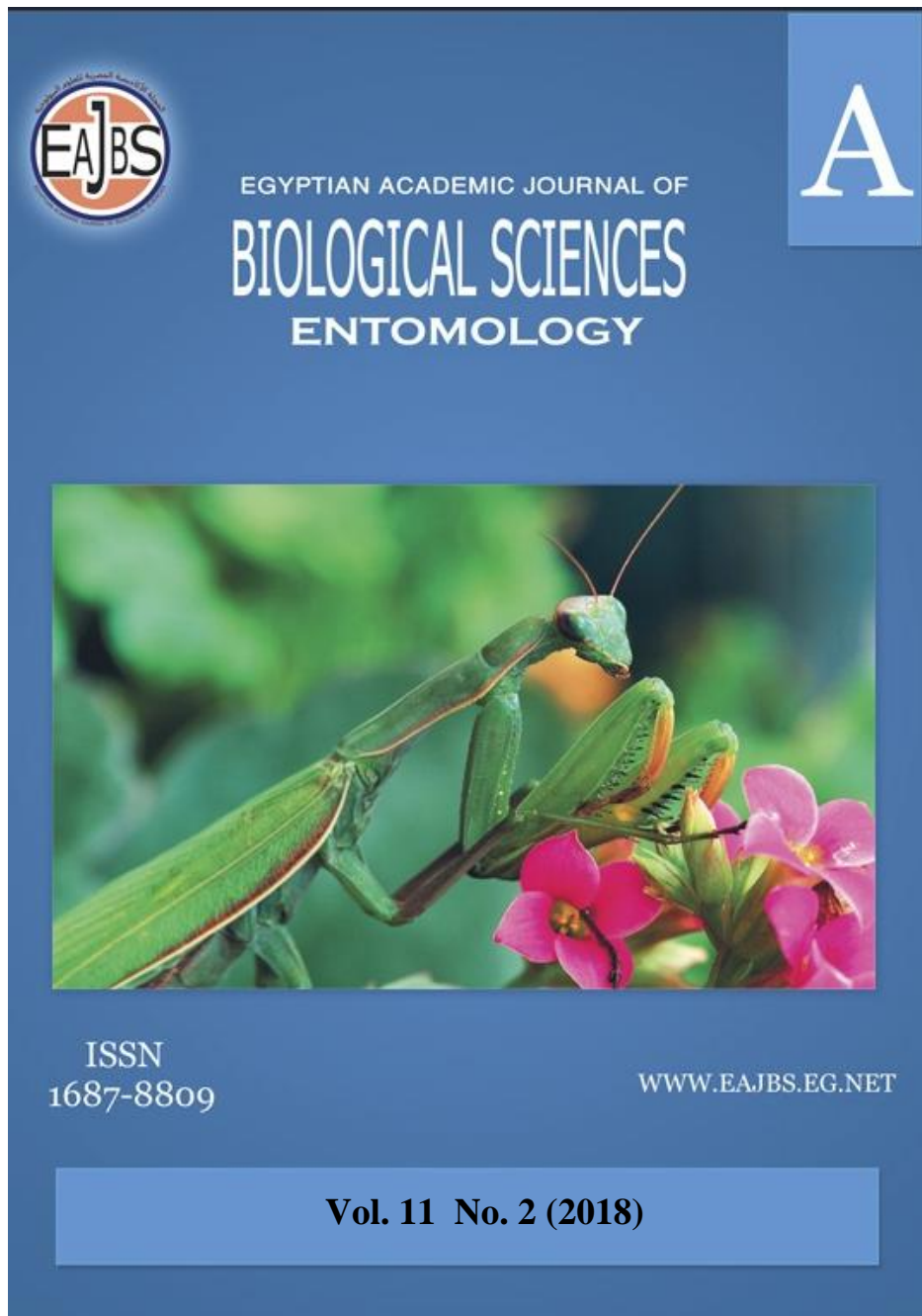


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**Effect of Some Soybean Varieties on Biological Aspects and Fecundity of The Two Spotted Spider Mite , *Tetranychus urticae* Koch ( Acari: Tetranychidae)**

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**ABSTRACT**

Biological and fecundity of the two spotted spider mite, *Tetranychus urticae* Koch reared on three soybean varieties: Giza 111, Giza 83 and Giza 22 were evaluated under laboratory conditions of  $25\pm 1$  oC and  $65\pm 5\%$  R. H. The developmental times from egg to adult stage ranged from 14.15 to 11.4 days on Giza111 and Giza83 varieties, while, on Giza22 variety it lasted 10.10 days for female, while, the male life cycle stayed 12.3, 10.2 and 9.3 days, when, fed on the same soybean varieties. Female longevity was differed among the tested soybean varieties whereas, it lasted 10.90, 9.15 and 9.45 days when fed on, Giza111, Giza83, and Giza22 varieties of soybean , respectively. The tested soybean varieties greatly affected fecundity, female deposited of the reared mite , where the maximum number of laid eggs were registered on Giza22 variety ( 45.50 egg), while, the least number of laid eggs of the spider mite, *T. urticae* was observed on Giza111 variety( 34.50).

