POTENCY OF SOME BIOCONTROL AGENTS IN SUPPERSING THE POPULATION OF THE AMERICAN BOLLWORM, *HELICOVERPA ARMIGERA* (HUB.)

BY

HEND ALASHRY ALSAYED ALASHRY

B.Sc. Agric. Sci. (Economic Entomology) Cairo University, 2000

Master in Environmental Science, Ain –Shams University, 2012.

A Thesis Submitted in Partial Fulfillment

of

The Requirements for the doctor of Philosophy Degree

in

Environmental Sciences

Department of Environmental Agricultural Sciences

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APPROVAL SHEET

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ABSTRACT

Hend Alashry Alsayed Alashry. Potency of Some Biocontrol Agents in Suppersing the Population of the American bollworm, *Helicoverpa armigera* (Hub.) Unpublished Ph.D. Thesis in Environmental Agricultural Sciences, Institute of Environmental Studies and Research, Ain Shams University, 2018.

The activities of the tested enzymes included acetylcholinesterase, alkaline and acid phosphatases, α and β- esterases, glututhione S- transferase, mixed function oxidase in the whole homogenates of the different instar larvae from the 3rd to the 6th of the field colony of *Helicoverpa armigera* (Hubner) were higher than the corresponding of the laboratory strain. The levels of enzymes activity increased gradually from the 3nd to the 6th instar larvae. Similarity in the total protein content which recorded higher in the different instar larvae of the field colony than the laboratory strain. The toxicity of the tested insecticides was higher against the 2nd instar larvae than the 4th instar larvae. Dipel was the most effective compound against the two instars larvae, whereas Bio-power recorded the least toxic compound. For toxicity index, Dipel DF the most toxic compound was selected as standard insecticides, whereas based on relative potency level, bio power the least toxic one was chosen as standard material. Bio power and Dipel DF showed the steepest toxicity line. According to the quantal scoring Dipel DF was the most pronounced insecticide for pupation. Based on inhibition of the adult emergence Proclaim recorded the most effective one. Tafaban exhibited the highest level of resistance in the 4th instar larvae of the field colony by using laboratory discriminating concentration. The highest reduction rates in the male moths caught in the pheromone traps and the larval infestation in tomato fruits were noticed in fields treated with egg parasitoid *Trichogramma evanescens* supported with additional belt of the same parasitoid. Predator's populations were much higher in the untreated plot than the treated plots with different control methods. The highest numbers of predators were noticed in plots treated with *Trichogramma . evanescens* followed by plots treated with entomopathogenic fungi and bacteria, whereas the least predator's number were associated to insecticidal application.

Key words: *Helicoverpa armigera, Trichogramma evanescens,* Entomopathogenic fungi and bacteria, predators, Insecticides, Tomato.

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List of abbreviations and acronyms involved in This Thesis

No.	Abbreviation	Meaning	Page
1	WPTC	World Processing Tomato Council,	1
2	*et al.*	*et alii* = and others (authors)	3
3	h.a.	Hectare = 10000 m^2	7
4	Spp.	Plural species	7
5	IOBC	International Organization for Biological Control	11
6	IPM	Integrated pest management	12
7	w/v,	Weight per volume	13
8	ml./ha	Milligrams/ hectare	15
9	cv.	Cultivar variety	15
10	L./ha	Liter / hectare	15
11	gm.	Gram	16
12	PBW	Pink Bollworm	17