شبكة المعلومات الجامعية

بسم الله الرحمن الرحيم

شبكة المعلومات الجامعية

التوثيق الالكتروني والميكروفيلم

شبكة المعلومات الجامعية

جامعة عين شمس

التوثيق الالكتروني والميكروفيلم

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نقسم بالله العظيم أن المادة التي تم توثيقها وتسجيلها
علي هذه الأفلام قد أعدت دون أية تغيرات

يجب أن

تحفظ هذه الأفلام بعيدا عن الغبار

في درجة حرارة من ١٥-٢٥ مئوية ورطوبة نسبية من ٢٠-٤٠%

To be Kept away from Dust in Dry Cool place of 15-25- c and relative humidity 20-40%

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EFFECT OF SOME FORMULATED PESTICIDES ON TETRANYCHUS URTICAE AND ITS PREDATOR *AMPLYSEIUS GOSSIPI*

BY

Refaat Ibrahim El-Sayed Magouz
B.Sc. Agric. (Pesticides). Tanta Univ., 1977

THESIS

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Tetranychid mites are common pests in agricultural systems, causing in many cases, greater economic losses than any other arthropod pest. The severity of plant injury caused by spider mites depends upon numerous factors influencing their feeding and reproduction. Of particular importance are the nature and condition of the host plants and the influence of physical factors on both host and mite.

The two spotted spider mite *Tetranychus urticae* (Koch) has been extensively studied and the early work was reviewed by **Huffaker *et al.* (1969)**. *T. urticae* infests a wide range of economic plants in the field such as cotton **(Leigh *et al.*, 1968)**, strawberry **(Sances *et al.*, 1981, 1982)**, cucumber **(De Ponti, 1980)**, tomato **(Rodriguez *et al.*, 1972)**, peanuts **(Boykin and Campbell, 1982)**, peppermint **(Hollingsworth, 1980)**. Tobacco, cotton, cucumber, beans and tomato are also attacked under glass **(Patterson *et al.*, 1974)**, together with numerous ornamental plants **(Hamlen and Lindquist, 1981)**. Fruit orchards may also be infested and damage has been reported on apple, peach, pear, almond and walnut **(Hoy *et al.*, 1980, Penman and Chapman, 1980)**.

The spider mite problem was not solved by reliance solely on the use of acaricidal chemicals since mites very rapidly developed resistance to many of these compounds **(Huffaker *et al.*, 1970)**. Alternative, non-chemical methods of control have been widely assessed, the most successful non-chemical technique had been the exploitation of predatory mites **(Van De Vrie *et al.*, 1972)** which are commonly found in agricultural ecosystems and in unsprayed orchards.

These natural enemies are frequently responsible for maintaining spider mite populations below damaging levels. The heavy use of insecticides on crops have frequently affected these natural enemies more than the spider mites, causing outbreaks of the latter **(McMurtry *et al.*, 1970)**.

However, chemicals did not invariably adversely affect control by predators. Organophosphates had been the most commonly used insecticides in crops, although spider mites were among the first pests which developed resistance to organophosphates **(Morgan and Anderson, 1958)**, these insecticides continued to be used because of their effectiveness for control of many orchard insect pests. As a result of this continued use, several species of predatory mites developed resistance to organophosphates. Resistance to carbamate insecticides, synthetic pyrethroids and to some specific acaricides was also reported in predators **(Hoy and Knop, 1981)**.

The use of predators had proved the most effective control method for tetranychid mites and the most effective predators have been found in the family phytoseiidae **(Huffaker *et al.*, 1970; Abou Awad and El-Banhawy, 1985)**. *Amblyseius fallacis* (Garman) is an important phytoseiid mites on various crops **(Croft and McGroarty, 1977)**, and it is a key predator for managing spider mites **(Specht, 1968)**. Also *Amblyseius gossipi* (El-Badry) has one of the faster developmental rates and has high oviposition and predation rates. It was collected and described by **El-Badry (1967)**. The outbreaks of the red spider mite frequently occur when predation pressure is removed. This could arise if the insecticides are more toxic to the predatory mites than to the prey, but the antifeeding effects of deposits could interfere with successful predation

without causing mortality. It has been demonstrated that permethrin, fenvalerate and cypermethrin have greater toxicity to the predaceous mites *Amblyseius fallacis, Metaseiulus occidentalis* and *T. pyri* than to the phytophagous mite *Tetranychus urticae* **(Rock, 1979; Wong and Chapman, 1979)**.

Sublethal effects can supplement mortality not only by reducing feeding but by reducing the reproductive potential **(Jackson and Wilkins, 1985 and Abou Awad and El-Banhawy, 1985)**; and by interfering with oviposition **(Hajjar and Ford, 1989)**. However, stimulation of reproduction by insecticides has also been reported in planthoppers and aphids **(Chelliah *et al.*, 1980)**.

Some pesticides showed different effects other than lethal ones, **Dittrich *et al.* (1974)** found that permethrin and fenvalerate reduced food consumption in the red spider mite *T. urticae* with a consequent reduction in egg laying.

Penman and Chapman (1983) and Iftner *et al.* (1986) also showed that fenvalerate is a repellent and induces an avoidance reaction in *T. urticae* **Penman *et al.* (1986)** further found that various additional pyrethroid insecticides showed repellency to the red spider mite.

Suppression of oviposition in mites was also demonstrated on residues of fenvalerate by **Hall (1979) and Penman *et al.* (1981)**. While, in predatory mites, **Barritt (1984)** demonstrated a lowered consumption of prey eggs contaminated with the fungicide bupirimate.

The possibility of controlling phytophagous mites by a combination of biological and chemical methods had proved a less costly and more permanent method of control than had pesticides alone **(Croft, 1978 and Hislop and Prokopy, 1981)**.

Clearly, if chemical and biological methods are to be successfully integrated, then the impact on beneficial arthropods of pesticides applied to control key pests and diseases, must be minimized. Successful control depends upon three principle aspects of the predator's biology, firstly the rate of prey consumption, secondly the relative rates of predator and prey egg production, and thirdly the relative rates of development through the life cycle. These factors are closely related since, for example, egg production by the predator is directly influenced by prey consumption.

Low levels of pesticides, which do not cause mortality can influence the success of a predator as a result of behavioural modification. So, the present study was carried out to examine the toxic effect of some insecticides against the adult females of the two spotted spider mite, *T. urticae.* and to examine the sublethal effects of these chemicals on some biological aspects of this mite and its predators *Amplyseius gossipi* such as fecundity, hatchability. The feeding behaviour of the predator under sublethal insecticidal effect was also studied.