

Biotechnology innovation in biological control of plant diseases

Ilan Chet Hebrew

University of Jerusalem, Israel

Abstract

Biological control, the use of antagonistic organisms that interfere with plant pathogens represent an ecological approach to overcome the problems caused by hazardous chemical pesticides applied in plant protection. The mycoparasite *Trichoderma* is an efficient bio-control agent excreting extracellular chitinases, β -1-3 glucanases and proteases. Cloning these genes into plants can induce their resistance to diseases. Moreover, this bio-control agent can induce systemic resistance (ISR) to diseases by priming the expression of several plant defense related genes which enables *Trichoderma* treated plants to be more resistant to subsequent pathogen infection. Root colonization by *Trichoderma* strains results in massive changes in plant metabolism leading to accumulation of antimicrobial compounds in the whole plant. Studies have demonstrated that *Trichoderma* can ameliorate also plant performance in the presence of various abiotic stresses such as drought, salinity and heavy metals. Understanding the molecular basis of the diverse modes of action *Trichoderma* can lead to a better environmental-friendly control of plant diseases.

chetilan@gmail.com

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