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POPULATION DENSITY OF SOME INSECTS INFESTING *Lantana camera* L. SHRUBS AND THEIR PREDATORY INSECTS AT MANSOURA DISTRICT

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ABSTRACT

Field experiments were conducted in the experimental farm of the Faculty of Agriculture, Mansoura University between January and December during the two successive years 2012-2013 and 2013-2014. Biweekly samplings were done on *Lantana Camara* L., to evaluate the population density of some insect pests attacking Lantana and their predators. The obtained results revealed that there were five species namely this species were *Planococcus citri* Risso, *Ferrisia virgata* (Cockerell), *Orthezia insignis* Browne, *Aphis gossypii* Glover and *Bemisia tabaci* (Gennadius) were recorded. The results showed that *P. citri* was the most dominant species in the two years of study. The predatory insects were *Hyperaspis vinciguerra* Capra, *Scymnus syraicus* Marseul *and Chrysoperla carnea*(Stephens). The population density of *P. citri* recorded three peaks in the two years of study, *F. virgata* had three peaks and *O. insignis* had three peaks in the two years of investigation.

A. gossypii had three peaks during the two years, while the data cleared that *B. tabaci*, had three peaks during the two years of investigation. The dominant predator was *H. vinciguerra* the main predator of mealybug insects and this predator had four peaks during the two years of study. *Scymnus syraicus* and *Chrysoperla carnea* had one peaks during the two years of investigation.

INTRODUCTION

Lantana camara L. is a popular ornamental shrub in Egypt, it has been grown specifically for use as an ornamental plant. And the leaf extract used for controlling some insects according (Baidoo and Adam 2012), In Ghana studies the effect of *L. camara* leaf extracts n the population density of three cabbage pests, *Plutella xylostella* L., *Brevicoryne brassicae* L. and *Hellula undalis* Fabricius and they found that the Spraying on cabbage plants with the plant extracts reduced the numbers of pests and increased yield by 25.80%. Lantana infested with various insect such as aphids, white fly and mealybug these species caused damage of lantana and cause malformation of this ornamental plants. No found researches about insects infesting lantana shrubs in Mansoura region. Therefore the investigation aimed to survey the insect infesting Lantana camara L. and studied the population density of the major insects caused damage to lantana shrubs and their predators at Mansoura district.

MATERIALS AND METHODS

The study was carried out in the Experimental farm of the Faculty of Agriculture, Mansoura University to survey and studying the population density of the insect pests attacking *Lantan camara* L. and their predators

during the two successive years 2012 and 2014. No insecticidal treatments were applied in Lantana during the whole experimental period .Two sampling methods were used, visual examination and sweep net.

1-Visual examination:

Ten trees of the same age and size were chosen at random of *Lantana camara* L., and served as replicates during the course of this study.

Twenty-five lantana leaves and five branches 30 cm length were collected weekly in randomly from each shrub, and were kept inside polyethylene bags, and transferred to the laboratory of Economic Entomology Department, Faculty of Agriculture, Mansoura University for examination. Alive nymphs and adults of mealy bugs, aphid, whitefly and immature stags of the predators were counted on both surfaces of lantana leaves using a binocular microscope. Daily records of temperature and relative humidity during the study were obtained from the Meteorological Station. Ministry of Defense at Shawa Air Base Station Mansoura governorate.

2. Sweep net:

Throughout the period from first week of January, 2012 until the last week of December, 2014, ten lantana trees were sampled weekly using the sweep net. Five double strokes of sweep net of a regular size were carried out in each of the four cardinal directions of the chosen shrubs, so that each sample was represented by twenty double strokes for each shrub. The five double strokes catch of each direction for each tree was transferred to a plastic sac tied by a rubber band and transferred to the laboratory for anesthetization by ether to identification, counting and recording.

RESULTS AND DISCUSSION

Survey of insect pests infesting lantana shrubs

The obtained results in Table (1) showed that the total numbers and percentages of certain insect species attacking Lantana shrubs . There were five insect species belong to four families of the order Homoptera. Total numbers of individuals recorded from these species were 74109, 771861 in 2012-2013 and 2013-2014 years, respectively.

