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## Trichogram Reproduction On Cotton Scoop Eggs In Biolaboratory

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### ABSTRACT

The article discusses the issue of mass reproduction in the biological laboratory of the ovarian parasite of Lepidoptera - Trichogramma, in particular the species *Trichogramma evanescens* Wes, widely represented in the nature of Uzbekistan. against the dangerous pest of cotton bollworm. In Uzbekistan, much attention is paid to the use of a biological method, in particular entomophages, which, unlike the chemical method, is characterized by safety for the environment and high biological efficiency reaching 69-75%. The article describes the technology of reproduction of trichogramma in a biological laboratory on eggs natural hosts of the entomophage.

### KEYWORDS

Biological method, biolaboratory, cotton scoop, trichogramma, mother material, sitotrog, biological efficiency, entomophage dispersal, reproduction technology.

### INTRODUCTION

The boxworm, the larva of the cotton bollworm (*Heliothis armigera* Hb.) Damages the flowers, buds and bolls of cotton, as well as corn cobs, tomato fruits, pea kernels and many other crops. Affected buds and young

cotton bolls fall off, which greatly affects the overall yield.

In the conditions of Central Asia and the Caucasus, the first mass year of butterflies coincides with the time of the formation of

cotton ovaries and falls on average from May 20 to June 20. With average monthly temperatures equal to 20°C, the development of the pest takes 43-44 days, with an increase in temperature to 30°C it is reduced to 30 days.

Various methods are currently used to combat box worms, in particular, agrotechnical, chemical and others. Farmers in Uzbekistan widely use the biological method, which has proven to be highly effective and is the most economically viable.

The main natural enemies of the cotton bollworm from parasitic organisms are: trichogramma, apanteles, microplateis, macrocentrus, barilipa, bunchus, amblyteles, tahina flies and some other representatives of the insect world. In total, more than 45 species of naturally inhabiting hymenoptera parasites of the cotton bollworm and 10 species of tachinid flies are known in the cotton growing regions.

## MATERIALS AND METHODS

In the system of protection of the cotton crop, great importance is attached to the parasite - the egg-eater of the Trichogramma pinto species, in particular the species *T. evanescens* Wes, widely represented in the nature of Uzbekistan, which belongs to the representatives of the family. Trichogrammatidae, order Hymenoptera. Insects belonging to this family of chalcids, despite their small size 0.12-1.2 mm, are considered ovarian parasites of moths, and many other harmful lepidopteran pests, because they develop inside their eggs. Unlike larvae, adults feed on the nectar of flowers.

Trichogramma hibernates in the phase of adult larvae in the eggs of various lepidopteran pests, where it later turns into a pupa and then, gnawing through the shell, flies out in

the form of an imago. After mating, begins to lay eggs.

*Trichogramma evanescens* Westw are small insects (0.4-0.6 mm), light brown to black. The forewings are wide with cilia, 2 times as long as the wing width. Males are similar to females, only the antennae of the female are 5-segmented, in contrast to the 3-segmented antennae of the male.

In agrobiocenoses, they are found on crops of cotton, corn, tomatoes, cabbage, beets and other crops. It is considered one of the main entomophages in the protection of crops from harmful butterflies, because guided by the smell of the pest, it lays 1-2 of its eggs in the eggs of the pests, in which it develops further by feeding on the internal contents.

On average, one female can lay 45-60 eggs. Biological efficiency is 69-75%. The optimal conditions for development are: temperature in the range of 20-33°C with a relative humidity of 75-90%. In the population, the number of females is greater and amounts to 75-90%. In the conditions of Uzbekistan, it gives 10-12 generations.

An adult insect lives on average 4-6 days, when the temperature drops to 10-11°C, it hibernates.

## TRICHOGRAMMA REPRODUCTION TECHNOLOGY IN THE BIOLABORATORY

According to the proven technology, in order to obtain the required quantity of high-quality products of the trichogram under the conditions of artificial reproduction in biolaboratories, it is necessary to have a supply of mother material. Mother material includes biological material collected in nature, which includes the collection of moth eggs infected with trichogramma. Collection of mother material begins in August and

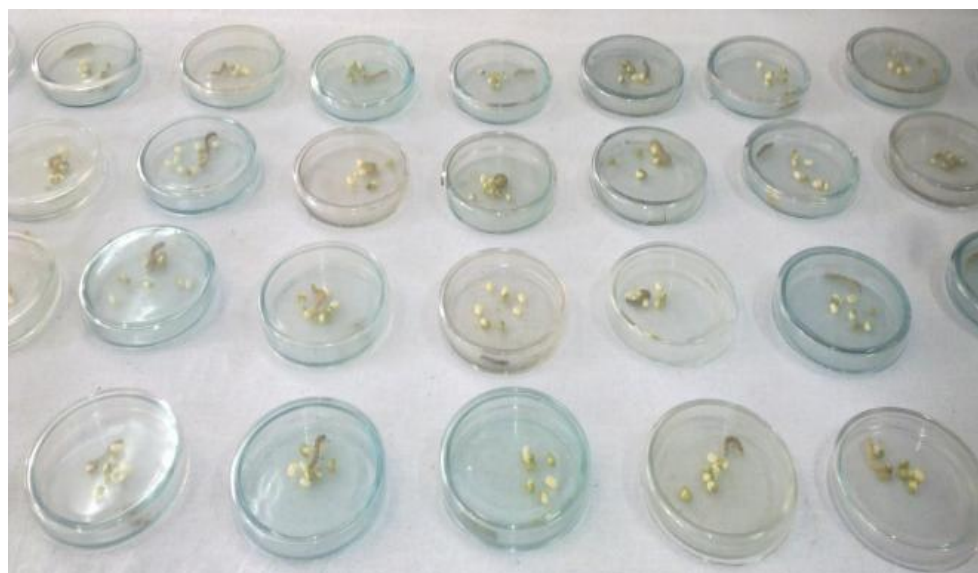
continues until January-February. The production of mother material includes separate stages:

1. Collecting natural trichogramma in the fields.
2. Growing scoop eggs.
3. Cultivation of Trichogramma mother material.
4. Entering the grown trichogramma into diapause.

