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THE RELATION BETWEEN SOME PERCING SUKING INSECTS AND THEIR ASSOCIATED PREDATORS POPULATIONS ON COTTON PLANTS AT DAKAHLIA GOVERNORATE.

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ABSTRACT

Aphis gossypii Glov. population exhibited two annual distinct peaks during April and August on cotton plants. Also, Bemesia tabaci Genn. population showed two peaks of seasonal abundance in each season during May and September. Four distinct peaks were record to Empoasca spppopulations, one peak during June , two during July and last one during August in each seasons

Coccinella undecimpunctata L. and Chrysoperla carnea Steph. approved to be the key predators affecting on A.gossypii population. while C. undecimpunctata and Paederus alfierii Koch were the most predators affecting on B.tabaci. On contrary, the main factor affecting Epoasca spp. Population was the daily mean temperature and the effects of predators was relatively low.

INTRODUCTION

In Egypt. Cotton is a major economic crop for its important role in the national income.

The cotton plant is liable to be attacked all over its growing season by different serious pests such as aphids, leafhoppers and cotton whitefly. These pests are considered to be the most destructive cotton pests and are responsible for grate loss of both cotton yield and quality, either directly by sucking plant juice, produce honeydew which along with an associated fungus or indirectly as vectors of virus diseases (Butler *et al.*, 1985 and Brown and Nelson, 1984).

The ecological information is very important to design successful programs to protect crops from damage caused by insects. Therefore, the present work aimed to study the population density of some sucking insect pests and their associated predators under field condition in response to temperature degrees and relative humidity to know the suitable time for controlling these sucking pests by using pesticides to conservation.

MATERIALS AND METHODS

The present work was carried out at Talkha district Dakahlia Governorate during the two successive cotton seasons 2002 and 2003 in an area cultivated with cotton plants. To study the abundance of the most important piercing sucking insects attacking cotton plants. The insect pests were *Aphis gossypii* Glov., *Bemisia tabaci* Genn. and *Empoasca* spp. and their associated predators *Coccinella undecimpunctata* L., *Paederus alfierii* Koch, *Chrysoperla carnea* Steph. and the true spiders.

Completely randomized block design with four replicates each of 175 m was planted with Giza (86) cotton variety on March 23 & 25 during 2002 and 2003 seasons. For counting the number of aphid, white fly and

leafhopper populations. 25 cotton leaves from each replicate were picked weekly at random from three (upper, middle and lower of plants). Both leaf surfaces were examined carefully. The present insect predators *C undecimpunctata*, *Paederus alfierii*, *Chrysoperla carnea* and the true spiders on the collected samples were recorded by using visual examination, while, the true spiders were examined by aid of hand lens. The normal agricultural practices were followed. Daily records of mean temperature along with relative humidity obtained from the Agro meteorological station at El-Mansoura region to represented the climatic conditions effect, during 2002 and 2003 seasons. The correlation and regression analysis between insect population and each predator population, mean temperature and mean relative humidity was done by using Minitab for windows program.

RESULTS AND DISCUSSION

1- Population density of certain piercing sucking insect pests and their associated predators.

Data presented in Tables (1 and 2) show mean numbers of certain pests and their associated predators during 2002 and 2003 seasons.

A- Piercing sucking insect pests.

a) Cotton aphids, *Aphis gossypii* Glov.:

Data presented in Table (1) show the population fluctuation of cotton aphid on cotton leaves during 2002 and 2003 seasons. According to the obtained results it could be stated that the aphid population was found on cotton plants during the period from the 3rd week of April to the end of September in both years. The mean numbers of initial occurrence were 4.92 and 3.74 individuals / leaf at 18 °C and 18.5 °C with 69 % and 70 % R.H for the two seasons . The population of aphids started with high number (first peak) on the first inspection (April 21) then decreased gradually reach the lowest density on 1st week of June with a mean number of 1.14 aphids / leaf in 2002 season, but in 2003 season the population of aphids tended to increased gradually till reached its first peak on 3rd week of May with a mean numbers of 6.51 aphids / leaf. After this peak the number of aphids tended to decline and reached it's the lowest abundance on the 2nd week of June with 2 mean numbers of 1.28 aphids / leaf.