Pesudocoocidae insects were the most dominant in the two years of study. Two insect pests were recorded from this family namely: *planococcus citri* Risso and *Ferrisia virgata* (Cockerell). The numbers and ratios of these species were as follows, (38140 individuals = 51.46%) and (15379 individuals = 20.75%)in the first year and (40021 individuals = 51.85) and (15891 individuals = 20.59%) for *P. citri* and *F. virgata* during the second year, respectively .It can be noted that *P. citri* was the most dominant species during the two years of study.

From family Ortheziidae, only *Orthezia insignis* Browne was recorded (5762 individuals=7.78%) and (6141 individuals =7.96%) during the two years of investigation.

Aphis gossypii Glover, one species from Aphididae was caught, the numbers and ratio was (7833 individuals = 10.57%) and (9569 individuals = 12.39%) in the two years of study.

The ratio of *Bemisia tabaci* (Gennadius) was (6995 individuals =9.*44%) and (5564 individuals=7.21%).*

David *et al*. (2013) mentioned that lantana infested with the scale *Insignorthezia insignis*.

Murali Baskaran *et al.* (2007) recorded the scale insect *O. insignis* which were found infesting the leaves of coleus.

Table 1. Total number of injurious insect species and their percentages to the total catch on lantana during 2012 and 2013 years at Mansoura district.

Years / Species	2012		2013	
	Total	(%)	Total	(%)
1- Order Homoptera:				
1. Fam.: Pseudococcidae:				
Planococcus citri Risso	38140	51.46	38140	51.85
Ferrisia virgata (Cockerell)	15379	20.75	15891	20.59
2. Fam.: Ortheziidae				
Orthezia insignis Browne	5762	7.78	6141	7.96
3. Fam.: Aphididae:				
Aphis gossypii Glover.	7833	10.57	9569	12.39
4. Fam.: Alerodyidae				
Bemisia tabaci (Gennadius)	6995	9.44	5564	7.21
Total	74109	100	77186	100

Survey of Predatory insects inhabiting Lantana shrubs:

Data represented in Table (2) showed that the numbers of certain predatory insect species inhabiting Lantana shrubs and their percentages to the total catch during the two years of study. Two predators (*H. vinciguerra* and *S. syraicus*) were recorded belonging to order Coleoptera, and *C. carnea* from Neuroptera. Total recorded individuals of these predators were 1915 in 2012 and 2013 and 2127 in 2013 and 2014 years, respectively. *H. vinciguerra* was the most dominant species during the two years of investigation. The numbers and ratios of this species were (653 individuals =34.10%) and (730 individuals = 34.32%), *S. syraicus* was(614 individuals = 32.06%) and (683 individuals = 32.11%)and *Ch. carnea* (648 individuals =33.84%) and (714 individuals =33.57%) during the two years of study, respectively.

Martinea *et al.* (2003) in Spain, recorded the coccinellid *Cryptolaemus montrouzieri* Muls as a predatory insect of *P. citri* .

Fowler (2004) realsed *Hyperaspis pantherina* as abioagent for the lantan mealybug *orthezia insignis* in Helena island and after release the scale outbreaks have not been recorded

Maryam *et al*.(2013) mentioned that the predatory insects associated with *Maconiellicoccus hirsutus* were *Nephus arcuatus* Kapur, *Hyperaspis polita* Weise, *H. vinciguerrae* Capra, *Exochomus nigripennis* Erichson, *Scymnus syriacus* Marseul *Chrysoperla carnea* (Stephens) on Hibiscus plants in Iran

Table 2. Total number of predatory on lantana district during 2012 and 2013 years at Mansoura District.

Years / Species	2012 / 2013		2013 / 2014	
	Total	(%)	Total	(%)
1- Order Coleoptera:				
1. Fam.: Coccinellidae:				
Hyperaspis vinciguerra Capra	653	34.10	730	34.32
Scymnus syraicus Marseul	614	32.06	683	32.11
2. Order.: Neuroptera				
1. Fam.: Chrysopidae				
Chrysoperla carnea (Stephens)	648	33.84	714	33.57
Total	1915	100	2127	100

Population density of important insects infesting Lantana shurbs at Mansoura district:

1. Citrus mealybug, *Planococcus citri* Risso:

Data represeted in Fig.(1) revealed that *P. citri* had three peaks in the two years of study. Highest peak was found in the second week of October (3386 individuals / 250 leaves) in 2012, while it was (2932 individuals/ 250 leaves) by the end of October, 2013, when the temperature reached(23.40°C , 21.41°C)and the relative humidity were (82% and 85.92%) in 2012,2013 respectively. Other two peaks were recorded during the third week of February and the first week of March in the two years respectively, and the last one recorded by the end of May in both years of study.

