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OCCURRENCE OF TETRANYCHUS URTICAE KOCH AND ITS MAIN MITE PREDATORS ON LUPIN AT EL- KHATARA DISTRICT, SHARKIA GOVERNORATE, EGYPT (TETRANYCHIDAE & PHYTOSEIIDAE)

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ABSTRACT

The present work was carried out to study the population fluctuation of mites inhabiting lupin, Lupinus termes L. at El- Khatara district, Sharkeia Governorate, Egypt, during the two successive growing seasons of 2004/ 05 and 2005/06. The recorded phytophagous species was the two spotted spider mite, Tetranychus urticae Koch (Fam. Tetranychidae) and its natural enemies, Amblyseius swirskii Athias - Henriot and A. cydnodactylon Shehata & Zaher (Fam. Phytoseiidae). The highest values of population density for T. urticae and its predatory species were recorded at the times of high temperature and low relative humidity through the end of the two seasons .

Key words: Population fluctuation, *Tetranychus*, Phytoseiidae, lupin.

INTRODUCTION

Lupin, *Lupinus termes* L. as a legume crop is recognized as one of the oldest crops for about 4000 years (Ibrahim, 1990). Its importance to many of the Mediterranean civilizations was apparently independently domesticated in both the old and new world (Gross, 1986 and Holden *et al*., 2005). In Egyp, 3745 feddans were cultivated with lupin during season of 2007. Field observation showed that lupin is liable to be attacked by several mite species causing damage to the plants .

Thus, the present authours thought to study the mites inhabiting that crop, especially their is no previous data dealing with such study.

The present work aimed to study the occurrence of the serious phytophagous mite, *T. urticae* on lupin crop in addition to its predators during the two growing seasons 2004/05 & 2005 /06 at El- Khatara district, Sharkia Governorate, Egypt.

MATERIALS AND METHODS

1- Experimental design:

An experiment was carried out at El –Khatara district, Sharkia Governorate, during the two successive growing lupin seasons of 2004 / 05 and 2005 / 06 to study the population fluctuation of *Tetranychus urticae* Koch and its mite natural enemies, *Amblyseius swirskii* Athias-Henriot and *A. cydnodactylon* Shehata & Zaher. The experimental area was chosen and divided into three plots, each plot equals ⅛ feddan (21× 25m^2). It was characterized by sandy soil and was the previous crop. The border

width was 60cm between plots . The field was planted with *Lupinus termes* L. on November, 15th during both seasons. Normal agricultural practices were followed and no pesticidal treatments were applied during the whole experimental period.

2- Population fluctuation of mites:

Samples were randomly collected from diagonals of the inner square area of each experiment plot. For counting the mite species, 50 leaves were sampled fortnight intervals from each plot through different levels of the plant. The upper and lower surfaces of the leaf were examined carefully (Hassanein *et al*., 1971).

The obtained data were statistically analyzed according to Snedcor and Chochran (1980) to show the influence of temperature and relative humidity on population density of the mite species.The. difference between means were tested using Duncan s New Multiple Range Test (Duncan, 1955).

RESULTS AND DISCUSSION

Data presented in Tables (1&2) and Figure 1 (A-D) show the population behaviour of the two spotted spider mite, *Tetranychus urticae* Koch and its mite natural enemies, *Amblyseius swirskii* Athias- Henriot and *A. cydnodactylon* Shehata & Zaher associated with lupin plants from December to April during the two growing seasons of 2004/ 05 & 2005/ 06.

1- Population fluctuation of *Tetranychus urticae:*

This phytophagous mite started its infestation from Jan. 1st, 2005 with 6 mites/ leaf, at 16.3°C and 64.9% *R.H.* . The mean density increased gradually showing one peak at the first half of April with a mean number of 82 mites/ leaf, at 20.3°C and 57.9% *R.H.* , then decreased again to 80 mites/ leaf when the plants begun to dryness at 23.4°C and 55.5% *R.H.,* (table ,1 and fig.,1 A&B).

In the second season 2005/ 06 the infestation started at 15 December 2005 with 7 mites/ leaf at 17.1°C and 65.1% *R.H.* until the last half of April making two peaks at 15th Jan. and 15th Feb., with a mean numbers of 21 and 38 mites/ leaf at 15.6, 17.6 and 64.4, 63.6% *R.H*., respectively (Table 2 and Figure 1, A & B).

