J. Plant Prot. and Path., Mansoura Univ., Vol.8 (2), 95 – 99, 2017

Biological Studies on Aphid Species Infesting Citrus Varieties

Eldafrawy, B. M.
Depart. of Economic Ent. and Agric. Zool. , Fac. of Agric ., Menoufia University, Menoufia Governorate, Egypt

ABSTRACT

The biological aspects of two aphid species, *Aphis gossypii,* and *Aphis craccivora* reared on three citrus varieties (*Citrus sinensis, C. reticulate, C. aurantifolia*) were studied under green house conditions of the Faculty of Agriculture, Menoufia University. The obtained results showed that the biological aspects were varied among the three citrus varieties. The longest generation period for both aphid species under study were 14.21 days as overall average for *Aphis gossypii* and 16.86 days for *Aphis craccivora* on lime seedlings , whereas the shortest generation period was recorded on Navel orange as 10.25 and 10.58 days for *A. gossypii, A. craccivora* , respectively. The longest parturition period for *A. gossypii* were 13.58 days as overall average on mandarin and was 10.72 days for *A. craccivora* on navel orange , whereas the shortest parturition period was recorded on lime as 9.88 for *A. gossypii,* and 9.18 days for *A. craccivora* on lime seedlings. The longest averages of life cycle was recorded for *A. gossypii* on mandarin as 26.11 days , and it was 27.0 days for *A. craccivora* on lime , whereas the shortest life cycle was recorded on navel orange as 23.66 days for *A. gossypii,* and 9.18 days for *A. craccivora* on the same variety. As for the adult longevity , the longest period was 17.45 days for *A. gossypii* females on navel orange, and was 15.05 days as overall average for *A. craccivora* on mandarin , whereas the shortest adult longevity period was recorded on lime as 14.5 and 13.7 days for *A. gossypii,* and *A. craccivora* on lime seedlings. It could be concluded that navel orange was more preferable host for the two aphid species compared with the other citrus varieties.

Keywords: *Aphis gossypii, Aphis craccivora,* biology, citrus varieties, Aphid**.**

INTRODUCTION

Citrus orchards occupied an important role in the national economic in many countries specially in Egypt. Citrus insect pests are the most serious pests in Egypt , causing considerable damage to citrus crops. *Aphis gossypii* Glover is an important agricultural pest because it has a broad host range, and transmits many agriculturally important plant viruses. Damage is direct through feeding which can kill the host, but also productivity is reduced long before plant death (Andrews and Kitten 1989, Cartwright 1992). Damage is indirect through contamination with aphid honeydew and by vectoring viral pathogens. Honeydew causes economic loss through physical contamination and through providing a nutrient source for fungi that contaminate produce and reduce photosynthesis rates by blocking sunlight.

The cotton aphid, *Aphis gossypii* Glover, is an agriculturally important pest. It colonizes N600 host plants and transmits N50 plant viruses (Blackman and Eastop, 2006; Ebert and Cartwright, 1997). The cowpea aphid (*Aphis craccivora*) has become a serious insect pest in Egypt on a variety of legumes such as faba bean, cowpea and pea (El-Ghareeb *et al*., 2002). A. craccivora causes major yield losses not only by sucking plant sap but also by transmission of two major viruses; faba bean necrotic yellows virus and bean leaf roll virus (Laamari *et al*., 2008). Moreover, while feeding; *A. craccivora* can inject a powerful toxin into the plant causing stunting and killing the plant (Anonymous, 2015).

In Egypt, Fifteen aphid species attacking citrus trees were collected from six locations in Egypt among them *Aphis gossypii* Glover and *Aphis craccivora* Koch (Aphididae : Homoptera). Moreover, Attia (1983) ; Attia *et al* .(1990) , El–Nagar (1974) , El–Nagar *et al* . (1982) and Ismail , *et . al*. (1986) conducted studies on some aphid species.

