INTRODUCTION

The cotton leaf-worm, *Spodoptera littoralis* (Boisd.) is one of the most important pests attacking cotton, particulary during the period from May to September, causing serious damage. In year of heavy infestation, **Bishara (1951)** recorded that the losses caused by ***S. littoralis*** amounted to million Kentars.

The ovicidal action of different pesticides against *S. littoralis* eggs has been investigated by several authors; **Mitri and Kamel (1970), Abdel- Rahman (1972)**, **Zeid *et al.* (1973)**, **Ascher and Nemny (1974)**, **Abo-El ghar *et al.* (1976)**, **Abo El-ghar *et al.* (1980**), **Ahmed (1987)**, and **Zidan *et al.* (1987)**, etc.Most of these studies covered the direct ovicidal action on egg-masses.

Another, noctuid, attacking cotton plants; the greasy cut-worm, *Agrotis ipsilon* (Hufn.) is well known to attack many of the winter and early summer crops especially cotton seedlings. In seasons of high abundance, damaged plants are necessary to be resown .Resowing usually, leads to high infestation with thrips when plants are in the seedling stage and cotton boll-worms at the end of the season .

Also, the crop maize is subjected to heavy attack by important insect i.e., the European corn borer; *Ostrinia nubilalis*, which causes damage to maize plant.

The application of synthetic insecticides, several times, during the cotton season are carried out every year. However,

this wide and repeated use of insecticides lead to complex of problems, i.e., the upset in natural balance between pests and their natural enemies, developing of resistance in target insects and the mammalian toxicity which due either to direct contact with insecticides, especially, during insecticidal application or through contact with environment which appeared to be polluted with insecticides. Therefore, it seems necessary to investigate other control methods either to substitute the insecticidal use or to be used in combination with insecticides against target insects in order to avoid or diminish the hazards of insecticides.

Also, the application of pesticides for the control of *S. littoralis, A. ipsilon* and *O. nubilalis* in Egypt is often directed against the larvae. Less consideration has been given to other stages in which the pest may be susceptible. An important stage in this respect is the egg stage which is exposed on the leaves and could be an easy target for insecticidal application.

In insects, it is well known that the prothoracic gland hormone (moulting hormone) initiates the moulting process, but the outcome of moult depends on the titer of juvenile hormone which is naturally secreted by corpora allata. Thus, the presence of high titer of JH in the last larval, or nymphal, instar may lead either to an additional instar or disturbs the last moult and the result is, usually, intermediate forms and all cases, mostly, lead to mortality. It is thought, therefore, that the use of insect growth regulating hormone mimics (juvenile hormone analogues) may prove to be efficient in controlling several insect species.

Insect growth regulators (IGRs) are insecticides acting on various insect orders by disrupting chitin synthesis, a

polysaccharide of particular importance to arthropods. Since it is the synthesis that is disrupted, the major effect of members of this group is upon those periods of the life cycle where chitin is being formed and where its incorrect or insufficient production can lead to malformation of later stages of the life cycle.

Many authors investigated IGRs ovicidal effects on insects species (**Abdallah *et al.*, 1975**; **Abdel-Sattar *et al.*, 1982** and **Moawad *et al.*, 1996b).**

Therefore, the present study was carried out to investigate the effect of JHAs, (i.e. tebufenozide, pyriproxyfen and fenoxycarb) and IGIs (i.e. hexaflumuron, flufenoxuron, lufenuron, diflubenzuron and chlorfluazuron) on eggs of the mentioned insect pests on:

1-The hatchability of different ages of eggs.

2-The relative susceptibility of different egg ages of the tested insects to tested compounds.

3-The latent effect on different ages of eggs.

4-The reproduction potential of *S. littoralis*.

5-The embryonic development of the cotton leaf worm.

6-Effect of the tested compounds on the embryonic development of the cotton leafworm.