

## **INCIDENCE and SEASONAL FLUCTUATION of MITES INHABITING SPONGE GOURD, *Luffa cylindrica* M. ROEM. at SHARKIA GOVERNORATE, EGYPT**

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### **ABSTRACT**

The present work was carried out to study the incidence and population fluctuation of mites inhabiting *Luffa cylindrica* M. Roem. in three districts at Sharkia Governorate, Egypt. Eleven species of mites were recorded where the phytophagous mite *Brevipalpus obovatus* Donnadieu and the predacious species *Amblyseius badryi* Yousef & El-Borollosy were the most abundant species. Interrelation between mite species and both temperature & relative humidity, also, pest mites – predators interrelations, were studied

**Keywords:** Incidence, Population Fluctuation, mites, Sponge Gourd, Temperature, R.H..

### **INTRODUCTION**

The sponge gourd *Luffa cylindrica* M. Roem. (Fam. Cucurbitaceae) is a sub – tropical plant, which requires warm summer temperature and long frost-free growing season when grown in temperate regions. It is an annual plant which produces fruit containing fibrous vascular system. They have a long history of cultivation in the tropical countries of Asia and Africa. Burma is reported to be the center of diversity for sponge gourd. The main commercial production countries are China, Korea, India, Japan and Central America. Cucurbitaceous plants are considered the most abundant and moderate spread all over Egypt, but *Luffa* is moderately spread in Egypt. Usually the crop shelters several mite species of which some are phytophagous such as *Brevipalpus obovatus* Donnadieu and *Tetranychus cucurbitacearum* (Sayed). Other associated mites are predators which feed on the phytophagous mite eggs or their postembryonic stages (Shehata, ١٩٦٧ and Wahab *et al.* ١٩٧٤). The dry fibrous, inner portion of the mature fruit of sponge gourd is used for bathing, cleaning utensils, making shoe sales, as filters in factories (Malik, ١٩٩٤).

The present work aimed to study the incidence of mites associated with *Luffa* crop and seasonal fluctuation to the most common species in relation to climatic factors in three districts located at Sharkia Governorate.

### **MATERIALS AND METHODS**

#### **Experimental Design:**

The present study was carried out at three districts of Sharkia Governorate, Egypt, namely, Hehia, Abou – Kabeer and Zagazig, during the growing seasons of the sponge gourd, *Luffa cylindrica* M. Roem. In the two successive years ٢٠١٠ -١١ to study the incidence and population fluctuation

of mites occur on the crop vegetation. An area of one feddan ( $1000 \text{ m}^2$ ) was chosen in each of the three districts and was divided into three plots. The experimental areas were planted with the crop on March. Population fluctuation of phytophagous and predator mites:

Twenty five leaves samples were collected randomly from both diagonals of the inner square area of each experimental plot, every two weeks for counting the mites. The plant leaves were placed in polyethylene bags with appropriate labels. All the mites collected on the leaves were counted then mounted in Hoyer's medium for identification. Users Guide to Mstate. (A software program for design management and analysis) Freed *et al.* (1989) was used for estimating the simple correlation between phytophagous mites, predator mites and the climatic factors of temperature and relative humidity.

## RESULTS AND DISCUSSION

Mites associated with the sponge gourd, *Luffa cylindrica* M. Roem were studied during two successive years 2010-2011. The cultivated two seasons of the crop at the three tested districts in Sharkia Governorate, Egypt, indicated the occurrence of eleven species three phytophagous, five predacious and three of miscellaneous feeding habits. These mites belong to three suborders and seven families as follows:

Suborder : Actinedida:

Family: Tetranychidae Donnadieu

*Tetranychus cucurbitacearum* (Sayed) (phytophagous)

*Bryobia cristata* (Duges) (phytophagous)

Family: Tenuipalpidae Berlese

*Brevipalpus obovatus* Donnadieu (phytophagous)

Family: Tydeidae Kramer

*Tydeus (Tydeus) kochi* Oudemans ( miscellaneous)

