

# SCALE AND MEALYBUG INSECTS INVADE CITRUS ORCHARDS AT MENOUFIA GOVERNORATE, EGYPT

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## ABSTRACT

A survey of insects infesting citrus orchards was conducted in Menoufia governorate at three localities during 2019. The most common insects were, cottony cushion scale, *Icerya purchase*, seychelles scale, *Icerya seychellarum*, comma scale, *Lepidosaphes beckii*, citrus black scale, *Chrysomphalus aonidum*, and red scale, *Aonidiella aurantii*. The obtained results revealed no infestation was recorded along with July and August of *Icerya* (Mealybugs) insects. However, there were two peaks recorded in May and November, as well as the highest averages were recorded in Tala center while the lowest were recorded in Alshohadaa center, moreover Shebin Elkom center occupied intermediate status between the two centers. There were no mealybugs insects during July and August, but the highest average numbers were recorded in May. Tala center orchard has the highest population of tested insects on Naval Orange along with the experiment. There were no *Chrysomphalus aonidum* insects at Shebin Elkom and Alshohadaa of Balady mandarin orchards during year months. Tala and Shebin Elkom orchards have similar numbers but Alshohadaa has smaller averages. Shebin Elkom orchard has the highest infection with *Lepidosaphes beckii*, and *Aonidiella aurantia*, while Alshohadaa has the least numbers. It could be recommended that control of these pests must be done along with June, July, and August, where the least population of insects.

**Keywords:** Insects, *Icerya purchase*, *I. seychellarum*, *Lepidosaphes beckii*, *Chrysomphalus aonidum*, *Aonidiella aurantii*.

## INTRODUCTION

Egypt occupied the first rank in exporting citrus for the second year, with a total of 1.7 million tons in 2019, almost 38.5% of the orange global exports in 2019, **ASWAQ Financial Company, 2019**. Citrus orchards occupied almost all the governorates in Egypt (**USDA, 2016**). The cultivated area with citrus increased by 41 % reaching 349,880 feddans in the 2016/2017 season versus 248,530 feddans in

2006/2007. Citrus is the biggest cultivated fruit crop in Egypt, the cultivated area reached (485940 feddans) representing 30% of the total fruit cultivated area (1,668,700 feddans), the total Citrus area reached (418,415 feddans) approximately, produces 4.272.886 metric tons, from 1,340,000 tons are exported (**Ministry of Agriculture 2016**). The most common pests infesting citrus orchards are orange spiny whitefly, *Aleurocanthus spiniferus*, Quaintance, Citrus long-horned beetle, *Anoplophora chinensis* Forster, (cotton aphid) *Aphis gossypii* Glover, Oriental fruit fly, *Bactrocera dorsalis* Hendel, Chinese citrus fly, *B. minax* Enderlein, *Chelidonium arentatum* Dalman, Citrus whitefly, *Dialeurodes citri* Ashmead, Asian citrus psyllid, *Diaphorina citri* Kuwayama, western flower thrips, *Frankliniella occidentalis* Pergande, the green peach aphid, *Myzus persicae* Sulzer, *Nadezhdiella cantori* Hope, Citrus red mite, *Panonychus citri* McGregor, Citrus leafminer, *Phyllocnistis citrella* Stainton and *Toxoptera (Aphis) citricidus* Kirkaldy, causing problems and affected citrus harvests quantity and qualities (weight, sugar content, and appearance) **Wang et al., 1999**.

Scale insects cause injuries while ingestion plant sap and excrete honeydew that becomes an excellent medium to black sooty mold fungus reducing photosynthesis by 70%, leading to early senescence and loss of aesthetic value. As well as inject toxic saliva and are vectors of viruses. (**García Morales et al., 2017a; Mibey, 1997; Franco, 2004**). Survey studies are vital for population dynamics data documentation and informing about potential alien insects. The exotic pests can be costly owing because of the increase of crop damage, control programs, and quarantine restrictions on trade (**Pimentel et al., 2002; Jendoubi, 2018**).

This study was conducted to update the information on important insect pests that invades citrus orchards in Menoufia governorate, Egypt to develop pest management technologies that are sustainable and compatible with citrus farmers' conditions.

## MATERIALS AND METHODS

A total of 216 samples were collected randomly along the season. Three randomly composite leaf samples were monthly collected from Naval orange, and Balady mandarin at three different orchards located in Menoufia governorate throughout the season from January to December 2019, the selected trees were at the same age and never have been treated for pests or pathogens. The tested orchards were, the experimental orchard of the Faculty of Agriculture at Shebin Elkom center, orchard located in Zenara village, Tala center, and orchard in Kafr Ashma village, Alshohadaa center.

