## ABSTRACT

Studies were carried out on guava trees (*Psidium guajava*) at Hannout and Abo- El- Shekok villages, Kafr Saker district. Sharkia Governorate during three successive years (1999, 2000 and 2001) to survey the important scale insects and mealybugs and their associated parasitoids. Seven species of scale insect and mealybugs belong to four families and three parasitoids species belonging to two families were recorded. Seasonal abundance. number of generations, effects of climatic factors. preferable surface and distribution for both of *Hemiberlesia latamae*. *Pulvinaria psidii* and its associated parasitoids were studied. Relationship between the infestation and leaves chemical components were estimated. Equilibrium point between *H. lataniae* and its associated parasitoids under field conditions was calculated.

## CONTENTS

	Page
INTRODUCTION	1
REVIEW OF LITERATURE	4
1. Seasonal abundance	4
1.1. Family: Diaspididiae	4
1.1.1. The latania scale insect, Hemiherlesia lataniae	
(Signoret)	4
1.2. Family: Coccidae	6
1.2.1. The guava soft scale insect, <i>Pulvinaria psidii</i> Maskell	6
1.2.2. The brown soft scale insect, Coccus hesperidum	
Linnaeus	8
1.2.3. The citrus wax scale insect, Ceroplastes	
floridensis Comstock	9
1.2.4. The olive black scale insect, Saissetia oleae (Olivier)	10
1.3. Family: Pseudococcidae	11
1.3.1. The citrus mealybug, <i>Pseudococcus citri</i> (Risso).	
	11
1.4. Family: Margarodidae	12
.4.1. The ornamental palm mealybug, <i>lcerya</i>	1-
	12
seychellarum (Westwood)	12
2. Parasitoids	13
3. Effects of climatic factors on scale insects,	
mealybugs and their parasitoids	16

۰.

MATERIALS AND METHODS	21
I. Survey, population densities and seasonal	
abundance	21
2. Estimation of parasitism ratios	22
3. Effect of climatic factors on the insect population	
and parasitism ratios	22
4. Chemical analysis	23
4.1. Moisture and ash analysis	23
4.2. Protein, fats and carbohydrates analysis	23
4.3. Amino acids fraction analysis	24
5. Limitation of equilibrium point between	
Hemiherlesia lataniae (Signoret) and their	
associated parasitoids under field conditions	24
RESULTS AND DISCUSSION	26
PART ONE	
1.1.a. Survey of scale insects and mealybugs infested	
guava trees	26
1.1.b. Survey of parasitoids of scale insects	32
1.2. Seasonal abundance of some scale insects	34
1.2.1. Seasonal abundance of <i>Pulvinaria psidii</i> Maskell	34
1.2.1.1. Outer zone	34
1.2.1.1.1. Female population	34
1.2.1.1.2. Nymph population	47
1.2.1.1.3. Total number of alive stages	48
1.2.1.1.4. Total number of non alive stages	49
1.2.1.1.5. Percentage of total mortality	50
1.2.1.1.6. Percentage of parasitism	51

1.2.1.2.1. Female population		51
1.2.1.2.2. Nymph population		52
1.2.1.2.3. Total number of alive stages		65
1.2.1.2.4. Total number of non alive stages		66
1.2.1.2.5. Percentage of total mortality		67
1.2.1.2.6. Percentage of parasitism		67
. 1.2.1.3. Effect of climatic factors	,	68
1.2.1.3.1. Outer zone		68
1.2.1.3.1.1. On females		68
1.2.1.3.1.2. On nymphs		75
1.2.1.3.1.3. On total number of alive stages		76
1.2.1.3.1.4. On total number of non alive stages		77
1.2.1.3.1.5. On percentage of total mortality	· · · • • • • • • • • • • • • • • • • •	77
1.2.1.3.1.6. On percentage of parasitism		78
1.2.1.3.1.7. Combined effect of climatic factors		78
		<b>8</b> 0
1.2.1.3.2.1. On females	••••	<b>8</b> 0
1.2.1.3.2.2. On nymphs		80
1.2.1.3.2.3. On total number of alive stages		87
1.2.1.3.2.4. On total number of non alive stages		87
1.2.1.3.2.5. On percentage of total mortality		88
1.2.1.3.2.6. On percentage of parasitism		89
1.2.1.3.2.7. Combined effect of climatic factors		89
1.2.1.4. Preferable surface		90
1.2.1.5. Number of generations		99
1.2.1.6. Distribution		112
1.2.1.6.1. Effect of tree directions (Horizo	ntal	
distribution)		112

*.*.

-

1.2.1.6.1.1. On the total number of alive stages
1.2.1.6.1.2. On the percentage of parasitism
1.2.1.6.1.3. The preferable direction for insect and its
parasitoid
1.2.2. Seasonal abundance of Hemiberlesia lataniae
(Signoret)
1.2.2.1. Outer zone
1.2.2.1.1. Female population
1.2.2.1.2. Nymph population
1.2.2.1.3. Total number of alive stages
1.2.2.1.4. Percentage of total mortality
1.2.2.1.5. Percentage of parasitism
1.2.2.2. Inner zone
1.2.2.2.1. Female population
1.2.2.2.2. Nymph population
1.2.2.2.3. Total number of alive stages
1.2.2.2.4. Percentage of total mortality
1.2.2.2.5. Percentage of parasitism
1.2.2.3. Effect of climatic factors
1.2.2.3.1. Outer zone
1.2.2.3.1.1. On females
1.2.2.3.1.2. On nymphs
1.2.2.3.1.3. On total number of alive stages
1.2.2.3.1.4. On total number of non alive stages
1.2.2.3.1.5. On percentage of total mortality
1.2.2.3.1.6. On percentage of parasitism
1.2.2.3.1.7. Combined effect of climatic factors
1.2.2.3.2. Inner zone

	1.2.2.3.2.1. On females	168
	1.2.2.3.2.2. On nymphs	175
	1.2.2.3.2.3. On total number of alive stages	175
	1.2.2.3.2.4. On total number of non alive stages	176
	1.2.2.3.2.5. On percentage of total mortality	177
<b>.</b>	1.2.2.3.2.6. On percentage of parasitism	177
-	1.2.2.3.2.7. Combined effect of climatic factors	178
	1.2.2.4. Preferable surface	179
	1.2.2.5. Number of generations	187
	1.2.2.6. Distribution	201
	1.2.2.6.1. Effect of tree direction (Horizontal	
	distribution)	201
	1.2.2.6.1.1. On total number of alive stages	201
	1.2.2.6.1.2. On the percentage of parasitism	210
	1.2.2.6.1.3. The preferable direction for the insect and	
٤,	its parasitoids	212
	PART TWO	
	2. Chemical analysis	215
	PART THREE	
	3. Limitation of equilibrium point between H. lataniae	
	and its associated parasitoids	221
	SUMMARY	230
	REFERENCES	238
_	ARABIC SUMMARY	

~