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Endophytic fungi of olive tree and its potential application in protection against *Colletotrichum acutatum*

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Endophytes are a group of microorganisms that reside asymptotically within most living plant tissues. Several reports have indicated that endophytes are able to protect their host against phytopathogens, suggesting their agricultural application as biocontrol agents. Thus, in this work we intend to assess the diversity of fungal endophytes in three olive tree cultivars with different susceptibilities to one of the most damaging diseases, the olive anthracnose, and select the strains with the greatest antagonistic effect against *Colletotrichum acutatum*, the main causal agent of this disease. The fungal endophytes were isolated from roots, leaves and twigs of healthy trees of cvs. Cobrançosa (moderately resistant), Picual (tolerant) and Galega (susceptible), and identified by rDNA sequencing. The *in vitro* effect of the isolates obtained against *C. acutatum* was analyzed by the dual-culture method. The three cultivars clearly differed according to the endophytic fungal communities. The frequency of endophytic colonization and fungal diversity were greater on cv. Galega, followed by cv. Picual and cv. Cobrançosa, in all of the plant tissues analyzed (roots, leaves and twigs). Among the species identified in the cv. Cobrançosa, *Paecilomyces lilacinus*, *Fusarium oxysporum* and *Trichoderma gamsii* were the most frequently isolated. *Fusarium oxysporum*, *F. rodolens* and *F. nematophilum* were the most dominant species in cv. Picual, whereas in the cv. Galega were *Phomopsis columnaris*, *F. oxysporum* and *Macrophomina phaseolina*. Among the fungi isolated from cv. Cobrançosa, *P. lilacinus*, *Hypocrea lixii* and *Penicillium roseopurpureum*, significantly inhibited the growth, sporulation and germination of *C. acutatum*. By contrast, only one species from cv. Galega (*T. gamsii*) and another from cv. Picual (*Ceratobasidium albasitensis*) were inhibitory to *C. acutatum*. These findings indicate that some fungal endophytes might be involved in the protection of olive tree against this pathogen. This knowledge is relevant for exploring endophytic fungi as biocontrol agents and for

elucidation of the mechanism of enhanced disease resistance in olive tree cultivars.

Key words: *Olea europaea*, olive anthracnose, biological control, plant resistance, fungal diversity

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