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.

Note: This work is partly presented at 8th World Congress on Agriculture & Horticulture, March 02-04, 2017 | Amsterdam, Netherlands