**INTRODUCTION**

The two spotted spider mite, *Tetranychus urticae* Koch is considered one of the main sucking pests infesting different crops in different countries of the world, whereas, the spider mites cause a great damages and losses, it's continue a major limiting factor of different crops Yassin, (1997) and Taha et al. ( 2001). Spider mites feed on green substance and leaves juice causing tiny yellow spots or stipples, on leaves. As the injury becomes more severe, leaves turn yellow, then brown or bronze and finally drop off causing yield loss and may transfer some plant diseases, resulting in reducing the quantity and quantity of production, Bake and Connel, (1961), Jeppson et al .(1975), Taha and EL-Rais (1996 ). The effect of different plant hosts on developmental stages and fecundity of the spider mites attracted the attention of many authors to investigate ,Azouz (2005), Romieh and Abo-Shanaf (2007), Gotoh and Nagata, (2007) and El-Sandy et al. (2010).

The aim of the present study is to shed some light on the influence of host plant varieties on the developmental stages and some the biological aspects as :

longevity, fecundity and life span of spider mite, *Tetranychus urticae* Koch under laboratory conditions.

## MATERIALS AND METHODS

### Rearing technique and mite sources:

A pure culture of spider mite *T. urticae* was propagated on sweet potato cuttings placed in glass jar, filled with water. The colony was kept at room temperature  $25 \pm 1$  °C and 24 illumination. The leaf discs were placed upside down on wet cotton wool pads inside 10 cm Petri-dishes. The dishes were arranged in complete randomized block design with three replicates. Each Petri-dish contained three discs. Each disc was surrounded with tangle peat to prevent mite escape. Petri-dishes were covered and kept at  $25 \pm 1$ °C and  $65 \pm 5$  % R. H. Petri-dishes were examined twice a day. Discs were replaced by new ones as soon as began to wilt and the mites of different stages were recorded, incubation period, larval, protonymphal, deutonymphal stages, life cycle, longevity of male and female, fecundity and life span of both female and male were counted on three soybean varieties, Giza111, Giza83 and Giza22.

### Statistical analysis:

Data were analyzed by one-way analysis of variance and means comparisons at 0.05 level of significance using fisher's least significant differences (L.S.D) using statistical analysis system (SAS) software (1988).

## RESULTS AND DISCUSSION

Development of the two spotted spider mite, *Tetranychus urticae* Koch through; egg, larva, protonymph, deutonymph and adult stages when fed on three soybean varieties, Giza111, Giza83 and Giza22 were determined under laboratory conditions. The developmental durations of all stages on three soybean varieties as shown in Table (1) were as follow :

### Incubation Period:

The incubation period varied with different host plants ranging from (3.30) to (4.15) for female and from (3.70) to (4.00) days for male, when the egg were maintained under the same conditions of  $25 \pm 1$  °C and  $65 \pm 5$  % R. H.

### Immature Stages:

The duration of female larval stage, was found to be affected by the host plant species on in which they developed. It varied from 2.05 days on Giza22 to 2.63 days on Giza111 variety. This period changed from 1.90 days to 2.40 days for male at the same pattern.

### Protonymphal Stages :

Data presented in Table(1) indicated that the average duration of protonymphal stage changed from 2.25 to 3.79 days for female and from 1.70 to 3.10 days for male when mites fed on the same trend of mentioned soybean varieties. The longest protonymphal stage period was registered with Giza111 variety for female and male.

### Deutonymphal Stage:

The duration of female deutonymphs showed a marked dependence on host plants on which they develop individuals reared on Giza111 leaves recorded the longest period 3.58 days, while, it was minimum on Giza22 2.50 days, the male deutonymphal period lasted 2.00, 2.40 and 3.00 days when it fed on Giza22, Giza83 and Giza111 varieties under the same conditions.

**Total Immature Stages:**

Female total immatures from egg hatching to adult emergence of spider mite, *T. urticae* ranged from 6.80 to 10.0 days according to the host plants (Table 1) .

