Study the life aspects of Eriasinsulana Boisd on some of the marshmallow family crops

Merri Kadhum Mubasher¹, Malik H. Karem² and Ahmed Sh. Jabbar

¹,² Department of Plant Protection, College of agriculture, Al-Muthanna University, Iraq.

Email: ahmedshmkv65@gmail.com

Abstract. Based on the importance of cotton crops Gossypium spp., Abelmoschus esculentus and Hibiscus sabdariffa in Iraq, and because of damage caused by Eriasinsulana boisd cotton worm for these crops, Life data that helps to explain the persistence of this insect as a pest threatening the marshmallow family crops was studied and the main points for the development of effective control programs against it. The results of the laboratory study showed that all the life aspects of the insect were affected during the breeding of different plant families (cotton, okra, hibiscus). The shorter duration of larvae development was 16.27 days and the mean weight was 0.28 g when it was raised on the hibiscus plant and its length was 22.35 days and the highest rate was 0.35 g (18.42 days) and the average weight (0.32 g) on the okra. The highest survival rate was 57% for cotton, while the lowest for the hibiscus plant was 42%. The study showed that the host had an effect on the average period of development of pupa and adult females, with the highest rate of 12.35 and 55.17 days on cotton and the lowest rate of 10.75 and 31.37 days on the hibiscus, respectively. 0.31 and 0.27 g respectively on cotton, while 0.27 and 0.21 g respectively fell on the hibiscus. In terms of the average pre-laying period, the highest rate was 6.24 days on the hibiscus plant, corresponding to 3.89 days on cotton and 5.21 days on the okra. The longest period of laying the eggs was 42.12 days on the cotton, while at least 17.93 days on the hibiscus. The adult insect had the largest number of eggs fed on cotton (75.16 eggs / female) while the lowest number when feeding on the hibiscus (43.3) eggs / female. The results of the study showed that the highest rate of post-ovulation period for the female insect was 3.25 days on the hibiscus and decreased to the lowest rate (2.00 days) on the cotton. It is concluded that the growth and development of the insect was optimal for feeding on cotton.

1. Introduction

Eriasinsulana Boisd is one of the most important pests affecting the cotton crop in many parts of the world. Its larvae feed on most parts of the plant and fruit. The insect also infects other plants that belong to the Malvaceae family of about 50 genera and 1000 species (Abro et al., 2004), such as Abelmoschus esculentus, baker Malva parviflora and hibiscus sabdariffa L.

That the biological activities of insects are generally affected by the food content of the host, which may not be associated with preference or lack of preference, but that the host contains useful or harmful food for the insect's roles (Kanher et al., 2014 and Pathan et al., 2007).

In Iraq, many studies on the life and environment of the pest have been carried out and ways of controlling it, but they have not addressed the effect of the host or the dietary medium on their life.
performance (Al-Sabiliti et al., 2003). The present study aims at identifying the nutritional preference of *E. insulana* on three different plant families and the effect of these families on the life performance of the pest roles and the possibility of investing the results in the integrated management program.

2. Materials and methods

*Eosulana Boisd* larvae were collected with different ages of infected papaya, taken from fields planted in Al Muthanna Governorate. Samples were placed in glass bottles 5×10 cm away and left in the laboratory until the larvae were unable. The pupa was placed in Petri dishes and placed in wooden cages of 40 × 40 × 40 cm covered with all sides except the base of the wood. Within each crate, plastic bottles of 20 cm each have mixed soil mixed with 1:1 ptosis and pre-planted with *Gossypium* spp. The *Albemoschus esculentus* and the *Hibiscus sabdvriffa* L.

When the plants reached the stage of the four leaves were used to lay the eggs of the insect and each host separately and replaced the consumed plants constantly (EL_Sayed and others, 2008). Entire insects were prepared from their appearance inside the cages with pieces of cotton moisturized with a 10% sugar solution placed in a 2 × 2.5 cm Petri dish. The eggs were collected in the plants daily for use in subsequent experiments. Petri dishes, each 15 cm long and 5 cm high, were placed in the base of a thin layer of dry cotton to get more eggs from the insect, 10 pairs of pupae were transferred and were distinguished through their size and placed inside the dish and when the adults of the virgins fed the solution of diabetes as mentioned earlier and covered the large dish with a piece of cloth and placed in the incubator (Termaks) and put in its base glass containers with diameters 19.5 × 3.5 cm and Add 30 g of (KOH) in 100 ml of water to obtain constant relative humidity (70 ± 5%). The thermometer and relative humidity are used to ensure that the temperature is maintained at ± 27 ± 1 °C and its relative humidity.

The incubator was provided with a 20 watt light source with a timer to give a fixed light duration of 16 hours light and 8 hours of darkness. The eggs that were placed on the dry cotton layer and on the cloth continued to be monitored and collected daily for subsequent use in larvae and colony preservation. 30 fresh larvae were taken with three replicates, each containing 10 larvae and fed to each pre-planted vegetable farmer.

The fruits of the plants used to feed the larvae were individually fertilized with 20% sodium hypochlorite solution and washed with distilled water. The larvae were incubated in the incubator at 27 ± 1 °C, 16 hours of light and 70 ± 5% relative humidity. Each treatment was repeated three times. Depending on the duration of the larval role, Larval weight (g / 5 larvae) and percentage of larval survival on each host.

The pupae obtained from the growth and development of the larvae were collected for each host of the three studied families and continued to be monitored according to the average duration of the pupa stage and the average weight of the pupa (gm / 5 virgins). Adult phase and adult weight (g / 5 adult). The average number of eggs per female, the pre-egg rate, the egg-laying time and the post-egg laying rate for each vegetable host were determined separately to determine the effect of the plant host on the life performance of *E. insulana*. (CRD). The rates were compared to the LSD test.

