صفاء أبو السعود محمد

شبكة المعلومات الجامعية

بسم الله الرحمن الرحيم

صفاء أبو السعود محمد

شبكة المعلومات الجامعية

شبكة المعلومات الجامعية

التوثيق الالكتروني والميكروفيلم

صفاء أبو السعود محمد

شبكة المعلومات الجامعية

جامعة عين شمس

التوثيق الإلكتروني والميكروفيلم

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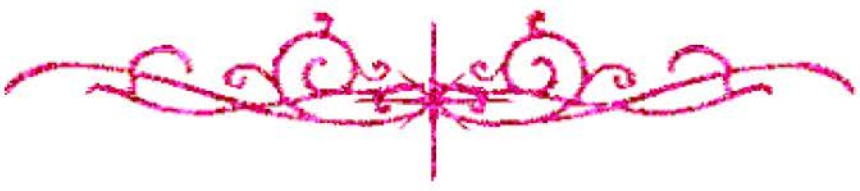

صفاء أبو السعود محمد

شبكة المعلومات الجامعية

بالرسالة صفحات لم ترد بالأصل

STUDIES ON MITES INHABITING SOIL UNDERNEATH CERTAIN FRUIT TREES IN EGYPT

A THESIS

Presented to the Graduate School

Faculty of Agriculture

(Saba Bacha)

ALEXANDRIA UNIVERSITY

In Partial Fulfillment of the Requirements
For the Degree of

MASTER OF AGRICULTURAL SCIENCE

IN

(PLANT PROTECTION)

BY

MOHAMED MAHROUS YOUSEF EL-SHAZLY

1999

STUDIES ON MITES INHABITING SOIL UNDERNEATH CERTAIN FRUIT TREES IN EGYPT

Presented by

Mohamed Mahrous Yousef El-Shazly

For the degree of

MASTER OF AGRICULTURAL SCIENCES

(Plant Protection)

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INTRODUCTION

Acarines may be found in virtually any environment including severe desert tundra situations, mountaintops, deep soil strata, subterranean caves, hot springs, and ocean floors. In short, mites have colonized almost every terrestrial, marine and fresh water habitat known to man (**Krantz, 1978**). The **Acari** exhibit various associations with other organisms, from phytophagy, predation, and parasitism to intricate commensal and phoritic relationships (**Evans et al., 1961**).

The mesofauna of the soil exerts an extremely great influence on the processes in the soil through its simple presence, its quantity, and especially through its living processes. One of the most important components of this mesofauna is the representative of the subclass mites (**Acari**); their abundance even in soils poor in organic materials reaches the order of $10,000/m^2$, in forest litter or moss their abundance reaches the order of $100,000/m^2$. By long odds, as well as all other greater taxons, mites are very heterogenous as far as life history and especially their type of feeding are concerned and also the abundance of the different groups is also different (**Baker and Wharton, 1952**).

The knowledge of distribution and abundance of soil fauna as a part of the structure of an ecosystem is very important in order to understand the dynamics of any ecosystem. Every type of soil has unique interactions between members of the fauna, mites included, and the dominance of one group over others varies. (**Chiba *et al.*, 1975** and **Santos *et al.*, 1981**).

Soil mites are of great biological importance both in natural and in cultivated soils. Of late, much attention has been paid to them especially because of their sensitivity to a number of chemicals used in agriculture.

Of the soil mites, the oribatids (box mites) represent the greatest portion of both individuals and species, but also the **Mesostigmata (Gamasida)** and Tarsonemid mites share about 25 – 30 % of the total fauna regarding their abundance (**Balogh and Mahunka, 1983** and **Zaki, 1983**).

The factors causing soil mites to aggregate are still unknown. Generally, such a distribution might be explained by several factors, e.g. the clustering of eggs, the choice of microhabitats, which are particularly suitable as a result of local conditions. Such as the soil types and quality, vegetation cover, soil temperature and moisture, seasons and monthly average temperatures, relative humidity and rainfall (**Edwards and Lofty, 1971; Butecher *et al.*, 1971; Usher, 1976** and **Zaki, 1983**).

On the other hand, pome trees are by far the most important fruit crops in Egypt as well as all over the world. At present, many parts of newly reclaimed lands in Egypt are under cultivation with various fruit trees such as apple, pear and guava as far as other fruit crops for both local consumption and export.

Unfortunately, the studies of mites inhabiting soil beneath either pome or guava trees have been greatly hampered by the lack of modern reference works from which they can be identified. However, this great lack knowledge stimulated our attentions to launch just the present study.

Therefore, it seemed worthwhile an attempt to study the ecology of mites inhabiting soil underneath apple, pear and guava biotopes in three Governorates, i.e. Alexandria, Behera and Menoufia. In addition, correlations with weather factors, species composition and population fluctuations of the most dominant species were concerned.

I. REVIEW OF LITERATURE

1. Survey and population dynamics of soil mites:

To our knowledge, there were few available literary data concerning ecology of mites inhabiting soil beneath either pome or guava trees. It was surprising that although the acarine fauna is well known one, it could hardly find published data concerning the populations of soil mites beneath these trees especially in Egyptian ecosystems. Thus, the results obtained by different investigators on other biotopes were used. The following is a selected review of literature related to ecological work.

Many workers generally observed seasonal variation in the distribution of soil mites. Most of these authors have related these variations to environmental factors. For instance, **Sheals (1957)** reported that the large numbers of oribatid mites occurred in October and February, but the lowest population was noticed in December. Soil mites under European conditions, are usually most abundant in autumn and winter and least abundant in summer (**Wallwork, 1959; Haarlov, 1960; Block, 1966** and **Persson and Lohm, 1977**). However, **Usher (1975)** who found summer maximum in total populations in deciduous forests in Scotland as an exception.

Evans *et al.* (1961) mentioned that high population densities of the soil **Acari** occurred in autumn and winter seasons and low population during summer season.

Hughes (1961) asserted that the mites of **Acaridida** comprised among the important groups of soil mites, since most of them are truly saprophagous feeding on the decay plant materials.