CONTENTS

			Page
I.		INTRODUCTION	1
II.		REVIEW OF LITERATURE	3
	1.	Survey of Insect Pests and Mites Associated with Date Palm Trees in Egypt	3
	2.	Biological Studies on E. cautella	14
	3.	Biological Studies on P. cuprea	21
III.	1.	MATERIAL AND METHODS Survey of Insect Pests and Mites	24
		Associated with Date Palm Trees in Egypt	24
	2.	Biological Studies on E. cautella	25
	3.	Biological Studies on P. cuprea	27
IV.		RESULTS AND DISCUSSION	30
	PA	ART ONE: SURVEY OF DATE PALM TREE INSECT PESTS	20
	1.	Survey Studies	30 30
	1.1.	Survey of Insect Pests and Mites Associated with Date Palm Trees	30
	40 sgc 800	in Egypt	30
	1.1.1	Termites	32

1.1.2	Mealy bugs	34
1.1.3	Scale insects	34
1.1.4	Lepidopterous fruit moths	36
1.1.5	Coleopterous fruit beetles	37
1.1.6	Coleopterous boring beetles	39
1.1.7	Coleopterous Scarabaeid grubs	44
1.1.8	Wasps	50
1.1.9	Mites	51
1.2. 1.3.	Distribution of infestation with the insect pests associated with date palm trees in the different governorates of Egypt Distribution of infestation with the insect pests Associated with the different varieties of date palm trees in Egypt ART TWO: BIOLOGICAL STUDIES	58 65 ON
	Ephestia cautella	
1.	Biological studies on E. cautella	73
1.2.	Biological aspects on E. cautella	73
1.2.1	Copulation	73
1.2.2	Pre-oviposition period	73
1.2.3	Oviposition period	76

1.2.4	Post-oviposition period	77	
1.2.5	The number of eggs laid per female		
1.2.6	Adult longevity	80	
1.2.7	The larval instars	85	
1.2.8	The larval duration	89	
2.	Comparative studies on E. cautella		
	reared on different hosts during the	89	
	different generations	0)	
2.1	The egg stage	90	
2.2	The larval stage	91	
2.3	The pupal stage	92	
2.4	The Adult stage	93	
2.5	The total life-cycle	94	
PAI	RT THREE: BIOLOGICAL STUDIES Potasia cuprea	ON	
3.	Biological Studies on <i>P. cuprea</i> in Egypt	105	
3.1.	The egg stage	105	
3.1.1	General description	105	
3.1.2	The egg hatchability	107	
3.1.3	The incubation period	109	

3.1.4	The total number of eggs	
3.1.5	Effect of nutrition on the number on eggs laid by <i>P. cuprea</i>	110
3.2	The larval stage	113
3.2.1	General description of larval instars	113
3.2.2	Larval habits and food	115
3.2.3	Duration of larval stage	116
3.2.4	Rate of larval injury	120
3.3.	The pupal stage	124
3.3.1	General description	124
3.3.2	The pre-pupal duration	124
3.3.3	The pupal duration	124
3.4.	The adult stage	128
3.4.1	Emergence	128
3.4.2	General description	131
3.4.3	Pre-oviposition period	131

3.4.4	Oviposition periods	131
3.4.5	Post-oviposition period	132
3.4.6	Longevity	132
3.4.7	Death of the beetles	135
4	Total life-cycle	135
5	The annual generations	138
	100	
6	Natural enemies	138
6.1	Predators	138
6.2	Parasites	139
	CONCLUSION	140
	SUMMARY	145
	REFERENCES	162
	ARARIC SHMMADV	

V.

VI.

VII.

VIII.