Family : Tarsonemidae Kramer

*Tarsonemus confusus* Ewing (miscellaneous)

Family: Stigmaeidae Oudemans

*Agistemus exsertus* Gonzalez (predator)

Suborder: Gamasida:

Family: Phytoseudae Berlese

*Amblyseius swirskii* (Athias-Henriot) (predator)

*A. cydnodactylon* Shehata and Zaher (predator)

*A. zaheri* Yousef and El – Brollosy (predator)

*A. badryi* Yousef and El – Brollosy (predator)

Suborder : Oribatida:

Family: Haplozetidae Grandjean

*Xylobates souchnaiesis* Abdel Hamid (miscellaneous)

The aforementioned results were in agreement with data of Harranger (1974) EL- Atrouzy (1968), Guitierrez (1970), Wahab *et al.* (1974) and Abdel Salam *et al.* (1980) for predaceous mites. They surveyed mite species inhabiting different vegetable crops.

### Population fluctuation:

Data present in (Fig 1) showed the population behavior of the two phytophagous mites and its mite natural enemies associated with sponge gourde *L. cylindrical* M. Roem. and simple correlation between them with temperature and relative humidity. Also, the correlation coefficient between the two pest mites and its two predators at the three districts, Abdu- Kabber Hehia and Zagazig Sharkia Governorate , Egypt during the two successive season 2010-11.

#### 1-population fluctuation of phytophagous mites

##### a. *Brevipalpus obovatus*:

This phytophagous mite started its infestation from April 10<sup>th</sup>, 2010 (Fig. 1) with 0.64 mite/ leaf at abuo- Kabber at 19.3°C & 62.9% R.H. In Hehia the beginning of the infestation recorded 0.68 mite/leaf in April 1<sup>st</sup>, at 20.1 °C & 60.4% R.H. In Zagazig the mite started its infestation from May 10<sup>th</sup>. With 0.4 mite/leaf at 24.9 °C & 60.8 .R.H . The mean density increased gradually showing one peak at both districts Abuo-Kabber and Zagazig , the first peak appeared at Oct. 10<sup>th</sup>. Abuo-Kabber with a mean number of 8.44 mite /leaf, at 20.2 °C and 67.3% R.H. , in Zagazig the mean number of 6.24 mite/leaf in 10<sup>th</sup>. Oct. at 20.2 °C & 67.3 R.H.. In Hehia, the false spider mite appeared for the first time on April 1<sup>st</sup>, with a mean number of 0.68 individual / leaf at 20.1 °C and 60.4% R.H. then the population decreased reaching zero at April 10<sup>th</sup>. The mean density increased gradually reaching 3 peak at July 1<sup>st</sup>, Aug. 10<sup>th</sup>. And Nov. 1<sup>st</sup>. with a mean number of 3.06, 3.16 and 4.24 individual / leaf at 27.4 °C, 30.3 °C & 69.7 and 66.0%, 70.2% and 69.7% R.H. , respectively .

In the second season, 2011, the infestation started at 1<sup>st</sup>. May 2011 (Fig. 2) at both districts Abuo-Kabber and Zagazig with a mean number of 0.96 and 0.64 individual/ leaf at 23.6 °C & 60.2% R.H. respectively, while in Hehia beginning of the infestation recorded 0.6 mite /leaf in May 10<sup>th</sup>. at 20.2 °C & 61.4 % R.H. .The mean density increased gradually showing one peak at both districts, the first peak appeared at Nov. 1<sup>st</sup>. at Abuo-Kabber with a mean number of 10.0 mite / leaf, at 20.3 °C 68.0% R.H., while in Zagazig it appeared at Oct. 1<sup>st</sup>. with a mean number of 10.0 individual / leaf at 24.0 °C & 60.7% R.H. After wards the mean number declined gradually to 3.72 individual /leaf at the end of the season at 10 Dec. at 17.2 °C & 70.3 % R.H. at Abuo-Kabber, while in Zagazig the mean density declined gradually to Zero at the end of the season at 10 Nov. In Hehia the population increased gradually showing the first peak at 10 Aug. with a mean number of 0.8 mite /leaf at 30.9 °C & 71.0 R.H.. After wards, the mean density decreased suddenly to zero in 10 Sep. at 27.6 °C & 68.1 R.H., then increased again to 6.4 individual /leaf in 10<sup>th</sup>. Oct., then mean density declined abruptly to zero at the end of the season.

