

**ECOLOGICAL AND BIOLOGICAL STUDIES ON THE
SCALE INSECT PEST, *INSULASPIS TAPLEYI*
(WILLIAMS) ATTACKING MANGO TREES IN EGYPT
AND ENVIRONMENTALLY SAFE METHODS FOR
IT'S MANAGEMENT**

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**A Thesis Submitted in Partial Fulfillment
of
The Requirement for the Doctor of Philosophy
In
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**Department of Agricultural Science
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دراسة بيئية وبيولوجية على حشرة المانجو المحارية فى مصر وأساليب المكافحة الآمنة لها

رسالة مقدمة من الطالبة

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ABSTRACT

Mango trees (*Mangifera indica* L.) became one of the most important fruit crops it distributed in most regions of Egypt. Mango trees are liable to be infested with many serious insect pests during growth stages including scale insects and mealy bugs. All field trails were carried out in Mango orchard located at El-Mansoria, Giza Governorate. The following objects were studied in the present work:

1- Biological aspects of *Insulaspis tapleyi* (Williams) were studied on mango seedling under laboratory condition, such as durations of nymphal stages for males and females, pre-oviposition, oviposition, postoviposition period, female fertility, female longevity, sex ratio, incubation period and number of generation. This study completed five successive overlapping generations on mango seedling throughout a period of one year (late August 2005 till late September 2006).

2- Physiological zero and heat units required to complete the development of different stages to complete one generation, (DD-degree) were determine based on rate of development under controlled condition of temperature and R.H. %

3- Survey study of scale insects and mealy bugs attacking mango trees in Giza Governorate revealed that nineteen scale insects and mealy bugs species belonging to four families were found on mango trees were focused on *Insulaspis tapleyi* (Williams). Ecological and biological studies.

4- Ecological investigation was conducted for two years (early-January, 2005 to mid-December 2006). The obtained results can be summarized as follows:

As for, nymphs, males, females, females with eggs had 4-3, 4-5, 5-4 and 4-3 annual peaks in the first and second year respectively whereas total population showed 4-3 annual peaks in the first and second year respectively. Four successive over lapping generations were recorded. Correlation coefficient " r" revealed that both day maximum and night minimum temperature has highly significant positive effect on all stages of *I. tapleyi* as well as total population during the two years of study. Daily relative humidity has insignificant effect during the two years of study.

Distribution pattern of *I. tapleyi* on the four cardinal direction of mango trees revealed that the East and North direction harbored relatively high population in the two years of study with no-significant difference between the number of insect in the four cardinal directions. The parasitoid, *Aphytis sp.* had 6 and 5 peaks in the first and second year respectively. Percent of parasitism on *I. tapleyi* ranged 7.72- 21.9 and 2.92- 29.76 in both two years respectively.

5- The evaluation of the efficiency of certain compounds belonging to different chemical groups of different mod of action namely, mineral oil, Insect growth regulators (IGRs) and organophosphors insecticide were conducted against *I. tapleyi*. Data demonstrated that all tested compound alone or mixture of (IGRs) + oil and organophosphors + oil could be used successfully to control *I. tapleyi* and significantly suppress the population of the insect. The analysis of variance yielded significant differences between the post treatment counts in all treatment while no significant differences between oil and IGR + oil were detected.

Key words: *Insulaspis tapleyi*, biology, ecology, threshold of development, thermal requirement and control

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CONTENTS

Contents	Page
1. INTRODUCTION	1
2. REVIEW OF LITERATURE.....	5
1. Biological studies on scale insects belonging to super family Coccoidea.....	5
2. Survey of scale insects belonging to super family Coccoidea (Order: Homoptera) infesting economic host plant.....	32
3. Ecological studies on scale insects belonging to super Family Coccoidea.....	34
4. Parasite and predators attacking scale insects belonging to super family Coccoidea.....	41
5. Chemical control of scale insects.....	50
3. MATERIALS AND METHODES.....	56
I. BIOLOGICAL STUDIES.....	56
1. Laboratory studies on mango seedling.....	56
1.1. Insect source	56
1.2. Nymphal stage	58
1.3. Pre-oviposition period.....	58
1.4. Oviposition period	58
1.5. Post-oviposition period.....	58
1.6. Longevity of female and male adults	58
1.7. Egg incubation period.....	58
1.8. Generations.....	59

1.9. Fertility.....	59
2. Laboratory studies on potato tubers.....	60
2.1. Experimental design	60
2.2. Insect source	60
2.3. Assessment threshold of development for the different stages.....	61
2.4. Estimation of thermal requirements.....	62
2.5. Host plant suitability.....	62
2.6. Statistical analysis.....	63
II. ECOLOGICAL STUDIES	64
2. Field studies.....	64
2.1. Survey of scale insects and mealy bugs infesting mango trees in Giza, Egypt	64
2.2. Population fluctuation of <i>I. tapleyi</i> infesting mango trees at Giza, Governorate.....	65
2.2.1. Area of experiments.....	66
2.2.2. Sampling method.....	66
2.2.3. Identification of insects.....	66
2.2.4. Population density.....	67
2.2.5. Number of annual generation.....	67
2.2.6. Associated parasitoid.....	67
2.2.7. Meteorological date.....	68
2.2. 8. Statistical analysis	68
III. CHEMICAL CONTROL	69
3. Field evaluation of certain insecticides against <i>I. tapleyi</i> on mango trees.....	69
3. 1. Experiment area	69