3. Results and discussion

The results showed that the studied plant families had a different effect on the life performance of *E. insulana*. The percentage of larvae that completed phase 57, 44 and 42 on the plant families was cotton, Pomegranate horns and hibiscus, respectively (Table 1). Significant differences were found in the rate of larval stage, which was studied on the studied plant families, and significant differences were found in the weight of larvae fed on cotton nut and hibiscus. The results of the table showed significant differences in the percentage of larval survival on cotton nut, Pomegranate horns.
and hibiscus, while no significant effect was observed on the host species. The survival of the larvae among larvae that have completed their growth on Pomegranate horns and hibiscus. The average duration of pupae was 12.35, 11.32 and 10.75 days on cotton nut, Pomegranate horns and hibiscus nuts, respectively.

The results of the statistical analysis did not show significant differences between the rates of development of the stage of larvae when feeding the insect on the cotton nut and okra, while it was high morale between cotton and hibiscus and less significant between the papaya and hibiscus (table 2), The difference in the rates of development of the pupae may be due to a difference in the nutritional content among the studied plant families, which is reflected positively or negatively on the biological activities of the insect. The results of the study indicated in the same table that there is no significant effect in the weight of the weight of the virgin feed the insect on the cotton nut, okra and hibiscus nut.

The results of Table (3) show that the period of the adult stage fed on the studied plant families was 55.17, 43.22 and 31.37 days, respectively. The results of the statistical analysis showed significant differences between the adult stage of the studied stages. Between the average weight of adults whose larvae feed on the fruits of cotton, papaya and larvae that feed on papaya and hibiscus fruits, while high in morbidity between cotton and hibiscus.

The females of the insect fed larvae surpassed the cotton nut and the average number of eggs was 75.16 eggs, while the females who were fed the eggs were 58.83 eggs / female, while the lowest rate was 42.8 eggs / female for the fed females. Chrysanthemum table (4). The results of the statistical analysis in the same table showed that the pre-egg laying period may be affected by host species. Significant differences were found between the averages on the studied plant families the highest rate was 6.24 days for the nourished females on the hibiscus, 3.89 days for the cotton nut, and 5.21 days for the okra.

The results of the above table showed that egg laying time was also affected by host differences. The statistical analysis showed that there were significant differences between the mean duration of eggs laying on the three tested marshmallows, the average mean of 17.93 days on hibiscus and the highest average of 42.12 days on cotton nut. Differences in egg laying averages may be due to differences in the type and concentration of chemicals contained in each studied host. In terms of post-egg laying rate, the longest period of feeding females on the hibiscus and okra was 3.25 and 2.81 days, respectively and decreased to 2 days on cotton. The results showed that the effect of variability of the host was insignificant between the two treatments: cotton and okra. While it was significant between cotton and hibiscus. No significant differences were recorded in post-egg laying period between feeding females and their larvae on okra and hibiscus kernels and may be due to difference in insect strain, used varieties and environmental conditions.

That the results of this study can contribute to provide additional information on the life of the insect on different plant families and the reflection in the resistance to the cultivation of plant families that are more resistant to this pest and could be included in the programs of integrated pest management.

| Table (1) Effect of plant host on the duration, weight and survival rate of E. insulana (Boisd). |
|------------------|------------------|------------------|------------------|
| **Type of host** | **Duration of larval role (day)** | **Average larval weight (g / 5 larvae)** | **Larval survival rate%** |
| Cotton           | 22.35            | 0.35             | 57               |
| Okra             | 18.42            | 0.32             | 44               |
| Hibiscus         | 16.27            | 0.28             | 42               |
| L. s.dh105       | 2.618            | 0.043            | 3.662            |
### Table (2) Effect of the plant host on the length and weight of the pupae role of the cotton coconuts E. insulana (Boisd).

| Type of host | Average duration of pupae (day) | Average weight of pupae (g / 5 pupa) |
|--------------|---------------------------------|-------------------------------------|
| Cotton       | 12.35                           | 0.31                                |
| Okra         | 11.82                           | 0.30                                |
| Hibiscus     | 10.75                           | 0.27                                |
| L.s.d0.05    | 0.657                           | N.S.                                |

### Table (3) Effect of plant host in the length and weight of adults of the cotton coconuts E. insulana (Boisd).

| Type of host | Average duration of adult (day) | Average weight of adult (g / 5 adults) |
|--------------|---------------------------------|---------------------------------------|
| Cotton       | 55.17                           | 0.27                                  |
| Okra         | 48.22                           | 0.24                                  |
| Hibiscus     | 31.37                           | 0.21                                  |
| L.s.d0.05    | 16.873                          | 0.043                                 |

### Table (4) Effect of the plant host on the number of eggs, the pre-egg laying period and the post-egg laying period of the cotton wool of the cotton coconuts E. insulana (Boisd).

| Type of host | Average number of eggs | Average pre-egg laying (day) | Average egg laying (day) | Average duration of post-egg laying (day) |
|--------------|------------------------|-----------------------------|--------------------------|------------------------------------------|
| Cotton       | 75.16                  | 3.89                        | 43.12                    | 2.00                                     |
| Okra         | 57.83                  | 5.21                        | 25.00                    | 2.81                                     |
| Hibiscus     | 43.30                  | 6.24                        | 17.93                    | 3.25                                     |
| L.s.d0.05    | 5.741                  | 0.934                       | 0.845                    | 0.826                                    |

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