Aphids generally cause great damage to citrus trees , The symptoms of this damage on citrus is the weakening of the plant vigor , curling of its leaves and the production of stunt plants (Darwish *et al* ., 1994, Komazaki *el al* .,1979 and komazaki , *et al.* , 1983) . Few authors studied the biology of aphid on citrus varieties and other host plants (Shim *et . al* , 1979 ; Mendoza *et . al*., 1997 and Satar *et al*., 1998). In Egypt , El–Nagar *et al*. (1984) studied the seasonal abundance of *Aphis gossypii* Glover on certain fruit trees by weekly samples for 1 year on the Noval and Baladi varieties of orange (*Citrus sinensis* var. nobilis and *C. sinensis* var. baladi), lime (*C. aurantiifolia*), mandarin, guava, apple and pear trees in Qualubia Province, Egypt, and found that aphid insects were abundant along February to September whenever suitable food plants were available. Moreover, *Aphis gossypii* Glover is a destructive pest of over two dozen crops world wide. Damage to a few of these crops is due to direct feeding, but for most of these crops its impact is through its role as a virus vector (Timothy and Cartwright 1997).

From the previous view, this article was conducted to study the biology of two aphid species, *Aphis gossypii,* and *Aphis craccivora* reared on three citrus varieties under green house conditions.

MATERIALS AND METHODS

Biological studies on *Aphis gossypii* and *Aphis craccivora* were carried out on three varieties(orange *Citrus sinensis* Variety Navel , mandarin *C. reticulate* Variety Balady and lime *C. aurantifolia* Variety Balady) under greenhouse conditions , from September to November for *A.craccivora* and from May to July for *A.gossypii* 2015 in the Economic Entomology of the Faculty of Agriculture , Menoufia University.

To study the life cycle of *A. gossypii* and *A. craccivora* on the considered citrus varieties under greenhouse conditions healthy seedlings of each variety were chosen and kept under greenhouse conditions. Twenty apterous viviparous females of both the two aphid species were transferred to each seedling and only a single nymph was kept under perforated transparent plastic cage until death . The seedlings were examined

daily and durations of nymph stage , preparturition , parturition , and post parturition periods , and adult stages were estimated for three months (May, June , and July, 2015).

The experiment of *Aphis gossypii* was carried out during May, June, and July, 2015 , while it was during September, October, and November, 2015 for *A. craccivora* .

RESULTS AND DISCUSSION

To study the biology of the two aphid species (*Aphis gossypii*, *A. craccivora*) three citrus varieties seedlings were potted (navel orange , mandarin and lime) . Gravid aphid females were transferred to the previous citrus seedlings . The female progeny was observed from the beginning of birth until the death. The obtained results presented in Tables (1 to 6) concluded the effect of citrus varieties on the durations of some biological aspects of *Aphis gossypii* and *A. craccivora*.

1 – Biology of *Aphis gossypii*:

Nymphal stage :

First instar : data in Tables (1,2,3,7) showed that the duration periods were ranged between 1.33 to 2.47, days on the three citrus varieties along the three months of rearing, however, the grand mean period of the first instar were lasted 1.36,1.97and 2.26 days on the three citrus verities(navel orange , mandarin and lime) respectively**.**

Table 1. Biological aspects of *Aphis gossypii* infest Navel orange seedlings along three months under green house conditions

Biological aspects	May,2015	Navel Orange June,2015	July,2015
		Stage period in Days ± SE	
1st instar	1.43±0.51	1.33±0.49	1.33±0.49
2nd instar	2.00±0.00	2.07±0.26	1.33±0.49
3rd instar	2.00±0.00	2.00±0.00	2.07±0.26
4th instar	2.00±0.00	2.00±0.00	2.07±0.26
Generation time	10.21±0.61	10.37±0.74	10.17±0.98
Life span	23.71±0.73	23.87±1.55	23.40±1.06
Pre parturition	2.11±0.56	2.33±0.49	2.13±0.35
Parturition	12.36±0.93	12.47±1.46	12.13±0.74
Post parturition	1.64±0.50	1.53±0.52	1.53±0.52
Adult longevity	16.11±0.84	16.33±1.50	15.80±0.86

