# HOST PREFERENCE OF THE PHYTOSSID MITE, *EUSEIUS SCUTALIS* (ATHIAS-HENRIOT)

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# ON SOME PESTS

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**Key Words:** *Euseius scutalis, Tetranychus urticae, Bemesia tabaci*, *Thrips tabaci*, *Aphis gossypii,* Palm pollen, Host preference.

**ABSTRACT:**

The present study was carried out in plant protection department laboratory, Fac. of Agric., Fayoum Univ. during 2018, and conducted under the optimum conditions of 27±1°C and 70±5% R.H. The predaceous mite, *Euseius scutalis* Athias-Henriot (Acari: Phytoseiidae) was reared on nymphs of *Bemesia tabaci* Genn, *Tetranychus urticae* Koch, *Thrips tabaci* Lind, *Aphis gossypii* Glover. and Palm pollen. The phytosiid mite preferred nymphs of *T. urticae* then *B. tabaci* and *T. tabaci,* while the nymphs of *A. gossypii* and palm pollen appeared as unsuitable hosts.

**INTRODUCTION**

Mites of Family Phtoseiidae are mostly present on plant surface and are predators of phytophagous mites and other small insect pests of various agricultural crops worldwide **(Al-Shammery 2010; Demite, *et al.*, 2014).**

The predacious mite, *Eusieus scutalis* Athias-Henriot (Phytoseiidae: Acari) is a common predator in Egypt and in the world **(Mahmoud, 1998; Rahil *et al.*, 2004; Sayed *et al*., 2006; Mostafa, 2012 and Fouly *et al.,* 2013).**

Predacious mites are important natural enemies of several phytophagous mite pests, eggs and hatched immature stages of various insects (Homoptera, Thysanoptera, Lepidoptera and Hemiptera) on various crops also have the ability to feed on other sources of food such as pollen grains, plant fluids, honeydew and artificial diets, .

Chemical pesticides caused several environmental problems, additional to their high expenses, e.g. appearance of pesticide resistant strains of pest and appeared more effective on the beneficial organisms. Many authors studied the effect of different pesticides on the phytosiid mite, *E. scutalis* and observed that the synthetic Pyrethroid, Organophosphates and Carbamates were more toxic to *E. scutalis* than to *T. urticae* **(El-Banhawy & Reda, 1988; Abo-El-Ella, 1993; Marzouk, 1997; El-Saadany *et al*., 1999; Rahil *et al.,* 2004; Ali & Laithy, 2005 and Sayed *et al*., 2006.).**

The objective of this study improves our knowledge about host preferences of five different food types under laboratory conditions on biological aspects of mature and immature stages of the predaceous mite, *E. scutalis*. The nymphs of the tetranychid mite, *Tetranychus urticae* Koch, cotton thrips, *Thrips tabaci* Lind, cotton whitefly, *Bemesia tabaci* Genn, cotton aphid, *Aphis gossypii* Glove. and the palm pollen were used as prey.

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**MATERIALS AND METHODS**

To study the host preference of the phytosiid mite, *E. scutalis* on four nymphs of *T. urticae*, *B. tabaci*, *T. tabaci* and *A. gossypii* addition on palm pollen grains, (table, 1) the biological aspects were conducted under the suitable laboratory conditions of 27±1°C and 70%R.H. **(El-Laithy and Fouly, 1992; Mahmoud, 1998; Rahil *et al*., 2004; Sayed *et al.,* 2006; Al-Shammery, 2011 and Fouly *et al*., 2013)** at plant protection department, Fac. of Agric., Fayoum Univ. The relative humidity was maintained by using saturated solution of Potassium hydroxide **(Abdel Gayed, 2004).** The needed pest cultures were gained as follows:

**Table (1): The hosts were used for rearing *E. scutalis*.**

|  |  |  |
| --- | --- | --- |
| **Host** | **Family** | **Stage** |
| ***Bemisia tabaci* Genn** | **Aleyrodidae** | **2nd instar nymphal** |
| ***Tetranychus urticae* Koch** | **Tetranychidae** | **Nymphs** |
| ***Thrips tabaci*** [**Lindeman**](https://en.wikipedia.org/w/index.php?title=Karl_Eduard_Lindeman&action=edit&redlink=1) | **Thripidae** | **Nymphs** |
| ***Aphis gossypii* Glover** | **Aphididae** | **Nymphs** |
| **Palm pollen grains** | **--------** | **-------** |

