

**COMPARATIVE STUDIES ON THE EFFECT OF
INSECT-PARASITIC NEMATODES AND
THEIR RELATIONS TO INSECT HOST**



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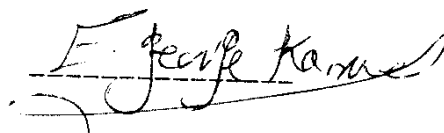


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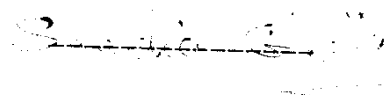
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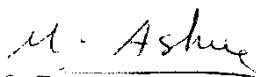
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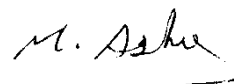
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THEIR RELATIONS TO INSECT HOST**

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**Studied by the candidate in partial
fulfilment of the requirements for the**

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- 2. Histology and Experimental Histology**
- 3. German Language**



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INTRODUCTION

1. INTRODUCTION

The environment is polluted by different kinds of insecticides which are considered as serious pollutants with deleterious effects on the human and other animals specially the economic animals due to the increase in their production and use with a large amounts without any control in recent years. The increasing cost of insecticides as well as their adverse side effects both on environment and living beneficial organisms as well as acute and chronic toxicity to man and animal and the disturbance of natural balance between pests and their natural enemies and the rapid development of insecticide resistance, increased the need for an alternative method for insect control. Therefore, it is necessary to avoid the potential environmental hazards of conventional insecticides, accordingly, the reach for an alternative biological control agent becomes inevitable requirement.

Consequently, biological control is recommended to avoid the disastrous effects occurring by the use of chemical insecticides.

Some biological control agents with potential for insect pest control in Egypt include the nematodes Steinernema feltiae Filipjev (= Neoaplectana carpocapsae Weiser, and Heterorhabditis heliothidis, polyhedrosis virus, the bacterium Bacillus thuringiensis, Xenorhabdus nematophilus (= Achromobacter nematophilus) and many others.

Nematodes are used as biological control in many countries because of its merits, no toxicity to mammals and high selectivity to target organisms.

The relation between insects and nematodes is still of utmost interest to biologists, not only from the biological control view point but also for some haemolymph and histological studies.

Many species of nematodes parasitizing insects were surveyed during the last few decades. Members of the genus Steinernema were studied and proved to have a wide host range and relatively quick establishment in the insect host.

This non-specificity is attributed to accompaniment of the bacteria which release in the haemocoel of the insect, after the penetration of the nematode, causing septicemia to the insect.

The present study was suggested to make comparative studies on the effect of insect-parasitic nematodes and their relations to two harmful insects from two orders, Lepidoptera and Diptera.

The first is the cotton leafworm Spodoptera littoralis as an example of Lepidoptera and it's considered as one of the most serious pests not only in Egypt but also all-over the world, it causes severe crop damage,

and it is an important agricultural insect.

The second pest is the house fly Musca domestica as an example of Diptera and it is an important medical insect. The house flies create an uncomfortable environment for man as well as transefering some diseases.

* The aim of the present work is to investigate the following points:-

- (1) The susceptibility of different stages of insect-hosts to parasitic nematode.
- (2) The infestation intensity of insect hosts by nematodes.
- (3) Development of nematodes within the insect hosts.
- (4) Production of invasive larvae of Steinernema feltiae nematodes in the insect hosts.
- (5) Defensive reactions of insects.
- (6) Histopathological effects of parasitic nematodes Steinernema feltiae Filipjev on the insect hosts such as the effect of nematode inoculation on fat bodies, gut, muscles and cuticle of the last instar larvae of S.littoralis (Boisduval) and M.domestica Linnaeus.

REVIEW OF LITERATURE

2 - REVIEW OF LITERATURE
SUSCEPTIBILITY OF DIFFERENT STAGES OF INSECT
HOSTS TO PARASITIC NEMATODES

Extensive research studies have been conducted throughout the last few decades on the entomophilic steinernematid nematodes in biological control of pests and have proven relatively quick establishment in a wide host range. Therefore it has been considered as one of the most effective biocontrol agents used lately. In the following literature review, I would like to throw some light on the effect of the entomogenous nematode Steinernema feltiae (= Neoa plectana carpocapsae), its associated bacterium Xenorhabdus nematophilus Synonymy (= Achromobacter nematophilus) and some another organisms used as biological control agents, on their insect host especially from point of view; susceptibility of various insects to nematode infection, it should be emphasized that the literature is full of research works on the relationships between the nematode N. carpocapsae and various insect pests belonging to different orders. Lists of insects parasitized by nematodes were recorded, as early as, 1900 (Schultz, 1900), Hall (1929) and Neveu-Lemaire (1936). The following review will be concerned mainly with N. carpocapsae and other organisms as a general parasite to insects.