

**COMPARISON STUDIES ON THE POPULATION DYNAMIC OF *Panonychus citri* (MCGREGOR) INHABITING CITRUS TREES AT ASSUIT AND KAFR EL-SHEIKH GOVERNORATES**

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### **ABSTRACT**

It was observed that the highest rate of numerical density for citrus red mite *P. citri* (McGregor) in September at Kafr El-Sheikh, where the injury in the summer months and then gradually less in the winter months. It was found that the most common variety of municipal Balady orange citrus susceptible to this species followed by lemon while the less sensitive for infection was Mandarein . Numerical density rate of the mite species *P. citri* more at Kafr El-Sheikh than the numbers of this species at Assiut.

### **INTRODUCTION**

Citrus are one of the most important fruits in Egypt . The cultivated area is estimated to be 167.164 Feddan, produced 1,243, 568Tons (2013). Citrus cultivations are centered in two large geographic regions (The fertile Delta area and the newly reclaimed land) .The fruit characters (fruit weight, fruit length and width, peel thickness and weight, acidity, total soluble solids percentage and vitaminc) were affected by mite infestation .

The loss of fruit quality and quantity as a result of feeding by such mite are a perennial problem, which requires a suitable mean of control to reduce its severity . Many spray criteria three citrus mites have been used, but one cannot easily use them to relate mite populations to damage or economic loss .Many investigators in Egypt recorded the effect the mites in citrus trees. The objective of the present work threw light on the comparison of the population dynamic of *Panonychus citri* during two successive years at Assuit and Kafr El-Shikh governorates

### **MATERIALS AND METHODS**

The experiments were carried out at Assiut and Kafr El-Shikh governorates for two successive years (2012/2014). Samples of 25 leaves of every citrus varieties namely Balady orange, Mandarin and Lemon replicated were collected three times biweekly. The samples were examined in the laboratory as soon as possible after collection by the aid of

aStereomicroscope. Mite numbers on upper and lower leaf surfaces were recorded. Mite species were examined microscopically and identified.

The comparison between the effect of air temperature and relative humidity (R.H.) on the presence of mite species associated with some citrus varieties during seasons 12/2013, 13/2014. at Assuit and Kafr El-Shikh governorates. The data were subjected to statistical analysis.

## RESULTS AND DISCUSSION

### Comparison the Population density of *P. citri* (McGregor) infested three citrus varieties during season 12/2013 in Assuit and Kafr El-Sheikh.

#### A. Seasonal abundance of *p. citri* on Balady orange variety .

Data presented in table (1) and fig. (1) demonstrated that, the population density of *P. citri* infested Balady orange variety during the season 12 / 2013 in Assuit, where the mean values of infestation were 7.75, 10.00, 4.75, 1.50 and 2.50 individuals in June, July, Aug., Nov. and Feb. months for Balady. at temperatures of 31.40, 32.35, 30.07, 19.89 and 14.83 °C and relative humidity of 25.36, 36.47, 40.22, 59.18 and 59.36 % respectively., but in the season 12/2013 in Kafr El-Sheikh, these values were 16.75, 24.00, 24.50, 30.50, 63.25, 96.25, 39.00, 26.75, 4.25, 4.00 and 1.00 individuals at temperature 22.80, 25.80, 28.45, 29.23, 29.83, 27.50, 25.28, 20.39, 15.97, 13.40 and 14.87°C and relative humidity of 63.53, 62.87, 65.18, 68.53, 68.52, 67.45, 70.27, 75.31, 72.74, 77.99 and 77.04% in April, May, June, July, Aug., sept., Oct., Nov., Dec., Jan., and Feb. respectively.

Other months were showed free from infestation for Balady, in April, May, Sept., Oct., Dec., Jan. And Mar. during the 12/2013 seasons, in Assuit.

The other months were showed free from infestation for Balady, on Mar. during the 2012/2013. seasons, at temperature of 18.43°C and relative humidity of 65.23 %, in Kafr El-Sheikh respectively.