1. **Stock cultures of pests:**
   1. ***. Tetranychus urticae* Koch.**

A separate stock culture was prepared under laboratory condition. Infested leaves of castor bean, *Ricinus communis* L. were collected from Fayoum province **(Al-Adawy, *et al.,* 2001)**. The newly emerged adults were collected and introduced on sweet potato plants grown in plastic pots under wooden cages covered with muslin to avoid cross contamination. Immature individuals were used for preparing small cultures in Petri dishes provided with sweet potato leaves; its ridges dipped in thin layer of agar 0.6% to prevent escape the mites. All treatments were replicated ten times **(Mahmoud, 1998; Rahil, *et al*., 2004 and Sayed,** ***et al*., 2006).**

* 1. ***Bemisia tabaci* Genn.**

Rearing of *B. tabaci* was carried out by collecting the adults of flies from cucumber plants by sweeping net traps in paper bag and placed on another sweet potato plants in cages (40×60×50cm) to separate this pest from other pests **(Abdel Gayed, 2004)**

* 1. ***Thrips tabaci*** [**Lindeman**](https://en.wikipedia.org/w/index.php?title=Karl_Eduard_Lindeman&action=edit&redlink=1)**.**

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Nymphs of *T. tabaci* was collected from cotton seedling and transferred to the laboratory in paper bags, then placed on cotton seedling cultivated in the Lab. To avoid escape the thrips, the plants were placed in cages (40×70×50 cm3) and covered with muslin (**Gawaaad,and Shazli, 1969).**

* 1. ***Aphis gossypii* Glover.**

The collection and rearing of *A. gossypii* were carried out as above mentioned in rearing of *T. tabaci*.

* 1. **Collection and preparation of Pollen**:

 Pollen of date palm *Pheonyx dactylefira* L. was used. Flowers of the plants were collected where pollen was collected by using a manual shaker to release the pollen and left for three days in sunlight. Pollen grains were kept in small glass vials in a refrigerator until use ([**AL-Shammery, 2010**](https://scialert.net/fulltextmobile/?doi=je.2011.365.374#404030_ja)**).**

1. **Rearing *Eusieus scutalis* (Athias-Henriot)**

To arise stock culture of the predatory mite, *E. scutalis*, its nymphs and adults were collected from castor bean leaves growing in a private Farm at Fayoum, Egypt in 2018 and placed on sweet potato plants infested by *T. urticae* mite, these plants were placed in special cages covered with muslin to avoid escape the predaceous mites to another cages and contaminate the culture of pests **(Mahmoud, 1998; Rahil *et al.,* 2004; Sayed *et al.,* 2006 and Momen & El-Sawi 2008).**

1. **Host preference experiments:**

To study the host preference of *E. scutalis*, one couple of newly emerged adult collected from the stock culture, were confined in ten of discs were placed in Petri dishes provided with sweet potato leaves; its ridges dipped in thin layer of agar 0.6% to prevent escape the mites and this disc provided with 10 nymphs (of each host). This unit represented one replicate kept at the optimum condition, 27±1°C and 70±5%R.H. Ten replicates for each host were used and examined daily for renewing the host. **(Sayed, *et al*., 2006).**

Periods of ovipositions, male and female longevity were calculated, in addition, the number of deposited eggs/female, daily deposited eggs/ female and preying capacity were calculated. The duration of immature stages (larvae & nymphs), percentages of mortality, food consumption and sex ratio were determined per host. **(Zanty, 1987 and Mahmoud, 1998)**

1. **Mixed food consumption:**

Di, tri, tetra and penta combinations were used to calculate the mixed food consumption for adult of *E. scutalis,* 24 treatments were used as follows in Table 2:

**Table (2): Mixed food consumption for rearing *E. scutalis*.**

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|  |  |  |  |
| --- | --- | --- | --- |
| **No.** | **Combinations** | **No.** | **Combinations** |
| **1** | ***T. urticae - B. tabaci*** | **13** | ***T. urticae - B. tabaci- Pollen*** |
| **2** | ***T. urticae - T. tabaci*** | **14** | ***T. urticae - T. tabaci- A. gossypii*** |
| **3** | ***T. urticae - A. gossypii*** | **15** | ***T. urticae - T. tabaci- Pollen*** |
| **4** | ***T. urticae- Pollen*** | **16** | ***T. urticae - A. gossypii- Pollen*** |
| **5** | ***B. tabaci- T. tabaci*** | **17** | ***B. tabaci- T. tabaci- A. gossypii*** |
| **6** | ***B. tabaci- A. gossypii*** | **18** | ***B. tabaci- T. tabaci- Pollen*** |
| **7** | ***B. tabaci- Pollen*** | **19** | ***B. tabaci- A. gossypii- Pollen*** |
| **8** | ***T. tabaci- A. gossypii*** | **20** | ***T. tabaci- A. gossypii - Pollen*** |
| **9** | ***T. tabaci- Pollen*** | **21** | ***T. urticae - B. tabaci- T. tabaci- A. gossypii*** |
| **10** | ***A. gossypii- Pollen*** | **22** | ***T. urticae - B. tabaci- T. tabaci- Pollen*** |
| **11** | ***T. urticae- B. tabaci- T. tabaci*** | **23** | ***B. tabaci- T. tabaci- A. gossypii - Pollen*** |
| **12** | ***T. urticae- B. tabaci- A. gossypii*** | **24** | ***T. urticae - B. tabaci- T. tabaci- A. gossypii - Pollen*** |

Ten replicated were used /treatment, the experiment unit consists of Petri dish, (15cm diameter) provided with agar 0.6% in the bottom and leaf of sweet potato in the center their edges inserted in agar. The number of used preys was 10 individuals /prey, renews daily and counted until died of the predator (male and female).

1. **Statistical analysis:**

Means of data at all treatments were statistically compared at 5% probability level by L.S.D test according to the methods given by **Senedecor and Cochran (1981).**

**RESULTS AND DISCUSSION**

For adults, (table, 3 and fig,1 &2) the longest period of oviposition, female and male longevity (33.8, 38.9 and 14.22 days, respectively) associated with the highest fecundity (55.73 eggs/female) and rate female/day of oviposition period (2.60 eggs) was recorded at feeding of nymphs of *T. urticae*. Such values were reduced insignificantly by using nymphs of *B. tabaci* (27.7, 28.6 & 10.2 days, 42.17 eggs/female and 2.31 eggs/female/day) and nymphs of *T. tabaci* (30.22, 35.2& 12.12 days, 41.15 eggs/female and 2.28 eggs/female/day). While by feeding on nymphs of *A. gossypii*, these data decreased with high significantly to record (16.2, 19.22 & 11.22 days, 23.40 eggs/female and 1.26eggs/female/day). The palm pollen grains unsuitable host for rearing *E. scutalis*, at this conditions, the female lived for two weeks only and laid 12.2 eggs during the oviposition period (9.2 days) These data agreement with **Abdel Gayed, 2004,** when reared this predator on nymphs of *T. urticae* and *B. tabaci*.

As seen from in table, (3) and fig,3 preying capacity per couple differed significantly at feeding *E. scutalis* on different hosts to record high consumption (180.66 individuals with *T. urticae*, and 172.22 individuals with *T. tabaci*). While the low consumption (67.22 individuals) was record at feeding on nymphs of cotton aphid, *A.gossypii*. The highest count of preyed nymphs of *T. urticae* by couple of the predaceous mite, *E. scutalis*, (188.2 individuals with a rate of 7.00 prey/day of adult longevity was recorded by **Abdel Gayed (2004).**

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**Table (3): Host preference of *E. scutalis* adults reared on different hosts under laboratory conditions**

