

Table Of Content

Journal Cover	2
Author[s] Statement	3
Editorial Team	4
Article information	5
Check this article update (crossmark)	5
Check this article impact	5
Cite this article	5
Title page	6
Article Title	6
Author information	6
Abstract	6
Article content	7

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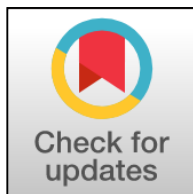
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Development and Harm of *Liriomyza Sativa* Blanchard leaf--mining Flies

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Abstract

This article is focused on the continuation of the development of miners that are considered to be main pests of vegetable plants. Due to the gathered information, it was identified that in an optimal condition, a generation of a leaf-mining fly (*Liriomyza sativa* B) develops in 17.5 days. Also, we have identified the level of its harm to vegetable plants.

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Introduction .

During the period of growing vegetables all over the world, a number of problems appear in protecting the plants from pests and diseases and we can observe that 20-40% of vegetable plants are destroyed under the influence of pests and diseases. Besides that, numerous chemicals used in management of the amount of pests and diseases influence the environment and human health and in the result of it, the generation of harmful organisms that are tolerant to pests are appearing. These kinds of problems are influenced by global changes of the climate in the Earth as well. This is followed by the destruction of a biologic change, unexpected increase in the number of pests and in the management of their quantity.

Vegetable plants are planted in more than 344 thousand hectares of land and in more than 10 thousand hectares of green houses in our Republic. Vegetable plants are harmed by a number of pests and some representatives of *Agromyzidae* family are considered to be the important ones. According to Kenneth Spenser's observations *Liriomyza* generation of leaf-mining flies make much harm to plants all over the world. 24 of 300 types of this generation are considered to be economically important. One of them, *Liriomyza sativae* Blanch is considered as a polyphage insect. It mainly harms the plants of solanum, leguminous and pumpkin families. In the USA it harms tomatoes much but cotton plants are considered to be less harmed [1].

As Sh.T.Khujayev believes, the lowest temperature for the development of eggs, a larva and puparium of leaf-mining flies is about +9-10°C. Under +25-30°C, the eggs and larva need 7-9 days for their. The same temperature with 8-9 days is necessary for the development puparium. When the temperature is 15°C the eggs, larva and puparium develop in 25-30 days [2].

Changler L.D. and Gilstrap F.E. determined development indices of *L. trifolii* type under 24°C in a laboratory condition. In this condition the female with testicles laid approximately 17.9 ± 29.8 eggs. 68.9% of the laid eggs became larva. The eggs developed in 4.2 ± 0.1 days, larva in 5.8 ± 0.2 days and chrysalis in 10.2 ± 0.4 days. It was identified that the most destruction was among eggs and chrysalis in the period of development [3].

Materials and methods of investigation :

in our investigations, we identified the development period of *L. sativae* type of leaf-mining flies in vegetable plants of Andijan region. Also, in order to determine the harm of (*L. sativae*) leaf-mining fly to solanum plants, we grew tomato, bell pepper and eggplants in flower pots for laboratory experiments. Puparium of pests were brought from diseased plant leaves and were put in tens of test-tubes. They were kept until flies came out of them. As soon as the flies came out, they were put into the plants that were isolated from one another. We made observations on the time of laid eggs, the time and place of larva's coming out from pores. We took 15 pores so that to observe the state of larva's development, they were watched by the help of a magnifying glass, micrometric lens and their sizes were defined. The harms made to plant leaves by larva were defined every 24 hours.

The development continuation of *L. sativae* (under +25°C, in 60-65% of air moist, bio laboratory of Andijan branch of TSAU, 2016-2017).

Investigation results .

As a result of our investigations, development continuation of *L. sativae* and sizes of its phases were studied under 25°C temperature with 60-65% air moist in conditions of a laboratory. Due to the investigations carried out in the laboratory, a full generation of *L. sativae* developed fully in 17,5 days in our experiment. The length of *L. sativae* type of leaf-mining fly was 0.18 ± 0.01 mm, its color was whitish. The incubation period of eggs was 3.3 ± 0.20 days. 4,7 ± 0,30 days are needed for full development of larva. The longest period in the development of leaf-mining flies is the process of larva development. The primary chrysalis (puparium) is yellowish, and then it changes to brown (pic.1). Its chrysalis is in cylindrical shape, the length of which approximately 1.56 ± 0.5 mm, the breadth is 0,5 mm. In our experiment this period lasted 9,5 days (there were the pupariums whose period of development lasted 8,6 and 11,5 days too).

Picture 1. Larva and chrysalis of a leaf-mining fly

In this picture we can see that, the larva period of a pest is 4.5-5 days. Our next observations were depicted in picture 2. Here we can see that in (*L. sativae*) type of leaf-mining flies harmed 0.75 cm² of the layer of tomato leaves, 0.62 cm² of the layer of bell pepper leaves and 0.71 cm² layer of eggplant leaves in the larva period.

Picture 2. Harms of (*L. sativae*) type leaf-mining flies to leaf layers of different plants in the larva period (cm²).

It was known by the experiment that the plant leaves harmed most among solanum family were tomato's leaves.

Conclusion .

Leaf-mining flies are considered to be the pests that harm vegetable plants in conditions of Andijan region. We identified that in optimal conditions the continuation period of full development of the generation of these pests last 17.5 days. Also, we determined the larva of leaf-mining flies harm 0,75 cm² layer of tomato leaves, 0,62 cm² layer of bell pepper leaves and 0,71cm² layer of egg-plant leaves in the period of its development.

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