In conclusion, the highest infestation for Balady orange were observed on Sept. at Kafr El-sheikh and July on Assuit. The other months were showed few numbers infestation for Balady orange, during season 12/2013 in Assuit.

#### B. Seasonal abundance of *P. citri* (McGregor) on Mandarin variety.

Data presented in table (1) and fig. (1) demonstrated that, the population density of *P. citri* (McGregor) infested Mandarin variety during the season 12 / 2013 in Assuit, where the mean values of infestation were 2.25, 6.50, 5.25, 2.00 and 0.50 individuals in June, July, Aug., Sept. and Nov., months for Mandarin, respectively. while in the season 12/2013 in Kafr El-Sheikh these values were 7.50, 8.00, 8.00, 8.50, 9.50, 12.00, 10.25, and 5.25, in individuals at temperature 22.80, 25.80, 28.45, 29.23, 29.83, 27.50, 25.28 and 20.39 °C and relative humidity of 63.53, 62.87, 65.18, 68.53, 68.52, 67.45, 70.27 and, 75.31% in April, May, June, July, Aug., sept., Oct. and Nov., respectively.

Other months were showed free from infestation by mite species for Mandarin, in April, May, Oct., Dec., Jan., Feb. And Mar., during the 12/2013

season, in Assuit. and on Dec., Jen., Feb. and Mar.in Kafr El-Sheikh.

In conclusion, the highest infestation were observed on Sept., at Kafr El-Sheikh and on July, at Assuit during season 12/2013.

**C. Seasonal abundance of *P. citri* (McGregor) on Lemon variety .**

Data presented in table ( 1 ) and fig. (1) demonstrated that, the population density of *P. citri* infested Lemon variete during the season 12 / 2013 in Assuit . where the mean values of infestation were 1.50, 1.50, 11.75, 3.25 and 1.25 individuals in May, June, July, Aug and Nov. months for Lemon, respectively. at temperatures of 29.07, 31.40, 32.35, 30.07 and 19.89 °C and relative humidity of 24.24, 25.36, 36.47, 40.22 and 59.59.18% respectively. but in the season 2012/2013 in Kafr El-Sheikh , these values were 16.25, 6.50, 8.25, 8.75, 10.00, 21.50, 5.00 and 8.75 in dividuals at temperature 22.80, 25.80, 28.45, 29.23, 29.83, 27.50, 25.28 and 18.43 °C and relative humidity of 63.53, 62.87, 65.18, 68.53, 68.52, 67.45, 70.27 and 65.23% in April, May, Juny, July, Aug, sept, Oct and Mar. respectively.

Other months were showed free from infestation for Lemon, in April, Sept., Oct., Dec., Jan., Feb. And Mar. during the 12/2013 seasons, in Assuit.

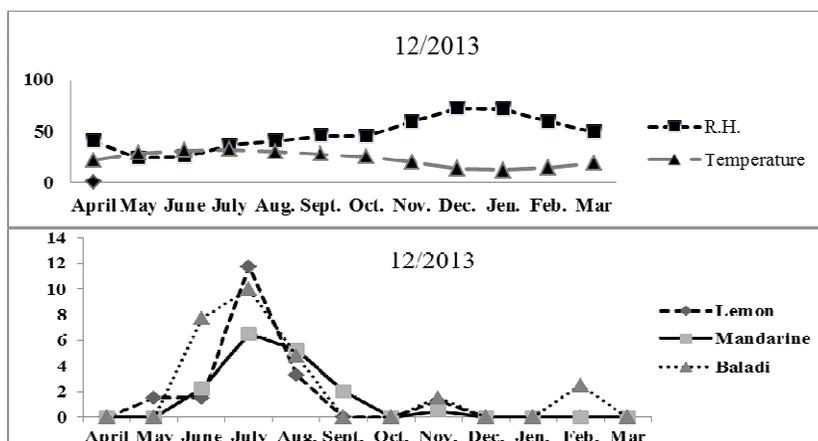
In Kafr El-Sheikh the other months, were showed free from infestation for Lemon, on Nov., Dec., Jen. and Feb. during the 12/2013. season, at temperature of 20.39, 15.97, 13.40 and 14.87°C and relative humidity of 75.31, 72.74, 77.99 and 77.04%, respectively.