##### B. *Tetranychus cucurbitacearum* (Sayed)

The mite started its infestation from March 10<sup>th</sup> 2010 (Fig. 1) with 1.6 mite/leaf at Abuo-Kabber at 18.3 °C & 61.4% R.H.. In Hehia the beginning of the infestation recorded 0.92 mite/ leaf in April 1<sup>st</sup> at 20.1 °C & 60.2 % R.H.. Then it dropped to zero in 10<sup>th</sup> April. In Zagazig the beginning of infestation recorded 0.36 mite / leaf in May 1<sup>st</sup>, at 21.0 °C & 09.4 % R.H.. The mean density increased gradually reaching 4 peaks at April 10<sup>th</sup>, May 10<sup>th</sup>, Aug. 1<sup>st</sup>

and Oct. 1<sup>st</sup> with a mean number of 3,0, 2,76, 0,2 and 3,72 individual/leaf at 19,3 °C, 24,9 °C 28,0 °C & 23,0 °C and 62,9%, 60,8%, 69,80% & 60,0% R.H., respectively, then the population decreased reaching zero at Nov. 10<sup>th</sup> at Abuo-Kabber. The mean density increased gradually reaching two peaks at both districts. In Hehia at May 10<sup>th</sup> Aug 10<sup>th</sup> with 2 mean number of 2,64 and 3,02 individual / leaf at 24,9 & 30,3 °C and 60,8% & 70,2% R.H., respectively. In Zagazig it was 2,12 & 3,32 individual / leaf during July 10<sup>th</sup> and Aug. at 29,3 °C & 30,3 °C and 68,0% & 70,2% R.H. respectively. Then the population decreased reaching zero at the end season at both districts.

In the second season, 2011 (Fig. 2) the mite started its infestation from Mar. 10<sup>th</sup> at three districts with a mean number of 2,12, 3,1 and 2,68 individual / leaf at 20,2 °C & 60,2 % R.H. respectively at abuo-Kabber, Hehia and Zagazig. In Abuo-Kabber the mite recorded four peaks at Mar. 1<sup>st</sup>, Aug. 1<sup>st</sup>, Sep. 1<sup>st</sup> and Oct. 1<sup>st</sup> with a mean number of 3,28, 10,44, 10,12 and 0,24 individual / leaf 19,0 °C, 30,0 °C & 24,0 °C and 61,0% R.H., 72,3% R.H., 69,2% R.H., & 60,7 R.H. then the population decreased reaching zero at the end of the season (Dec. 10<sup>th</sup>). The mean density at Hehia was increased gradually reaching two peaks at May 10<sup>th</sup> & Aug. 1<sup>st</sup> with a mean number of 11,0 & 14,36 individual / leaf at 20,2 °C & 30,0 °C and 61,4% R.H. & 72,3 % R.H.. After that the number decreased slowly reaching zero at the end of the season (10 Dec. ) In zagazig the mean density increased quickly, reaching the maximum value of 6,24 mite / leaf on 10 May. After wards the mean density showed increasing and some what decreased at 10 Jan., after that it showed a peak at 1 Aug., reaching 0,72 individual / leaf. After that the mean number showed decreased and somewhat increased at 10 Sep. after that the mean number decreased slowly to reach zero at the end of the season (10 Dec.)