Population dynamics of the most common insects, *Icerya purchase*, *Icerya seychellarum*, *Lepidosaphes beckii*, *Chrysomphalus aonidum*, and *Aonidiella aurantii* were determined. Samples were collected in polyethylene bags, tightly closed, and transferred directly to the laboratory to be examined using a dissecting microscope. Insect individuals were counted and mounted singly for identification.

The obtained results were analyzed by the computer using the CoStat 6.400 Statistical CoHort Software program, Copyright © 1998- 2008. CoHort Software 798 Lighthouse Ave. PMB 320 Monterey CA, 93940 USA, using ANOVA test with LSD 5%.

## RESULTS AND DISCUSSION

### **1-Seasonal fluctuation of *Icerya seychellarum* and *I. purchase* on Naval Orange at Menoufia Governorate:**

The obtained data in Chart (1) refers that the least numbers of mealybug species were recorded in July and August recording zero infestation of *Icerya* insects. However, two peaks were recorded in May and November, where *Icerya seychellarum* recorded 8.3, 4.3, and 3.3 /10 leaves at Tala, Shebin Elkom, and Alshohadaa, respectively in November, but the highest were recorded in May, recording 13.0, 6.6, and 5.6 /10 leaves at Tala, Shebin Elkom, and Alshohadaa, respectively. *Icerya purchase* recorded 6.0, 3.6 individual /10 leaves in November at Tala, and Shebin Elkom, but recorded 3.6 at Alshohadaa in October, while the highest population was observed in May 10.6 at Tala and 5.3 /10 leaves at Shebin Elkom, and Alshohadaa, this indicated that the highest averages were recorded in

Tala center while the lowest were recorded in Alshohadaa center, moreover Shebin Elkom occupied intermediate status between the other centers.

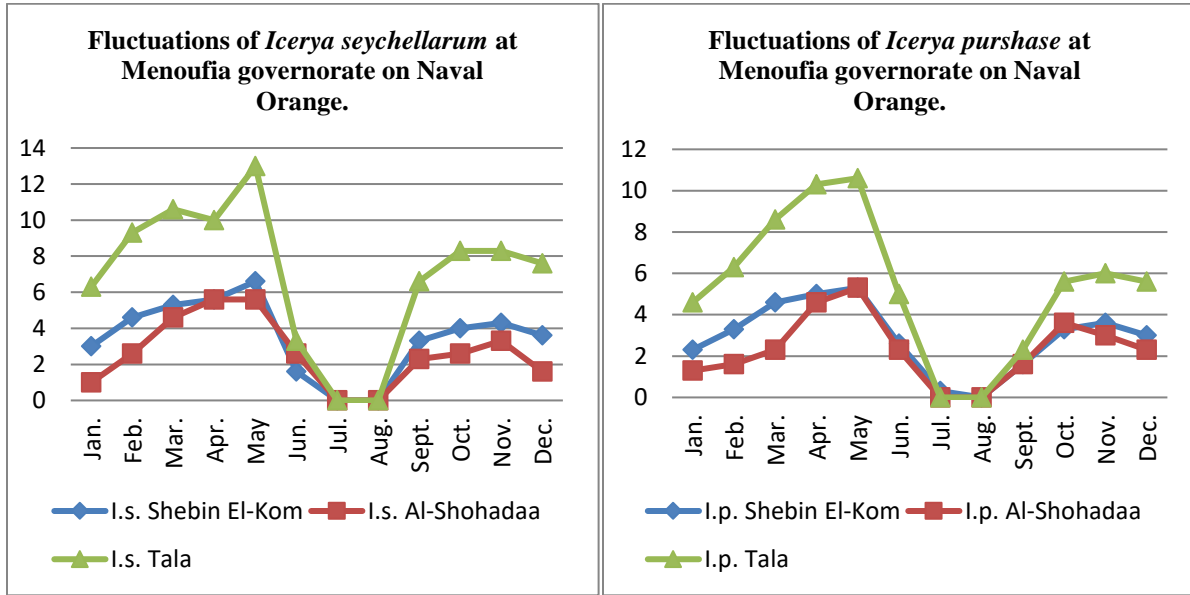


Chart (1) Fluctuations of *Icerya seychellarum*, and *I. purchase* at 3 centers on Naval Orange.

## 2-Monthly fluctuation of *Icerya seychellarum* and *I. purchase* on Balady mandarin at Menoufia Governorate:

The data represented in Chart (2) show that there were no individuals of mealybug species during July and August months, but the highest average numbers were recorded in May recording 4.3 and 3.6/10 leaves at Shebin Elkom, 4.0 and 2.6/10 leaves at Alshohadaa, and 5.3 and 6.6/10 leaves at Tala.