After that the number of aphids increased gradually till reached its second peak at the end of August with a mean numbers of 9.31 aphids / leaf at 29.5 °C and 71 % R.H in the first season and 10.41 aphids / leaf during the 4th week of August at mean temperature of 31 °C and 62 % R.H in the second season.

These results were confirmed by Hassanein *et al* (1995), Sewify *et al.* (1996), Kalafalla *et al.* (1997), Salem (1998) and Ragab (2004) who reported the peak of infestation with *A.gossypii* was obtained during August.

b) Cotton whitefly, *B.tabaci*

Data in Table (1) show the population fluctuation of the cotton whitefly, *B.tabaci* on cotton leaves. Data indicated that the building up of whitefly population started during the first week of may and extended till the end of September in both years of study.

The mean number of initial occurrence were (1.18 and 1.13 individuals / leaf) adult / leaf at 21 °C and 70 % R.H and 25 °C and 67 % R.H for the two seasons. The population fluctuated reached to 2.22 and 1.3 (the first peak) insect per leaf in the 3rd week of May during 2002 and 2003 seasons respectively. Then the population decreased until reach its minimal (1.0 and 0.87) nymphs per leaf in the 3rd week of June and first week of June during 2002 and 2003 seasons. respectively. After that the population increased gradually till reached its second peak, on the first week of September with a mean number of 7.65 insect / leaf in the first season, while it was 10.11 insect / leaf in the second season. These results agreed with those obtained by Nassef (1995), and Ragab (2004).

Table (1): Population density (no. of insects / leaf) of certain piercing sucking insect pests on cotton plants at Dakahlia Governorate during 2002 & 2003 seasons.

Date of inspection	*A. gossypii* Glov.		*B. tabaci Genn.*		*Empoassca spp.*	
	2002	2003	2002	2003	2002	2003
April, 21	4.92	3.74	0	0	2.30	0
27	4.50	4.81	0	0	2.15	0
May, 3	4.76	2.33	1.18	1.13	1.60	1.23
9	4.00	3.15	1.35	1.17	1.18	1.60
15	3.16	4.40	1.50	0.80	0.33	0.45
21	3.9	5.11	2.22	1.30	0.49	1.10
27	2.79	6.51	2.10	1.14	1.60	1.62
June, 2	1.92	2.36	1.60	0.93	1.95	2.43
8	1.14	1.50	1.23	0.87	1.87	2.80
14	1.36	1.28	1.21	1.29	1.18	1.65
20	1.54	1.93	1.00	1.13	2.10	0 79
26	2.13	1.60	1.11	1.19	3.11	3.60
July, 2	2.45	1.94	2.15	1.55	3.51	3.80
8	2.96	2.47	2.85	2.18	3.37	2.39
14	3.74	3.52	3.37	3.51	2.80	2.44
20	4.31	3.85	3.77	3.89	1.82	3.70
26	5.22	4.37	3.86	4.16	3.72	3.54
August, 1	6.00	5.26	4.12	5.60	1.66	3.17
7	6.34	6.61	4.50	6.31	1.28	2.60
13	7.21	7.00	4.79	7.00	2.00	5.13
19	8.71	9.30	5.13	7.17	3.30	5.17
25	9.00	10.41	5.44	7.90	4.78	7.90
31	9.31	8.56	6.71	8.63	1.90	5.47
Sept., 6	7.49	8.00	7.65	10.00	1.79	4.50
12	6.14	5.70	5.49	10.11	1.40	2.16
18	5.65	4.86	4.95	7.90	0.72	1.20
24	5.32	4.71	5.39	6.83	0.36	0.83
30	3.26	3.18	5.47	6.60	0.23	0.51
Total	**129.23**	**128.46**	**90.14**	**109.29**	**54.50**	**71.78**

c) leafhoppers (*Empoasca* spp.)