In conclusion, the highest infestation for Lemon, were observed on Sept. at Kafr El-Sheikh and July on Assuit during season 2012/2013.

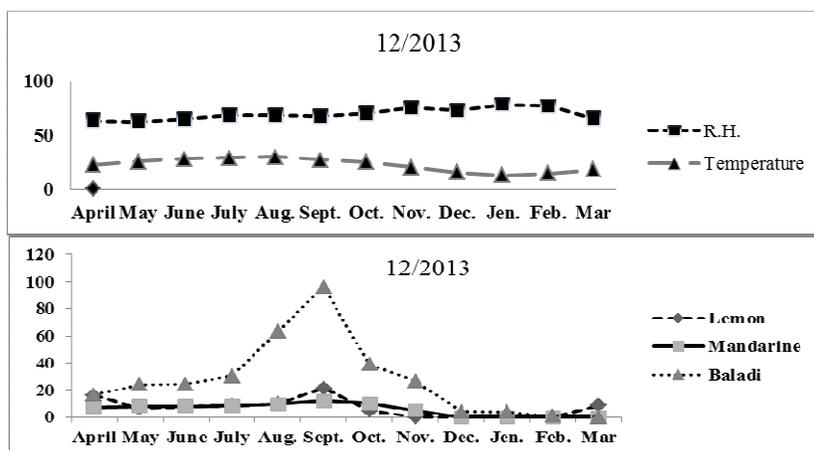
**Table ( 1 ) Comparison the Population density of *P. citri* (McGregor) infested three citrus varieties during seson 12/2013 in Assuit and Kafr El-Sheikh**

Months	Mean no. of moving stages / 25 leaves									
	12/2013 (Assuit)					12/2013 (Kafr El-sheikh)				
	Balady	Mandarin	Lemon	Mean of Temp.°C	R.H.	Balady	Mandarin	Lemon	Mean of Temp.°C	R.H.
April	0.00	0.00	0.00	22.07	40.32	16.75	7.50	16.25	22.80	63.53
May	0.00	0.00	1.50	29.07	24.24	24.00	8.00	6.50	25.80	62.87
June	7.75	2.25	1.50	31.40	25.36	24.50	8.00	8.25	28.45	65.18
July	10.00	6.50	11.75	32.35	36.47	30.50	8.50	8.75	29.23	68.53
Aug.	4.75	5.25	3.25	30.07	40.22	63.25	9.50	10.00	29.83	68.52
Sept.	0.00	2.00	0.00	28.21	45.70	96.25	12.00	21.50	27.50	67.45
Oct.	0.00	0.00	0.00	25.56	45.12	39.00	10.25	5.00	25.28	70.27
Nov.	1.50	0.50	1.25	19.89	59.18	26.75	5.25	0.00	20.39	75.31
Dec.	0.00	0.00	0.00	13.93	72.10	4.25	0.00	0.00	15.97	72.74
Jen.	0.00	0.00	0.00	12.57	71.40	4.00	0.00	0.00	13.40	77.99
Feb.	2.50	0.00	0.00	14.83	59.36	1.00	0.00	0.00	14.87	77.04
Mar	0.00	0.00	0.00	19.23	49.40	0.00	0.00	8.75	18.43	65.23
Total	26.50	16.50	19.25			330.25	69.00	85.00		

**Assuit**



**Kafr El-Sheikh**



**Fig. (1) Comparison the Population density of *P. citri* (McGregor) infested three citrus varieties during seson 12/2013 in Assuit and Kafr El-Sheikh**

**Comparison the Population density of *P. citri* (McGregor) infested three citrus varieties during seson13/2014 in Assuit and Kafr El-Sheikh**

