

SELECTION AND CHARACTERIZATION OF CANDIDATE BIOINOCULANT *TRICHODERMA* STRAINS ISOLATED FROM SOILS OF THE HUNGARY-SERBIA CROSS BORDER REGION

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Many biological soil inoculant products contain *Trichoderma* component(s) due to the beneficial effect of these organisms on both the soil and the plants. These filamentous fungi take part in the degradation of plant residues in the soil, contribute to the maintenance of the soil nutrient level by recycling nutrients, and may also prevent the survival of plant pathogens which could otherwise overwinter on the undegraded plant residues. *Trichoderma* strains are also beneficial by promoting plant growth and induce Systemic Acquired Resistance (SAR) in plants, furthermore, they are useful agents against plant pathogens – especially other fungi – through their antagonistic abilities by secondary metabolite production, efficient competition for space and nutrients and eventual mycoparasitism.

In this study we examined *Trichoderma* strains with promising abilities for later use as biological agents. A total of 55 *Trichoderma* strains were isolated from various Hungarian and Serbian agricultural soils. The isolates were identified by the sequence analysis of a fragment of the *tefla* (translation elongation factor 1 α) gene. Enzyme activity tests were performed to unveil the cellobiohydrolase, β -xylosidase, phosphatase and β -glucosidase enzyme production of the strains by chromogenic paranitrophenyl substrates. Based on the data of the enzyme activity tests and the DNA analysis, 9 *Trichoderma* strains were selected in the first round for further study. The selected strains were subjected to a series of experiments where their biocontrol abilities against plant pathogenic fungi including *Sclerotinia sclerotiorum*, *Colletotrichum gloeosporioides*, *Fusarium solani* species complex, *Phoma cucurbitacearum*, *Alternaria solani*, *Gaeumannomyces graminis*, *Fusarium graminearum*, *Botrytis cinerea* and



Fusarium culmorum were evaluated. The growth rates of the strains under various pH conditions in the pH range of agricultural soils, and their tolerance of heavy metal compounds such as copper, zinc and cadmium were also determined.

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