As shown in Table (1) the mean number of *Empoasca* spp. were 2.3 and 1.23 insects / leaf on 21 April and 3 May during 2002 and 2003 seasons at mean temperature of 18 & 18.5 °C and 69 % & 70 % R.H. The population fluctuated tended to decreased and increased until reach to the

first peak (1.19 and 2.80 individuals / leaf) on the 2nd and 8th of June during 2002 and 2003 seasons. The second peak were occurred on 25 August and the first week of July with mean number of (3.51 and 3.80) individuals / leaf at mean temperature of 28.5 & 31°C and 65 & 62 % R.H during two seasons. After that the population fluctuated and exhibited the third peak on the 26th of July (3.72 and 3.54). While, the last peak (fourth) was observed on the 25th of August to reach the lowest density (0.23 and 0.51) insects / leaf at the end of September.

These results are agreement with those obtained by Nassef (1995), Sewify *et al.* (1996) and Ragab (2004) they found that the highest peak of *Empoasca* spp. occurred during July and August.

B. Population density of natural enemies.

Data presented in Table 2 indicated the mean numbers of certain predators associated with cotton plants during 2002 and 2003 seasons.

a) *Coccinella undecimpunctata* L. :.

The mean number of *C.undecimpunctata* population increased until reach the first peak (1.87 and 1.95) individuals / leaf on May 21 during 2002 & 2003 season. The second peak occurred with mean numbers of 1.32 and 1.93 individuals / leaf on June in the first season and on June 20 in the second season. Then the population was fluctuated during the period of study until rich the lowest density at the end of both seasons.

b) *Paederus alfierii*

During the two seasons of study the population started with high numbers (0.87 and 0.74) individuals leaf until reach to the highest peak 0.89 individuals / leaf on the 3rd of May in the first season while it was (1.9) individuals / leaf on the 6th of June in the second season. After that *P. alfierii* populations decreased gradually until the end of both seasons. Population was more abundance in the second season (22.42) than that in the first season (10.9).

c) *Chrysoperla carnea*

Results in Table (2) indicate that the aphid lion population on cotton plants recorded three peaks of seasonal abundance during the period of inspection in both seasons. The first peak appeared on the 5th of May with mean number of (1.12 and 1.85) individuals / leaf during both seasons. The second peak was recorded on the 14th of June with mean numbers of 0.95 and 1.17 individuals / leaf during both seasons, the third peak was recorded in the 7th of July with mean numbers of 0.8 & 1.17 individuals / leaf during 2002 and 2003 seasons.

d) True spiders.

The results in Table (2) clearly indicated that the population of true spiders on cotton plants was recorded at low numbers as compared with the other predators. Three peaks were recorded during the period of inspection, the first one was recorded on the 21 of May with mean numbers of 0.81 and 1.08 during the first and second season. The second peak was recorded on the 14th of June with mean numbers of 0.73 in the first season and 0.9 individuals / leaf on the 20th of June in the second seasons. The third peak was recorded during 25th of August with mean numbers of 0.52

individuals / leaf during 2002 season. Generally, the total number of these predators were more abundant during 2003 season than 2002 season.

Data shown in Table (2) indicated that the four predators can be arranged in descending orders according to the total numbers of each species as follow, *C. undecimpunctata, Chry. carnea, P. alfierii* and true spiders.

Table(2):Population density of certain predators associated with piercing sucking insects on cotton plants at Dakahlia Governorate during 2002 & 2003 seasons.