**A. Seasonal abundance of *P. citri* (McGregor) on Balady orange variety**

Data presented in table (2) and fig. (2) demonstrated that, the population density of *P. citri* (McGregor) Balady orange variety during the season 13 / 2014 in Assuit , where the mean values of infestation were 7.00, 9.25, 3.50, 0.50, 0.50, 1.00, 2.00 and 1.50 individuals in June, July, Aug,

Sept, Nov, Jan, Feb and Mar. months for Balady orange at temperatures of 30.72, 31.87, 30.20, 29.30, 18.42, 12.40, 13.10 and 19.14°C and relative humidity of 27.24, 42.32, 45.42, 47.75, 62.15, 63.31, 52.22 and 46.40% respectively., but in the season 13/2014 in Kafr El-Sheikh, these values were 17.00, 24.50, 27.50, 35.00, 59.00, 90.75, 39.75, 22.75, 2.50, 1.50 and 1.00 in individuals at temperature 20.95, 26.62, 28.20, 28.31, 29.27, 27.71, 23.60, 20.26, 14.07, 14.41 and 17.32°C and relative humidity of 58.96, 60.40, 62.95, 67.13, 72.07, 68.80, 66.79, 75.71, 79.84, 79.52 and 71.45% in April, May, June, July, Aug., sept., Oct., Nov., Dec., Feb. and Mar. respectively.

Other months were showed free from infestation for Balady orange in April, May, Oct. and Dec. during the 13/2014 season, in Assuit.

In Kafr El-Sheikh the other months were showed free from infestation for Balady orange on Jan., during the 13/2014. season.

In conclusion, the highest infestation for Balady orange were observed on July at Assuit and Sept. on Kafr El-Sheikh during 2013/2014 .

#### **B. Seasonal abundance of *P. citri* (McGregor) on Mandarin variety .**

Data presented in table (2) and fig. (2) demonstrated that, the population density of *P. citri* (McGregor) infested Mandarin variety during the season 13 / 2014 in Assuit . where the mean values of infestation were 1.25, 1.25, 3.25 and 1.25 individuals in June, July, Aug. and Nov. months for Mandarin, respectively. at temperatures of 30.72, 31.87, 30.20. and 18.42°C and relative humidity of 27.24, 42.32, 45.42. and 62.15% respectively. while in the season 13/2014 in Kafr El-Sheikh these values were 7.00, 7.50, 7.75, 8.00, 8.25, 11.75, 6.25. and 2.25 in individuals in April, May, June, July, Aug., sept., Oct . and Nov. respectively.

Other months were showed free from infestation by mite species for Mandarin, in April, May, Sept., Oct., Dec., Jan., Feb. and Mar. during the 13/2014 season, in Assuit and on Dec, Jan, Feb and Mar. in Kafr El-Sheikh.

In conclusion, the highest infestation were observed on Aug. at Assuit and on Sept. at Kafr El-Sheikh during the season 13/2014.

#### **C. Seasonal abundance of *P. citri* (McGregor) on Lemon variety .**

Data presented in table (2) and fig. (2) demonstrated that, the population density of *P. citri* (McGregor) infested Lemon variety during the season 13 / 2014 in Assuit , where the mean values of infestation were 0.50, 1.25, 1.50, 10.00 and 1.00 individuals in April, May, June, July. and Aug., months for Lemon, respectively. While in the season 13/2014 in Kafr El-Sheikh these values were 16.50, 7.25, 10.50, 11.25, 13.00, 27.00, 4.25, 1.00, 5.25 and 4.25 in individuals at temperature 20.95, 26.62, 28.20, 28.31, 29.27, 27.71, 23.60, 13.94, 14.41 and 17.32°C and relative humidity of 58.96, 60.40, 62.95, 67.13, 72.07, 68.80, 66.79, 82.12, 79.52 and 71.45% in April, May, June, July, Aug, sept, Oct, Jan, Feb and Mar. respectively.