Table 2. Biological aspects of *Aphis gossypii* infest Balady mandarin seedlings along three months under green house conditions

Biological aspects	May,2015	Balady mandarin June,2015	July,2015
		Stage period in Days ± SE	
1st instar	1.69±0.60	2.47±0.52	1.75±0.68
2nd instar	1.19±0.40	2.47±0.52	2.31±0.48
3rd instar	2.00±0.00	2.40±0.51	2.19±0.40
4th instar	2.00±0.00	2.27±0.46	2.19±0.40
Generation time	10.63±0.81	12.00±1.57	11.00±1.41
Life span	25.63±0.96	28.33±1.45	24.38±1.20
Pre parturition	2.25±0.45	2.27±0.46	2.06±0.25
parturition	14.00±1.10	14.73±1.71	12.00±1.27
Post parturition	1.50±0.52	1.67±0.49	1.88±0.50
Adult longevity	17.75±1.29	18.67±0.63	15.94±1.00

Table 3. Biological aspects of *Aphis gossypii* infest Balady lime seedlings along three months under green house conditions

Biological aspects	May,2015	Lime June,2015	July,2015
		Stage period in Days ± SE	
1st instar	2.36±0.75	2.29±0.83	2.14±0.95
2nd instar	2.79±0.43	2.57±0.51	2.93±0.27
3rd instar	2.79±0.43	2.57±0.51	3.29±0.47
4th instar	2.86±0.54	2.64±0.50	2.36±0.50
Generation time	14.21±2.09	13.29±2.64	15.14±0.45
Life span	25.71±1.94	24.93±2.37	25.50±1.56
Pre parturition	2.86±0.77	2.64±0.63	2.93±0.48
parturition	9.93±0.62	10.36±1.01	9.36±1.28
Post parturition	2.14±0.54	1.86±0.54	1.43±0.76
Adult longevity	14.93±0.92	14.86±1.03	13.71±1.27

Second instar : data in Tables (1,2,3,7) showed that the duration periods were ranged between 1.19 to 2.93, days on the three citrus varieties along the three months of rearing, however, the grand mean period of the second instar were lasted 1.8,1.99and 2.76 days on the three citrus verities(navel orange , mandarin and lime) respectively.

Third instar : data in Tables (1,2,3,7) showed that the duration periods were ranged between 2 to 3.29, days on the three citrus varieties along the three months of rearing, however, the grand mean period of the third instar were lasted 2.02,2.2 and 2.88 days on the three citrus verities(navel orange , mandarin and lime) respectively.

Fourth instar : data in Tables (1,2,3,7) showed that the duration periods were ranged between 2 to 3.29, days on the three citrus varieties along the three months of rearing, however, the grand mean period of the fourth instar were lasted 2.02,2.15 and 2.62 days on the three citrus verities(navel orange , mandarin and lime) respectively.

Generation period :

The obtained results in Tables (1,2,3,7) revealed that the highest generation period of *A. gossypii* was 15.14 days on lime , while the lowest one was observed on Navel orange (10.17 days). Meanwhile the grand mean period was 10.25, 11.21, 14.21 days on the tested varieties (navel, mandarin, lime) respectively.

Life span :

The period of different individuals which lasted from the beginning of nymph stage until the end of female life showed that (Tables 1,2,3,7) the minimum life span was 23.4 days on navel orange during July, and the maximum was recorded with Mandarin (28.33 days) during June month. Meanwhile the grand mean period was 23.66, 26.11, 25.38 days on the tested varieties (navel, mandarin, lime) respectively.

Adult longevity:

Pre-parturition period :

The shortest period of mature aphid female life was recorded on Mandarin during July (2.06 days) , while the longest duration period was 2.93 days on Lime during July (Tables 1,2,3,7). Meanwhile the grand mean period was 2.19, 2.19, 2.81 days on the tested varieties (navel, mandarin, lime) respectively.

