

**BACTERIAL SYMBIONTS OF
ENTOMOPATHOGENIC NEMATODES AS
BIOCONTROL AGENTS**

By

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**B. Sc. Agric. Sci., (Biotechnology), Fac. Agric., Cairo Univ., 2004
M.Sc. Agric. Sci. (Agric. Microbiology), Fac. Agric., Cairo Univ., 2013**

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ABSTRACT

In this work, five strains of *Photorhabdus luminescence* isolated from a local nematode strains namely *Heterorhabditis indica* (EGAZ1), *H. indica* (EGAZ2), *H. indica* (EGAZ3), *H. indica* (EGAZ4), *H. indica* (EGAZ5). In addition to a second bacterial symbiont *Providencia rettgeri* of *H. indica* (EGAZ3), *Photorhabdus luminescens* subsp. *laumondii* HP88 which was isolated from *Heterorhabditis bacteriophora* (HP88), and *Xenorhabdus nematophilus* isolated from the hemolymph of *Galleria mellonella* infected with *Steinernema carpocapsae* (BA2). The identity of the isolated bacteria were authenticated referring to their cultural, morphological and biochemical traits as well as to their entomopathogenicity against *Galleria mellonella*. The 16S r RNA gene sequence technique was adopted for conclusive identification of the five isolates. Lab and pots experiments conducted to examine antimycotic activities of cell-free culture filtrates with different concentrations against plant pathogenic fungi *Fusarium oxysporum*, *Fusarium solani*, and *Schloteria rolsii*, also the nematicidal activities of the bacterial cell suspensions and cell-free culture filtrates with different concentrations against *Meloidogyne incognita* were studied and larvae toxicity of the bacterial cell suspensions and cell-free culture filtrates with different concentrations pointed out to moderate susceptibility of *T. absoluta* larvae to all bacterial cell suspensions as well as their toxins. However, the degree of susceptibility varied according to the strain genotype and toxin concentration. Higher densities cell suspensions up to 4×10^7 cells.ml⁻¹ and undiluted cell- free supernatant (100%) were the most effective larvicidal fluids. Percentage of *T. absoluta* mortality increased with increasing the supernatant concentration. Larvae mortality of up to 70 % was achieved when *T. absoluta* larvae were treated with either a cell suspension or the cell-free culture filtrates of *P. luminescence* (EGAP2). Histopathological effect of *P. luminescence* (EGAP2) on the midgut of *Tuta absoluta* was examined.

Key words: *Photorhabdus*, *Xenorhabdus*, Fungicidal, Nematicidal and Insecticidal.

DEDICATION

This work is dedicated to my father, because I owe it all to you. Many Thanks, my mother, my brothers (Mahmoud, Khaled, Ahmed, Amr and Hussien), my lovely sister (Shymaa) for their emotional support, my nephews, my nieces (Gody, Gana , Gehan, Malk, Gomana, Shrouk, Rodina) for always making me see the bright side of life, and finally to my dear friends (Heba Adel , Mai Mahrous and Amal Samir)

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