Noha and Abd-Rabou (2010) in Egypt, Mentioned that when temperature decrased the dimension of the mealy bug and lengthened the developmental period increased.

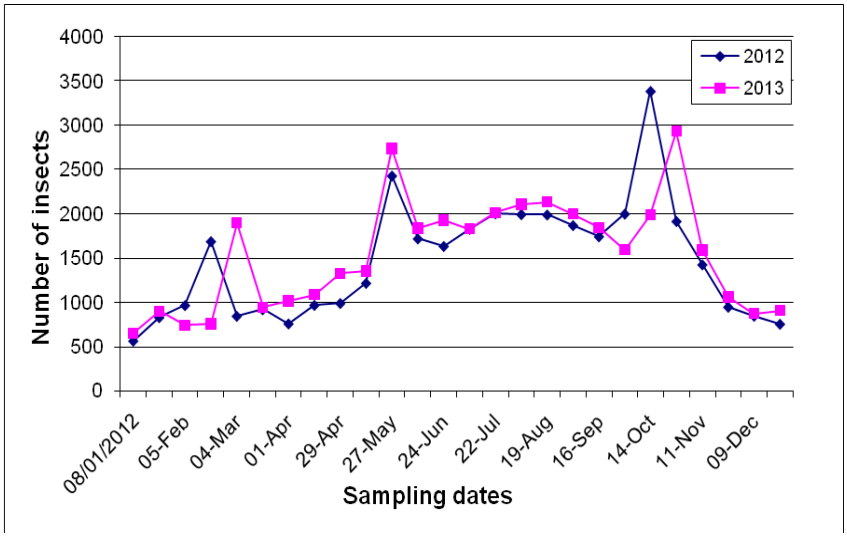

Fig.(1) Population density of *Planococcus citri* Risso on 250 lantana leaves during 2012 and 2013 years at Mansoura district.

2. The striped mealybug, *Ferrisia Virgata* (Cockerell):

Data in Fig. (2) showed that the species *F. virgata* had three peaks of abundance. These peaks were recorded in the mid of May, in the first week of July and the end of June 2012.2013, while the third peak were recorded in the mid of September in 2012 and the mid of October in the second year.

Ammar *et al*. (1979) found that three annual generations of *F. virgata* on *Acalypha macrophylla* in the early of June, July and August.

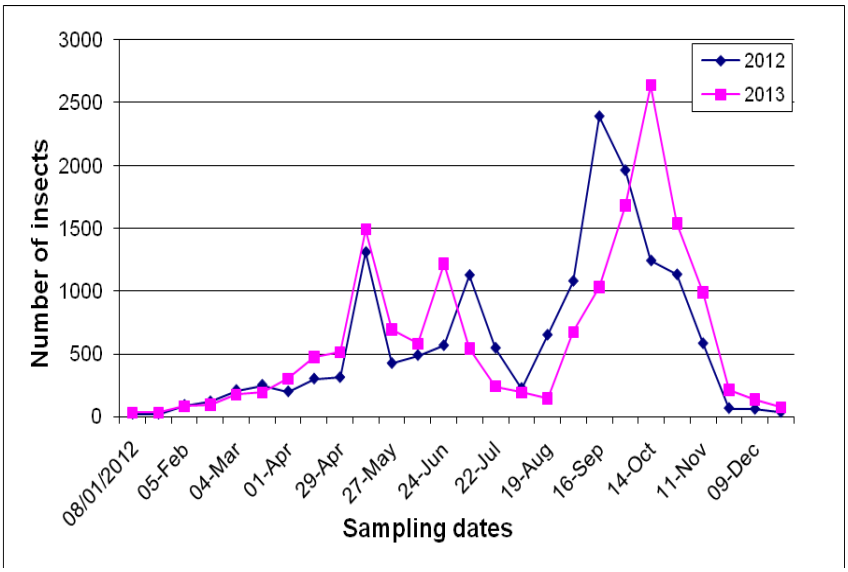

Fig. (2) Population density of *Ferrisia virgata* (Cockerell) on 250 lantana leaves during 2012 and 2013 years at Mansoura district.