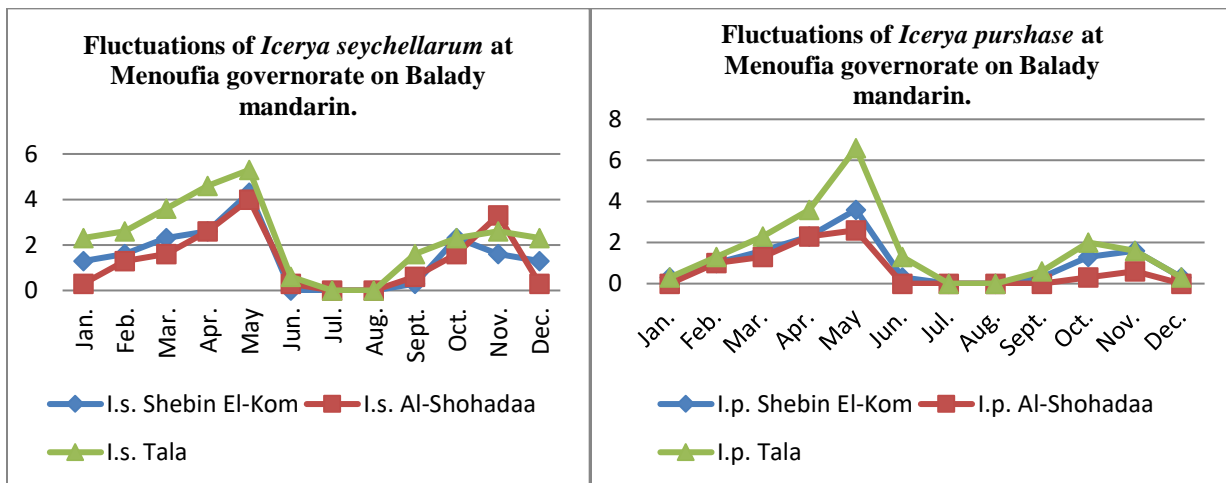


Chart (2) Fluctuations of *Icerya seychellarum*, and *I. purchase* at 3 centers on Mandarin.

### 3- Monthly fluctuation of *Icerya seychellarum*, *I. purchase*, *Chrysomphalus aonidum*, *Lepidosaphes beckii*, and *Aonidiella aurantii* on Naval Orange at Shebin El-Kom:

The obtained results in Table (1) indicated that there were significant differences in the average numbers of *I. seychellarum* infesting Naval orange at Shebin Elkom locality among months of the 2019 year. The highest average numbers were recorded at May 6.6 insect/10 leaves, while the least average numbers were recorded in July and August months recorded zero insects. As for *I. purchase* there were significant differences between the Average number of May 5.3 insects/10 leaves and the other months April 5.0 insects /10 leaves while August recorded 0.0 insect /10 leaves and July recorded 0.3 insect/10 leaves. *Ch. aonidum* recorded 0.0 insect/10 leaves in August and September, although May recorded 5.3 insects as the highest Average during the season of 2019. *L. beckii* recorded 14.6 insects /10 leaves in August as the lowest average and 32.0 insects as the highest average in May. *A. aurantii* recorded 0.0 insects/10 leaves in July and August and the averages increased gradually to reach 20.3 insects /10 leaves in May.

Table (1): Average numbers of insects per 10 leaves of Navel Orange along 2019 season at Shebin Elkom, Menoufia

Months 2019	Average numbers of Insects per 10 leaves				
	<i>Icerya seychellarum</i>	<i>Icerya purchase</i>	<i>Chrysomphalus aonidum</i>	<i>Lepidosaphes beckii</i>	<i>Aonidiella aurantii</i>
Jan.	3.0 f	2.3 e	0.0 f	19.6 cdef	10.6 e
Feb.	4.6 c	3.3 c	0.0 f	19.3 cdef	10.0 e
Mar.	5.3 b	4.6 b	0.0 f	20.3 cd	15.3 c
Apr.	5.6 b	5.0 ab	4.3 b	24.6 b	17.0 b
May	6.6 a	5.3 a	5.3 a	32.0 a	20.3 a
Jun.	1.6 g	2.6 de	3.6 c	22.3 bc	4.3 g
Jul.	0.0 h	0.3 g	2.0 de	15.0 ef	0.0 h
Aug.	0.0 h	0.0 g	0.0 f	14.6 f	0.0 h
Sept.	3.3 ef	1.6 f	0.0 f	15.3 def	1.0 h
Oct.	4.0 cde	3.3 c	2.3 d	17.6 cdef	6.0 f
Nov.	4.3 cd	3.6 c	3.3 c	18.6 cdef	12.3 d
Dec.	3.6 def	3.0 cd	1.6 e	20.0 cde	9.6 e
Total	41.9	34.9	22.4	239.2	106.4
LSD 5%	0.6	0.5	0.4	3.3	1.6

