with the tolerant cv. Cobrançosa were attributed to, *Hypocrea lixii, Trichoderma gamsii* and *Phomopsis columnaris,* within twigs, and to *Alternaria alternata* and *A. arborescens* within leaves. OA-susceptible Galega was differentiated by the species *Biscogniauxia mediterranea, Pyronema domesticum*and *Ochrocladosporium adansoniae,* isolated from twigs, and by *Chaetomium globosum, Pyronema domesticum* and *Biscogniauxia mediterranea* isolated from leaves. These analyses allow the identification of predictable fungal species that could explain the reduction of anthracnose disease infection in cv. Cobrançosa. The features of those species will be further confirmed by using in vitro and in vivo assays.

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