Date of inspection	*C.undecimpuncta*		*P.alfierii*		*Chry. carnea*		True spiders	
	2002	2003	2002	2003	2002	2003	2002	2003
April, 21	1 11	0.85	0.87	0.74	0.42	0.61	0.40	0 28
27	1.17	0.90	0.79	0.68	0.63	0.59	0 32	0 36
May, 3	1.43	1.17	0 89	0 66	0 75	0 68	0 63	0 34
9	1.15	1.62	0.75	1.16	0 58	0.59	0.55	0.47
15	1.28	0.98	0.86	1.19	0.39	0.48	0.67	0 65
21	1.87	1.95	0.77	1.18	0.86	1.10	0.81	1.02
27	1.24	1.38	0.59	1.22	1.12	1.85	0.74	1.06
June, 2	1.16	1.33	0.68	1.25	0.83	1.18	0.60	1.08
8	1.32	1.45	0.56	1.90	0.92	1.15	0.71	0.86
14	1.16	1.40	0.39	1.80	0.95	1.17	0.73	0.57
20	1.21	1.93	0.59	1.12	0 77	0.79	0.49	0.90
26	1.17	1.46	0.40	1.13	0 86	0 48	0.70	0 47
July, 2	0.96	1.30	0.39	0.86	0.75	0.76	0.56	0.38
8	0.88	1.00	0 28	0.77	0 69	1 00	0.39	0.56
14	0.69	0.93	0.36	1.00	0.59	1 11	0.51	0.63
20	0.57	0.86	0.22	0.72	0.57	0.88	0.48	0.42
26	0.74	0.65	0.19	0.83	0.80	1.17	0.42	0.44
August, 1	0.63	0.62	0.20	0.62	0.52	1.00	0.46	0.51
7	0.49	0.57	0.18	0.61	0.56	0.93	0.39	0.44
13	0.25	0.36	0.20	0.55	0.44	0.81	0 42	0.65
19	0.19	0 28	0.17	0.34	0.30	0.86	0.38	0.46
25	0.17	0.75	0.13	0.51	0.25	0.94	0.52	0 19
31	0.36	0.38	0.14	0.22	0.37	1.00	0 29	0.38
Sept., 6	0 48	0 26	0.13	0.23	0 32	1 00	0 26	0 42
12	0.55	0.49	0 11	0 30	0.30	0.90	0.31	0 38
18	0.39	0.61	0.12	0.31	0 23	0.47	0 37	0.35
24	0.37	0.42	0	0.28	0.26	0.28	0.29	0.24
30	0.28	0.36	0	0.24	0.15	0.19	0.21	0.23
Total	**23.27**	**26.26**	**10.90**	**22.32**	**16.18**	**23.07**	**13.61**	**14.74**

2- The relationship between the insect pests and their predators in response to mean temperature and relative humidity :-

Combined effect of predators, temperature and relative humidity on *A. gossypii, B. tabaci* and *Empoasca* spp. populations on cotton plants were estimated during the course of this study (Tables, 3, 4 and 5).

1- ***A. gossypii*** :-

Correlation and regression analysis between *A. gossypii* population and each of predators, temperature and relative humidity were done for 2002 and 2003 seasons (Table,).

From the statistical point of view, there were highly significant negative correlations between *A. gossypii* and predators populations during the first season as r-values between *A. gossypii* and each of *C. undecimpunctata*, *C. carnea*, *P. alfierii* and true spiders were -0.704,-0.680, -0.480 and -.572, respectively. In the second season (2003), *A. gossypii* population exhibited highly significant negative correlation with both of *C. undecimpunctata* and *P. alfierii* (r = -0.613 and -0.608), while the correlations were insignificant with *Chry. carnea* (r = 0.169) and true spiders (r = -0.190). The changes of *A. gossypii* population exhibited insignificantly positive correlation with the daily mean temperature during the first (r = 0.138) and second seasons (r = 0.201), also with the daily relative humidity there was insignificant correlation in the first season (r = 0.151) and the second seasons (r = -0.009) (Table, 3).

