

Species Composition of Main Pests of Fig and Bioecology of Important Species

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Annotation: The climatic conditions of Uzbekistan are favorable for the cultivation of crops adapted to the subtropical climate. These include figs. These tree-shrubs have been planted since ancient times and have become a branch of horticulture for the countries of Central Asia, including the people of Uzbekistan.

Key words: fig, climate, crops, cultivation.

Fig (*Ficus carica* L.) is a woody shrub that has been cultivated since ancient times. It has been known to mankind for 5-6 thousand years. Fig fruits are rich in various vitamins and sugar. Therefore, it is consumed as a medicinal fruit, and drugs such as "Kafiol" and "Regulaks" are prepared from its leaves for use in medicine. Figs are widespread in all countries with tropical and subtropical climates, and can be found in all countries along the Mediterranean Sea and in the regions of Central and Asia Minor. More than 600 of its varieties are known on earth [3].

The reason why this woody shrub is widespread is, firstly, its high productivity (130-170 quintals can be harvested from 1 hectare of planted figs), and secondly, the bush grows from shoots (vegetatively) and quickly enters the harvest.

There are 18 varieties of figs in Uzbekistan. Among them, the most common are: Yellow figs of Uzbekistan, Karshi figs, Kadota, Smirin black figs, etc. In the conditions of Uzbekistan, sufficient light and heat, artificial irrigation and soil conditions are favorable for fig cultivation. Therefore, it can be found in the courtyards of all regions and in special plantation-gardens. It is necessary to protect these trees and their fruits from various harmful organisms in order to obtain a high and quality harvest from figs, which are the gifts of the garden, and to meet the needs of the population [4].

Spider mite (*Tetranychus urticae* Koch.) and fig moth (*Choreutis nemorana* Hb.) can cause serious damage to figs. The fig moth is poorly studied, and in the conditions of the Fergana Valley, it is necessary to study and introduce its biological development characteristics, damage and scientifically based periods for combating it, as well as highly effective tools and methods.

Information about both harmful insects can be found in the monograph "Pests of agricultural crops found in Central Asia and their control" published in 1953 by Professor V.V.Yahontov, as well as in popular scientific articles of various scientists. But with the passage of time, significant changes took place within the members of the agrobiocenosis in the ecological regions, new demands were made for the protection of plants. This requires new in-depth research on these insects [5].

The fig moth (*Choreutis nemorana* Hb.) is a serious pest that occurs in all regions of Uzbekistan and causes considerable damage to figs [1].

In addition to Uzbekistan, it can be found in all neighboring countries and in the southern regions of Russia, the Crimea, the Caucasus, the mountainous regions of Central Asia, Southern Europe, the countries around the Mediterranean Sea, and the countries of Asia Minor.

In Uzbekistan, the fig tree is of great economic importance, especially in Surkhandarya, Vadi regions, Tashkent and other regions suitable for fig cultivation.

The fig moth has been taxonomically transferred to the family Choreutidae (previously it was in the family Glyphipteridae). Butterfly wings have a unique shape and color. Its size reaches 15-17 mm when the wings are folded [3].

From the top, the body is dark brown, and from the bottom it is light brown. The forewings are dark brown with indistinct markings, while the hindwings have two indistinct light spots and are dark brown. The edges

of the wings are covered with flowing hairs. The whiskers are long, stringy, with black transverse stripes. Eggs are oval-flat, runny-yellow, 0.5 mm.



Figure 1. Fig moth larvae

Worms are yellowish-green in color, rough on the surface, covered with many black spots, legs on the abdomen are thin and long. That's why the worms are active, and those who are disturbed quickly spread a thread and throw themselves down. The length of adult worms is 12-13 mm. Mushrooms are brown, cylindrical in shape, and have 1 pair of black spots at the end of the abdomen. Before pupation, the worm weaves a rather dense diamond-shaped white silk.



Figure 2. Buds of the fig propeller

The fig moth overwinters as a butterfly. Butterflies begin to fly in April, when the average daily temperature exceeds 13. After additional feeding, the butterflies start to fly and lay eggs. This usually falls on the middle of April. Later, depending on the air temperature, 22-27 days from 40-43 degrees (1st generation), 30-37 days for 3rd-4th generations and 5th-6th generations are needed for the development of each 1st generation. Some researchers report that the fig moth gives 3 generations per season [2].

We studied how the fig moth butterfly lives and lays eggs. For this purpose, 1 pair (male and female) mushrooms were placed in a small (capron mesh) box on tree branches. The sex of the future butterfly was determined based on the location of the genital lines at the end of the abdomen.



Figure 3. A plant damaged by the fig moth

It was determined that each female lived from 9 to 20 days. At this time (butterflies with additional feeding) each breed can lay up to 105 eggs on the underside of the leaf individually or in clusters of 10-14. Embryonic development of eggs lasts 4-6 days, worms hatch, 25-35 out of every 100 eggs remain sterile. Newly hatched worms first feed on the remains (shell) of the eggs they lived in, and then begin to gnaw on the green soft tissue of the leaf. To protect themselves, adult worms hide themselves by twisting the edge of the leaf with thin and soft threads that they weave. Although it protects against the attacks of various insects, it cannot protect itself from chemical insecticides [2].

The caterpillars of the moth mainly gnaw the fig leaves, leaving its vascular "skeleton". In this respect, they are similar to phyllophagous moths, but they also resemble carpophagous (fruit-eating) groups, especially since they damage fig fruits in their later generations.

Harmfulness. It is known that the fig tree produces 2 crops in a year. Damage to productivity of fig moth can be different in spring and autumn harvesting of trees. In the spring, the moth mainly damages fig leaves, and in the fall, it feeds more on the fruit.

Fig moth only damages figs. In the spring, it mainly eats the young leaves by crushing them. As a result, the branch and the tree lag behind in development, the first spring harvest is reduced. The pest spends its 3-4th generations during the "second" harvest period of the fig plant. This means more damage, because during this period, the buds of the crop are more appreciated than the leaves, and it feeds on them. During this period, the damage caused to fig productivity depends on the density of insects in the tree. An example of this is our research conducted in 2023 in the village of Chimyon, Fergana district, Fergana region. In our experiment, trees with fruits of 2 different damage levels were obtained: 10-15 and 16-23%. We compared these with controls, i.e. pest-free woody shrubs that had been treated chemically. 8 kg (12.8 s per hectare) of each bush less affected by the pest, and 14.4 kg less (23 s per hectare) from each of the heavily damaged bushes. Thus, it became clear how significant the damage of the fig moth is. Based on the obtained results, it was calculated to determine the IZMM to fight the fig moth.

In the above-mentioned experiment, if the average of the results obtained in both options is taken, if 1 out of every 200 fruits present in woody bushes is damaged (0.5%), 55 kg of fruits per hectare can be lost. Taking into account that the tested trees were also infested with a spider mite, if half of the damage is attributed to this pest, the fig moth itself can be considered as 1% of the IZMM. That is, if one out of every 100 fruits is infected with moth worms, 55 kg of fruit can be lost from 1 hectare. This means that only then the money spent on chemical treatment of 1 hectare of garden can be justified. In order to get even more profit, it can be economically effective to start protecting fig bushes from moths when an average of 1.5-2 out of 100 fruits (1.5-2%) are damaged.

In conclusion, protection of figs against fig moth should be started only when 1.5-2 out of 100 fruits (1.5-2%) are damaged. Then the processing can not only pay off, but also have an economic effect.

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