**Life Cycle:**

Female and male life cycle of the two spotted spider mite, *T. urticae* was affected by different host varieties and lasted (10.1 and 9.3), (11.4 and 10.2) and (14.15 and 12.3) days, when fed on Giza22, Giza83 and Giza111 varieties (Table1) and (Fig 1) .

The obtained results coincided with that obtained by Farrage et al. (1980), Sawires et al. (1990), Farris et al. (1991), who reported significant effects of different host plants on developmental stages of spider mite, *T. urticae* .

**Adult Longevity:**

Female longevity duration was 9.45, 9.15 and 10.9 days, when fed on different soybean varieties Giza22, Giza83 and Giza111 respectively .

The oviposition period lasted 6.15, 5.90 and 6.8 days as the same trend of the above mentioned soybean varieties. Table (2) and Figs (2).

**Fecundity:**

The total number of deposited eggs per female differed among the tested soybean varieties. Female laid an average of 34.5, 40.6 and 45.5 eggs with a daily rate of 5.07, 6.88 and 7.39 eggs, when female fed on the above mentioned soybean varieties. These results agree with that obtained by, Bounfou and Tanigoshi (2001), Azouz (1999) and El-sanady et al. (2010).

**Life Span:**

The obtained results in Table (1) and graphically illustrated in Fig (1) showed that the life span of spider mite, *T. urticae* when reared on Giza22, Giza83 and Giza111 soybean varieties lasted 19.55, 20.55 and 25.05 days for female, while, the male life span lasted 15.3, 16.7 and 18.5 days when fed on the above mentioned hosts, respectively . These results agree with that obtained by Satio (1979).

**Table (1): Duration in days of developmental stages of *Tetranychus urticae* Koch female on different soybean varieties at 25±1 °C and 65±5% R.H.**

<i>T. urticae</i> stages	Sex	Duration in days on three tomato varieties		
		Giza111	Giza83	Giza22
Egg (Incubation period)	♀	4.15±0.05	3.6±0.06	3.30±0.32
	♂	3.80±0.16	4.00±0.15	3.70±0.16
Larva	♀	2.63±0.11	2.22±0.22	2.05±0.33
	♂	2.40±0.12	2.00±0.23	1.90±0.25
Protonymph	♀	3.79±0.07	2.57±0.13	2.25±0.21
	♂	3.10±0.14	1.80±0.17	1.70±0.22
Deutonymph	♀	3.58±0.06	3.01±0.25	2.50±0.28
	♂	3.00±0.19	2.40±0.15	2.00±0.20
Total immatures	♀	10.0±0.33	7.80±0.32	6.8±0.42
	♂	8.5±0.15	6.2±0.20	5.6±0.29
Life cycle	♀	14.15±0.53	11.4±0.7	10.10±0.68
	♂	12.3±0.50	10.2±0.62	9.3±0.55
Adult longevity	♀	10.9±0.98	9.15±0.85	9.45±0.80
	♂	6.20±0.38	6.5±0.80	6.00±0.85
Life span	♀	25.05±0.83	20.55±0.90	19.55±1.24
	♂	18.5±0.35	16.7±0.69	15.3±0.99

**Table (2): Longevity and fecundity of *Tetranychus urticae* female on three soybean varieties.**

Biological aspects	Tomato varieties (Periods in days)		
	Giza111	Giza83	Giza22
Pre-oviposition	1.6±0.09	1.4±0.11	1.35±0.12
Oviposition	6.80±0.35	5.90±0.37	6.15±0.30
Post-oviposition	2.5±0.15	1.85±0.13	1.95±0.16
Adult longevity	10.90±0.98	9.15±0.85	9.45±0.80
	Fecundity (eggs)		
No. of eggs	34.50±2.9	40.60±3.5	45.5±3.2
Daily rate	5.07±0.3	6.88±0.32	7.39±0.25