The simple regression analysis for the effect of predators on *A. gossypii* population revealed highly significant negative effect during the first seasons as b = -3.64, -6.10, -3.87 and -8.06 for *C. undecimpunctata*, *Chry. carnea*, *P. alfierii* and true spiders, respectively. In the second season (2003), both of *C. undecimpunctata* and *P. alfierii* exhibited highly significant negative effects on *A. gossypii* population (b = -3.06 and -3.13), while the effects *C. carnea* and true spiders were insignificant as b-values were 1.24 and -0.07. The daily mean temperature showed insignificant positive effect (b = 0.08 and 0.15) on *A. gossypii* population during the first and second seasons, while the daily mean relative humidity showed positively (b = 0.09) and negatively (b = -0.004) insignificant effects on *A. gossypii* population during the first and second seasons (Table, 3).

Table (3). Effect of predators, temperature and relative humidity on *A. gossypii* population on cotton plants during 2002 and 2003 seasons.

Factor		Correlation and simple regression				Multi regression analysis		
		r	b	P	R^2	b.reg	P	E.V.%
2002	*C. undecimpunctata*	-0.704	-3.64	0.000	49.5	-5.00	0.042	58.4
	Chry. carnea	-0.680	-6.10	0.000	46.3	-2.02	0.441	
	P. alfierii	-0.480	-3.87	0.010	23.0	3.38	0.308	
	True spiders	-0.572	-8.06	0.001	32.7	1.03	0.774	
	Tem.	0.138	0.08	0.482	1.9	0.00	0.999	
	RH	0.151	0.09	0.444	2.3	-0.03	0.740	
2003	*C. undecimpunctata*	-0.613	-3.06	0.001	37.6	-1.23	0.222	72.7
	Chry. carnea	0.169	1.24	0.390	2.9	3.62	0.002	
	P. alfierii	-0.608	-3.13	0.001	37.0	-3.75	0.002	
	True spiders	-0.190	-0.07	0.333	3.6	-0.05	0.338	
	Tem.	0.201	0.15	0.306	4.0	0.09	0.344	
	RH	-0.009	-0.004	0.964	0.0	-0.15	0.019	

The percentage of variability attributed to the combined effect of the predators, temperature and relative humidity on the *A. gossypii* population were 58.4 and 72.7% for the two seasons.

On the other hand, it could be noticed that *C. undecimpunctata* was the mosty effective factor (R^2 = 49.5) in the first season followed by *Chry.*

carnea (R^2 = 46.3), but in the second season *C. undecimpunctata* was the most effective factor (R^2 = 37.6) followed by *P. alfierii* (R^2 = 37.0).
So, it could be concluded that the key factors affecting *A. gossypii* population were the predators (*C. undecimpunctata* and *Chry. carnea*) during the two seasons of this study.

2-2- *B. tabaci* :-

The relation between *B. tabaci* population and each of predators, temperature and relative humidity were evaluated during 2002 and 2003 seasons (Table, 4).

As shown in Table (4), there were highly significant negative correlations between *B. tabaci* and each of *C. undecimpunctata*, *C. carnea*, *P. alfierii* and true spiders (r-values were -0.838, -0.673, -0.855 and -0.635, respectively) in the first season. In the second season (2003), *B. tabaci* population exhibited highly significant negative correlation with both of *C. undecimpunctata* and *P. alfierii* (r = -0.801 and -0.764), while the correlations were negatively insignificant between *B. tabaci* and both of *C. carnea* (r = -0.103) and true spiders (r = -0.186). The correlation between the changes of *B. tabaci* population and daily mean temperature was highly significant positive in the first season (r = 0.534) and insignificant during the second seasons (r = 0.224), while with the daily relative humidity there was positively insignificant correlation in the first and second season as r-values were 0.187 and 0.338 (Table, 4).

Table (4). Effect of predators, temperature and relative humidity on *B. tabaci* population on cotton plants during 2002 and 2003 seasons.