**Fig (١) Population fluctuation of *B. obovatus* & *T. cucurbitacerum* per leaf of luffa at Abou-Kabber, Hehia and Zagazig, Sharkia Governorate during season ٢٠١٠**

**Cont. Fig (١) population fluctuation of *B. obovatus* & *T. cucurbitacerum* and its mite predators *A. exsertus* & *A. swirskii* per leaf of luffa at Abou-Kabber, Hehia and Zagazig, Sharkia Governorate during season ٢٠١٠**

## 2. Population fluctuation natural enemies

### A. *Agistemus exsertus* Gonzalez:

The predator appeared for the first time on April 1<sup>st</sup> 2010 (Fig. 1) with a mean number of 0.48 individual/ leaf at 20.1 °C and 60.2 %R.H. at Abuo-Kabber. In Hehia the predator appeared for the first time in 1<sup>st</sup> May with a mean number of 1.88 individual / leaf at 21.0 °C and 59.4 % R.H. .The mean density increased gradually reaching two peaks at both districts. In Abuo-Kabber, at May 10<sup>th</sup> and Oct. 1<sup>st</sup> with a mean number of 2.24 and 8.48 individual / leaf at 24.3 °C & 23.0 °C and 60.8 % & 60.0 % R.H., respectively. In Hehia, at July 10<sup>th</sup> and Oct. 10<sup>th</sup> .it was 4.24 and 4.02 individual/leaf at 24.3 °C & 20.0 °C and 68.0% & 67.3 % R.H., respectively, then the population decreased gradually until the end of the growing season at both districts. In Zagazig the predator appeared for the first time on May 10<sup>th</sup>, with a mean number of 0.44 individual / leaf at 24.9 °C and 60.8% R.H. and then, the mean density increased showing only one peak at Sep. 1<sup>st</sup>, with a mean number of 3.84 individual / leaf at 29.7 °C and 67.3% R.H. then the population decreased reaching zero at Nov. 10<sup>th</sup> .

In the second season 2011 (Fig. 2) the predator appeared for the first time on May 1<sup>st</sup> with a mean number at 1.0 individual / leaf at 23.6 °C and 60.2 % R.H. at Abuo- Kabber. The mean number increased quickly, reaching the maximum value of 11.02 individual / leaf on Oct. 1<sup>st</sup> at 24.0 °C 60.7 % R.H., then decreased suddenly, reaching zero before the end of the season at 10<sup>th</sup> Nov.

In Hehia the in the second season 2011 the predator appeared for the first time on Apr. 10<sup>th</sup> with a mean number of about 0.4 mite / leaf at 21.1 °C & 66.3 % R.H., then the mean density increased gradually, reaching the maximum peak recording 8.10 individual / leaf on 1<sup>st</sup> Oct. at 24.0 °C & 60.7% R.H. Afterwards, the mean density declined gradually to zero at the end of season at 10<sup>th</sup> Dec.

In Zagazig, the predator appeared for the first time on Jun. 1<sup>st</sup> with a mean number of 1.0 individual / leaf at 27.3 °C & 62.3 % R.H. and then, the mean density increased showing only one peak at Oct. 1<sup>st</sup>. with a mean number of 4.4 individual / leaf at 24.0 °C & 60.7 % R.H., then the population decreased reaching zero at Dec. 10<sup>th</sup> at 17.2 °C & 70.3 % R.H.

### b. *Amblyseius swirskii* Athias – Henriot:

The predator appeared for the first time in 10<sup>th</sup>, 2010 (Fig. 1) April at both districts Abuo-Kabber and Hehia with a mean number of 0.06 and 0.7 individual / leaf at 19.3 °C & 62.9 % R.H., respectively. In Zagazig, the predator appeared for the first time on May 10<sup>th</sup> with a mean number of 0.92 individual / leaf 24.9 °C and 60.8%R.H. The mean density increased gradually three peaks at each three districts, the mean density increased gradually reaching two peaks at May 10<sup>th</sup>. and Jul. 1<sup>st</sup> with a mean number of 1.02 and 2.6 individual / leaf at 24.9 °C & 27.4 °C and 60.8% & 66.0% R.H., respectively. The mean density recorded the maximum value of the species at the end of the growing season with 8.04 mite / leaf 10.6 °C and 72.0% R.H. at Abuo-Kabber (Fig. 1). In Hehia the mean density increased showing two peaks at May 1<sup>st</sup>. and July 10<sup>th</sup>. With a mean number of 1.04 and 3.4 mite / leaf at 21.0 °C & 29.3 °C and 59.4 % & 68.0% R.H., respectively. Then the