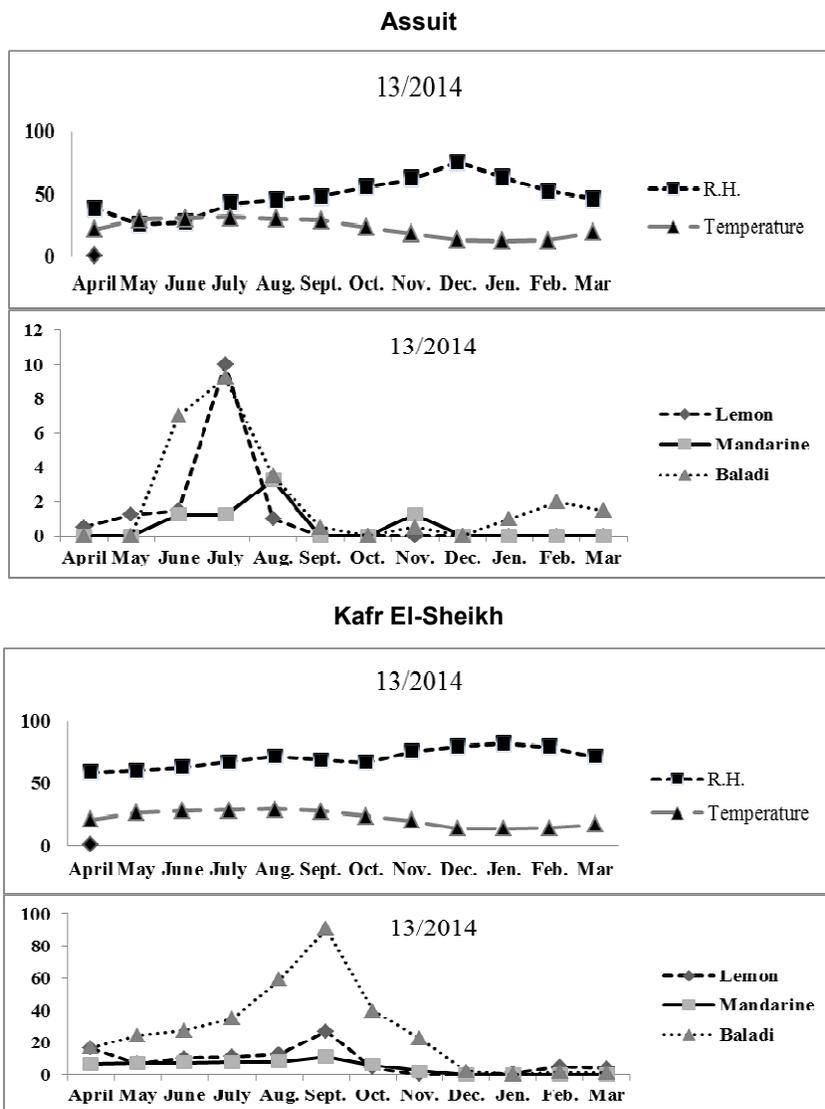


Fig. (2) Comparison the Population density of *P. citri* (McGregor) infested three citrus varieties during seson13/2014 in Assuit and Kafr El Sheikh.

The other month were showed free from infestation for Lemon, in Sept, Oct, Nov, Dec, Jen, Feb. And Mar. During the 13/2014 seasons, in Assuit at temperature of 29.30, 23.60, 18.42, 13.24, 12.40, 13.10 and 1914 °C and

relative humidity of 47.75, 55.60, 62.15, 75.42, 63.31, 52.22 and 46.40% respectively.

In Kafr El-Sheikh other months were showed free from infestation for Lemon, on Nov, and Dec. during the 13/2014. seasons, at temperature of 20.26 and 14.07 °C and relative humidity of 75.71 and 79.84%, respectively.

In conclusion, the highest infestation for Lemon, were observed on July at Assuit and Sept. on Kafr El-Sheikh.