Factor		Correlation and simple regression				Multi regression analysis		
		r	b	P	R^2	b. reg	P	E.V.%
2002	*C. undecimpunctata*	-0.838	-3.93	0.000	70 2	0.07	0.962	81 2
	Chry. carnea	-0.673	-5.48	0.000	45.3	-3.26	0.051	
	P. alfierii	-0.855	-6.27	0.000	73.1	-4 18	0.047	
	True spiders	-0.635	-8.12	0.000	40.4	0.23	0.917	
	Tem.	0.534	0.30	0.003	28.6	0 08	0 445	
	RH	0.187	0.10	0.341	3.5	0.01	0.815	
2003	*C. undecimpunctata*	-0.801	-5.35	0.000	64 2	-3.00	0.008	82.9
	Chry. carnea	-0.103	-1.01	0.602	1.1	0.43	0.697	
	P. alfierii	-0.764	-5 27	0.000	58 4	-0 19	0.010	
	True spiders	-0 186	-0.10	0.343	3.5	-0.05	0.304	
	Tem.	0.224	0.23	0.252	5.0	0.32	0 005	
	RH	0.338	0.21	0.079	11.4	0.05	0.386	

The simple regression analysis for the effect of predators on *B. tabaci* population revealed highly significant negative effect during the first seasons as b = -3.93, -5.48, -6.27 and -8.12 for *C. undecimpunctata*, *Chry. carnea*, *P. alfierii* and true spiders, respectively. In the second season (2003), both of *C. undecimpunctata* and *P. alfierii* exhibited highly significant negative effects on *B. tabaci* population (b = -5.35 and -5.27), while the effects *Chry. carnea* and

true spiders were negatively insignificant as b-values were -1.01 and -0.10. During the first season, the daily mean temperature showed positively high significant effect on *B. tabaci* population (b = 0.30), but the daily relative humidity showed positively insignificant effect on *B. tabaci* population (b = 0.10), while during the second season both of daily mean temperature and relative humidity showed positively insignificant effects on the pest population as b-values were 0.23 and 0.21 (Table, 4).

The percentage of variability attributed to combined effect of the predators, temperature and relative humidity on the *B. tabaci* population were 81.2 and 82.9% for the first and second seasons. The predator, *P. alfierii* was the highest effective factor on *B. tabaci* population (R^2 = 73.1) during the first season followed by *C. undecimpunctata* (R^2 = 70.2), while in the second season was *C. undecimpunctata* (R^2 = 64.2) followed by *P. alfierii* (R^2 = 58.4). Generally, it could be concluded that, the main factors affecting *B. tabaci* population were the predators especially, *C. undecimpunctata* and *P. alfierii*.

2-3- *Empoasca* spp. :-

Correlation and regression analysis between *Empoasca* spp. population and each of predators, temperature and relative humidity were done for 2002 and 2003 seasons (Table, 5).

From the statistical point of view, there were insignificant negative correlations between *B. tabaci* and each of *C. undecimpunctata*, *P. alfierii* and true spiders during the first and second seasons of this study as r-values during the first seasn were -0.168, -0.126 and -0.001 and were -0.349, -0.241 and -0.146, respectively during the second season. *Empoasca* spp. population exhibited positively insignificant correlation with *Chry. carnea* population during the first and second season (r = 0.137 and 0.288). In the first season, the correlation between the changes of *Empoasca* spp. population and both of daily mean temperature and relative humidity was positively insignificant (r = 0.232 and 0.110), while during the second seasons these correlations were positively high significant (r = 0.567) and insignificant (r = 0.326) (Table, 5).