**Mohamed, O. M. O.**

mean density declined, reaching 1,11 individual / leaf in 1<sup>st</sup>. Nov. at 19,7 °C and 69,7 %R.H. After wards, the population increased until the end of the growing season recording 3,21 mite / leaf in 1<sup>st</sup>. Dec., at 10,6 °C and 72,0% R.H. (Fig. 1), while in Zagazig the mean density increased gradually showing two peak at the first peak at the first day of Sep. with a mean number of 3,11 mite / leaf at 29,7 °C and 67,3% R.H. , while second peak at Sep. 10<sup>th</sup>. with a mean number of 2,02 mite / leaf, at 27,2 °C and 66,1% R.H. .Then the mean density declined, reaching 1,64 individual / leaf at the first day of Oct. at 23,0 °C and 60,0% R.H.

**Fig (1) Population fluctuation of *B. obovatus* & *T. cucurbitacerm* per leaf of luffa at Abou-Kabber, Hehia and Zagazig, Sharkia Governorate during season 2011**



Cont. Fig (٢) Population fluctuation of *B. obovatus* & *T. cucurbitacerum* and its mite predators *A. exsertus* & *A. swirskii* per leaf of luffa at Abou-Kabber, Hehia and Zagazig, Sharkia Governorate during season ٢٠١١

Afterwards the mean density increased until the end of the growing season recording 3,68 individuals / leaf in Dec. 1<sup>st</sup>. at 10,6 °C and 72,0% R.H. ( Fig. 1 )

In the second season, 2011 (Fig. 2) the predator appeared for the first time on May 10<sup>th</sup>, with a mean number of 1,1 individual / leaf at 20,2 °C & 61,4% R.H. at Abou-Kabber and then, the mean density increased gradually, reaching the maximum value of 9,8 mite / leaf at 17,2 °C & 70,2 R.H., at the end of the season (10 December ). In Hehia the predator appeared for the first time on Apr. 1<sup>st</sup>. with a mean number of 0,9 mite / leaf at 19,0 °C & 61,0 %R.H. , and the population increased gradually reaching a mean number of Abou-kabber 8,24 mite / leaf at 1<sup>st</sup>. Dec. showing its peak at 18,0 °C & 71,6% R.H. Then the mean declined, reaching 2,8 individual/ leaf the end of the season, while in Zagazig it appeared at the first time in 10<sup>th</sup> Apr. with a mean number of about 0,6 individual / leaf at 21,1 °C & 66,2%R.H. and then, the mean density increased showing the first peak at Nov. 1<sup>st</sup>. with a mean number 2,72 individual / leaf at 28,2 °C & 69,2% R.H., the mean density decreased suddenly, reaching zero at 1<sup>st</sup>. Oct. at 24,0 °C & 60,7 % R.H.. Afterwards, the population increased gradually showing second peak at Dec. 1<sup>st</sup>, with a mean number of 4,36 individual / leaf at 18,0 °C & 71,6% R.H. then declined to 2,11 individual / leaf at the end of the season.

**Interrelation between mite species and both temperature & relative humidity (Table 1)**

The correlation coefficient revealed that there is no significance between *Brevipalpus obovatus* as affected by temperature and relative humidity at three localities during the two seasons. An exception appeared showing a highly significant difference between *B. obovatus* with temperature at the first season at Hehia, but it was significant with at the same two seasons and for localities. Also, there was a significant correlation between mite and relative humidity during the second season at Abou-Kabber.

The correlation coefficient revealed that there is highly significance between *Tetranychus cucurbitacearum* as affected by temperature during the two seasons at Hehia, also, there was highly significant during the second season at Abou-Kabber and the first season at Zagazig, While there were significant during the second season at Zagazig, while there were significant during the second season at Zagazig, while it was insignificant during the first season at Abou-kabber. The correlation coefficient revealed that there in no significance between

*T. cucurbitacearum* as affected by relative humidity at three localities during the two season an exception appeared showing a significant during the first season at Abou-kabber.