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Hosts** | **Period of (in day)** | | | **Adult longevity** | | **Weekly deposited eggs/femal** | | | | | **Total deposited eggs/ female** | **Mean No. of eggs/ female/ day** |
| **Pre**  **oviposition** | **oviposition** | **Post**  **oviposition** | **Females** | **Males** | **1** | **2** | **3** | **4** | **5** |
| ***T. urticae*** | **2.80**  **±**  **0.19**  **2.4** | **33.8**  **±**  **0.70**  **19-27** | **4.12**  **±**  **0.51**  **2-6** | **38.9**  **±**  **0.71**  **30-40** | **14.22**  **±**  **0.20**  **10-18** | **19.7**  **±**  **1.12**  **16-20** | **13.8**  **±**  **1.2**  **10-14** | **12.3**  **±**  **1.12**  **7-13** | **9.8**  **±**  **0.11**  **6-10** | **2.7**  **±**  **0.20**  **0-3** | **55.73**  **±**  **1.90**  **30-62** | **2.60**  **±**  **0.13**  **1.2-3.4** |
| **\*\*180.66 (5.9)** | |
| ***B. tabaci*** | **2.33**  **±**  **0.13**  **2-4** | **27.7**  **±**  **0.33**  **15-19** | **1.6**  **±**  **0.01**  **0-2** | **28.6**  **±**  **0.11**  **20-32** | **10.2**  **±**  **0.13**  **8-12** | **15.2**  **±**  **0.13**  **12-16** | **13.1**  **±**  **0.11**  **11-14** | **6.8**  **±**  **0.01**  **5-7** | **2.1**  **±**  **0.01**  **0-3** | **-** | **42.17**  **±**  **1.20**  **22-45** | **2.31**  **±**  **0.130**  **1.1-2.4** |
| **\*\*121.21(5.12)** | |
| ***A. gossypii*** | **2.81**  **±**  **0.09**  **2-4** | **16.2**  **±**  **0.62**  **5-13** | **2.50**  **±**  **0.75**  **1-3** | **19.22**  **±**  **1.03**  **11-27** | **11.22**  **±**  **1.21**  **4-17** | **18.2**  **±**  **2.01**  **9-26** | **6.22**  **±**  **1.22**  **5-11** | **0.5**  **±**  **0.50**  **0-6** | **-** | **-** | **23-90**  **±**  **3.70**  **10-32** | **1.26**  **±**  **0.21**  **1.0-2.1** |
| **\*\*67.22 (4.12)** | |
| ***T. tabaci*** | **2.11**  **±**  **0.10**  **2-3** | **30.22**  **±**  **0.80**  **19-28** | **3.13**  **±**  **0.42**  **2-5** | **35.2**  **±**  **0.91**  **21-42** | **12.12**  **±**  **0.12**  **9-13** | **13.6**  **±**  **0.12**  **9-16** | **11.2**  **±**  **0.11**  **11-12** | **9.2**  **±**  **0.13**  **9-10** | **5.1**  **±**  **0.12**  **5-6** | **1.2**  **±**  **0.01**  **0-2** | **41.15**  **±**  **1.12**  **30-49** | **2.28**  **±**  **0.01**  **1.9-2.8** |
| **172.12 (5.9)\*\*** | |
| **Palm pollen** | **2.12**  **±**  **0.11**  **2-3** | **9.2**  **±**  **0.12**  **5-3** | **1.2**  **±**  **0.13**  **0-2** | **12.6**  **±**  **0.11**  **9-13** | **9.3**  **±**  **0.01**  **8-10** | **7.6**  **±**  **0.01**  **6-8** | **4.1**  **±**  **0.11**  **3-5** | **-** | **-** | **-** | **12.2**  **±**  **0.19**  **8-3** | **1.20**  **±**  **0.01**  **1.12-1.70** |
| **L.S.D (0.05** | **0.52** | **3.12** | **1.20** | **3.21** | **2.12** |  |  |  |  |  | **2.11** | **0.21** |

**N.B.: \*\* Consumed prey / couple and data between parentheses represent daily consumption**

The longest incubation period, 1.73 days associated with the highest hatchability (93.30%) were recorded at feeding on nymphs *T. urticae*, decrease insignificantly to 1.39, 1.32, 1.32 and 1.29 days at feeding on *A.* *gossypii, B tabaci, T. tabaci* and palm pollen grains, respectively. The moderate durations of larvae, protonymph, deutonymph and total life span, 1.40, 1.80, 1.92 and 6.23 days, respectively, with the lowest percentages of mortalities, 7.11, 0.00, 2.10 and 15.22% were recorded at feeding on nymphs of *T. urticae* (table, 4& fig, 4).