The simple regression analysis for the effect of predators on *Empoasca* spp. population revealed insignificant negative effect during the first (b = -0.47, -0.49 and -0.004) and second seasons (b = -1.33, -0.95 and -0.04) for *C. undecimpunctata*, *P. alfierii* and true spiders, respectively. *C. carnea* exhibited insignificant positive effect on *Empoasca* spp. population during the first and second seasons (b = 0.59 and 1.62). During the first season, the daily mean temperature and relative humidity showed positively insignificant effect on *Empoasca* spp. population (b = 0.07 and 0.03), while in the second season the effect of daily mean temperature was positively high significant (b = 0.33) and the effect of daily mean relative humidity was positively insignificant as b-value was 0.12 (Table,).

The percentage of variability attributed to combined effect of the predators, temperature and relative humidity on the *Empoasca* spp. population were 30.6 and 55.8% for the first and second seasons.

On the other hand, it could be noticed that the effects of predators on *Empoasca* spp. population was relatively low in comparison with the daily mean temperature (Table, 5).

Table (5). Effect of predators, temperature and relative humidity on *Empoasca* spp. population on cotton plants during 2002 and 2003 seasons.

Factor		Correlation and simple regression				Multi regression analysis		
		r	b	P	R^2	b.reg	P	E.V.%
2002	*C. undecimpunctata*	-0.186	-0.47	0.342	3.5	-3.56	0.022	30.6
	Chry. carnea	0.137	0.59	0.488	1.9	3.47	0.043	
	P. alfierii	-0.126	-0.49	0.524	1.6	3.11	0.140	
	True spiders	-0.001	-0.004	0.998	0.00	0.02	0.994	
	Tem.	0.232	0.07	0.235	5.4	0.05	0.646	
	RH	0.110	0.03	0.578	1.2	-0.01	0.799	
2003	*C. undecimpunctata*	-0.349	-1.33	0.069	12.2	-1.24	0.205	55.8
	Chry. carnea	0.288	1.62	0.137	8.3	0.82	0.426	
	P. alfierii	-0.241	-0.95	0.217	5.8	-0.34	0.747	
	True spiders	-0.146	-0.04	0.458	2.1	-0.01	0.898	
	Tem.	0.567	0.33	0.002	32.1	0.32	0.003	
	RH	0.326	0.12	0.091	10.6	0.07	0.219	

In general, our results are in agreement of those of El-Mezayyen (1993) who reported that the predators occurred in high numbers in early plantation. Also, the increase in the population of predators during first period were associated with a decrease in the population of pests under investigation, this might be due to the high efficiency of the predators. An irreversible effect was obtained between the mean numbers of insects and predators during late seasons, these can attributed to the variation of environmental condition or the agricultural treatments.

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العلاقة بين تعداد بعض الحشرات الثاقبة الماصة ومفترساتها المرتبطة بها علـى محصول القطن فى محافظة الدقهلية .

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أوضحت النتائج أن تعداد من القطن *Aphis gossypii* أظهر ذروتين سنويا خـلال شهرى ابريل وأغطس على محصول القطن. كذلك فان تعداد الذبابة البيضاء *Bemisia tabaci* أظهر ذروتين أيضا خلال شهر مايو وسبتمبر ، أما تعداد نطاطات الأوراق *Empoasca* spp. فأوضح أربعة ذروات خلال العام أحدهم فى شهر يونيو واثنين فى شهر يوليو والأخير فى شـهر أغسطس.

أما بالنسبة للمفترسات المرتبطة بالحشرات الثاقبة الماصة فاتضح أن أبو العيد ١١ نقطة *Coccinella undecimpunctata* و أسد المن *Chrysoperla carnea* كانا أكثـر المفترسـات تـأثيرا علـى تعـداد المـن *A.gossypii* ، بينمـا أبـو العيـد ١١ نقطـة *C.undecimpunctata* و الرواغة *P.alfieni* كانا أكثر المفترسات تأثيرا على أعداد الذبابة البيضاء *B.tabaci* وعلى العكس فان المتوسطات اليومية لدرجة الحرارة كانت العامل المؤثر على نطاطات الأوراق *Empoasca* spp. بينما كان تأثير المفترسات منخفضا عليها .