The correlation coefficient revealed that there is highly significance between *Agistemus exsertus* as affected by temperature during the first season at both, Hehia and Zagazig also, there was a highly significant during the second season at Abou-Kabber while there was a significant during the second season at the two districts, Hehia and Zagazig while, their was no significance during the first season at Abou-Kabber, but it was no significant between *A. exsertus* with relative humidity while there were a significant during the second season at Zagazig.

**Table (1) Correlation between (*Brevipalpus obovatus*, *Tetranychus cucurbitacearum*, *Agistemus exsertus* & *Amblysius swirskii* with (temperature & relative humidity) at Abou-kabber, Hehia & Zagazig during 2010 – 2011.**

Species	Locality Season variable	Abou-Kabber						Hehia						Zagazig					
		2010			2011			2010			2011			2010			2011		
		r	b	p	r	b	p	r	b	p	r	b	p	r	b	p	r	b	p
<i>B. obovatus</i>	Mean temp.	0.67	0.39	ns	0.23	0.11	ns	0.66	0.20	**	0.20	0.49	*	0.48	0.18	*	0.19	0.18	*
	Mean R.H.	0.27	0.18	ns	0.20	0.08	*	0.27	0.09	ns	0.21	0.44	ns	0.20	0.10	ns	0.21	0.17	ns
<i>T. cucurbitacearum</i>	Mean temp.	0.17	0.04	ns	0.07	0.08	***	0.83	0.18	***	0.14	0.16	***	0.91	0.18	***	0.19	0.03	*
	Mean R.H.	0.00	0.10	*	0.22	0.21	ns	0.16	0.04	ns	0.23	0.23	ns	0.30	0.07	ns	0.22	0.03	ns
<i>A. exsertus</i>	Mean temp.	0.43	0.24	ns	0.18	0.26	**	0.07	0.18	**	0.20	0.39	*	0.91	0.20	***	0.19	0.00	*
	Mean R.H.	0.29	0.18	ns	0.22	0.26	ns	0.34	0.12	ns	0.21	0.36	ns	0.30	0.09	ns	0.19	0.09	*
<i>A. swirskii</i>	Mean temp.	0.07	0.04	ns	0.22	0.39	ns	0.47	0.09	*	0.23	0.04	ns	0.27	0.07	ns	0.22	0.86	ns
	Mean R.H.	0.64	0.40	**	0.16	0.20	***	0.02	0.12	*	0.14	0.28	***	0.77	0.22	***	0.14	0.44	***

The correlation coefficient revealed that there is no significance between *Amblyseius swirskii* as affected by temperature during the two seasons, while, there was significance during the first season at Hehia, but it was highly significant with relative humidity during the two seasons at three districts. An exception appeared showing a significance during the first season at Hehia.

**Pest Mite – Predators Interrelation (Table 2):**

The correlation coefficient revealed that there is highly significance between *B. obovatus* and *A. exsertus* during the two seasons at three districts while, there was no significance during the second season at Abou-Kabber. The correlation coefficient revealed that there is no significance between the *B. obovatus* and *A. swirskii* during the second season at three districts while, there was significance during the first season at both district (Abou-Kabber and Zagazig), but it was highly significant during the first season at Hehia. The correlation coefficient revealed that there is no significance between *T. cucurbitacearum* and *A. exsertus* during the second season at Hehia and Zagazig also, it was no significant during the first season at Abou-Kabber, but it was highly significant during the first season at Zagazig and Abou-Kabber, but it was during the second season. The correlation coefficient revealed that there is no significance between *T. cucurbitacearum* and *A. swirskii* during the two seasons at three districts, while, there was significance during the first season at Hehia.

Table (٢): Correlation between (*B. obovatus*, *T. cucurbitacearum*, *A. exsertus* & *A. swirskii*) at Abou-Kabber, Hehia & Zagazig during ٢٠١٠ – ٢٠١١.

