



# **Some Biological Studies on Certain Land Snails and Their Control**

**By**

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## SUMMARY

Some experiments were conducted to study the role of either the different soil moisture or the varied food stuff on some biological aspects of *Eobania vermiculata* such as; total number of laid eggs per pair animals, weight of eggs, incubation period, hatchability and weight of varied old of immature stages under laboratory condition ( $65\% \pm 2$  R.H and  $25^{\circ} \pm 5$  C°). Also, some experiments were designed to estimate the role of the breeding food stuff on the choice of each of *Eobania vermiculata*, *Helicella vestalis* and *Monacha obstructa*. This manuscript deals with effect of Lambda-Cyhalothrin 5%EC and Chlorpyrifos 50%EC pesticides on the immature stage and adult of the previous mentioned land snails species. The gained results could be concluded as follows:

### I. Biological Studies:

#### I.A. Total number of laid eggs by *Eobania vermiculata*

I.A.1. The effect of the tested moisture levels on each of the number and weight of the laid eggs by pair of the brown garden snail, *Eobania vermiculata* could be arranged dissentingly according to their mean as follows:

a) For mean of the total number of the laid egg by pair of snails was:



75% (92.3 eggs) > 25% (76.8 eggs) > 50% (72.6 eggs)

b) For mean weight of the laid egg (10 egg) was:

75% (0.24 g/10 eggs) > 50% (0.22 g/10 eggs) > 25% (0.14 g/10 eggs)

**I.A.2.** The leaves of lettuce (47.1 egg / a pair / day) was the most suitable one food for breeding the tested snails because of the fecundity of *Eobania vermiculata* was highest for the individuals which fed on it followed by cabbage (40.3 eggs / a pair / day ), clover (35.5 eggs / pair / day) and spinach (30.8 eggs / pair / day).

### **I.B. Incubation period**

**I.B.1.** Mean of the incubation period ranged between 14.0 days at level 75% soil moisture and 14.8 days at level 25% soil moisture. These results reported that eggs of *Eobania vermiculata* need a higher soil moisture to last a short time to hatch.

**I.B.2.** The mean of incubation period for the brown garden snails which bred on lettuce, cabbage, clover and spinach at 75% soil moisture level was 14.03, 15.33, 14.95 and 16.21 days respectively. These finding proved that leaves of lettuce is the suitable diet for *Eobania vermiculata* breeding followed by clover, cabbage, and spinach.

## **I.C. Hatchability**

**I.C.1.** The obtained results illustrated that the hatchability percentages as a mean at 25%, 50% and 75% soil moisture levels respectively were 33.3%, 33.3% and 32.3%. The former figures proved that the three experimented levels of soil moisture had the same effect on the hatchability percentage of the brown garden snails *Eobania vermiculata* which fed on leaves of lettuce under the adjusted laboratory conditions.

**I.C.2.** The mean of hatchability percentage of the eggs which laid by *Eobania vermiculata* fed on lettuce, cabbage, clover and spinach at 75% soil moisture was; 34.09%, 33.32%, 33.32% and 32.84%. These finding assured that the hatching eggs of the tested snails did not affect with the feeding materials. On the other words, leaves of each of lettuce, cabbage, clover and spinach have the same effect on the fertility of *Eobania vermiculata*.

## **I.D. Immature stage weight**

**I.D.1.** The mean weight of immature stage of 2 weeks old at the varied tested soil moisture levels ranged between 20.99g at 75% soil moisture and 24.93g at 25% soil moisture. For 50% and 75% soil moisture levels the mean weights of one week old, two week old, four week old, six week old, eight week old and twelve

week old of immature stage of *Eobania vermiculata* respectively were; (0.37 and 0.38 g), (1.03 and 0.84 g), (2.30 and 2.59 g), (4.61 and 4.78 g), (9.47 and 10.69 g) and (21.46 and 20.99 g).

**I.D.2.** Effect of varied food stuff type (lettuce, cabbage, clover and spinach) on weight of the different ages of immature stage (1, 2, 4, 6, 8 and 12 week old) of the brown garden snails, *Eobania vermiculata* which bred at 75% soil moisture level under adjusted laboratory conditions could be arranged descendingly according to their mean weight as follow:

- For 2 weeks old: clover (0.98 g) > spinach (0.90 g) > cabbage (0.86 g) > lettuce (0.84 g).
- For 6 weeks old: lettuce (4.78 g) > clover (4.44 g) > spinach (3.93 g) > cabbage (3.82 g)
- For 12 weeks old: lettuce (20.99 g) > clover (19.83 g) > cabbage (18.94 g) > spinach (16.56 g)

## **II. Food preference:**

Three experiments were conducted to illustrate the role of the breeding food stuff on the attraction of the next experimental snails to the offered foods.

- **For *Eobania vermiculata***

Cabbage and lettuce attracted the largest number of *Eobania vermiculata* and had the most consumed amount from them. Whereas, spinach had the least number of snails and its consumption for the whole breeding food stuff.

– **For *Helicella vestalis***

Lettuce attracted the largest number of *Helicella vestalis* and had the most consumed amount from it. Whereas, spinach had the less number of *Helicella vestalis* and its consumption for all foods which the snails were bred on it. For example *Helicella vestalis* which fed on spinach attracted in biggest number to lettuce (3.4 indiv/day) and in lowest number to clover (1.9 indiv/day). As well as the most consumed amount from lettuce (1.8 g/10 indiv/ day) and the lowest from cabbage (0.7 g/10indiv /day)

– **For *Monacha obstructa***

The mean number of the attracted individuals of *Monacha obstructa* and their consumed amount from the tested foods. For the consumed amount from clover, cabbage, lettuce and spinach respectively were; (11.6, 9.0, 10.8 and 4.8 indiv/day) and (7.9, 2.5, 4.5 and 0.9 g/10snails/day) for the snails which bred on clover. In general lettuce attracted the biggest number

of *Monacha obstructa* and had the most consumed amount from it.

Whereas, spinach had the less number of *Monacha obstructa* and its consumption.

### III. Toxicology studies:

A serial of experiments had been conducted to evaluate the efficiency of certain pesticides (Lambda-Cyhalothrin 5% and Chlorpyrifos 50%) against adults and immature stage of *Eobania vermiculata*, *Helicella vestallis* and *Monacha obstructa* using leaf dipping technique under laboratory conditions. The gained results revealed that *M. obstructa* was the most susceptible than the two other species for the adult which exposed to Lambda-Cyhalothrin 5%. The LC50 value of Lambda-Cyhalothrin 5% was 0.78%, 0.82% and 0.68% for of *Eobania vermiculata*, *Helicella vestallis* and *Monacha obstructa*, respectively. On the other hand, immature stage of the experimental species exhibited altered response to Lambda-Cyhalothrin 5% than their adult. In addition the results obtained cleared that the immature stage and adult of the three target species of land snails had the same response to the Chlorpyrifos 50% nearly. The gained figure proved that Chlorpyrifos 50% has a best molluscicidal activity against adult

and immature stage of *Eobania vermiculata*, *Helicella vestalis* and *Monacha obstructa* than Lambda-Cyhalothrin 5%.