TAXONOMICAL AND ECOLOGICAL STUDIES OF THRIPS SPECIES IN AN OLIVE GROVE IN ISMAILIA GOVERNORATE

By

MAALY EASA ABDALLA WAFY

B.Sc. Agric. Sci. (Pomolgy), Fac. Agric., Cairo Univ., Egypt, 2003.
M.Sc. Agric. Sci. (Pomolgy), Fac. Agric., Cairo Univ., Egypt, 2009

THESIS

Submitted in Partial Fulfillment of the Requirements for the Degree of

DOCTOR OF PHILOSOPHY

In

Agricultural Sciences

(Economic Entomology)

Department of Economic Entomology and Pesticides
Faculty of Agriculture
Cairo University
EGYPT

2018

Format Reviewer Vice Dean of Graduate Studies

APPROVAL SHEET

TAXONOMICAL AND ECOLOGICAL STUDIES OF THRIPS SPECIES IN AN OLIVE GROVE IN ISMAILIA GOVERNORATE

Ph.D. Thesis
In
Agri. Sci. (Economic Entomology)

By

MAALY EASA ABDALLA WAFY

B.Sc. Agric. Sci. (Pomolgy), Fac. Agric., Cairo Univ., Egypt, 2003.
M.Sc. Agric. Sci. (Pomolgy), Fac. Agric., Cairo Univ., Egypt, 2009

Approval Committee

Dr. ABD El-RAHMAN GAMAL El-DIN ABD El-RAHMAN
……
Researcher Professor of Pesticide, Plant Protection, Desert Researches Center.

Dr. El- SAID SADEK HEGAZI ……
Professor of Pomology, Fac. Agric., Cairo University.

Dr. IMAN IBRAHIM EL-SEBAEY……
Head Research, Plant Protection, Research Institute, Agriculture Research Center

Dr. ESSAM ABD EL-MAGUIED AGAMY……
Professor of Entomology, Fac. Agric., CairoUniversity.

Date: 23 / 10 /2018

SUPERVISION SHEET

TAXONOMICAL AND ECOLOGICAL STUDIES OF THRIPS SPECIES IN AN OLIVE GROVE IN ISMAILIA GOVERNORATE

Ph.D. Thesis
In
Agri. Sci. (Economic Entomology)

By

MAALY EASA ABDALLA WAFY

B.Sc. Agric. Sci. (Pomolgy), Fac. Agric., Cairo Univ., Egypt, 2003.
M.Sc. Agric. Sci. (Pomolgy), Fac. Agric., Cairo Univ., Egypt, 2009

SUPERVISION COMMITTEE

Dr. ESSAM ABD EL-MAGUIED AGAMY
Professor of Entomology, Fac. Agric., Cairo University.

Dr. MONIR MOHMMED EL-HUSSEINI
Professor of Entomology, Fac. Agric., CairoUniversity.

Dr. IMAN IBRAHIM EL-SEBAEY
Head Research, Plant Protection, Research Institute, Agriculture Research Center

Name of Candidate: Maaly Easa AbdAllah Wafy **Degree:**Ph.D.
Title of Thesis: Taxonomical and ecological studies of thrips species in an olive grove in Ismailia governorate
Supervisors: Dr. Essam Abdel-Maguied Agamy
Dr. Monir Mohmmed El-Husseini
Dr. Iman Ibrahim El-Sebaey
Department: Economic Entomology and Pesticides **Branch:** Entoomology
Approval: 23 /10/ 2018

