

**TRUE SPIDERS AS A BIOCONTROL AGENT
FOR CONTROLLING SPIDER MITES IN EGYPT**
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Abstract

In Egypt, through the last ten years, the two-spotted spider mite, *Tetranychus urticae* Koch caused damages for different field crops. This study aims to evaluate the biological aspects of the true spider, *Thomisus spinifer* Cambridge when fed on *T. urticae* and the efficiency of food consumption of this predaceous species. Results indicated that the life cycle of the spider lasted 231.67 and 193.72 days for the female and male respectively. The different spiderling of the spider consumed about 30 eggs and 25 adult stages of the spider mite per day.

Introduction

The true spiders play an important role for controlling some pests which cause serious damage for the most important economic crops and their fruits especially vegetable crops and their fruits. They form one of the most ubiquitous groups of predaceous organisms in the animal kingdom (over 30,000 species). Levy (1970) studied the developmental cycle of spider species *Thomisus onustus* Walckenaer (Family: Thomisidae). He found that the female spider maintains a stable cycle of one year, whereas the males showed a change in the length of their developmental cycle, according to the phase from which they originate.

Mansour et al. (1980) reared the spider species *Cheiracanthium mildei* L. Koch at 24±1°C and 55-60% R.H. on the prey *Spodoptera littoralis* Boisd. larvae. Males of *C. mildei* required mean ig 185 days after hatching to reach maturity, became adults after 7-8 months, and lived for an average of 73 days as adults. Females required a mean of 231 days after hatching to mature, reached adult after 9-10 months, and lived for an average of 240 days as adults.

Sallam (1996) studied the biological aspects of *Cheiracanthium jovium* at 25°C and 60-70% R.H. feeding on *Ceratitis capitata* adults. Data revealed that the incubation period was 14.06 days. The female went through 8-9 spiderlings before reaching maturity, while the male went through 7-8 spiderlings. Total life span was 387.62 and 234.73 days for female and male, respectively.

This present work aims to study the biological aspects of *Thomisus spinifer* Cambridge (Araneida : Thomisidae) and its role for controlling the two spider mite as a biocontrol agent.

Materials and Methods

A culture of spider species *Thomisus spinifer*, were collected from the field (about 2 cm) separately and confined in a translucent glass or plastic container (30 ml) facilitates good observation of the spider. Special care and observations twice a day were required in order to obtain details of the biological aspects. The spider species fed on *T. urticae*. The two-spotted spider mite, *T. urticae* was reared using a method provided by Cotton and Field Crops Acarology Research Division, Plant Protection Research Institute. Adult mites were reared on sweet potato leaves in Petri dishes 9 cm X 2 cm.

The leaves were put on cotton damp with water. The spider and its prey (on sweet potato leaves) were put in porous transparent boxes made of plastic. The experiments were carried out in an incubator at 26±1°C and 60-70% R.H., for biological studies.

Individual females from the laboratory culture or the field were allowed to oviposit and the newly hatched individuals were transferred to separate vials to complete their development under the controlled conditions.

Results and Discussion

The biological aspects were studied and can be summarized as follows:

1- Feeding Behavior

The spider caught the prey *T. urticae* between its chelicerae by helping of the legs and inserted its chelicerae in the mite body.

2- Mating Behavior

The virgin female stays feeding for 15 days before mating. Some plant leaves were provided in the container to emulate the natural conditions and to allow a space route for the male. The female was placed first in the container and allowed to web and get ready for mating.

The female stopped moving around and started to come close to him in retractive movement a few times. The male started to come close to her moving his front legs up and down and pedipalps alternatively. The female hung herself to the silky webbing and got ready for mating. The male moved under her and started the copulation process. The mating process continued for about 10-12 seconds after which the male escaped away.

3- Incubation Period

The egg incubation period of the spider lasted 24.61 and 23.80 days for female and male respectively, when fed on adult stages of *T. urticae*.

4- Developmental Stages

Duration from the first to eighth spiderling is presented in Table (1).

Female spider went through 8 spiderlings before reaching maturity, while male spiders went through 7 spiderlings. The life cycle of the spider required about 231.67 and 193.72 days for female and male spiders, respectively.

5- Food Consumption

The true spider *Thomisus spinifer* durated to eight spiderling for female and seven for male. The food consumption for each spiderling was an average number of 5-7 eggs and 3-4 adult stages of spider mites for the first and the second spiderling, while the third and fourth spiderling consumed an average of 8-9, 4-5 eggs and adult stages.

The fifth and sixth spiderling consumed 7-8 eggs and 608 of adult stages of spider mites. The (7th-8th) spiderling predator consumed about 9 and 10 eggs and adult stages respectively for each spiderling per day.

This study is in the same line of El-Naggar et al. (1997) where they studied the biological aspects of *Thomisus spinifer* on the Mediterranean fruit fly, *Ceratitis capitata* at 26°C in Egypt. Data proved that female spider went through 8 spiderlings before reaching maturity, while male spiders went through 7 spiderlings. The life cycle required 198.7 and 165.4 days for female and male spiders, respectively.

References

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Table (1): Life cycle of the spider species *Thomisus spinifer* when fed on *T. urticae* at 26+1°C and 60-70% R.H.

Stages	Duration in days	
	Female	Male
Egg incubation period	24.61	23.80
1 st spiderling	15.10	14.80
2 nd spiderling	22.80	22.20
3 rd spiderling	24.20	24.30
4 th spiderling	29.61	28.24
5 th spiderling	23.44	24.21
6 th spiderling	28.16	27.92
7 th spiderling	31.42	28.25
8 th spiderling	32.33	-
Total	231.67	193.72