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Generally, by feeding on all hosts, females outnumber males (1.3:1, 2.1:1, 1.1:1 and 2.1:1), while at feeding on palm pollen grains, the sex ratio was 1:1.2. At all hosts the number of consumed preys and daily consumption increased gradually with the progressive stage and instars. The larvae lived for 1-3 days and consumed 3.22, 3.11, 2.16 and 3.20 nymphs, respectively at *T. urticae, B. tabaci, A. gossypii* and *T. tabaci* (table, 4).

**Table (4): Host preference of *E. scutalis* immature stages reared on different hosts under laboratory conditions.**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Hosts** | **Eggs** | **Larva** | **Nymph** | | **Total** | **Sex ratio** |
| **1st** | **2nd** |
| ***T. urticae*** | **1.73**  **±**  **0.06**  **1-2**  **\*\***  **(6.70)** | **1.40**  **±**  **0.11**  **1-2**  **3.22 (2.15)**  **(7.11)** | **1.80**  **±**  **0.11**  **1-3**  **5.60 (3.4)**  **(0.0)** | **1.92**  **±**  **0.13**  **1-3**  **9.35 (4-9)**  **(2.1)** | **6.23**  **±**  **0.08**  **5-7**  **18.33(3.24)**  **(15.22)** | **1.3:1** |
| ***B. tabaci*** | **1.32**  **±**  **0.12**  **1-2**  **\*\***  **(7.22)** | **1.28**  **±**  **0.13**  **1-3**  **3.11 (2.10)**  **(8.12)** | **1.70**  **±**  **0.13**  **1-2**  **4.6 (3.2)**  **(4.0)** | **1.80**  **±**  **0.12**  **1-2**  **7.2 (4.1)**  **(6.6)** | **5.33**  **±**  **0.01**  **4-6**  **18.01(3.01)**  **(19.22)** | **2.1:1** |
| ***A. gossypi*** | **1.39**  **±**  **0.14**  **1-2**  **\*\***  **(7.20)** | **2.13**  **±**  **0.12**  **2-3**  **2.16 (1.7)**  **(22.7)** | **2.30**  **±**  **0.14**  **2-3**  **2.1 (1.2)**  **(12.6)** | **2.10**  **±**  **0.01**  **1-2**  **2.3 (1.1)**  **(14.6)** | **7.01**  **±**  **0.31**  **5-8**  **7.21 (1.01)**  **(40.22)** | **1.1:1** |
| ***T. tabaci*** | **1.32**  **±**  **0.11**  **1-2**  **\*\***  **(6.25)** | **1.42**  **±**  **0.01**  **1-2**  **3.20 (2.11)**  **(8.10)** | **1.66**  **±**  **0.13**  **1-2**  **4.1 (3.1)**  **(3.6)** | **1.90**  **±**  **0.13**  **1-2**  **8.7 (4.3)**  **(3.1)** | **5.60**  **±**  **0.13**  **4-6**  **17.22 (2.9)**  **( 14.22)** | **2.1:1** |
| **Palm pollen** | **1.29**  **±**  **0.12**  **1-2**  **(6.33)** | **2.22**  **±**  **0.03**  **1-3**  **-**  **(30.10)** | **2.40**  **±**  **0.11**  **1-3**  **-**  **(20.11)** | **2.10**  **±**  **0.02**  **2-3**  **-**  **(19.22)** | **8.10**  **±**  **0.02**  **7-9**  **-**  **(55.07)** | **1:1.2** |
| **L.S.D** | **0.30** | **0.45** | **0.61** | **0.62** | **1.30** | **-** |

**\*\*Shows the total consumed prey / life (average of daily consumption)**

**Data in parentheses represent percentage of mortality**



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The above mentioned results agree with **El-Laithy & Fouly (1992) and Mahmoud (1998)** studied the life cycle of *E. scutalis* at 26±1°C and 70±3% R.H. at feeding on *T. urticae* nymphs, the total life cycle was 5.6 days correlated with 1.87, 22.33 and 5.12 days for the periods of the preoviposition, oviposition and postoviposition, respectively.