Means in each column followed by the same letter are not significantly different at 5%

**4- Seasonal fluctuation of *Icerya seychellarum*, *Icerya purchase*, *Chrysomphalus aonidum*, *Lepidosaphes beckii*, and *Aonidiella aurantii* on Naval Orange at Al-Shohadaa:**

The obtained results represented in Table (2) indicated that there was no infestation with *Ch. aonidum* in Alshohadaa Center during the 2019 months. The highest average numbers of *I. seychellarum*, *I. purchase*, and *L. beckii* were recorded in May month as 5.6, 5.3, and 11.3 insects /10 leaves, respectively, besides, the highest average of *A. aurantii* was 7.6 insects /10 leaves in April, while the lowest average numbers of *I. seychellarum*, *I. purchase* recorded zero in July and August, although *A. aurantia* recorded zero infection in May, June, July, and August. The least numbers of *Lepidosaphes beckii* were recorded in August with 4.6 insects /10 leaves.

Table (2): Average numbers of insects per 10 leaves of Navel Orange along 2019 season at Alshohadaa, Menoufia

Months 2019	Average numbers of Insects per 10 leaves				
	<i>Icerya seychellarum</i>	<i>Icerya purchase</i>	<i>Chrysomphalus aonidum</i>	<i>Lepidosaphes beckii</i>	<i>Aonidiella aurantii</i>
Jan.	1.0 f	1.3 f	0.0	7.6 b	6.3 b
Feb.	2.6 d	1.6 f	0.0	7.0 bc	6.3 b
Mar.	4.6 b	2.3 e	0.0	6.6 bcd	8.0 a
Apr.	5.6 a	4.6 b	0.0	8.0 b	7.6 a
May	5.6 a	5.3 a	0.0	11.3 a	2.3 d
Jun.	2.6 d	2.3 e	0.0	7.6 b	0.0 e
Jul.	0.0 g	0.0 g	0.0	5.3 de	0.0 e
Aug.	0.0 g	0.0 g	0.0	4.6 e	0.0 e
Sept.	2.3 d	1.6 f	0.0	5.6 cde	0.0 e
Oct.	2.6 d	3.6 c	0.0	6.3 bcd	3.3 c
Nov.	3.3 c	3.0 d	0.0	6.6 bcd	5.3 b
Dec.	1.6 e	2.3 e	0.0	7.3 b	5.6 b
Total	31.8	27.9	0.0	83.8	44.7
LSD 5%	0.5	0.4	0.0	1.1	0.8

Means in each column followed by the same letter are not significantly different at 5%

**5- Seasonal fluctuation of *Icerya seychellarum*, *Icerya purchase*, *Chrysomphalus aonidum*, *Lepidosaphes beckii*, and *Aonidiella aurantii* on Naval Orange at Tala center:**

The obtained results in Table (3) revealed that there were no individuals of *Icerya seychellarum*, and *I. purchase* recorded along with July and August, as well

as no individuals were observed of *A. aurantia* along with July, August, and September, and *C. aonidum* were absent along June, July, and August. *Lepidosaphes beckii* recorded 12.6, 12.3, and 14.6 /10 leaves in August, September, and October, respectively as the most decreased numbers. However, the five insects under study recorded the highest average numbers in May with 13.0 and 10.6 /10 leaves for *I. seychellarum*, *I. purchase*, 9.6, 35.3, and 14.3 /10 leaves for *C. aonidum*, *L. beckii*, and *A. aurantii*, respectively.

Table (3): Average numbers of insects per 10 leaves of Navel Orange along 2019 season at Tala, Menoufia

Months 2019	Average numbers of Insects per 10 leaves				
	<i>Icerya seychellarum</i>	<i>Icerya purchase</i>	<i>Chrysomphalus aonidum</i>	<i>Lepidosaphes beckii</i>	<i>Aonidiella aurantii</i>
Jan.	6.3 e	4.6 d	0.3 e	21.3 cd	8.3 cd
Feb.	9.3 bc	6.3 c	0.0 e	21.3 cd	8.6 cd
Mar.	10.6 b	8.6 b	0.6 e	23.6 c	9.3 c
Apr.	10.6 b	10.3 a	7.6 b	28.3 b	12.0 b
May	13.0 a	10.6 a	9.6 a	35.3 a	14.3 a
Jun.	3.3 f	5.0 cd	0.0 e	24.0 c	7.6 cd
Jul.	0.0 g	0.0 f	0.0 e	16.6 ef	0.0 e
Aug.	0.0 g	0.0 f	0.0 e	12.6 f	0.0 e
Sept.	6.6 e	2.3 e	0.6 e	12.3 f	0.6 e
Oct.	8.3 cd	5.6 cd	3.6 c	14.6 f	6.3 d
Nov.	8.3 cd	6.0 cd	3.0 c	16.3 ef	7.6 cd
Dec.	7.6 de	5.6 cd	1.6 d	19.3 de	8.0 cd
Total	83.9	64.9	26.9	245.5	82.6
LSD 5%	1.2	1.0	0.7	3.2	1.6