**Table ( 2 ) Comparison the Population density of *P. citri* (McGregor) infested three citrus varieties during seson13/2014 in Assuit and Kafr El- Sheikh .**

Months	Mean no. of moving stages / 25 leaves									
	13/2014 (Assuit)					13/2014 (Kafr El-Sheikh)				
	Balady	Mandarin	Lemon	Mean of Temp. °C	R.H.	Balady	Mandarin	Lemon	Mean of Temp. °C	R.H.
April	0.00	0.00	0.50	22.07	38.31	17.00	7.00	16.50	20.95	58.96
May	0.00	0.00	1.25	29.81	25.80	24.50	7.50	7.25	26.62	60.40
June	7.00	1.25	1.50	30.72	27.24	27.50	7.75	10.50	28.20	62.95
July	9.25	1.25	10.00	31.87	42.32	35.00	8.00	11.25	28.31	67.13
Aug.	3.50	3.25	1.00	30.20	45.42	59.00	8.25	13.00	29.27	72.07
Sept.	0.50	0.00	0.00	29.30	47.75	90.75	11.25	27.00	27.71	68.8
Oct.	0.00	0.00	0.00	23.60	55.60	39.75	6.25	4.25	23.60	66.79
Nov.	0.50	1.25	0.00	18.42	62.15	22.75	2.25	0.00	20.26	75.71
Dec.	0.00	0.00	0.00	13.24	75.42	2.50	0.00	0.00	14.07	79.84
Jen.	1.00	0.00	0.00	12.40	63.31	0.00	0.00	1.00	13.94	82.12
Feb.	2.00	0.00	0.00	13.10	52.22	1.50	0.00	5.25	14.41	79.52
Mar	1.50	0.00	0.00	19.14	46.40	1.00	0.00	4.25	17.32	71.45
Total	25.25	7.00	14.25			321.25	58.25	100.25		

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### مقارنة الكثافة العددية للنوع *Panonychus citri* المرتبط بأشجار الموالح فى محافظة أسيوط وكفر الشيخ

عبدالستار محمد متولى , كرم محمد السيد , محمد أبو الحمد عبدالمقصود أبو شوشة و عماد عبدالغفار الشامى

- ١- قسم الحيوان الزراعى والنيماتودا بكلية الزراعة جامعة الأزهر بالقاهرة .
- ٢- قسم أكاروسات الفاكهة بمعهد وقاية النبات بمركز البحوث الزراعية بالجيزة .
- ٣- قسم الحيوان الزراعى والنيماتودا بكلية الزراعة جامعة الأزهر فرع أسيوط .

أجريت دراسة لمعرفة تذبذب أعداد حلم الموالح الأحمر *Panonychus citri* على ثلاثة أنواع من الموالح وهى البرتقال البلدى والليمون البلدى واليوسفى فى محافظة كفر الشيخ وأسيوط خلال عامين ٢٠١٢، ٢٠١٣، ٢٠١٣/م ٢٠١٤، ٢٠١٤م .

وأوضح من خلال الدراسة أن هناك ارتباط بين أعداد الحلم ودرجات الحرارة والرطوبة حيث وجد أن أعلى تعداد للحلم كان فى شهر سبتمبر على أنواع الموالح الثلاثة خلال الموسمين ٢٠١٢، ٢٠١٣، ٢٠١٣/م ٢٠١٤، ٢٠١٣م فى محافظه كفر الشيخ . بينما كانت الكثافة العددية للحلم عاليه فى محافظة أسيوط فى شهر يوليو على أنواع الموالح الثلاثة خلال الموسمين المذكورين سابقاً ماعدا اليوسفى حيث كانت الكثافة العددية عاليه فى شهر أغسطس خلال الموسم الثانى (٢٠١٣-٢٠١٤م). كما وجد من خلال النتائج أن الكثافة العددية فى محافظة كفر الشيخ كانت أعلى من الكثافة العددية فى محافظة أسيوط وهذا يرجع إلى زياده نسبه الرطوبه فى محافظه كفر الشيخ كما وجد أن البرتقال البلدى كان أكثر الأنواع الثلاثة إصابه بالحلم .