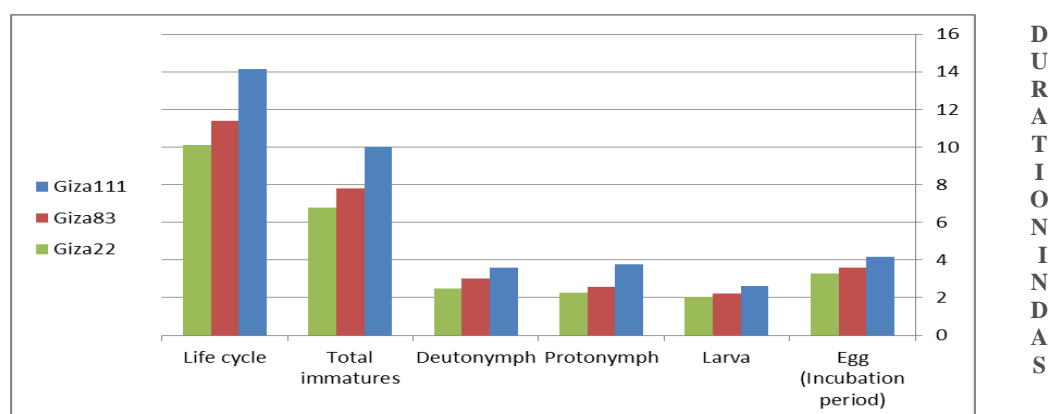


Fig. (1): Duration in days of developmental stages of *T. urticae* when reared on three varieties of soybean at 25±1 °C and 65 ±5% R.H.

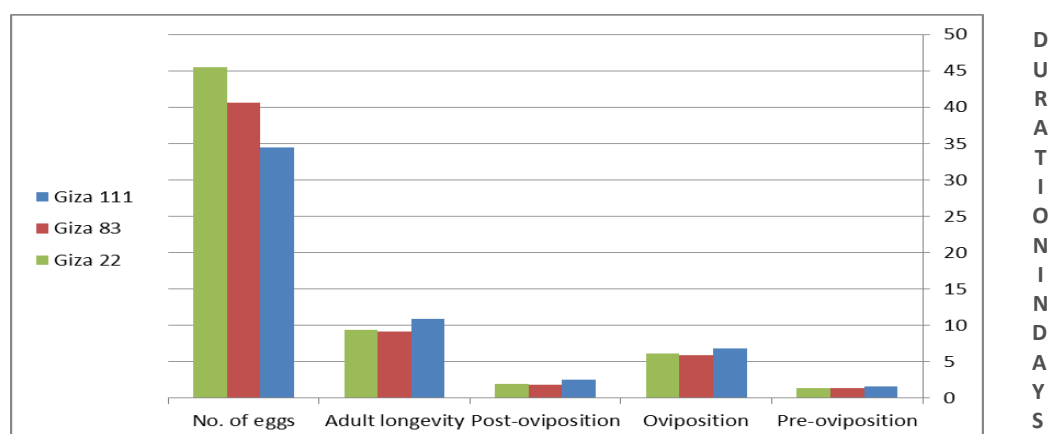


Fig. (2): Longevity and Fecundity of *T. urticae* adult female (pre-oviposition, oviposition and post-oviposition periods) when reared on three soybean varieties.

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## ARABIC SUMMARY

تأثير بعض أصناف فول الصويا على المظاهر البيولوجية والخصوبة للعنكبوت الأحمر ذي البقعتين  
*Tetranychus urticae* Koch (Acari: Tetranychidae)

سهام علي عزالدين

معهد بحوث وقاية النبات - مركز البحوث الزراعية - الدقي - مصر

أجريت دراسات بيولوجية على العنكبوت الأحمر العادي *Tetranychus urticae* Koch لدراسة تأثير ثلاثة من أصناف فول الصويا على المظاهر البيولوجية والخصوبة تحت ظروف معملية حيث تم تربيته على ثلاث أصناف من فول الصويا. ( Giza111- Giza83- Giza22 ) عند درجة حرارة  $25 \pm 1$  هم ورطوبة نسبية  $65 \pm 5\%$ .

أوضحت النتائج أن مراحل التطور المختلفة والخصوبة للعنكبوت الأحمر قد تأثرت للأصناف المختبرة حيث أوضحت الدراسة أن دورة الحياة من البيضة إلى الحيوان البالغ استغرقت 9.3 ، 10.2 ، 12.3 يوماً عند التغذية على الصنف Giza22 والصنف Giza83 والصنف Giza111. كما أن فترة حياة الأنثى البالغة استغرقت 10.10 ، 11.4 ، 14.15 يوماً عند التغذية على الأصناف المذكورة على نفس الترتيب . ولقد كان لاختلاف صنف فول الصويا تأثيراً واضحاً على خصوبة الإناث حيث وضعت الأنثى 45,5 بيضة عند التغذية على الصنف Giza22 بمتوسط يومي 7.39 بيضة بينما عند التغذية على Giza111 وضعت الأنثى 34.50 بيضة بمتوسط يومي 5.07 بيضة وكان معدل وضع البيض 40.60 بيضة عند التغذية على الصنف Giza83 بمتوسط يومي 6.88 بيضة. ومن النتائج السابقة نستخلص أن العوامل النباتية لها تأثيراً واضحاً على التطور والخصوبة للعنكبوت الأحمر العادي.