Means in each column followed by the same letter are not significantly different at 5%

#### 6- Seasonal fluctuation of *Icerya seychellarum*, *I. purchase*, *Chrysomphalus aonidum*, *Lepidosaphes beckii*, and *Aonidiella aurantii* on Balady mandarin at Shebin Elkom:

The statistical analysis of the data in Table (4) indicated that there were no significant differences among the numbers of each of *C. aonidum*, *I. seychellarum*, and *I. purchase* at June, July, August, and September, recording the least ones, while the highest infestation was noticed in May with 4.3, and 3.6 insects/ 10 leaves. *Lepidosaphes beckii* recorded the lowest averages in July and August with 10.0 and 11.3 insects/ 10 leaves, but the highest infestation was in May, recording 112.0

insects/ 10 leaves. As for *Aonidiella aurantii* there were no significant differences between July and August samples, while the highest average number was recorded in May as 14.3 insects / 10 leaves.

Table (4): Average numbers of Insects per 10 leaves of Balady mandarin along 2019 season at Shebin Elkom, Menoufia

Months 2019	Average numbers of Insects per 10 leaves				
	<i>Icerya seychellarum</i>	<i>Icerya purchase</i>	<i>Chrysomphalus aonidum</i>	<i>Lepidosaphes beckii</i>	<i>Aonidiella aurantii</i>
Jan.	1.3 c	0.3 f	0.0	38.3 d	6.6 de
Feb.	1.6 c	1.0 e	0.0	59.6 c	7.6 d
Mar.	2.3 b	1.6 c	0.0	67.3 c	9.3 c
Apr.	2.6 b	2.3 b	0.0	94.3 b	12.6 b
May	4.3 a	3.6 a	0.0	112.0 a	14.3 a
Jun.	0.0 d	0.3 f	0.0	33.3 d	5.6 e
Jul.	0.0 d	0.0 f	0.0	10.0 e	0.0 g
Aug.	0.0 d	0.0 f	0.0	11.3 e	0.0 g
Sept.	0.3d	0.3 f	0.0	33.6 d	2.3 f
Oct.	2.3 b	1.3 d	0.0	38.3 d	5.6 e
Nov.	1.6 c	1.6 c	0.0	57.6 c	7.6 d
Dec.	1.3 c	0.3 f	0.0	40.3 d	7.0 de
Total	17.6	12.6	0.0	595.9	78.5
LSD 5%	0.3	0.2	0.0	9.3	1.1

Means in each column followed by the same letter are not significantly different at 5%

### 7- Monthly fluctuation of *Icerya seychellarum*, *I. purchase*, *Chrysomphalus aonidum*, *Lepidosaphes beckii*, and *Aonidiella aurantii* on Balady mandarin at Alshohadaa:

Regarding the data in Table (5) it is clear that *C. aonidum* has not existed in the 2019 months on Mandarin at Alshohadaa center. No individuals of *Icerya purchase* were recorded in January, June, July, and December, while the highest average number recorded in May. *Icerya seychellarum* has no exist in July and August, however, May month recorded 4.0 insects /10 leaves as the highest number. No individuals of *Lepidosaphes beckii* were recorded in July and August, while it recorded 14.3 insects /10 leaves in May month as the highest average observed during the year, furthermore, there were no individuals of *A. aurantia* along with June, July, and August, and recorded its highest numbers in May month as 5.3 insects /10 leaves.



Table (5): Average numbers of Insects per 10 leaves of Balady mandarin along 2019 months at Alshohadaa, Menoufia

