

**BIO - MONITORING THE CHANGES IN
THE POPULATION DENSITY OF PINK
BOLLWORM IN RELATION TO
THE CORRESPONDING CROP
SIZED SYSTEM**

By

DALIA ABDALLAH ABDEL-SALAM MOHAMMED

B.Sc. Agric. Sc. (Entomology), Ain Shams University, 2000

M.Sc. Agric. Sc. (Economic Entomology), Ain Shams University, 2008

**A thesis submitted in partial fulfillment of
the requirements for the degree of**

DOCTOR OF PHILOSOPHY

in

**Agricultural Science
(Economic Entomology)**

**Department of Plant Protection
Faculty of Agriculture
Ain Shams University**

2013

Approval Sheet

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This thesis for Ph.D. degree has been approved by:

Dr. Mohammed Abdel-Ghaffar Mahmoud

Prof. of Economic Entomology, Faculty of Agriculture, El-Azhar University.

Dr. Mohamed Salem Abd El Wahed

Prof. of Economic Entomology, Faculty of Agriculture, Ain Shams University

Dr. Shoukry Ahmed El-Sayed El-Refai

Prof. of Economic Entomology, Faculty of Agriculture, Ain Shams University.

Date of Examination: 7 / 11 / 2013

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Under the supervision of:

Dr. Shoukry Ahmed El-Sayed El-Refai

Prof. of Economic Entomology, Department of Plant Protection,
Faculty of Agriculture, Ain Shams University.
(Principal Supervisor)

Dr. Abd El-Aziz Abouel-Ela Abd El-Aziz Khedr

Head of Research of Economic Entomology, Plant Protection
Research Institute, Agricultural Research Centre.

ABSTRACT

Dalia Abdallah Abdel-Salam: Bio-Monitoring the Changes in the Population Density of the Pink Bollworm in Relation to the Corresponding Crop Sizing System. Unpublished Ph.D. Thesis. Department of Plant protection, Faculty of Agriculture, Ain Shams University, 2013.

The pink bollworm, *Pectinophora gossypiella* (Saund.) is the most destructive lepidopterous cotton pest in Egypt, causing a lot of yield losses. The great importance of this insect pest as mainly, this study is an attempt to acquire more information about the population dynamics and time of occurrence of *P. gossypiella*. Also, the need for more accurate stimulation. The aim of this part of study is to establish the velocity constants; i.e. the relationship between temperature and speed of development which give a quantitative expression for this relationship, using thermal summations of temperature dependent growth for insect population modeling has become vital. To be able to decide the appropriate times for controlling the bollworms, it was essential to learn something of their population densities under the field conditions of Menoufia Governorate. The seasonal history of the pests occurring on a crop, their population density, fluctuation in abundance and population composition in relation to crop and weather conditions should be thoroughly known for timely adoption of protection measure.

Biochemical aspects in the pink bollworm *P. gossypiella* strains. Hydrolyzing enzymes activity, i. e. acetylcholinesterase, alkaline phosphatase, carboxyl esterase and nonspecific-esterases as well as total protein contents, total carbohydrate and total lipids were determined in the 4th instar larvae of *P. gossypiella* strains. In this

study, five different field colony strains were compared with the baseline laboratory strain that was not subjected to any insecticides.

Six strains of the pink bollworm, *Pectinophora gossypiella* were used in the present study. The laboratory strain was used as a baseline in the molecular biology assays. Five strains were selected from natural populations, fields located in Behira, Kafr El-Shiekh, Qlyubia, Sharkia and Beni-Suef Governorates. The finger print studies included the analysis of the plod genomic DNA of the tested strains under this study by using RAPD-PCR method. A battery of five primers was used to evaluate the mutagenic among the sex strains. The primers were (OPA-18 OPD-03 OPB-03, OPC-02 and OPE-12). It is interest to note that the less damaging effect to pink bollworm DNA could be attributed to a good detoxifying mechanism developed by the insect as a result of wide spread and long term exposure of insect larvae in additional to different thermal degrees in the fields.

Keywords:

Pectinophora gossypiella, Developmental threshold, Thermal units, Seasonal abundance, Generations, Biochemical aspects, Hydrolyzing enzymes, Nonspecific-esterases, Total protein, Total carbohydrate, Total lipids, Molecular.

ACKNOWLEDGEMENT

Ultimate thanks to “ALLAH”

I would like to express my deepest appreciate and respect to **Prof. Dr. Shoukry Ahmed El-Rafai**, professor of Economic Entomology, Plant Protection Department, Faculty of Agriculture, Ain Shams University for suggesting the research work, for his kind supervision, generous assistance, continuous support, encouragement, constructive criticism and correcting the manuscript.

I would like to express my sincere thanks to **Prof Dr. Abdel-Aziz Abouel-Ela Khidr**, Professor of Economic Entomology, Bollworms Research Department, Plant Protection Research Institute, for suggesting the research work, generous help, close supervision, encouragement during the preparation of the work and willingness to discuss various problems and reviewing the manuscript.

I wish to express my deepest gratitude to **Late Prof. Dr. Gamil Borhan El Dein El-Saadany**, Professor of Economic entomology, Plant Protection Department, Faculty of Agriculture, Ain Shams University for his endless support and suggesting the research work.

The author wishes to express her sincere thanks and gratitude to **Prof. Dr. Azza Kamal Emam**, Professor of Economic Entomology, Head of Plant Protection Department, Faculty of Agriculture, Ain Shams University for her kind help, valuable scientific advice and faithful encouragement.

I would like to thank all staff member and assistants in the Department of Plant Protection, Faculty of Agriculture, Ain Shams University for their kind friendship and encouragement.

I would also like to thank all staff member and assistants in the Department of Bollworms Research, Plant Protection Institute, Agricultural Research Center for their kind help.

Deep appreciation and love are expressed to my family including ***my father, my sisters, my brother*** and ***my family in law***, for fruitful help and continuous encouragement throughout this work.

Finally, I would like to express special gratitude and sincere thanks to my husband ***Hytham*** for his continuous encouragement, fruitful help and patient support during this work. I hope the great and blessing future for my lovely children, ***Rana*** and ***Ahmed***.

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