THE ABILITY OF SOME SELECTED ISOLATES OF *Trichoderma* spp. TO IMPROVE SEED VIABILITY AND PLANT HEALTH THROUGH SEED TREATMENTS

By

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A Thesis Submitted in Partial Fulfillment
Of
The Requirement for the Degree of

DOCTOR OF PHILOSOPHY
in
Agriculture Sciences
(Biotechnology and Food Safety in Arid Regions)

Department of Biotechnology and Food Safety in Arid Regions
Arid Land Agricultural Graduate Studies and Research Institute
Ain Shams University

2022

ABSTRACT

Heba Hamdi Hammad Afifi: The Ability of some Selected Isolates of *Trichoderma* spp. to Improve Seed Viability and Plant Health through Seed Treatments, Unpublished Ph.D. Thesis, Department of Biotechnology and Food Safety in Arid Regions, Arid Land Agricultural Graduate Studies and Research Institute (ALARI), Ain Shams University, 2022.

Among ninety eight *Trichoderma* isolates obtained from plant rhizosphere soil of sixteen governorates in Egypt, and conserved seeds. Nine isolates were highly performed against high temperature, salinity and drought stresses under *in vitro* conditions and pot experiments. Also, they showed their ability as biological control agents against the phytopathogenic fungi *Fusarium oxysporum* and *Rhizoctonia solani* through the dual culture technique with more than 85% inhibition. The nine isolates were phenotypically characterized and identified by specific species primers which confirmed their species as five isolates of *Trichoderma harzianum*, three isolates of *Trichoderma viride*, and one isolate of *Trichoderma virens*. The isolates NGB-T14, NGB-T20 and NGB-T33 were able to grow at ±45ºC in *in vitro*, and the NGB-T14, NGB-T16, NGB-T17 and NGB-T18 isolates showed a significant salinity tolerance up to 2M. While the NGB-T59, NGB-T86 and NGB-T90 were grown in 30% PEG for drought tolerance. The *ex vivo* pot treatments under abiotic stresses with selected isolates were tested individually and showed an enhancement in morphological and biochemical traits compared with the untreated seeds. In determination of the biochemical traits, proline and chlorophyll were significantly increased under severe abiotic stresses. *T. harzianum* (NGB T14) alleviated the heat stress on plants to survive under ±40°C. Moreover, *T. harzianum* (NGB-T14) gave the best profile in high salinity levels

that can reach 12 dSm-1. The isolate *T. viride* (NGB-T59) was the best in drought tolerance. These observations may be of use to phytosanitary services for growers and agricultural researchers under the arid land for sustainable utilization.

Key Words: Abiotic stresses, Seed treatments, *Trichoderma* sp., Biofertlizer, Proline detection and Genotypic Identification.

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