The factors affecting on mass rearing of the predaceous mite, *E. secutalis* and found that suitable temperature and relative humidity were 25±1°C and 73±5%R.H., respectively. The highest reproduction, fecundity and predation efficiency were recorded at feeding on *T. urticae* nymphs and eggs of *B. tabaci*. At the same conditions, the egg incubation period was 1.7days. Life cycle and adult longevity were 5.7& 17.4 days for male and 6.95& 30.4days for female. The respective total deposited eggs/female and rate of reproduction/day were 32.00 eggs/female and 2.10eggs/female/day. On *T. urticae* nymphs, the immature stages of *E. scutalis* consumed 9.8prey, while the preying capacity for adult rate of consumption/day was 154.00 preys and 8.85 prey/ day.

In this respect, similar values were obtained by [**Van Rijn and Tanigoshi (1999)**](https://scialert.net/fulltextmobile/?doi=je.2011.365.374#630489_ja) who found that sex ratio was not affected by food source, where females proportion (%) ranged from 56 to 64%. Also, [**Fouly (1997)**](https://scialert.net/fulltextmobile/?doi=je.2011.365.374#531186_ja)found that female progeny of *Proprioseiopsis* *asetus* presented only 52% in the first generation when fed on *Eutetranychus orientalis.*

On the other hand, comparing the present data with those obtained by [**AL-Shammery (2010)**](https://scialert.net/fulltextmobile/?doi=je.2011.365.374#404030_ja), it is clear that feeding on immature stages of  *T. urticae*significantly prolonged the oviposition period (18.6 days) as compared with date palm pollen (12.42 days). While date palm pollen caused a higher egg production where each female laid an average of 42.62 eggs as compared with 30.66 eggs when the food was immature stages of the two-spotted spider mite.

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Also, the previous results don't agree with the findings of [**Kasap and Lu 2004)**](https://scialert.net/fulltextmobile/?doi=je.2011.365.374#389058_ja)who found a lower net reproductive rate (R0) of *E. scutalis* fed *Panonychus citri* which averaged only 26.03. Also (R0) averaged 26.73, 13.24 and 13.60 when the predatory mite *E. scutalis* fed on immature stages of the three tetranychid mites, *T. urticae, Eutetranychus orientalis* and *Oligonichus afrasiaticus*, respectively.

At the same trend, in Saudi Arabia, **Al-Shammery (2011)** reared *E. scutalis* on four kinds of pollen date palm, orange, castor bean & alfalfa) under laboratory conditions (26°C & 70% R.H.), she observed that the development period significantly affected by kind of pollen. Feeding on date palm pollen caused the highest rate of survival (94%), deposited eggs (42.62 eggs)| and female longevity (12.42 days).

**Fouly *et al.,* (2013)** reared *E. scutalis* on *T. urticae*, *B. tabaci* and date palm pollen in the laboratory conditions (26°C and 70%R.H.) life cycle averaged 5.20 and 6.19 days, 6.40 and 7.23 days, 7.80 and 7.85 days for male and female, when fed on palm pollen, immature stages of *T. urticae* and *B. tabaci*, respectively.

**El-Halawany *et al.,* (2017)** recorded that the female longevity ranged between 16.70 and 28.2 day. Longest female longevity and highest fecundity was reared on *T. urticae* motile stages (49.3eggs/female). The highest consumption rate of adult female was 496.2 individuals when fed on *Tegolophus quavae* Boezek, while the lowest was 161.2 individuals on *T. urticae* motile stages.

Food consumption of *E. scutalis* adult (one male & one female) by using the combination in used of preys (*T. urticae, B. tabaci, T. tabaci*, *A. gossypii* and pollen) is summarized in table (5).

