

## **Highly specialized entomophags of the leaf-roller moth (*Lepidoptera*, *Tortricidae*), as a composite part of the apple-tree protection system**

Lapa O., Drozda V.

*National Agrarian University, Kyiv, Ukraine*

The specific weight of the fruit planting leaf-roller moth complex exceeds 30% of the total inimical fauna fond. The leaf-roller moth has the highest level of injuriousness among all other phytophages, because they feed on not only leaves, bark, sticks, buds and roots, but on fruits too. It is known, that to this group relates harmful pest like the codling moth (*Laspeyresia pomonella L.*), which can damage 30 – 70% or even 100% of the apple crop. Among the leaf-roller moth complex, there is the largest group of phylophags that counts more then 18 specimens. In conditions of Lisostep they are monocyclic. Research of the caterpillar phenology showed that according to periods of growth, adapted to phenological stages of the forage crops and to damage character, they can be divided in two groups: early- and lately-spring specimens. The representatives of the first group – are fruit chatoyant, plumbeous-striped, gemmaceous and smoke-colored that damage apple-tree during the period of excrescence of the bud excretion phenological stage until the ovary fall. The maximal density of their population characterizes in the bud excretion phenological stage – is a pink bud. The lately spring specimens actively feed during blossoming period – the ovary fall. These are the next specimens like osier, omnivorous, reticular, striped-cold and rose. The asynchronism in growth periods of the early-spring specimens' complex comparatively to leaf-roller moths of the second group remains on the following stages. The large pupation of the caterpillars and flight of the imago representatives observed on 12-16 days earlier then of late spring specimens.

During the current years, there is an actual problem of improvement and scientific reasoning of the garden protecting system, taking into account the fact that gardens are the largest pesticides containing agrocenosises. Reducing and rationalization of the processing are possible in terms of in-depth study of particularities of the agrocenosis functioning, entomocomplex interaction and

selecting of the effective methods, with indispensable considering of the parasites and carnivores populations useful activity.

In particular, in our researches we used the parasite *Ascogaster quadridentatus* – primary egg-larvar species that affects all leaf-roller moth specimens and other epidopterous pests. Female parasite oviposits into the leaf-roller moth egg. A larva of the parasite completes its growth in the older caterpillar. The technology of the large laboratorial breeding and accumulation of the parasite, with following parasites releasing in gardens, worked out.

In researches, with the aim of increasing the ascogaster vitality and productivity were used the nucleotides: uracil (URL), methyluracil (MG) and 5-piperidine-methylene-6-methyluracil (BES-221), by extra nutrition of 10% sugar solution in different concentrations.

The codling moth eggs, affected by females, were placed on the green apples to feed caterpillars with growing parasite. The positive effect was estimated according to parameters like growth duration in the caterpillar of the codling moth, prolificacy, duration of imago life, competitiveness in agrocenosis, level of affection the leaf-roller moth. The results of researches illustrated in table 1.

As follows, starting parasit populations, as a result of nucleotides effect, were highly viable and competed with natural parasite populations for the hosts – eggs of the leaf-roller moth and females of their species. The longer duration of life was typical for imago, and especially the compounds effected on breeding potential of females. The tested females oviposited considerably much more eggs, then the control populations, and accordingly the term of breeding potential was longer. Practically the gonads function lasted for the whole life of imago. Furthermore, they were characterized by motion and searching activity. As a result, they efficiently affected the leaf-roller moth eggs. The ascogaster was used as a component of the apple-tree protection integrated system, by artificial colonization. According to the pheromone snare parameters (5-7 imagoes captured for one snare per 7 days), at the period of the mass oviposition beginning, we conducted spraying of the trees with hormonal insecticide Insegar 25 WP according to the

dosage 0,6 kg/hectare and in 3 days the ascogaster's imago were released on the basis of 200 females per a tree. In fact, such integration provided stable garden protection from the leaf-roller moth complexes and other concomitant epidopterous pests. The technological parameters and possibilities of the leaf-roller moth caterpillars' parasites *Microdus rufipes* breeding were studied too. As in the case of the previous species, we used nucleotides in water solutions for imago's extra nutrition. This parasite affects the codling moth caterpillars quite efficiently. The laboratorial researches allowed establishing the optimal technology regimes of the parasite growing. The results of the researches illustrated in the table 2.

It is determined that using one of a three preparations (BES-221) substantially stimulates parasite's growth in the laboratorial culture. As in the case of the previous species, we observed the distinct stimulant's effect on the function of female parasites gonads. As a result, of increasing the practical prolificacy of the females was the affection of the large amount of codling moth eggs.

In fact, the both specimens widely enlarge their response norm within the limits of each species genetic program. It is offered the practical technologies as a composite part of the integrated apple-tree protection systems. These technologies are certified. It is obvious that these technologies should be used, first of all, in the nature conservation zones, the specific-oriented economies, at the holiday centers, the river outlets and at the specialized economies, where child's and dieted foodstuffs are produced.

Table 1

**The indexes of the leaf-roller moth parasites *Ascogaster quadridentatus* growth after extra nutrition of the imago by nucleotides**

Preparation	Concentration	Life-time duration of imago, days	Ovipositing Egg/female, specimen's number	Duration of the one generation growth, days	Competitiveness in the agrocenosis	Eggs affected, %
Control	-	14,8 ± 1.6	237,3 ±11.4	38.4 ± 1.6	Flaccid, do not compete	54.3
MT	0.01	17.0 ± 1.8	266.8 ±14.3	36.8 ± 1.8	Actively set in the garden	64.8
MT	0.002	19.1 ± 1.3	291.4 ± 9.7	33.1 ± 1.3	Successfully compete with natural ones	75.2
MT	0.0005	19.6 ± 1.4	303.1 ±10.2	32.4 ±1.4	Compete with nature ones	74.6
HIP <sub>05</sub>	-	22.4	18.6	2.1	-	6.2
URL	0.01	21.2 ± 2.1	378.4 ±14.7	34.8 ±2.1	Actively affect eggs	74.8
URL	0.002	20.8 ±1.9	352.2 ±15.2	36.7 ±1.8	Competitive	68.7
URL	0.0005	23.8 ±2.6	329.6 ±12.3	35.1 ±1.4	Compete with nature ones	69.1
HIP <sub>05</sub>	-	16.2	15.4	6.2	-	7.1

Table 2

**Influence of the nucleotides on the leaf-roller moth parasite *M. rufipes* growth**

Preparation	Concentration	Life-time duration of imago, days	Ovipositing Egg/female, specimen's number	Duration of the one generation growth, days	Competitiveness in the agrocenosis	Eggs affected, %
Control	-	17.4 ± 1.3	104.8 ±1.9	31.2 ± 2.2	Flaccid, do not compete	39.2
URL	0.01	19.8 ± 1.6	109.8 ±6.6	29.3 ±1.8	Actively affect eggs	51.4
URL	0.002	28.4 ±1.3	119.7 ±2.7	27.9 ±1.5	Competitive	66.2
URL	0.0005	29.1 ±1.6	129 ±2.2	28.8 ±1.8	Compete with nature ones	68.3
HIP <sub>05</sub>	-	14.4	15.2	3.1	-	5.3