

ECOLOGICAL STUDIES ON CITRUS BROWN MITE

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THESIS

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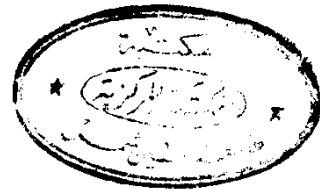
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INTRODUCTI ON

INTRODUCTION

The oriental red mite, Eutetranychus orientalis (Klein) is primarily a pest of citrus in Egypt , but also infests some other fruit trees, field crops, and vegetables . As well as other phytophagous mites, the rate of growth of population depends to a large extent upon food preference and upon egg laying capacity which in turn is influenced by weather factors . The food plant can have much influence on the biology of a mite species and weather conditions, especially temperature and humidity, affect the time required for the completion of the life cycle and thus may retard mite development .

In addition, natural enemies are very important agent in reducing or regulating populations of such injurious plant - feeding mites .

With the increasing interest in citrus growing in Egypt, especially for export , it becomes important

to study some factors that affect the biotic potential of this mite species . The objectives of the present study are :

1. To determine the effect of temperature on mite development ;
2. To evaluate the host preference and its influence on mite development ;
3. To evaluate the effect of mating and crowding on fecundity of females ;
4. To estimate mite populations, in the field , on different hosts ; and
5. To estimate the predation potential of two of the most common predatory mites, namely, Agistemus exsertus Gonzalez and Amblyseius gossipi Elbadry on the citrus brown mite .

REVIEW OF LITERATURE

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II. REVIEW OF LITERATURE

Effect of temperature on mite biology :

Several reports have been published on the biology of tetranychid mites, with some emphasis on the effect of temperature on development , as temperature is expected to influence the speed of development of eggs and other stages of mites .

Studying the fluctuations in the population of A.orientalis, (Anychus) clarki (MCG.) , Dean (1955) reported that population of mites became numerous during late summer and early autumn. However, number of mites was relatively low in October (1950), probably owing to heavy rain in September at Rio Grande Valley . Texas, then increased by December . No active mites or eggs could be found in February following temperatures below 25°F for 20 hours and below 52°F for 75 hours (minimum 10°F). mites reappeared in few groves by May

and were numerous in late June and early July .

The relation between temperature and incubation period of Tetranychus telarius (L.) was studied by Harrison and Smith (1961) where hatching of eggs occurred within 2.38 days at 32.5 °C (90.5°F.) and 33.19 days at 11.5°C (52.7°F).

Siddig and Elbadry (1971) studied the biology of Eutetranychus sudanicus Elbadry in the green house on Citrus aurantiiflora leaves under temperatures at 30-36°C in summer and 25-29°C in winter . The pre-ovipositional period averaged 1.7 days and females deposited an average of 2 eggs per day for 11.3 days. Total number of eggs laid by a single female averaged 27.2 eggs . The egg incubation period averaged 4.9 days . The duration of the larval stage averaged about 2.9 days in summer and 3.7 days in winter . The protonymphal stage lasted for an average duration of 1.7 days in summer and winter, respectively . The

duration of the deutonymphal stage averaged 2.2 days for males and 2.4 days for females . Total development period for males was 11.5 days and for females was 12.1 days. Adult male and female longevity were estimated as 11.1 and 14.0 days on the average . These conditions gave also the highest population density of mites . In addition , the life span of the adult females increased with the decrease in temperature , the longest period was attained at 15°C.

Only fertilized females of Eutetranychus sudanicus were able to produce female offspring and that unfertilized females produced only male offspring. Igilinsky et al (1974) studied the development in Tetranychus desertorum (Banks) and Tetranychus bimaculatus Harvey in the field and demonstrated that slight elevation in temperature shortened markedly the egg stage but with less effect on duration of the other stages .