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# BIOECOLOGY AND HARM OF THE LEAF MINING FLY

**Annotation:** This article is focused on a number of references referring to bioecological characteristics of *Liriomyza cicerna* Rodani type of leaf mining flies. The article also comprises the observation references on the damage of the larvae of this pest to types of plants. Apart from it, a number of observations were carried out on the damage level of leaf mining fly to agriocultural plants.

**Key words:** pest, *Liriomyza cicerna* Rodani, bioecology, harm, protection.

All over the world it is observed that numerous problems have been appeared in protecting vegetable plants from pesticides and diseases in the process of their germination and that average 20-40% of vegetable plants grown in the world is being destroyed under the influence of pesticides and diseases[1]. Vegetable growing is developing rapidly as other farm branches in our Republic. Especially, its development is important in increasing the export share of fruit-vegetables and developing the economy of agriculture. In developing vegetable growing creating new sorts, developing the measures of fighting against pesticides is considered to be very important questions of today. Protecting plants from harmful organisms is cconsiderd to be of governmental importance. At present it is obvious that it is impossible to apply protecting measures practically not having objective information about pesticides, diseases and weeds of agricultural plants on one hand and being aware of objective knowledge on environment and its changing tendencies on the other hand. Therefore, it is important to study the development, spread of harmful organisms in agricultural plants and the level of their harm to plants.

Vegetable plants are harmed by a number of pesticides and some members

[1]FAO, 2016.

of *Agromyzidae* family are considered to be main pesticides. Protection of vegetable plants from pesticides, diseases and weeds is considered to vital in supplying food security and developing export share in or Republic in order to preserve the crop fertility of agricultural plants and supply the population with qualitative food. As Sh.T.Hujayev regards, the lowest favorable temperature for the development of eggs, larvae and puparium of leaf mining flies is +9-10°C. In +25-30°C temperature, 7-9 days is needed for the development of eggs and larvae of the leaf mining fly. Under the same temperature for the development of puparium 8-9 days are needed. In 15°C the growth and development of eggs, larvae and puparium last 25-30 days [1.].

*Liriomyza cicerina* Rodani started to appear in Turkey from the 2nd half of April when the air temperature was 9-14.3ºC and the soil temperature was 19.2-21.2ºC. In 3-20 days after imago appeared and when the plant height was 5-10 cm, the larvae started to appear. The pesticide density was high 2 times, at the end of May and June [2].The forehead of *Liriomyza cicerina* Rodani is 1.5 times larger than its eyes, the wings are 1.3-1.5 mm. the color of its forehead is reddish-yellow, the 3rd part of its mustachio is of dark color. Legs are black, pelvis is mainly yellow. Puparium is redddish, back respirators have 7-9 joints. In Europe *L.cicerina* harms chickpeas, *L. Brynoe* harms tomato and pumpkins, *L. neitzkei* harms onions mainly[3].

During 2022-2023 we carried out a number of investifgations on determing the fertility of *L.Ciceirna* type of leaf mining fliers in the laboratory of Andijan agriculture and agrotechnologies Institute. In order to study the fertility of female flies, the experiments were carried out in 3 repititions in 4 different air temperature varieties (18-20˚,20-25˚,25-30˚,30-35˚˚C) and 3 relative humidity (40%,60%,80%). The results of the carried experiments are given in table 1.

Table 1.

**Fertility of *L.ciccerina* in different conditions**

**(Laboratory experiment, 2022-2023).**

| Experiment versions | Air temperature, $t^0$ | Relative humidity of the air, % | | |
|---|---|---|---|---|
| | | 40% | 60% | 80% |
| | | Level of fertility, piece | | |
| 1 | 18-20ºC | 30.4 | 74.2 | 37.6 |
| 2 | 20 -25ºC | 136.4 | 201.6 | 129.3 |
| 3 | 25-30 ºC | 189.4 | 205.3 | 190.7 |
| 4 | 30-35 ºC | 71.6 | 148.6 | 79.3 |

Here, it was confirmed that in conditions with 18-20˚C of air temperature and 40% of air humidity fertility of pesticides composed 30.4 pieces, under 60% of air humidity fertility was equal to 74.2 pieces and when the air humidity was 80% the fertility composed 37.6 pieces.