3. Lantana bug, *Orthezia insignis* Browne:

Data in Fig.(3) revealed that *O. insignis* had three peaks. The first peak was found in the mid of March 2012 and in the beginning of April 2013

The second peak recorded in the third week of the May in both year, while the last one recorded in the beginning of September in the first year and in the second year it was recorded in the end of September

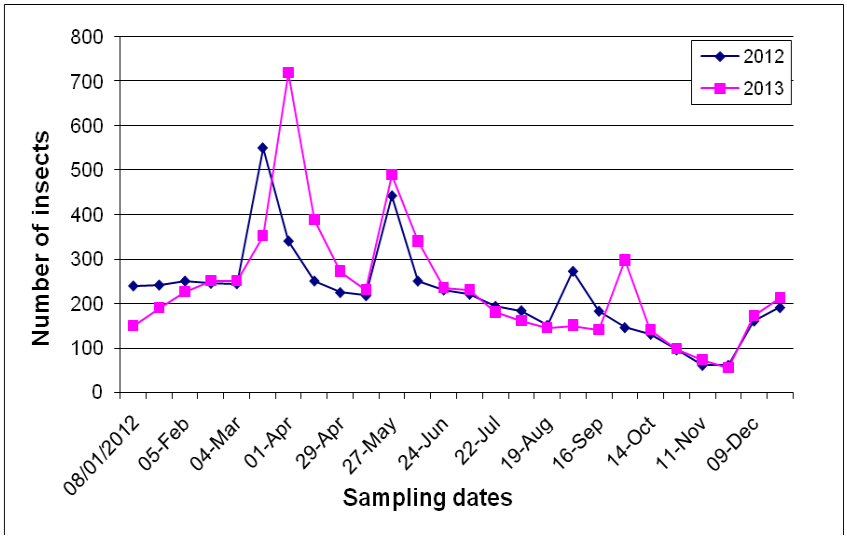

Fig. (3) Population density of *Orthezia insignis* Browne on 250 lantana leaves during 2012 and 2013 years at Mansoura district.

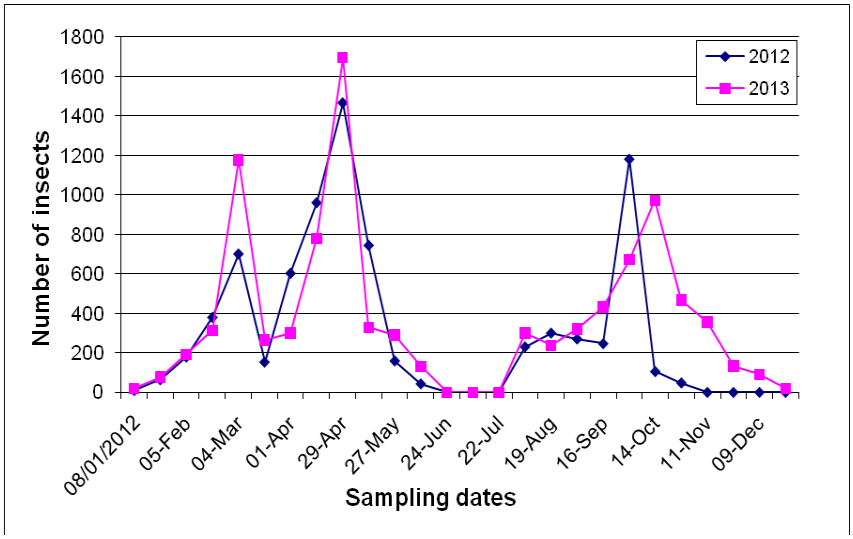

Fig. (4) Population density of *Aphis gossypii* Glover on 250 lantana leaves during 2012 and 2013 years at Mansoura district.

