



**STUDIES ON PHYTOPHAGOUS MITES AND THEIR
ASSOCIATED PREDATORS ON TOMATO CROP AT
FAYOUM GOVERNORATE**

By

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ABSTRACT

Tomato (*Solanumlycopersicum* L.) is one of the most nutritious and economically important horticultural crops worldwide.

General survey of mites associated with tomato hybrids leaves during six seasons (2015 – 2018) was conducted. Eight and five hybrids were cultivated in winter and summer plantations, respectively. Four mite species were found, two species were considered as phytophagous mites namely (*Tetranychus urticae*) and (*Aculopslycopersici*), one as debatable species (*Tydeuscalifornicus*) and one as predacious mite (*Amblyseiuscydnodactylon*).

Three tomato hybrids were planted in summer plantation during 2017 & 2018 seasons namely, Super-gekal, 09 and El-basha. Only one mite species was collected namely, *T. urticae* during 2017 season, while during 2018 season, *A. lycopersici*, *T. californicus* and *A. cydnodactylon* were collected from the same previous hybrids.

Biological aspects of *T. urticae* on tomato hybrids (550 and 010) at 20°C and 60% R.H. and (Blatenium and Super strain B) at 25°C and 65% R.H. were studied. For females, total immature on both tomato hybrids (550 and 010) was averaged 18.09 and 19.6 days, respectively. While for males, it was averaged 16.08 and 16.68 days. Preoviposition, oviposition and postoviposition periods on both tomato hybrids (550 and 010) were averaged (1.6 and 3.3), (3.2 and 2.6) and (2.05 and 1.5) days, respectively. The fecundity of females was 3.75 and 2.8 eggs/female. Total longevity for females was averaged 6.85 and 7.5 days on tomato hybrids (550 and 010), respectively, while for males, it averaged 6.7 and 6.42 days. Egg hatching for 550 hybrid was higher than 010 hybrid (90 and 88%), respectively.

The preoviposition, oviposition and postoviposition periods on both tomato hybrids (Blatenium and Super strain B) were averaged (1.125 and

1.17), (2.25 and 1.76) and (1.63 and 1.29), days respectively. The fecundity of females was 2.75 and 3.47 eggs/female. Egg hatchability was 88 and 80%, respectively.

Biological aspects of *A. lycopersici* on tomato hybrid (010) at 20°C and 60% R.H were studied. The periods of protolarvae and duetolarvae, were recorded 1.42 and 2.5 days and 1.28 and 2.14 days for females and males, respectively. Total longevity for females and males were averaged 4.78 and 4.5 days, respectively.

The preoviposition, oviposition and postoviposition periods were averaged 1.5, 1.7 and 1.57, respectively. The fecundity of females was 1.6 eggs/female with egg hatchability of 93% and egg incubation period of 1.28 days.

Effect of *T. urticae* infestation on some histological leaf characteristics for four tomato hybrids (Super gekal & 09 & Blatenium and Super strain B) were studied. (09) hybrid has the lowest number of the palisade parenchyma compared with other tomato hybrids. The average number of the spongy parenchyma thickness varied in different tomato hybrids leaves.

Photosynthesis in tomato leaves was affected by mite infestation by reducing photosynthetic pigments such as chlorophyll a, b and total carotenoids.

All organic compounds (Lipids, Carbohydrates, Proteins, Flavonoids, Phenols and Alkaloids) were affected due to infestation.

The effect of orange oil LC₅₀ on *T. urticae* biological aspects was studied, the highest effect was recorded with directly egg treatment which obtained from untreated females and egg which obtained from treated

females, while the lowest effect of orange oil on biology was observed when females treated.

For directly egg treatment, mortalities in larvae, proto-nymph and deuto-nymph were 92, 95 and 98%, respectively. Mortalities were 44, 62, and 86 % and 8, 12, and 15 % on eggs which obtained from treated females and directly female treatment, respectively.

Also, the effect of four concentrations (20000, 10000, 5000 and 2000 ppm) of orange oil on *T. urticae* biological aspects was studied.

Keywords: Tomato, *Tetranychus urticae*, *Aculops lycopersici*, Ecology, Biology, Anatomy, Biochemical attributes, Orange oil.