Faculty of Science
Entomology Department

Seasonal dynamics of the two spotted red spider mite, *Tetranychus urticae* and its associated predatory spiders on some field crops in Qalubyia governorate, Egypt

A Thesis
Presented to the Faculty of Science
Ain Shams University
In partial Fulfillment for the award of the M.Sc. degree in Entomology

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2016

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ACKNOWLEDGMENT

Firstly, ultimate thanks to **Allah**.

I would like to express my deepest thanks to **Prof. Dr. Nawal Mahmoud Sanbaky**, **Professor of Entomology Department**, **Faculty of Science**, **Ain Shams University**, for her faithful encouragement, valuable supervision and critically reviewing the manuscripts.

I would like to express my sincere thanks and appreciation to **Prof. Dr. Nadia Helmy Ahmed**, **Professor of Entomology Department**, **Faculty of Science**, **Ain Shams University**, for her faithful encouragement, support, valuable advice and supervision during this study.

I am particularly grateful to **Prof. Dr. Mohammed Hassan El-Erksousy**, **Professor of Spiders**, **Plant Protection Research Institute**, **Agriculture Research Center**, for suggesting the research work, supervision and guidance during the progress of the study.

Special thanks to **Dr. Amal Ebrahim Abu-zaed**, Assistant Prof. of Acarology, Plant Protection Research Institute, Agriculture Research Center, for help me and her guidance during the progress of the study.

Also, special and deepest thanks to my **father, late mother, husband, brothers and sisters** for their encouragement, patience and moral support.

The **author** is also indebted to the head of the Department of Entomology, Faculty of Science, Ain Shams University, as well as to all the staff members.

Abstract

The seasonal dynamics of *Tetranychus urticae* Koch on clover and cotton crops were investigated at Qaha research Station, Qalubyia governorate, Egypt during two successive years, 2013 and 2014. Infestation of clover and cotton started in January and June, respectively. The monthly collected number and percent occurrence of eggs and most movable life stages gradually increased to reach peaks in March and September then decreased in next month(s) at the end of the season of each of clover and cotton, respectively. Eggs were the most abundant life stage of the total stages collected in each month and adult females predominated males and most other movable life stages monthly collected throughout the clover and cotton seasons in each year. Generally, the annual number of each life stage of *T. urticae* infested each of the clover and cotton was higher in 2014 than 2013 and on clover than cotton in each year.

Laboratory rearing of *T. urticae* on leaf discs of each of clover and cotton at three different temperatures (15, 25 and 35˚C) and a relative humidity of 69±10 % showed that change of temperatures greatly affected development and reproduction of this mite. At 15˚C, no eggs were laid and development of the whole life cycle was arrested. However, development from egg to adult was accelerated by increasing temperature from 25 to 35˚C which shortened the durations of development of immature stages,

life cycle, adult female reproductive period (longevity) and life span. Fecundity and fertility were higher at 25˚C than 35˚C on each of clover and cotton and were the highest on clover at 25˚C.

Five hundred and fifty eight spiders belonging to 11 families of order Araneae were associated with *T. urticae* and collected on clover and cotton crops at Qaha research station in Qalubyia governorate, Egypt during two successive years, 2013 and 2014. During the period of study, Salticidae was the most abundant on the two crops followed by Theridiidae, Thomosidae, Philodromidae, Dictynidae, Miturgidae, Araneidae, Linyphidae, Lycosidae, Aglenidae and Gnaphosidae.

On clover, the collected families did not include Gnaphosidae in both years of study in addition to Araneidae in 2013 and Lycosidae, Philodromidae and Aglenidae in 2014. On cotton, Lycosidae and Aglenidae were not collected in both years in addition to Gnaphosidae in 2014. The numbers of the total collected spiders, Percent occurrence and hence abundance of each family varied on the studied crops in each season.

On clover and cotton most of the spider families started appearance with small numbers in winter (January) and late spring (May) then gradually increased to reach peaks in May and September, respectively. The total number of spiders collected was higher in 2013 than 2014 and on cotton than clover in each year of study.

Laboratory studies on food consumption and predation rate of early immatures and adult female of *Thanatus albini, Steatoda triangulosa* and *Thomisus spinifer* (family Philodromidae, Theridiidae, Thomosidae, respectively), showed the efficacy of the three spider species as predators on adult *Tetranychus urticae*. Immatures and adult females of the studied spiders consumed more and lived longer when fed on females than males of *T. urticae.* In immature spiders, the number consumed prey/ spider, predation rate and mostly the stage duration gradually increased by increasing age from the first to third spiderling. In female adult spiders, the 3 parameters were the highest (except predation rates of *Thomisus spinifer*) in female *Thanatus albini*, followed by *Thomisus spinifer* then *Steatoda triangulosa.*

Key words:

Tetranychus urticae, seasonal dynamic, biology, spiders

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