4. The cotton aphid, *Aphis gossypii* Glover:

The obtained results in Fig. (4) cleared that *A. gossypii* had three peaks in 2012and 2013. The highest peak was found by the end of April (1464 ,1694 individuals / 250 leaves) in the two years, while it was (3525 individuals / 250 leaves) in the second year of investigation, when the temperature reached 21.59°C and R.H. 61.0%.

The second peak was found during the end of September in the first year, it was in the second week of October in the second year of investigation, and the third peak were recorded in the first week of March in the two years.

Rahabpour and Yarahmadi (2012) observed *A. gossypii* during moderate temperature months of year (October to April) in Iran and density peak of *A. gossypii* was recorded during January to February.

Ahmad (2013) mentioned that the lowest mean percentage infestation of *A. gossypii* 2.25% was recorded on Hybrid Nirali, while Sarhad Green was mainly attacked by *A. gossypii* with mean percentage of 3.39%. *A. gossypii* population increased during 1st to 4th week and ranged from 2.85% to 3.68%. It decreased during 4th to 8th week interval from 3.68% to 2.42%.

5. Silverleaf whitefly, *Bemisia tabaci* (Gennadius):

Data in Figure (5) revealed that the population density of *B. tabaci*, there were three peaks during the two year of study. These peaks were recorded in the fourth week of April and the second week of October in the both years, while the last one was recorded in the third week of August and the third week of July in 2012-2013 respectively.

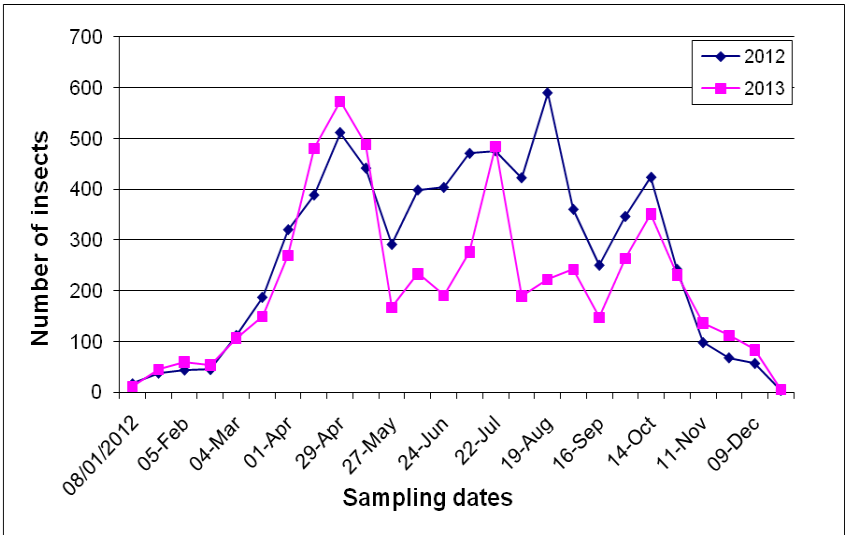

Fig. (5) Population density of *Bemisia tabaci* (Gennadius) on 250 lantana leaves during 2012 and 2013 years at Mansoura district.

ZHANG *et al*.(2013) in China, observed the peak of *B. tabaci* over a span of two to three weeks on cotton, starting in early (2010) or mid-August(2011).

Population density of predatory insect species associated with lantana insect pests:

1. *Hyperaspis vinciguerra* Capra:

Data in Figure (6) revealed that the population density of *H. vinciguerra*, there were four peaks during the two years of study. The first one recorded in the first week of April in the two years, and the second peak was recorded in the first week of September in the both study years.

Other two peaks were found on the second week of June, and the end of October in the 2012, while these peaks were recorded on the third week of June and the second week of November.