Parturition period :

The shortest parturition period was recorded on lime during July (9.36 days) , while the longest parturition period was 14.73 days on Mandarin during June (Tables 1,2,3,7). Meanwhile the grand mean period was 12.32, 13.58, 9.88 days on the tested varieties (navel, mandarin, lime) respectively.

Post parturition period :

Aphid females survived after the end of birth a period differed slightly on the tested citrus varieties ranged between 1.43 to 2.14 days . Meanwhile the grand mean period was 1.57, 1.68, 1.81 days on the tested varieties (navel, mandarin, lime) respectively.

Longevity :

Data in Tables (1,2,3,7) showed that the adult longevity of *Aphis gossypii* reared on three citrus varieties was ranged between 13.71 to 18.67 days. The grand mean longevity periods were 16.08, 17.45, 14.5 days on navel orange , mandarin, lime , respectively.

2 . Biology of *Aphis craccivora* :

Nymphal stage :

First instar : data in Tables (4,5,6,7) showed that the duration periods were ranged between 1.79 to 2.94, days on the three citrus varieties along the three months of rearing, however, the grand mean period of the first instar were lasted 2.05,2.39 and 2.79 days on the three citrus verities(navel orange , mandarin and lime) respectively.

Second instar : data in Tables (4,5,6,7) showed that the duration periods were ranged between 2 to 3.93, days on the three citrus varieties along the three months of rearing, however, the grand mean period of the second instar were lasted 2.06,2.54,3.46 and 2.76 days on the three citrus verities(navel orange , mandarin and lime) respectively.

Third instar : data in Tables (4,5,6,7) showed that the duration periods were ranged between 2.12 to 3.71, days on the three citrus varieties along the three months of rearing, however, the grand mean period of the third instar were lasted 2.2,2.45 and 3.34 days on the three citrus verities(navel orange , mandarin and lime) respectively.

Fourth instar : data in Tables (4,5,6,7) showed that the duration periods were ranged between 2 to 3.64, days on the three citrus varieties along the three months of rearing, however, the grand mean period of the fourth instar were lasted 2.11,2.61 and 3.27 days on the three citrus verities(navel orange , mandarin and lime) respectively.

Generation period :

The obtained results in Tables (4,5,6,7) revealed that the highest generation period of *A. craccivora* was 18.07 days on lime , while the lowest one was observed on Navel orange (10.5 days). Meanwhile the grand mean period was 10.58, 12.54, 16.86 days on the tested varieties (navel, mandarin, lime) respectively.

Life span:

The period of different individuals which lasted from the beginning of nymph stage until the end of female life showed that (Tables 4,5,6,7) the minimum life span was 22.71 days on navel orange during November, and the maximum was recorded with Lime (28.5 days) during September month. Meanwhile the grand mean period was 23.10, 23.82, 27.06 days on the tested varieties (navel, mandarin, lime) respectively.

Adult longevity:

Pre-parturition period:

The shortest period of mature aphid female life was recorded on Navel orange during October and November (2.12 days) , while the longest duration period was 3.13 days on Lime during October (Tables 4,5,6,7). Meanwhile the grand mean period was 2.15, 2.54, 2.99 days on the tested varieties (navel, mandarin, lime) respectively.

Parturition period:

The shortest parturition period was recorded on Mandarin during November (8.47 days) , while the longest parturition period was 10.79 days on Navel orange during September (Tables 4,5,6,7). Meanwhile the grand mean period was 10.72, 9.51, 9.18 days on the tested varieties (navel, mandarin, lime) respectively.

Post parturition period:

Aphid females survived after the end of birth a period differed slightly on the tested citrus varieties ranged between 1.5 to 2.4 days. Meanwhile the grand mean period was 2.28, 2.19, 1.52 days on the tested varieties (navel, mandarin, lime) respectively.