2- Population fluctuation of natural enemies of *T. urticae*:

A- *Amblyseius swirskii:*

During the first season, 2004/ 05, the predator appeared for the first time in 15th Jan.2005 with a mean number of about 6 individuals/ leaf at 17.3°C and 59.4% *R.H*., and the population increased gradually reaching a mean number of about 20 individuals/ leaf at 1st March, showing its peak, at 18.9°C & 60.8% *R.H.* . Then the mean density declined, reaching 6 individuals/ leaf in 15 March, at 18.2°C & 60.3 % *R.H*. Afterwards, the population increased until the end of the growing season recording 23 individuals/ leaf in 15th April, at 23.4°C & 55.5% *R.H*.(Table 1 and Figure1, A & C). During the second season, 2005/06, the predator recorded two peaks in 15 Jan. and 15 Feb. recording 10& 19 individuals/ leaf, at 15.6 & 17.6°C and 64.4

Table 1: Mean numbers of *Tetranychus urtica*e Koch and its predators *Amblyseius swirskii* Athias-Henriot and *A. cydnodactylon* Shehata & Zaher per leaf of lupin at El-Khatara, Sharkia Governorate during 2004/05.

Date \ Inspects		*Tetranychus urticae*	*Amblyseius swirskii*	*Amblyseius cydnodactylon*	Temp. °C	R.H. %
December	1	0	0	0	19.2	68.9
	15	0	0	0	18.3	63.6
January	1	6	0	3	16.3	64.9
	15	12	6	0	17.3	59.4
February	1	26	11	6	13.7	61.0
	15	44	13	10	18.9	68.9
March	1	57	20	13	18.9	60.8
	15	61	6	17	18.2	60.3
April	1	82	16	21	20.3	57.9
	15	80	23	25	23.4	55.5

Table 2: Mean numbers of *Tetranychus urticae* Koch and its predators *Amblyseius swirskii* Athias-Henriot and *A. cydnodactylon* Shehata & Zaher per leaf of lupin at El-Khatara, Sharkia Governorate during 2005/06.

Date \ Inspects		*Tetranychus urticae*	*Amblyseius swirskii*	*Amblyseius cydnodactylon*	Temp. °C	R.H. %
December	1	0	0	0	19.4	69.8
	15	7	0	0	17.1	65.1
January	1	11	0	0	14.8	65.4
	15	21	10	5	15.6	64.4
February	1	19	7	9	16.3	62.8
	15	38	19	4	17.6	63.6
March	1	32	14	6	18.8	61.9
	15	70	18	12	20.2	59.8
April	1	95	24	7	21.4	59.4
	15	103	30	26	23.9	57.5

& 63.6 % *R.H.*, respectively. Afterwards, the mean density decreased recording 14 individuals/ leaf, at 1st March. Then the population increased until the end of the growing season with 30 individuals/ leaf, at 23.9°C and 57.5% *R.H.*(Table 2 and Figure1 , A & C).