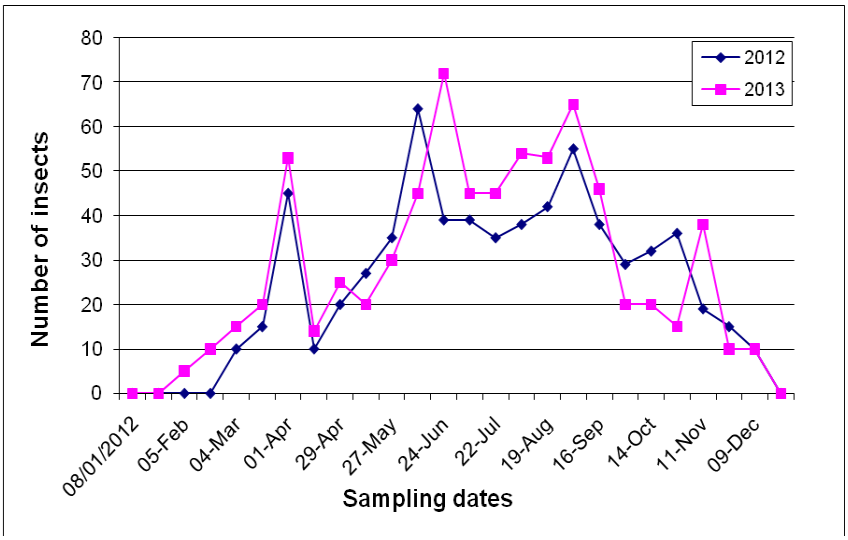

Fig. 6. Population density of *Hyperaspis vinciguerra* Capra on 250 lantana leaves during 2012 and 2013 years at Mansoura district.

2. *Scymnus syraicus* Marseul:

The obtained results in Fig.(7) revealed that *Sc. syraicus* had one peaks in 2012 and 2013 this peak was found in the third week of June in the both study years.

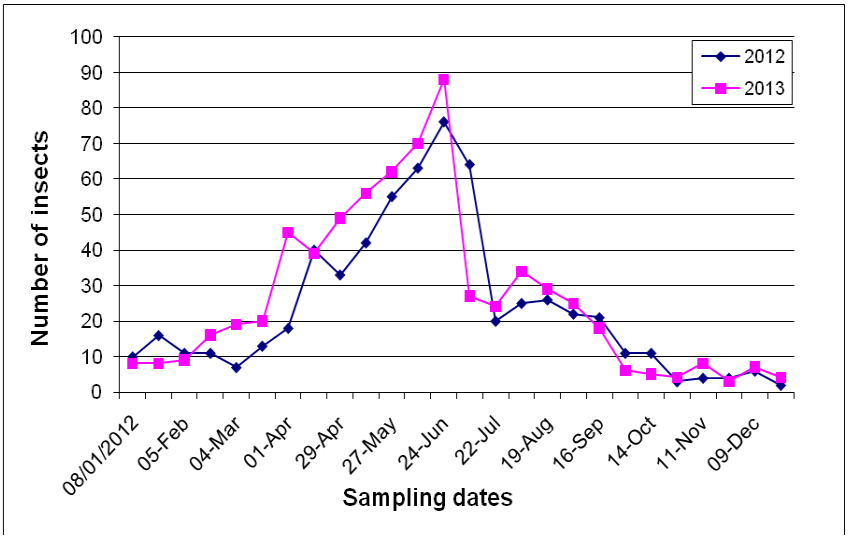

Fig. (7) Population density of *Scymnus syraicus* Marseul on 250 lantana leaves during 2012 and 2013 years at Mansoura district.

3. *Chrysoperla carnea* (Stephens):

Data in Figure (6) revealed that the population density of *C. carnea*, there are one peak during the two years of study. It was recorded in the second week of July and in the third week of July in 2012.2013, respectively.

Ramadan(2011) reported that *C. carnea* had three peaks on rose plants.