3. 2. Insecticides used	69
3. 3. Experimental design	70
3. 4. Sampling.....	70
3. 5. Statistical analysis.....	71
4. RESULTS AND DISCUSSION.....	72
I. BIOLOGICAL STUDIES.....	72
Laboratory studies on mango seedling	72
1. Description and behavior of different	
immature stage.....	72
1.1. The egg stage.....	72
1.2. The nymphal stage.....	72
1.3. Female instar nymphs.....	73
1.4. Adult female.....	74
1.5. Male instar nymphs.....	74
1.5.1. 1 st instar nymph.....	74
1.5.2. 2 nd instar nymph.....	74
1.5.3. 3 rd instar nymph (pre-pupa).....	75
1.5.4. 4 th instar nymph (pupa)	75
1.5.5. Adult male	75
2. Duration of different developmental stages.....	76
2. 1. Egg incubation period	76
2. 2. Duration of the nymph stage.....	80
2.2.1. Female first instar nymphs.....	80
2.2.2. Female second instar nymphs	81
2.2.3. Male instar nymph.....	82
2.2.4. 3 rd instar nymph (pre-pupa)	

and 4 th instar nymph (pupa).....	83
2.3. Female longevity.....	84
2.3.1. The pre–oviposition period.....	84
2.3.2. Oviposition period	86
2.3.3. Post-oviposition period	87
2.4. Adult female longevity.....	87
2.5. Sex ratio.....	88
2.6. Fertility.....	90
2.7. Number of annual generations of <i>I. tapleyi</i> under laboratory conditions.....	90
Laboratory studies on rearing <i>I. tapleyi</i> on potato tubers.....	92
2. Effect of different constant temperature on the duration of the developmental stages of <i>I. tapleyi</i>	92
2. 1. Egg stage.....	92
2. 1. 1. Incubation period and threshold of development.....	93
2. 1. 2. Female nymphal stage	96
2. 1. 3. Pre-oviposition period.....	100
2. 1. 4. Ovi-position period.....	103
2. 1. 5. Adult female longevity.....	106
2. 1. 6. Female longevity.....	109
2. 1. 7. Male nymphal stage.....	112
II. ECOLOGICAL STUDIES	116
3.1. Survey of scale insects and mealy bugs attacking Mango trees in Giza Governorate.....	116
3. 2. Systematic position and synonymy.....	118
3. 2. 1. Ecological studies.....	118
3. 2. 2. Distribution of <i>Insulaspis tapleyi</i>	119

3. 2. 2. 1. Seasonal occurrence of different stages on mango trees.....	119
3. 2. 2. 2. Nymphal stage.....	119
3. 2. 2. 3. Male nymphal stage (pre pupa & pupa) and adult males	126
3. 2. 2. 4. Adult females.....	128
3. 2. 2.5. Adult females with eggs.....	130
3. 2. 2. 6. Total population of <i>I. tapleyi</i>	133
3. 2. 2.7. Number of annual field generations.....	135
3. 2. 3. Effect of some weather factors on the population activity of <i>I. tapleyi</i>	141
3. 2. 3. 1. Effect of day maximum temperature.....	142
3. 2. 3. 2. Effect of night-minimum temperature.....	147
3. 2. 3. 3. Effect of daily relative humidity.....	147
3. 2. 3. 4. The combined effect of the three weather factors on the activity of <i>I. tapleyi</i>	148
3. 2. 4. Distribution of <i>I. tapleyi</i> on cardinal directions	149
3. 2. 5. Distribution of the parasitoid <i>Aphytis sp.</i>	153
3. 2. 5.1. Seasonal occurrence.....	153
3. 2. 5.2. Percent of parasitism	159
3. 2. 5. 3. Effect of host on the activity of parasitoid.....	160
III. Field evaluation of certain insecticides against <i>I. tapleyi</i> on mango trees at Mansoria, Giza Governorate.....	165
5. SUMMARY	170
6. CONCLUSION.....	179
7. REFERENCES.....	182

LIST OF TABLES

Table	Page
1 -Duration of the different developmental stages of female <i>I. tapleyi</i> on mango seedlings throughout five successive generations under laboratory condition, during 2005-2006 under the prevailing means of temperatures and relative humidity.....	77
2 -Duration of the different developmental stages of male <i>I. tapleyi</i> on mango Seedlings throughout five successive generations under laboratory condition, during 2005-2006 under the prevailing means of temperatures and relative humidity.....	78
3 -The sex ratio of <i>I. tapleyi</i> on mango seedlings under laboratory condition throughout five successive generations (2005-2006), under different temperature and relative humidity.....	89
4 -Mean egg incubation period, rate of development and thermal units of <i>I. tapleyi</i> at different constant temperature.....	93
5 -Mean duration of nymphal stage, rate of development and thermal units of <i>I. tapleyi</i> at different constant temperature.....	97
6 -Mean pre-oviposition period, rate of development and thermal units for <i>I. tapleyi</i> at different constant temperature.....	100
7 -Mean oviposition period, rate of development and thermal units of <i>I. tapleyi</i> at different constant temperature.....	103
8 -Mean duration of adult female longevity, rate of development and thermal units for <i>I. tapleyi</i> at different constant temperature.....	106