In the 2nd version when the air temperature was 20-25˚C and the air humidity was 40% the fertility of leaf mining flies composed 136.4 pieces, when the air humidity was relatively 60% it composed 20.,6 pieces and when the humidity was 80% the fertility composed 129.3 pieces.

In the 3rd version the air temperature was appointed to be 25-30˚C. In this version we studied the fertility of pesticides under three kinds of relative air humidity too. Here, when the relative air humidity was 40%, the average quantity of pesticide eggs composed 189.9 pieces, when the relative air humidity was 60% it composed 205.3 pieces. When the relative air humidity was 80% the fertility composed 190.7 pieces.

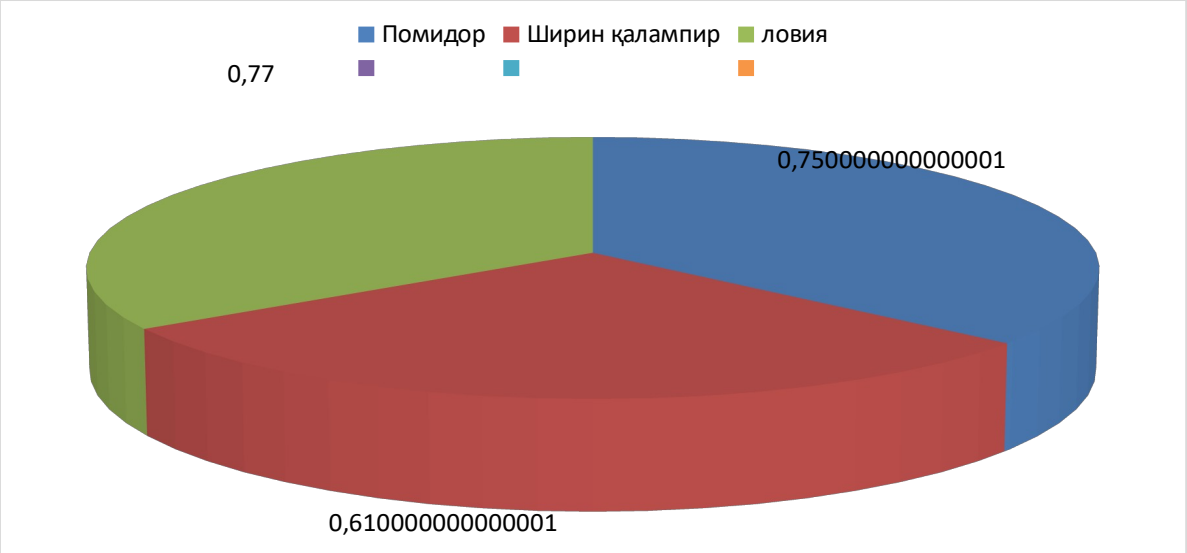
In the 4th version, the air temperature was appointed to be 30-35˚C. When the the relative air humidity is 40%, the fertility of leaf mining flies composed 71.6 pieces, when the relative air humidity was 60% it composed 148.6 pieces. When the relative air humidity was 80% the fertility composed 79.3.

We can see from it that the most favorable condition for *Liriomyza ciccernae* type of leaf mining flies is 25-30˚ and 60% of relative air humidity. Here, the pesticide may lay up to 205.3 pieces of eggs. When the air temperature is 16˚C the pesticides stops feeding and stars to prepare for diapauses. Thus 20˚C of

air temperature is considered to be relatively low degree for the development, reproduction of the pesticide and that 30-35˚C of air temperature is not a favorable condition for the pesticide development.

