

CONTENTS

	Page
I. INTRODUCTION	1
II. REVIEW OF LITERATURE	4
II.1. Natural infestation of cotton plants with <u>Pectinophora gossypiella</u> and <u>Earias insulana</u> ..	4
II.2. Bacterial diseases as a bio-controlling agents against lepidopterous insects	10
II.2.1. Infectivity tests	10
II.2.2. Field tests	20
II.3. Mode of action of <u>Bacillus thuringiensis</u>	25
II.4. Viruses infecting <u>Pectinophora gossypiella</u> ..	27
III. MATERIALS AND METHODS	31
III.1. Estimation of the natural infection of <u>P.</u> <u>gossypiella</u> larvae by diseases and the role of other mortality factors	31
III.2. Laboratory infectivity tests with <u>B.</u> <u>thuringiensis</u> Ber.	34
III.2.1. Effect on larvae of <u>E. insulana</u>	34
III.2.2. Tests against active larvae of <u>P.</u> <u>gossypiella</u>	39
III.2.2.1. Effect on the newly hatched larvae	40
III.2.2.2. Effect on the second and fourth instar larvae	41

CONTENTS : Cont.

	Page
III.2.3. Effect on resting larvae of <u>P.</u> <u>gossypiella</u>	42
III.3. Effect of field application of <u>Bacillus</u> <u>thuringiensis</u> spores on <u>Pectinophora</u> <u>gossypiella</u> infesting cotton bolls	43
III.3.1. Effect on larvae and subsequent stages	44
III.3.2. Effect on adults reproductivity	43
IV. RESULTS	46
IV. 1. Natural infection of the pink bollworm larvae with diseases and the role of other mortality factors	46
IV.1.1. Fayoum governorate	46
IV.1.2. Qalubia governorate	51
IV.1.3. Sharkya governorate	55
IV.1.4. Gharbyia governorate	59
IV. 2. Mortalities amongst collected <u>P. gossypiella</u> larvae and general estimation of the role played by different factors causing morta- lities at four governorates	60
IV. 3. Laboratory infectivity tests with <u>Bacillus</u> <u>thuringiensis</u> Ber.	68

CONTENTS : Cont.

	Page
IV.3.1. Effect on larvae of <u>Earias insulana</u> ...	68
IV.3.2. Tests against active larvae of <u>P.</u> <u>gossypiella</u>	75
IV.3.2.1. Effect on newly hatched larvae ...	75
IV.3.2.2. Effect on the second and fourth instar larvae	82
IV.3.3. Effect on resting larvae of <u>P.</u> <u>gossypiella</u>	92
IV.4. Effect of field application of <u>B. thuringiensis</u> on <u>P. gossypiella</u> infesting cotton bolls	98
IV.4.1. Effect on larvae and subsequent stages.	98
IV.4.2. Effect on adults reproductivity	103
V. DISCUSSION	107
V.1. Natural infection of the pink bollworm larvae with diseases and other mortality factors	107
V.2. Laboratory infectivity tests with <u>Bacillus</u> <u>thuringiensis</u> Ber.	109
V.3. Effect of field application of <u>B.</u> <u>thuringiensis</u> on <u>P. gossypiella</u> infesting cotton plants	116
VI. SUMMARY	120
VII. REFERENCES	126
ARABIC SUMMARY.	