Months 2019	Average numbers of Insects per 10 leaves				
	<i>Icerya seychellarum</i>	<i>Icerya purchase</i>	<i>Chrysomphalus aonidum</i>	<i>Lepidosaphes beckii</i>	<i>Aonidiella aurantii</i>
Jan.	0.3 ef	0.0 g	0.0	10.0 abcd	1.0 e
Feb.	1.3 d	1.0 d	0.0	11.6 abc	1.6 d
Mar.	1.6 d	1.3 c	0.0	12.3 ab	2.3 c
Apr.	2.6 c	2.3 b	0.0	14.3 a	3.3 b
May	4.0 a	2.6 a	0.0	9.3 bcd	5.3 a
Jun.	0.3 ef	0.0 g	0.0	2.3 e	0.0 g
Jul.	0.0 f	0.0 g	0.0	0.0 e	0.0 g
Aug.	0.0 f	0.0 g	0.0	0.0 e	0.0 g
Sept.	0.6 e	0.0 g	0.0	5.6 d	0.6 f
Oct.	1.6 d	0.3 f	0.0	8.0 bcd	3.0 c
Nov.	3.3 b	0.6 e	0.0	9.3 bcd	1.6 d
Dec.	0.3 ef	0.0 g	0.0	10.0 abcd	1.3 de
Total	15.9	8.1	0.0	92.6	20
LSD 5%	0.3	0.2	0.0	3.2	0.4

Means in each column followed by the same letter are not significantly different at 5%

### 8- Seasonal fluctuation of *Icerya seychellarum*, *I. purchase*, *Chrysomphalus aonidum*, *Lepidosaphes beckii*, and *Aonidiella aurantii* on Balady mandarin at Tala:

The Date in Table (6) refers to the months July and August recorded the highest temperatures along the year, so they have the least insect averages *Icerya seychellarum*, *I. purchase*, *Chrysomphalus aonidum*, and *Aonidiella aurantii* recorded 0.0 insects, but *Lepidosaphes beckii* recorded 12.6 and 11.3 insects. May has the most suitable weather, so it has the highest averages during the season recording 5.3, 6.6, 5.6, 121.3, and 9.0 for *Icerya seychellarum*, *I. purchase*, *Chrysomphalus aonidum*, *Lepidosaphes beckii*, and *Aonidiella aurantii*, respectively.

Table (6): Average numbers of Insects per 10 leaves of Balady mandarin along 2019 months at Tala, Menoufia

Months 2019	Average numbers of Insects per 10 leaves				
	<i>Icerya seychellarum</i>	<i>Icerya purchase</i>	<i>Chrysomphalus aonidum</i>	<i>Lepidosaphes beckii</i>	<i>Aonidiella aurantii</i>
Jan.	2.3	0.3 ef	1.3 d	42.3 d	6.6 c
Feb.	2.6 d	1.3 d	1.6 d	63.6 c	7.3 bc
Mar.	3.6 c	2.3 c	2.3 c	70.6 c	7.6 bc
Apr.	4.6 b	3.6 b	3.3 d	95.6 b	8.3 ab
May	5.3 a	6.6 a	5.6 a	121.3 a	9.0 a
Jun.	0.6 f	1.3 d	0.6 e	45.3 d	3.6 e
Jul.	0.0 g	0.0 f	0.0 f	12.6 e	0.0 f
Aug.	0.0 g	0.0 f	0.0 f	11.3 e	0.0 f
Sept.	1.6 e	0.6 e	0.3 ef	40.0 d	4.6 d
Oct.	2.3 d	2.0 c	2.3 c	43.3 d	5.3 d
Nov.	2.6 d	1.6 d	1.6 d	64.3 c	7.3 bc
Dec.	2.3 d	0.3 ef	1.3 d	40.3 d	6.6 c
Total	27.8	19.9	20.2	650.5	66
LSD 5%	0.4	0.4	0.3	10.0	0.9

Means in each column followed by the same letter are not significantly different at 5%

### 9- Seasonal fluctuation of *Chrysomphalus aonidum* in Menoufia governorate:

The obtained results depicted in Chart (3 L.) show that Tala has the biggest infection on Naval Orange along with the experiment, while results in Chart (3 R.) showed that Shebin Elkom and Alshohadaa has no infection with *Chrysomphalus aonidum* on Mandarin during the season.

### 10- Seasonal fluctuation of *Lepidosaphes beckii* in Menoufia governorate:

The obtained results in Chart (4 L.) indicated that Tala and Shebin Elkom had similar numbers but Alshohadaa has smaller averages, while the results in Chart (4 R.) indicated that Shebin Elkom has the highest population of *Lepidosaphes beckii*, while Alshohadaa has the least numbers.