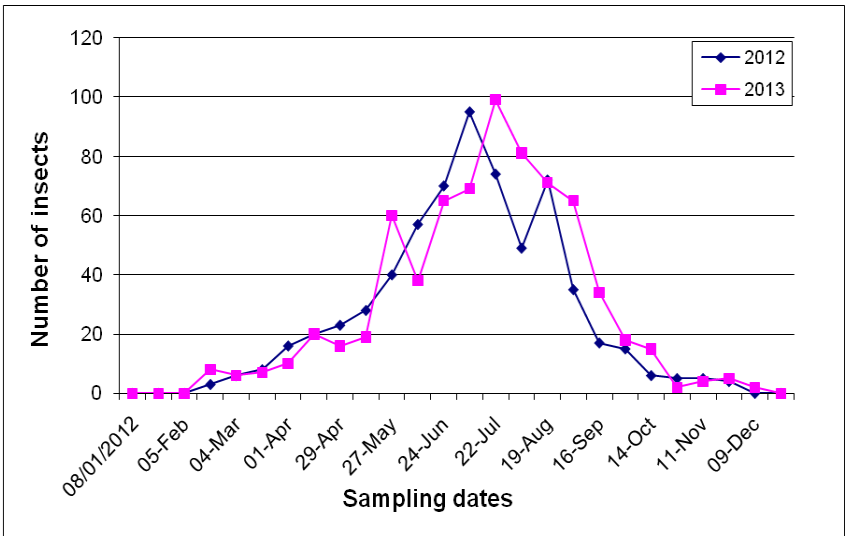

Fig. (8) Population density of *Chrysoperla carnea* Stephens on 250 lantana leaves during 2012 and 2013 years at Mansoura district.

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دراسات على الكثافة العددية لبعض الافات الحشرية التى تصيب شجيرات الانتانا والمفترسات الحشرية المرتبطة بها فى منطقة المنصورة

ليلى عبدالستار البطران ،عبد البديع عبد الحميد غانم ، لبيب محمود شنب و مروة محمود السيد رمضان
قسم الحشرات الاقتصادية - كلية الزراعة – جامعة المنصورة.

أجريت تجارب حقلية على بعض شجيرات الانتانا فى مزرعة كلية الزراعة – جامعة المنصورة خلال عامين متتاليين (٢٠١٢/ ٢٠١٣ و ٢٠١٣/ ٢٠١٤) لحصرو دراسة الكثافة العددية لبعض الآفات الحشرية التى تهاجم شجيرات الانتانا والمفترسات الحشرية المرتبطة بها

أولا: حصر للافات الحشرية والمفترسات المرتبطة بها على شجيرات الانتانا:

أوضحت النتائج المتحصل عليها وجود خمسة آفات حشرية تصيب نباتات الانتانا فى منطقة المنصورة خلال عامى الدراسة وهذة الانواع تتبع رتبة متشابهة الاجنحة وكان جملة الأفراد التى تم تسجيليها من هذة الأنواع ٧٤١٠٩ و ٧٧١٨٦ فرداً خلال عامى الدراسة على التوالى وهذة الانواع الحشرية كالتالى بق الموالح الدقيقى *Planococcus citri* Risso و بق الفريجاتا الدقيقى *Ferrisia virigata*(Cockerell) وبق الانتانا الدقيقى *Orthezia insignis* Browne ومن القطن *Aphis gossypii* Glover وذبابة القطن البيضاء(*Bemisia tabaci* (Gennadius ، وأظهرت النتائج أن بق الموالح الدقيقى كان أكثر هذة الأنواع انتشاراً خلال فترة الدراسة .

وأوضحت النتائج تواجد ثلاثة أنواع مفترسة تتبع رتبتين وهما غمدية الاجنحة وتم تسجيل نوعين هما المفترس *Hyperaspis vinciguerra* Capra ومفترس *Scymnus syraicus* Marseul ورتبة معرقة الاجنحة ومنها مفترس واحد وهو *Chrysoperla carnea* (Stephens) ، وكانت اكثر الانواع المفترسة تواجدا المفترس *H. vinciguerra*

ثانيا: دراسة الكثافة العددية لبعض الآفات الحشرية التى تصيب الانتانا والمفترسات الحشرية المرتبطة بها :

أوضحت النتائج أن بق الموالح الدقيقى و بق الفريجاتا الدقيقى وبقى الانتانا الدقيقى ومن القطن وكذلك الذبابة البيضاء كان لكل منهم ثلاث ذروات خلال عامى الدراسى وتختلف ذروتها باختلاف نوع الحشرة.

اما لمفترس ابو العيد *H. vinciguerra* له اربع ذروات خلال عامى الدراسة بينما سجل كلا من الاسكمنس واسد المن الاخضر ذروة واحدة خلال عامى الدراسة.