Longevity:

Data in Tables (4,5,6,7) showed that the adult longevity of *Aphis craccivora* reared on three citrus varieties was ranged between 12.93 to 15.67 days. The grand mean longevity periods were 15.05, 14.24, 13.7 days on Navel orange , Mandarin, Lime , respectively.

Table 4. Biological aspects of *Aphis craccivora* infest Navel orange seedlings along three months under green house conditions

Biological aspects	Navel Orange		
	September,2015	October,2015	November,2015
	Stage period in Days ± SE		
1st instar	1.79±0.47	2.27±0.83	2.09±0.62
2nd instar	2.00±0.00	2.12±0.33	2.06±0.24
3rd instar	2.29±0.47	2.12±0.33	2.18±0.39
4th instar	2.29±0.47	2.03±0.28	2.00±0.00
Generation time	10.57±0.92	10.68±1.51	10.50±0.87
Life span	23.36±1.39	23.24±1.75	22.71±0.92
Pre parturition	2.21±0.43	2.12±0.33	2.12±0.33
Parturition	10.79±0.48	10.77±1.20	10.59±0.94
Post parturition	2.36±0.50	2.29±0.59	2.18±0.53
Adult longevity	15.21±1.25	15.06±1.03	14.88±0.86

Table 5. Biological aspects of *Aphis craccivora* infest Balady mandarin seedlings along three months under green house conditions

Biological aspects	Mandarin		
	September,2015	October,2015	November,2015
	Stage period in Days ± SE		
1st instar	1.97±0.64	2.50±0.82	2.70±0.78
2nd instar	2.60±0.51	2.50±0.52	2.53±0.52
3rd instar	2.27±0.46	2.56±0.51	2.53±0.52
4th instar	2.67±0.62	2.63±0.50	2.53±0.52
Generation time	11.90±1.45	12.75±1.98	12.97±2.48
Life span	24.93±1.49	23.81±1.64	22.73±2.19
Pre parturition	2.40±0.51	2.56±0.51	2.67±0.49
parturition	10.87±0.35	9.19±0.83	8.47±0.83
Post parturition	2.40±0.51	2.38±0.50	1.80±0.41
Adult longevity	15.67±0.62	14.13±0.81	12.93±0.88

Table 6. Biological aspects of *Aphis craccivora* infest Balady lime seedlings along three months under green house conditions

Biological aspects	Lime		
	September,2015	October,2015	November,2015
	Stage period in Days ± SE		
1st instar	2.93±0.85	2.94±0.51	2.50±0.73
2nd instar	3.93±0.48	3.25±0.45	3.19±0.40
3rd instar	3.71±0.47	3.25±0.45	3.06±0.25
4th instar	3.64±0.63	3.19±0.40	3.00±0.00
Generation time	18.07±1.34	16.75±1.73	15.75±1.00
Life span	28.50±0.86	26.31±1.40	26.38±1.36
Pre parturition	2.86±0.36	3.13±0.34	3.00±0.00
Parturition	9.36±0.75	8.56±0.81	9.63±1.20
Post parturition	1.57±0.51	1.50±0.52	1.50±0.52
Adult longevity	13.79±0.80	13.19±0.83	14.13±1.03

Table 7. Grand mean periods of *Aphis gossypii* and *Aphis craccivora* infest citrus seedlings under green house conditions

Biological aspects	Aphis gossypii			Aphis craccivora		
	Navel orange	Mandarin	Lime	Navel orange	Mandarin	Lime
	Grand mean period in Days					
1st instar	1.36	1.97	2.26	2.05	2.39	2.79
2nd instar	1.8	1.99	2.76	2.06	2.54	3.46
3rd instar	2.02	2.20	2.88	2.20	2.45	3.34
4th instar	2.02	2.15	2.62	2.11	2.61	3.27
Generation time	10.25	11.21	14.21	10.58	12.54	16.86
Life span	23.66	26.11	25.38	23.10	23.82	27.06
Pre parturition	2.19	2.193	2.81	2.15	2.54	2.99
parturition	12.32	13.58	9.88	10.72	9.51	9.18
Post parturition	1.57	1.68	1.81	2.28	2.19	1.52
Adult longevity	16.08	17.45	14.5	15.05	14.24	13.70