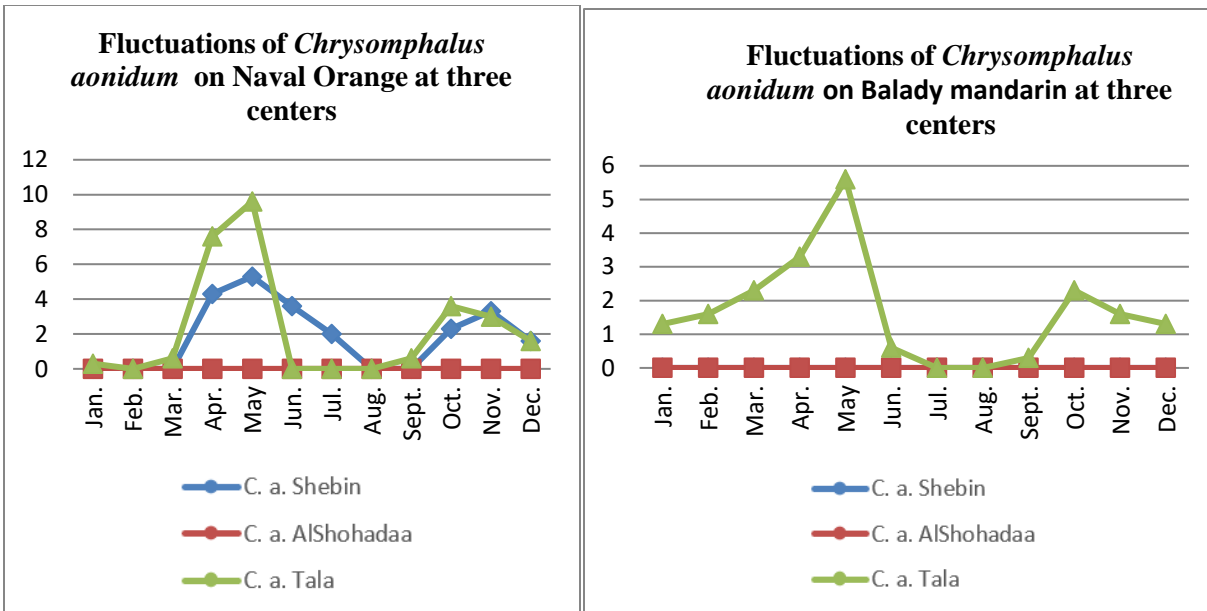


Chart (3) Fluctuations of *Ch.aonidum* on Naval Orange and Balady mandarin at the three centers

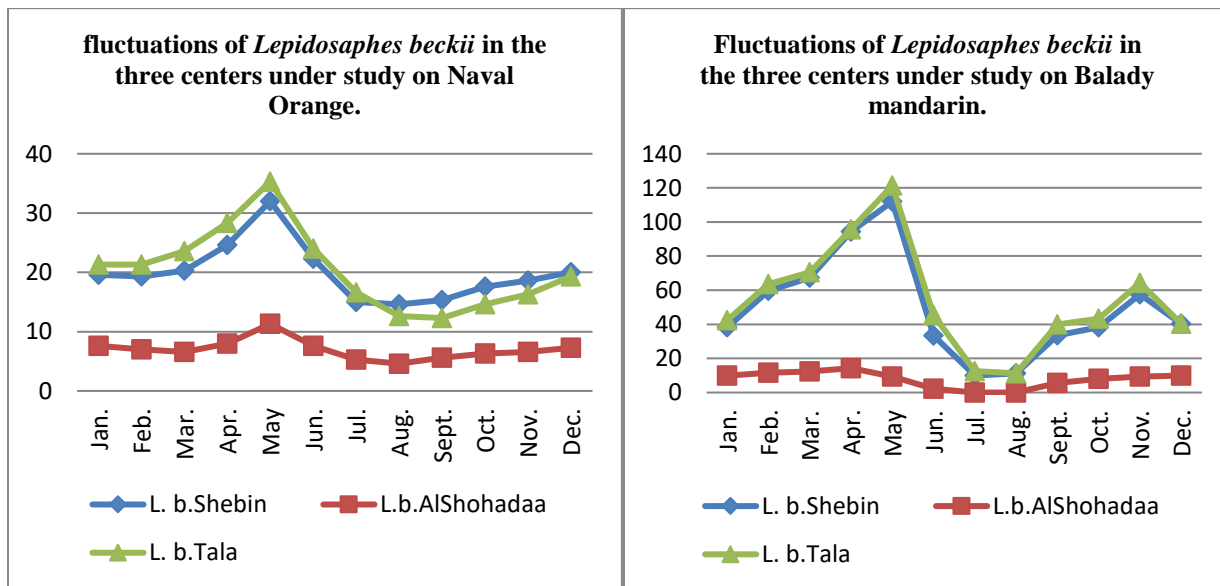


Chart (4) fluctuations of *L. beckii* in three centers on Naval Orange and Balady mandarin

### 11- Seasonal fluctuation of *Aonidiella aurantii* in Menoufia governorate:

The obtained results in Chart (5 L.) indicated that Shebin Elkom orchard has the highest numbers of *Aonidiella aurantii* on Naval Orange, while Alshohadaa has the least numbers, as well as the results in Chart (5 R.) indicated that Shebin Elkom orchard has the highest individuals of *A. aurantii* on Mandarin, while Alshohadaa

orchard has the least numbers. It could be concluded that *A. aurantii* had two peaks per year.