Species	Locality Season Variable	Abou-Kabber						Hehia						Zagazig					
		٢٠١٠			٢٠١١			٢٠١٠			٢٠١١			٢٠١٠			٢٠١١		
		r	b	p	r	b	p	r	b	p	r	b	p	r	b	p	r	b	p
<i>B. obovatus</i> <i>A. exsertus</i>		٠,٩٢	٠,٣٦	***	٠,٢٣	٠,٠٨	ns	٠,٨٩	٠,١٧	***	٠,١٦	٠,٢١	***	٠,٥٩	٠,١٣	**	٠,٠٨	٠,٠٢	***
<i>B. obovatus</i> <i>A. swirskii</i>		٠,٤٩	٠,٦٢	*	٠,٥٣	٠,١٥	ns	٠,٦٥	٠,٠١	**	٠,٢٢	٠,٢٣	ns	٠,٥٠	٠,٠٥	*	٠,٢٢	٠,٠٦	Ns
<i>T. cucurbitacearum</i> <i>A. exsertus</i>		٠,٣٦	٠,١٣	ns	٠,١٩	٠,١٤	**	٠,٥١	٠,٢٢	*	٠,٢٣	٠,١٣	ns	٠,٩٥	٠,٢٣	***	٠,٢٣	٠,١٧	Ns
<i>T. cucurbitacearum</i> <i>A. swirskii</i>		-٠,١٣	٠,٢٣	ns	٠,٢٢	٠,١٣	ns	٠,٤٤	٠,٥٠	*	٠,٢٢	٠,١٠	ns	٠,٤١	٠,٠٩	ns	٠,٢٢	٠,١٦	ns

The previous results indicate that the population density for *T. urticae* and its mite predators were increased with high temperature and low relative humidity. These results coincided with these obtained by Omar and Mohamed (٢٠٠٧) studied that the effect of temperature and relative humidity on *Bryobia cristata* (Duges) and its predator, *Lasioseius lindquisti* (Nasr & Abou-Awad) inhabiting sugar beet in Sharkia Governorate. Egypt. Also, they studied the simple correlation between the population fluctuation with some climatic factors and the correlation coefficient revealed that there is highly significance between the pest mite and its predator during the second at both districts, while, their was no significance during the first season. Farag *et al.* (١٩٩٨) recorded that the phytophagous and its predaceous mites on leguminous vegetable in Kaliobia and Giza Governorates throughout one year. They found that, the tetranychid mite *Tetranychus urticae* was the most dominant phytophagous species found on the crop. On kidney-been *Phaseolus vulgaris* the highest infestation was recorded in September and November (٨٨ and ١١٤ individual / leaf, respectively. Also, the population fluctuation of *Tetranychus urticae* and three phytoseiid predators were studied under greenhouse and field on kidney been (*Phaseolus vulgaris*) by (Youngin *et al.*, ١٩٩٨). They showed that the mite, *Tetranychus urticae* and its predatory mites were found throughout the period of the study. Amir and Kandeel (١٩٨٨) studied that the incidence of insects and mites associated with lentil plants as a legume crop at Zagazig district, Sharkia Governorate during the two seasons ١٩٨٤ – ١٩٨٦. They studied the population density and seasonal fluctuation of insect pests. Biasi and Santos (١٩٨٨) determined the susceptibility of white *Lupinus albus* L. as a green manure to *Tetranychus ludeni* Zacher in artificial infested fields in Parana, Brazil, in ١٩٨٨.