From the previous results it could be concluded that the shortest generation period was recorded on Navel orange as 10.25 and 10.58 days for *A. gossypii, A. craccivora* , respectively, and the shortest parturition period was recorded on lime as 9.88 for *A. gossypii,* and 9.18 days for *A. craccivora* on lime seedlings, moreover the shortest life cycle was recorded on navel orange as 23.66 days for *A. gossypii,* and 9.18 days for *A. craccivora* on the same variety, while the shortest adult longevity period was recorded on lime as 14.5 and 13.7 days for *A. gossypii,* and *A. craccivora* on lime seedlings. It could be concluded that navel orange was more preferable host for the two aphid species compared with the other citrus varieties.

REFERENCES

Andrews, G. L., and W. F. Kitten (1989). How cotton yields are affected by aphid populations which occur during boll set. Proceedings of the Beltwide Cotton Conference National Cotton Council of America Book 1:291- 293.

Anonymous, (2015). UC IPM: Cowpea Aphid on Alfalfa-UC Pest Management Guidelines. UC ANR Publication, pp. 3e30.

Attia , A . A (1983). Studies on the aphid fauna of fruit trees in Egypt . Ph. D. Thesis , Fac. of Agric. Cairo University

Attia M . B and M. F Mansour (1990).Susceptibility of four deferent apple rootstocks to certain injurious pests in correlation to their growth habit and some micro-nutrient contents . Menoufia J . Agric . Res 15 (2) : 1971 – 1983

Blackman, R.L., and Eastop, V.F., (2006). Aphids of the world's Herbaceous Plants and Shrubs-an Identification and Information Guide. John Wiley Inc., New York, NY.

Cartwright, B. (1992). Assessment of damage to watermelon by Aphis gossypii (Homoptera: Aphididae). Proceedings XIX international congress of entomology, China.

Darwish E. T.; H. Hedaya Karam ; A . A. Abo–Shaesha and F. S . El-Santil (1994). Aphids attacking fruit trees and associated natural enemies in Egypt . Alex . J . Agric . Res . 39 (2) 231 – 252.

Ebert, T., and Cartwright, B., (1997). Biology and ecology of Aphis gossypii glover (Homoptera: Aphididae). Southwest. Entomol 22, 116–153.

El-Ghareeb, M., Nasser, M.A.K., El-Sayed, A.M.K., and Mohamed, G.A., (2002). Possible mechanisms of insecticide resistance in cowpea aphid, Aphis craccivora (Koch). The role of general esterase and oxidase enzymes in insecticide resistance of cowpea. In: The First Conf. of the Central Agric. Pesticide Lab., 3-5 Sep., 2, pp. 635e649.

El–Laithy K.H. (1974). Studies on aphids infesting citrus plants in Egypt and its control . (M. Sc. Thesis, Fac. Agric., Ain Shams University) .

El–Nagar, S.; I. I. Ismail, and A. A. Attia (1984). Seasonal abundance of *Aphis gossypii* Glover on certain fruit trees . Bulletin De la Societe Entomologique d ' Egypte . 65 , 27 – 32.

Ismail , I . I . ; S . EL – Nagar and A . A . Attia (1986). The aphid fauna of fruit trees in Egypt . African , J. of Agric. Sciences . Publ . 13 (1 – 2) : 1 – 7 .

Komazaki , S.; K . Matsumoto and K. Matsumoto (1983).Life cycles and population fluctuations of aphids on citrus . Proceedings of the International Society of Citriculture 1981. 2 : 962 – 695 .