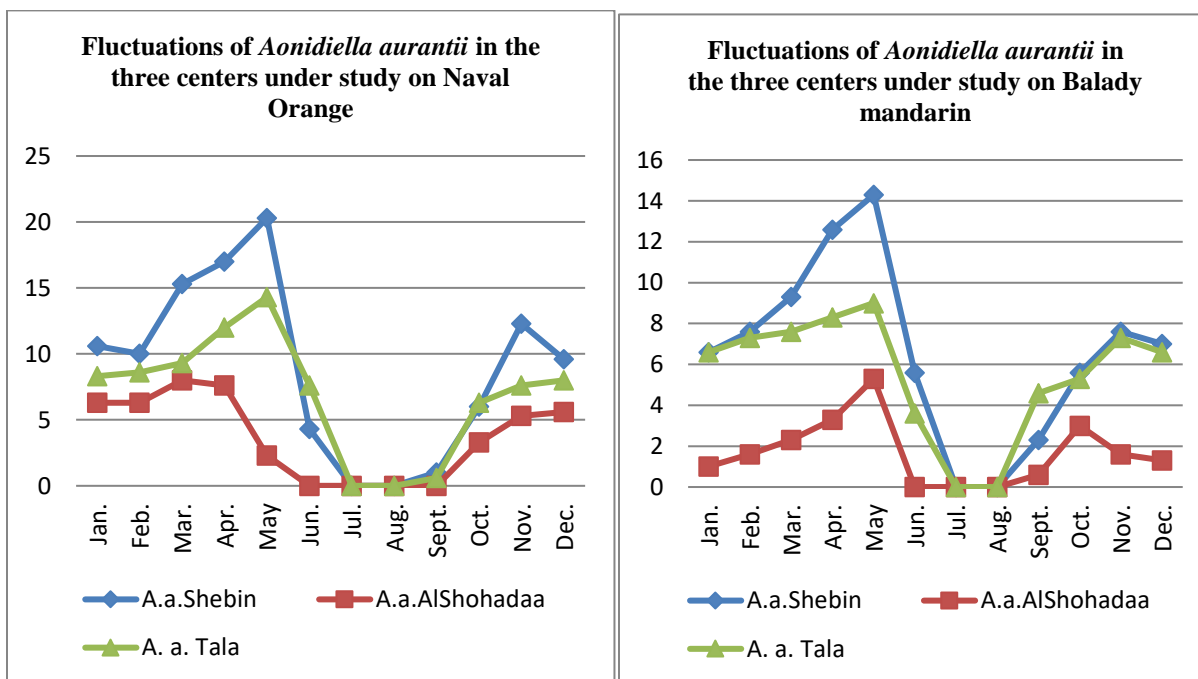


Chart (5) Fluctuation of *A. aurantii* in the three centers on Naval Orange and Balady mandarin.

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## الحشرات القشرية والبق الدقيقي التي تغزو بساتين الموالح في محافظة المنوفية، مصر

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### الملخص العربي

أجريت دراسة لحصر الحشرات القشرية والبق الدقيقي التي تصيب أشجار الموالح في ثلاثة مراكز بمحافظة المنوفية بجمهورية مصر العربية خلال العام 2019 وكانت الحشرات الأكثر شيوعاً هي: البق الدقيقي الاسترالي وبق الموالح الدقيقي وحشرة الموالح القشرية السوداء وحشرة الموالح المحارية والحشرة القشرية الحمراء. وأظهرت الدراسة عدم تواجد حشرات البق الدقيقي على اشجار الموالح في شهري يوليو وأغسطس وكانت هناك زيادة تدريجية في الأعداد ، كما كان هناك زيادة كبيرة في مجتمعات الحشرات تحت الدراسة في شهري مايو ونوفمبر ، كما أشارت النتائج المتحصل عليها إلى أن أعلى تعداد للحشرات المتطفلة على أوراق أشجار الموالح تم تسجيله في مركز تلا ، بينما تم تسجيل أقل تعداد للحشرات في مركز الشهداء ، واحتل شيبين الكوم مركزاً متوسطاً بين مركزى الشهداء وتلا. وخلصت النتائج الى ان حشرات البق الدقيقي والحشرات القشرية لها 2 جيل فى العام وذلك خلال شهرى ابريل ونوفمبر ، كما لوحظ ان اقل تعداد لهذه الحشرات كان خلال شهور يونيو ويوليو وأغسطس ولذا يفضل إجراء عمليات مكافحة لهذه الحشرات خلال هذه الشهور.