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Poster Abstract - D.28

SECONDARY METABOLITES PRODUCED BY *TRICHODERMA SPP* AND THEIR ROLE IN THE INTERACTION OF THIS FUNGUS WITH PLANTS AND OTHER MICRORGANISMS

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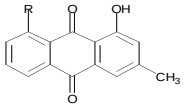
secondary metabolites, Trichoderma, antibiotics, biopesticides, systemic resistance

Trichoderma strains are among the most studied fungal biocontrol agents and are successfully used as biopesticides and biofertilizers in greenhouse and field plant production. These applications are related to their ability to control plant diseases and promote plant growth and development.

Biocontrol *Trichoderma* strains show different antagonistic mechanisms towards fungal pathogens. These include the production of a variety of antibiotics, mycoparasitism or hyperparasitism, competition for nutrients or space and cell wall-lytic enzymes activity. In addition, these fungi may induce systemic resistance in plant which prevents further attacks by pathogens. Secondary metabolites play an important role during biocontrol, although their modes of action towards microorganisms and plants have not been fully elucidated.

In this work, we isolated the major secondary metabolites from three biocontrol strains of *T. harzianum* (T22, T39 and A6) and one of *T. atroviride* (P1). Seven compounds were extracted and characterised from fungal culture filtrates: two new molecules, a T22 azaphilone (3) and a T39 butenolide (5), and five already known secondary metabolites [1-hydroxy-3-methyl-anthraquinone (1), 1,8-dihydroxy-3-methyl-anthraquinone (2), harzianolide (4), 6-n-pentyl-6H-pyran-2-one (7) and harzianopyridone (5)] were characterized. The compounds isolated showed different levels of antibiotic activity against the pathogens *Gaeumannomyces graminis* var. *tritici*, *Rhizoctonia solani* and *Pythium ultimum*, and may have specific modes of action and roles in the antagonistic activity of *Trichoderma*.

In order to investigate the potential involvement of secondary metabolism in the interaction of *Trichoderma* with plants, the ability of the newly isolated compounds to induce systemic resistance was evaluated. Preliminary results showed a reduction of disease symptoms in canola seedlings treated with the fungal metabolites and inoculated with the pathogen *Leptosphaeria maculans*.



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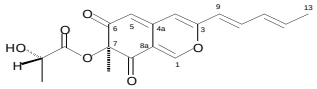
2 R = OH



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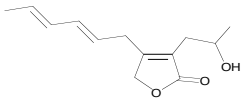

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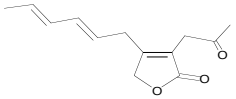

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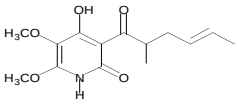

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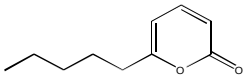

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