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EVALUATION OF THE PROPERTIES OF *Trichoderma* sp. ISOLATES AS BIOCONTROL AGENT AND BIOFERTILIZER

D. Maral, S. Sozer, Y. Gezgin, C. Kara, S. Sargin, R. Eltem, F. Vardar-Sukan

Ege University Faculty of Engineering, Department of Bioengineering 35100 Bornova, İzmir, Turkey

Abstract

Mycofungicides and fungal biofertilizers have gained interest for agricultural use because of their positive effect on controlling plant diseases and increasing crop production in an environmentally friendly manner. In recent years a wide range of biological control agents have been developed as commercial mycofungicidal products for plant disease control, while fungal biofertilizers have also been developed for application in crop production. Among them *Trichoderma* species are the most common fungal biocontrol control agents and are commercially formulated as biofungicides, biofertilizers, and soil amendments because of their induction of plant growth and their higher activity in soil remediation.

Trichoderma genus members are generally found in all soils including forest humus layer as well as in agricultural and orchard soils. These free-living filamentous fungi are highly interactive in root, soil and foliar environments. It has been known for many years that they produce a wide range of antibiotic substances, lytic enzymes and that they parasitize other fungi. They can also compete with other microorganisms; for example, for key exudates from seeds that stimulate the germination of propagules of plant-pathogenic fungi in soil and more generally, they compete with soil microorganisms for nutrients and/or space. As a biocontrol agent, *Trichoderma* type fungi, can be used to control a wide spectrum of plant pathogen fungi. The application of *Trichoderma* spp. has not only an antagonistic effect on plant pathogens but also a positive effect on plant growth and yield in some vegetable crops by promoting efficiency of basal organic fertilizer application. The increased growth response is mainly due to hydrolysis of cellulose in soil, mineral solubilization and uptake of minor and other minerals as well as improvement in the root morphology enabling the roots to exploit a large volume of soil.

In this study, eleven *Trichoderma* sp. isolated from lumbering industry were tested for their potential of being used as a biocontrol agent and bio-fertilizer. Therefore, mycoparasitic activity against three plant pathogens and lytic enzyme activities (mainly chitinase, β -1,3 glucanase and protease) were determined in respect of their antagonistic abilities and indole acetic acid production, cellulase activities, and phosphate solubilization abilities were tested to evaluate their effect on plant growth and soil remediation.