Komazaki , S,; Y . Sakamagi and R.Korenaga (1979) . Over wintering of aphids on citrus trees . Japanese J. of App. Ento. and Zoology . 23 (4) : 256 – 250 .

Laamari, M., Khelfa, L., and Coeur d'Acier, A., (2008). Resistance source to cowpea aphid (*Aphis craccivora* Koch) in broad bean (Vicia faba L.) Algerian landrace collection. Afr. J. Biotechnol. 7, 2486e2490.

Timothy A Ebert and B.O. Cartwright (1997). Biology and ecology of *Aphis gossypii* (Homoptera: Aphidiae). Southwestern Entomologist 22(1):116-153.

تأثير بعض أصناف الموالح على النواحى البيولوجية لنوعين من انواع المن

باسم محمد الدفراوي

قسم الحشرات الاقتصادية والحيوان الزراعى – كلية الزراعة – جامعة المنوفية

أجريت هذه الدراسة لمعرفة تأثير العائل النباتى على النواحي البيولوجية لنوعين من انواع المن حيث تمت تربية حشرات نوعى المن (من القطن – من اللوبيا) على ثلاثة أصناف من شتلات الموالح (أبو سرة- اليوسفى البلدى – الليمون البلدى) ، حيث تم عمل عدوى بنوعى المن للشتلات داخل الصوبة ومتابعة تطور الاطوار المختلفة للمن وحساب مدة هذه الاطوار . وكانت أهم النتائج مايلى : كانت أطول فترة استغرقها الجيل (generation time) للنوعيين تحت الدراسة للإناث على شتلات الليمون البلدى بمتوسطات 14.21 يوم فى من القطن *Aphis gossypii* ، 16.86 يوم فى من اللوبيا *Aphis craccivora* ، بينما سجلت اقصر فترة استغرقها الجيل لكلا النوعين على صنف ابو سرة حيث سجلت 10.25 يوم لمن القطن ، 10.58 يوم لمن اللوبيا . كانت أطول فترة وضع الاناث للحوريات (parturition period) على صنف اليوسفي البلدى بالنسبة لمن القطن بينما اطول فترة سجلتها اناث حشرة من اللوبيا كانت على صنف البرتقال ابو سرة حيث سجلا متوسط فترات 13.58 ، 10.72 يوما على التوالي طوال فترة الدراسة ، بينما كان اقصر متوسط فترات وضع الحوريات لمن القطن على صنف الليمون البلدي بمتوسط 9.88 يوم ، اما من اللوبيا فقد سجلت الاناث متوسط 9.18 يوما على نفس صنف الموالح. كان اطول متوسط فترات الحياة للاطوار المختلفة (life span) لحشرة من القطن على صنف اليوسفي البلدى بمتوسط 26.11 يوم حتى موت الحشرة الكاملة ، بينما سجلت حشرة من اللوبيا 27.0 يوم على صنف الليمون البلدي وكان اقصر متوسط تم تسجيله على صنف ابو سرة بمتوسط 23.66 يوم لمن القطن و 23.1 يوم لمن اللوبيا على نفس الصنف. اما عن طول فترة حياة الحشرة الكاملة (adult longevity) فقد سجلت اطول فترة على صنف اليوسفي البلدى بمتوسط 17.45 يوم لحشرة من القطن ، بينما كان لحشرة من اللوبيا بمتوسط 15.05 على صنف ابو سرة ، وكان اقصر فترات حياة هى 14.5 ، 13.7 يوم على صنف الليمون البلدي بالنسبة لكل من حشرتى من القطن ومن اللوبيا على التوالى. وهذه النتائج توضح أن البرتقال ابو سرة كان مفضلا لنمو وتطور حشرتى من القطن ومن اللوبيا مقارنة بالليمون البلدى واليوسفى البلدى ، حيث انه يوفر الاحتياجات الغذائية لنمو الأطوار الغير كاملة بينما يتساوى مع الصنفين الأخريين فيما يقدمه للحشرات الكاملة .