In order to determine the harm of leaf mining fly- *L.ciccernae* to beans, tomato and bell peepper, we grew tomatoes, bell peppers and beans in the flower pot for laboratory experiments. Puparia of the pesticide were brought from the damaged plant leaves and were put in 10 test tubes, they were kept until they turned into flies. As soon as the flies appeared they were put into the plants isolated frrom each other. Observations on the time of laying egs, the time and place of larvae coming out hollows were carried out. We took 15 hollows so that observe the statee of larvae development and they were observed with magnifying glass, their sizes were defined with the help of micrometer lens. The harms made larvae to plants were identified every 24 hours.

**Picture 1. Harm of leaf mining fly (*L.ciccernae*) to the surface of beans, tomato, bell pepper during its larvae period (cm²)**




According to it, the larvae of the pesticide has its larvae period during 5-5.3 days. The results of the experiment are given in the picture 1.2. We can see from the picture above that a leaf mining fly- *L.ciccernae* harmed 0.77cm² of bean plant

surface, 0.61 cm² of the leaf surface of bell pepper and 0.75cm² of the leaf surface of tomato plant during its larvae period.

Table 2.

Levels of damaging different plants by *L.cicerna* type of leaf mining flies (Andijan region, Andijan district 2022-2023).

| № | Types of plants | Number of pests on one plant leaf, piece | | | | |
|---|---|---|---|---|---|---|
| | | Day 3 | Day 7 | Day 14 | Day 21 | Day 28 |
| 1 | Tomato | - | 0.4 | 1.6 | 3.6 | 4.7 |
| 2 | Beans | - | 0.7 | 2.4 | 4.2 | 5.1 |
| 3 | Cucumber | - | 0.3 | 2.1 | 3.8 | 4.9 |
| 4 | Egg-plant | - | 0.1 | 1.3 | 2.1 | 2.8 |
| 5 | Bell pepper | - | 0.3 | 1.8 | 2.9 | 4.1 |

For this, first of all the best master plant was chosen. Tomato, beans, cucumber, egg plants, bell pepper were sown and grown in 10 flower pots each. When it was time of blossoming we harmed the plants with *L.sativae* type of leaf mining flies. For this, we brought the plant leaves damaged with leaf mining flies and spread them among plant leaves.

In 3 days after harming the plants with *L. Cicerna* type of leaf mining flies we started to observe them. Because, we had to know how the pesticide adapted the plant. On the 7$^{th}$ day of our observation we witnessed that there were average 0.4 piece of pesticide on one tomato leaf, 0.7 piece on a bean leaf, 0.3 piece on one cucumber and bell pepper leaf and 0.1 piecce on egg plant leaf.

On Day 14$^{th}$, we determined that there were average 1.6 pieces on one tomato leaf, 2.4 piecces on a bean leaf, 2.1 pieces on a cucumber leaf, 1.8 pieces on a bell

pepper leaf, 1.3 pieces on an egg plant leaf. On the 21st day of the experiment, there were average 3.6 pieces on one tomato leaf, 4.2 piecces on a bean leaf, 3.8 pieces on a cucumber leaf, 2.9 pieces on a bell pepper leaf, 2.1 pieces on an egg plant leaf. On the 28th day of our investigations we observed average 4.7 pieces on one tomato leaf, 5.1 piecces on a bean leaf, 4.9 pieces on a cucumber leaf, 4.1 pieces on a bell pepper leaf, 2.8 pieces on an egg plant leaf.

Based on the above investigation results we can say that as the most favorable master plant for *L. Cicerna* type of leaf mining fly, bean plant was determined.

**Picture 2. Bean plants sown in order to reproduce the leaf mining flies.**

In investigations carried out on beans the formation of pests population was observed to be frequent in June and July months.

In conclusion, it should be noted that the pore-forming fly - liriomyza cicerna is considered cosmopolitan and is distributed in all countries of the world. It harms a number of plants in our country. The climatic conditions of our republic are favorable conditions for the development of pests.

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