As far as the writer, no literatures were recorded in this trend. By using twenty four combination treatments, the highest consumed preys (241.04 prey/ couple) was recorded by feeding on all mixed preys, in this state, the predacious mite, *E. scutalis* fed on (190.28 *T. urticae*, 26.48 *B. tabaci,* 24.28 *T. tabaci* and pollen grains). As seen in table (5), the highest preying capacity were recorded at feeding on any mix *T. urticae* with other foods (*B. tabaci, T. tabaci, A. gossypii* and pollen), while the lowest consumption (38.24 individuals) was recorded at feeding on *A. gossypii* and pollen grains.

**Table (5): Food consumption of *E. scutalis* adults reared on combination of different hosts.**

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|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Hosts**  **Combinations** | **Consumed preys** | | | | | **Total** |
| ***T. urticae***  **(1)** | ***B. tabaci***  **(2)** | ***T. tabaci***  **(3)** | ***A. gossypii***  **(4)** | **Pollen**  **(5)** |
| **1-2** | **180.6** | **18.46** |  |  |  | **198.52** |
| **1-3** | **184.24** |  | **6.4** |  |  | **190.28** |
| **1-4** | **172.3** |  |  | **0.0** |  | **172.30** |
| **1-5** | **188.22** |  |  |  | **-** | **188.22** |
| **2-3** |  | **132.24** | **8.24** |  |  | **140.48** |
| **2-4** |  | **116.28** |  | **0.0** |  | **116.28** |
| **2-5** |  | **136.88** |  |  | **-** | **136.88** |
| **3-4** |  |  | **166.24** | **4.22** |  | **170.46** |
| **3-5** |  |  | **172.4** |  | **-** | **172.40** |
| **4-5** |  |  |  | **38.24** | **-** | **38.24** |
| **1-2-3** | **190.28** | **16.24** | **18.26** |  |  | **224.78** |
| **1-2-4** | **172.30** | **12.22** |  | **0.0** |  | **184.52** |
| **1-2-5** | **204.22** | **8.44** |  |  | **-** | **212.66** |
| **1-3-4** | **180.44** |  | **16.24** | **0.62** |  | **197.30** |
| **1-3-5** | **166.24** |  | **12.26** |  | **-** | **188.50** |
| **1-4-5** | **188.95** |  |  | **6.24** | **-** | **195.19** |
| **2-3-4** |  | **134.26** | **26.24** | **4.2** |  | **154.52** |
| **2-3-5** |  | **158.66** | **18.22** |  | **-** | **176.88** |
| **2-4-5** |  | **144.28** |  | **6.22** | **-** | **150.50** |
| **3-4-5** |  |  | **172.44** | **8.66** | **-** | **181.10** |
| **1-2-3-4** | **172.28** | **24.12** | **18.28** | **0.0** |  | **214.68** |
| **1-2-3-5** | **192.44** | **26.24** | **16.24** |  | **-** | **234.90** |
| **2-3-4-5** |  | **112.28** | **18.36** | **4.2** | **-** | **134.66** |
| **1-2-3-4-5** | **190.28** | **26.48** | **24.28** | **0.0** | **-** | **241.04** |

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**التفضيل العوائلي للمفترس الاكاروسي *Euseius scutalis***

**علي بعض الافات**

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اجريت هذه الدراسة بقسم وقاية النبات- كلية الزراعة- جامعة الفيوم عام 2018 تحت الظروف المعملية المثلي لتربية هذا المفترس( 27ºم ورطوبة نسبية 70%) وقد تمت تربية هذا المفترس علي حوريات كلا من العنكبوت الاحمر والذبابة البيضاء وتربس القطن ومن القطن بالاضافة الي استخدام حبوب لقاح نخيل البلح. ومن هذه الدراسة وجد أن أفضل العوائل لتربية هذا المفترس هي حوريات العنكبوت الاحمر يليه الذباب الابيض يليه تربس القطن بينما من القطن وحبوب اللقاح فكانت من العوائل الغير مناسبة لتربية هذا المفترس.