ABSTRACT

Survey and taxonomy of thrips species in olive groves at Ismailia governorate were stuided during 2013 and 2014 on different cultivars (El-Agizi; Manzanillo and Picual) and associated weeds in olive groves. The effect of some weather factors and plant heights on seasonal abundance of certain dominant species (*Haplothrips cahirensis* karny; *Dendrothrips eremicola* Priesener) were investigated. The primers ITS4A, 28S rRNA, 18S rRNA and the primer pairs COI-1 + COI-2 + COI-3 were used to identify the dominant thrips species and *Sericothrips kassimanus* Priesener). Seven species belong to six genera, four subfamilies and two families were recorded throughout this study *i.e.*: *H. cahirensis* Karny; *S. kassimanus* Priesener; *D. eremicola* Priesener; *Frankliniella occidentalis* (Pergaade); *Thrips tabaci* Lindeman*; T. microchatus* Karny and *Scirtothrips aurantii* Faure. A significant positive correlation between the mean temperature and the mean numbers of thrips and negative correlation between the mean relative humidity and thrips population have been noticed. The highest number of dominant species was observed at low level (60cm.) followed by medium (120cm.) while high level (200 cm.) harboured the lowest numbers. DNA sequence data for 18S rRNA gene showed appositive response to the three species. DNA sequences of the species based on 18S rRNA were recorded in the Gene Bank. The phylogenetic tree of the three thrips species was given also.

Keywords: Thysanoptera, thrips, olive, Ecology, Morphology,18s rRNA.

DEDICATION

I dedicate this work to whom my heart felt thanks; to my mother and my father for their patience and help, as well as to my brother Sameh, hasband Ahmed ,my children Maryam , Menna and Aser and all my feriends for all the support they lovely offered along the period of my post graduation.

ACKNOWLEDGEMENT

I wish to express my sincere thanks, deepest gratitude and appreciation to ***Dr. Essam Abd El- Maguied Agamy*** *Professor of Entomolgy, Faculty of Agriculture, Cairo University, for effective supervision, guidance and interest promoted this work and for his kind help and supplying materials in order to complete this work in his own vineyard.*

gratitude is also extended to ***Dr. Momir Mohmmwd El-Husseini*** *Professors of Entomology, Faculty of Agriculture, Cairo University for suggesting the problems, supervision, continued assistance and guidance through the course of study and revision of manuscript.*

Also, I wish to express my special thanks and deep gratitude to ***Dr. Iman Ibrahim El-Sebaey****, Head Research of Entomology, Plant Protection Research Institute Agriculture Research Center for greatest support, guidance through the course of study and sharing in supervision.*

Grateful appreciation is also extended to ***Dr. Mohamed Mohamed Abo-Setta,*** *Head Research of Entomology, Plant Protection Research Institute, Agriculture Research Center for greatest support.*

Grateful appreciation is also extended to ***Eng. Mohamed El-Kholy****, The owner of olive farm for greatest support.*

CONTENTS

LIST OF TABLES

LIST OF FIGURES

INTRODUCTION

The olive trees, *Olea europapea* L. is an important economically subtropical crop. The olive is used in many purposes such as pickling, oil extraction and the remains of fruits are used as fodder for domestic animals. The olive trees originated in the Eastern Mediterranean area since ancient times. In Egypt, it has been cultivated for thousands of years. It is considered as the second crop after citrus. The area under cultivation with olive reached 237,454 feddans (Fed = 2400 m^2) in 2014. Ismailia governorate has the largest area in Lower Egypt *i.e.* 19,691 feddans. (Ministry of Agriculture and land reclamation, Economic Affairs Sector, 2014)

Olive tree is attacked by a wide range of arthropods, but little attention has been given to thrips (Insecta: Thysanoptera). Thrips feed by puncturing the epidermal (outer) layer of host tissue and sucking out the cell contents, which results in stippling, discolored flecking, or silvering of the leaf surface. They can induce a range of symptoms in plant tissue by their feeding as scaring on fruits or leaves and flower deformation or reducing pollen critical levels. Also, thrips are vectors of a series of plant damaging viruses (tospoviruses). Moreover, it is inducing leaf gall in some ornamental plants. Thrips feeds on tender parts of the olive tree such as buds, developing leaves, developing inflorescences, flowers, fruits and tender bark causing leaf deformation, yellowish white blotches on lower surfaces, leaf curl, leaf defoliation, fruit deformation with deep hollows in ripe olive, fruit defoliation when attacked in early season, and also infested fruit become smaller. Furthermore, in 2009 the thrips