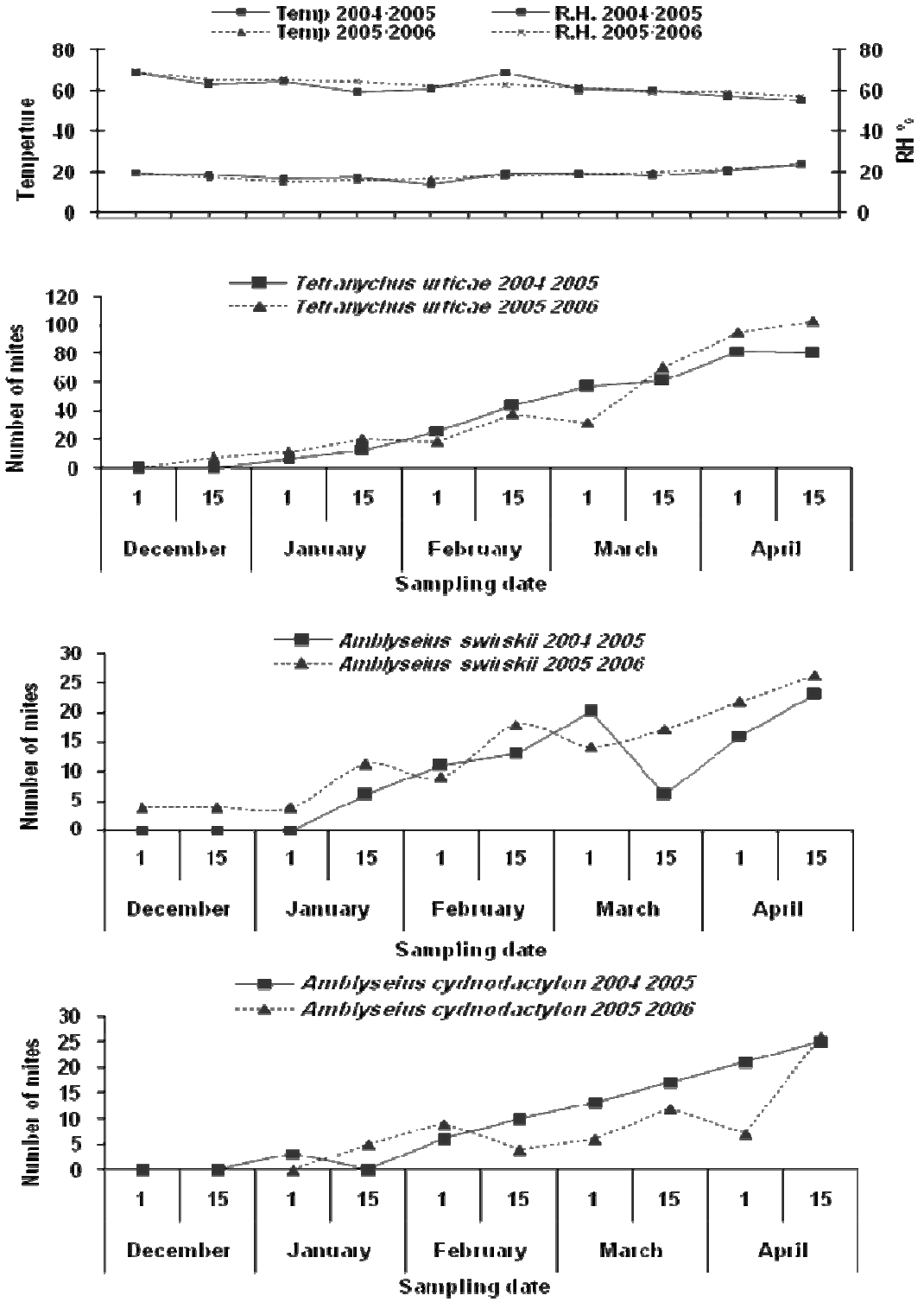

Fig. 1 (A-D): Population fluctuation of *Tetranychus urticae* and its mite predators, *Amblyseius swirskii* and *A. cydnodactylon* per leaf of lupin at El-Khatara, Sharkia Governorate during 2004/05 and 2005/06 seasons.

b- ***Amblyseius. cydnodactylon:***

During the first season, 2004/ 05, the predator appeared for the first time in 1st Jan. 2005 and increased reaching its peak, with a mean number of about 3 individuals/ leaf, at 16.3°C and 64.9% *R.H*.. Then it dropped to zero in 15th Jan.

Afterwards, the population increased gradually reaching the maximum value, 25 individuals/ leaf in 15th April, at 23.4°C and 55.5% *R.H*.(Table 1 and Fig.1 ,A & D). In the second season, 2005/ 06 it was recorded at Jan. 15th until the second half of April, showing two peaks. The first peak at Feb. 1st and the second at March 15th, with a mean number of about 9 & 12 individuals/ leaf, at 16.3 & 20.2°C and 62.8 & 55.8% *R.H*., respectively. The maximum value was recorded at the end of the season with 26 individuals/ leaf, at 23.9°C and 57.5% *R.H*.(Table 2 and Figure1 , A & D).

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 those obtained by Mohamed (2004), who studied the population fluctuation of *Tetranychus cucurbitacearum* (Sayed) infesting lupin in El-Salheia district during 1999- 2001, and showed that its population increased reaching the maximum values at the end of the two seasons. Farag *et al.* (1998) recorded that the phytophagous and its predaceous mites on leguminous vegetables in Kaliobia and Giza Governorate throughout one year. They found that, the tetranychid mite, *Tetranychus urticae* was the most dominant phytophagous species found on the the crop. On kidney-been, *Phaseolus vulgaris* the highest infestation was recorded in September and November (88 and 114 individuals/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*., 1998). They showed that the mite, *T. urticae* and its predatory mites were found throughout the period of the study. Amir and Kandeel (1988) studid that the incidence of insects and mites associated with lentil plants as a legume crop at Zagazig district, Sharkia Governorate during the two seasons 1984- 1986. They studied the population density and seasonal fluctuation of insect pests. Biasi and Santos (1988) determined the susceptibility of white lupin, *Lupinus albus* L. as a green manure to *Tetranychus ludeni* Zacher in artificial infested fields in Parana, Brazil, in 1988.

Conclusively, plants were infested between 80 and 100 days after planting and the evaluation was carried out 140 days after planting . It is concluded that lupin plant is susceptible to the mite.

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تواجد العنكبوت الأحمر ذو البقعتين ومفترساته الرئيسية علي نبات الترمس في منطقة الخطارة بمحافظة الشرقية

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أجريت التجربة لدارسة تذبذب أعداد أنواع الحلم المرتبط بنباتات الترمس في منطقة الخطارة بمحافظة الشرقية، خلال الموسمين ٢٠٠٤/٢٠٠٥ ، ٢٠٠٥/٢٠٠٦ وكانت الأنواع المسجلة هي نوع واحد نباتي التغذية هو أكاروس العنكبوت الأحمر العادي ذو البقعتين *Tetranychus urticae* وأهم أعدائه الحيوية من الأكاروسات وهى النوعين *Amblyseius A. swirskii, cydnodactylon*

وقد سجل أعلى معدل لكثافة التترانكيس يورتيكا والأنواع المفترسة الخاصة به عند درجات الحرارة العالية والرطوبة المنخفضة خلال موسمي الدراسة.