**Growing eggs of scoops - natural hosts of trichogramma.** To obtain the mother material

of Trichogramma, it is necessary to pass it through cultivation in a biological laboratory in the eggs of natural hosts in the autumn and winter periods. (fig. 1). (Kimsanbaev Kh.Kh.).

To obtain pest eggs, butterflies or scoop pupae collected in nature by various methods (for example, by light traps) are grown in a biological laboratory. One of the directions of obtaining eggs from butterflies of natural hosts is their breeding and reproduction in a biological laboratory in artificial or natural environments.



**Fig. 1. Mass breeding of butterflies scoop in a laboratory.**

To do this, males and females of scoop butterflies collected in nature are mixed in glass containers of 8-10 individuals. To collect further pest eggs, accordion-folded paper is laid inside the jar. To feed the butterflies, a cotton wool soaked in 20% sugar syrup is placed on the bottom of the can. Banks are covered with gauze, which is fixed with a rubber ring. Banks are stored at a temperature of 20-25°C and a relative

humidity of 65-70%. Banks are reviewed daily with the collection of laid eggs and deceased individuals, which are replaced with fresh ones.

Obtaining Trichogramma mother material from scoop eggs. Trichogramma collected in nature is stored in a wide-necked 1 liter glass container covered with a dense cloth on top. To feed the trichogramma, a cotton wool

soaked in 10% sugar syrup is placed on top of the fabric. The grown eggs of natural hosts are laid inside. When the ratio of males and females is 1:20, mating occurs. Banks are stored in the light at a temperature of 24-25°C and a relative humidity of 70-75% (Kh.Kh. Kimsanbaev, 2007).

After 5-7 days, the infected eggs turn black and are laid out from the container, replacing them with new, uninfected eggs. The change of lots of eggs is carried out 3-4 times. Thus, the uterine population of *Trichogramma* is obtained.



**Figure: 2. Bulk rearing of eggs in the laboratory grain moth infected with trichogramma**

## RESULT AND DISCUSSION

### Obtaining a commercial trichogram

Obtained from the uterine population in a massive way in the biolaboratory, the trichogram is the final product and is used in crops to control harmful Lepidoptera.

The mother material of the *Trichogramma* in the biolaboratory is propagated for 4-5 cycles on the eggs of the grain moth (sitotrogi).

For withdrawal from diapause, 2-3 g of *Trichogramma* stored in the refrigerator is placed in glass jars, which are stored at a temperature of 25-26°C and a humidity of 75-80%. After 3-6 days, the trichogramma years begins. To feed the trichogramma, a cotton

swab soaked in 20% sugar syrup is placed on top of the cloth covering the can.

To obtain a commercial trichogram, it is necessary to cultivate it on the eggs of a laboratory host of a grain moth. To do this, the cleaned 3 l jars are "steamed" and dried, then in a circular motion the jars are laid inside the jars grown in the biolaboratory. Then on the eggs of the grain moth adhered inside the jar, the mother material of the *Trichogramma* is released. The banks indicate the number of eggs laid by the sitotroga and the released trichogramma. Lighting is required to obtain a commercial trichogram.

After 5-6 days, the eggs of the grain moth, embedded inside the jar, infected with

trichogramma, darken and with a soft brush are collected in paper bags indicating the collected mass.

If it is impossible to immediately use sitotrogi eggs on crops infected with trichogramma, they can be stored for a short time in household refrigerators at a temperature of 1-30C and a humidity of 80-90%.

### Trichogramma application

For highly effective use of the commercial trichogram obtained in the biolaboratory, it is necessary to observe the technology of its reproduction. So, in the trichogramma production shop, the temperature should be kept within 25-300C during the day, 18-200C at night with a humidity of 60-70%. Trichogramma is fed daily with 20% sugar syrup, occasionally supplemented with pure water.

The first dispersal of Trichogramma in the fields coincides with the moment of laying eggs by pests. The terms of colonization are determined according to long-term forecasts and on the basis of data on the number determined by pheromone traps.

Infection of cotton bollworm eggs in the field is observed after 5-8 days. After 10-12 days, the effectiveness of infection of the pest's eggs is reduced by 4 times, and after 15 days, it is not observed at all. Consequently, for effective protection of the crop, a 3-fold release of the entomophage biomaterial is required. So, 0.5 + 0.75 + 0.5 g (or 30 + 50 + 30 thousand pieces) of trichogramma are settled per 1 hectare, for cotton crops the ratio is 60 + 80 + 60 thousand pieces (total 200 thousand).

### CONCLUSION

The first colonization with trichogramma is carried out after 5-6 days when pheromone

traps detect 2-3 butterflies of the cotton bollworm per day. The second and third time 3-4 days after detecting 1.2 moths per day. It is necessary to pay attention to the uniform distribution of the biomaterial. To do this, trichograms, ready to emerge from the infected eggs of the grain moth, are laid out in 2 or 3 l jars, then 100 pieces are placed there. folded 1-1.5 cm of scraps of paper on which emerged individuals of the entomophage settle.

Trichogramma is released early in the morning (at 6-11 o'clock), or in the evening (from 18-20 o'clock) on the shaded leaves of the lower or middle tier of plants. For 1 gatrichogram, it is settled in 100 places (according to the scheme 10 x 10 cm).

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