## REFERENCES

- Abdel-Salam, A. L.; A. M. Metwally, A. A. Yousef; N. A. El - Boghdady and M.F.A. Hegab (1980). Mites associated with vegetable plants in Egypt. Proc. 1<sup>st</sup> Conf., Plant Prot. Res. Inst., Cairo, Egypt, 3: 61-79.
- Amir, M.M.I. and M.M.H., Kandeel (1988): Preliminary survey of insects and mites inhabiting lentil plants at Zagazig district Sharkia Governorate, Egypt. Zagazig J. Agric. Res., 10(2): 872 - 880.
- Biasi, L. and H., Santos (1988): Susceptibility of vetch (*Vicia sativa*) and white lupin (*Lupinus albus* L.) to the phytophagous mites *Tetranychus ludeni* Zacher (Acari : Tetranychidae). Revista do setor do Ciencias-Agrarias, 10(1-2): 179 - 182.
- Farag, A.M.L.; K.M., Magada and H.H. Nadia (1998): Survey of mites inhabiting Cucurbitaceous and Leguminous vegetable in Kaliobia and Giza Governorates Journal of Agriculture Research, 76 (1): 63-68.
- Freed, R.; S. P. Eisensmith; S. Goetz; D. Reicosky; W.W. Sail and P. Wokberg (1989): Users guide to Mstatc A. software program for design management and analysis of AGRONOMIC Experiments Michigan State University.
- Harranger, J. (1964): Some pests of market garden produce grown in glasshouses. Phytoma, 16(104): 13-20.
- James, M.S. (2003): Horticultural Sciences, Department. A reviewed. Institute of Food and Agricultural Sciences, University of Florida, Gainesville FL 32611.
- Konsler, T.R., and D.L., Strides (1973): The response of cucumber to trellis vs. ground culture. Hort. Science, 4: 320 - 321.
- Malik, N.M. (1994) Vegetable crops, sponge gourd and ridged gourd. Horticulture, National Book Foundation, Islamabad, 223 pp.
- Omar, N.A.A. and O.M.O. Mohamed (2007): Effect of temperature and relative humidity on *Beryobia cristata* (Duges) and its predator, *Lasioseius Lindquist* (Naser & Abuo-Awad) inhabiting sugar beet in Sharkia Governorate, Egypt. (Acari : Tetranychidae, Ascidae). J. of Appl.-Sci., 22(12B): 682 - 690.
- Pestonjee, P. Pocha. and Sons (1902): Pochas Garden Guide. Pestonjee P. Pocha and Sons and Printed at pochas Horticultural press. No 1A, Middle Road, Poona, India, 121 pp.
- Shehata, K.K. (1967): Survey and biological studies on mites of family phytoseiidae and its economic importance. Ph.D. Thesis, Fac. Agric. Univ., 218 pp.
- Youngin, L.; Kwon, Gm. ; Lee, S.W.; Ryu, H. K. and Ryu, O.H. (1998). Density fluctuation of *Tetranychus urticae* and three predatory mite species (Phytoseiidae) by the differently infested levels. Journal of Applied Entomol., 26(3): 237-240.
- Wahab, A.E.A.; A.A. Yousef and H.M. Hemaeda (1974): Mites associated with vegetable and ornamental plants in lower Egypt. (Acarina : Parasitiformes, Acaiformes). Bull. Soc. Ent. Egypt., 43: 329 - 336.

## تواجد الاكاروسات على نبات اللوف فى محافظة الشرقية

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أجريت الدراسة لحصر اعداد انواع الحلم المتواجد على نبات اللوف فى ثلاث مناطق بمحافظة الشرقية و تم حصر احدى عشر نوعا - ثلاثة انواع نباتية التغذية و خمسة انواع مفترسة و و ثلاثة انواع غير محدد السلوك الغذائى .  
تم دراسة تذبذب أعداد أنواع الحلم المرتبط بنباتات اللوف فى ثلاثة مناطق بمحافظة الشرقية خلال موسمين ٢٠١٠ و ٢٠١١ كانت الانواع المسجلة هما نوعين نباتية التغذية أكاروس العنكبوت الاحمر العادى ذو البقعتين *Tetranychus cucurbitacearum* و اكاروس الحلم المبطن أو الكاذب *Brevipalpus obovatus* واهم أعدائهم الحيوية من الاكاروسات وهما النوعين *Agistemus exsertus* and *Amblyseuis swirsikii* وقد سجل اعلى معدل لكثافة الانواع النباتية التغذية و المفترسة عند درجات الحرارة العالية و الرطوبة المنخفضة خلال موسمى الدراسة.

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