Vital Annex: International Journal of Novel Research in Advanced Sciences (IJNRAS)
Volume: 02 Issue: 08 | 2023 ISSN: 2751-756X
http://innosci.org

Bioecological Characteristics of Walnut Worm – Archips Argyrospila W., its Damage and Control Measures

Nazarov Shaxzod Rustam o'g'li
Kat.i.x., Scientific-research institute of plant quarantine and protection

Shukurov Xushvaqt Mamasaliyevich
Q.x.f. doctor, Scientific-research institute of plant quarantine and protection

Nazarova Moxichexra Jamalovna
Supporting doctoral student, Scientific-research institute of plant quarantine and protection

Annotation: Nut worm - Archips argyrospila. Lepidoptera is a family of moths (butterflies), leaf-eaters are a family of Tortricidae. It was found that this pest is causing widespread damage in the walnut groves located in the mountain and sub-mountain regions of our Republic. Our research was conducted in Bostonliq district of Tashkent region. A. argyrospila, according to its developmental process or ontogeny, belongs to the group of fully developed insects, passing through four developmental stages: adult, egg, larva and pupa. Based on the obtained data, the phenological development of A. argyrospila can be compiled. According to this, A. argyrospila develops in two generations in the conditions of Tashkent region.

Keywords: Nut borer, ontogenesis, disease, phenological, developmental phase, mature breed, pre-mountain, cultivars, control, offspring, borers, walnut trees.

INTRODUCTION

The forestry of our republic is multi-faceted, including the establishment of forests, study, accounting, use of various forest resources, their protection, restoration, protection from pests and diseases. An important feature of forestry is that forest establishment takes many years. The total area of forests and bushes of our country is 3.2 mln. hectare is 7.2%.

In Georgia, scientific studies were carried out on the distribution of diseases and pests in common walnut (Juglans regia) and modern control measures against them.

A new species of mite Aceria erinea (Nalepa, 1891, Acariformes: Eriophyidae) was identified in the conditions of Belarus. This pest was not recorded in Belarus until 2012. This species is widespread mainly in southern regions, Central Europe, Asia Minor, North South America, Australia, and New Zealand.

In the conditions of Uzbekistan, walnut frugivorous Sarrothripus musculana Ersch., a representative of the family Cymbidae, reduces walnut productivity by 40-50%, in some districts by 80%, and scientific studies have been conducted on measures to combat this nut frugivorous.

Nut worm - Archips argyrospila. Lepidoptera is a family of moths (butterflies), a family of Tortricidae, a species of the genus Archips (see Fig. 2). It was discovered for the first time that this pest is causing widespread damage in the existing walnut groves in the mountain and sub-mountain regions of our Republic. Our research was conducted in Bostonliq district of Tashkent region.

Vital Annex: International Journal of Novel Research in Advanced Sciences (IJNRAS)
Volume: 02 Issue: 08 | 2023 ISSN: 2751-756X
http://innosci.org

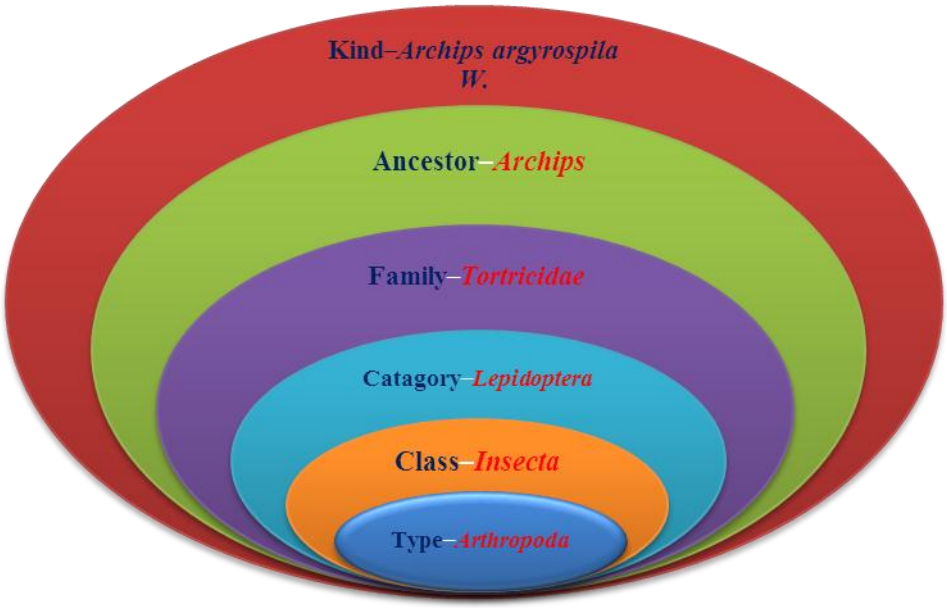


Figure 2. Systematic classification of the nut armyworm.

A. argyrospila, according to its developmental process or ontogeny, belongs to the group of fully developed insects, passing through four developmental stages: adult, egg, larva and pupa. Despite the fact that the morphological description of the pest by its phases is known today, various information can be found in literature sources. Synonyms: Retinia argyrospila Walker, Cacoecia columbiana Mc Dunnough, Tortrix furvana Robinson, Cacoecia vividana Dyar, Tortrix vsignatana Packard.

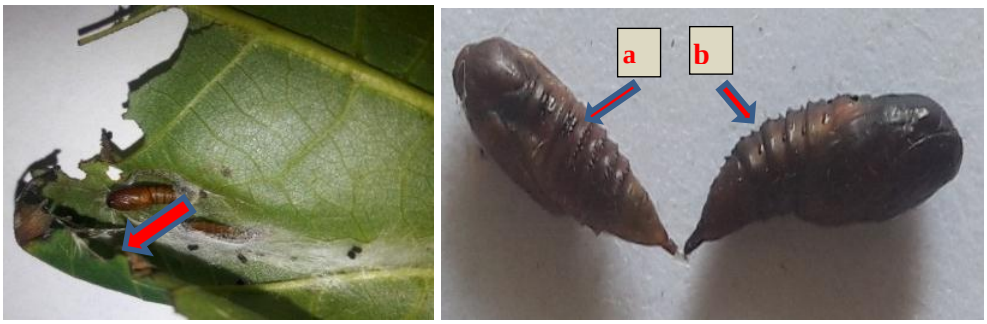
A. argyrospila overwinters in the form of eggs on tree branches or in bark cracks. She lays her eggs in clusters, the color of her eggs is brown during the winter, and in the spring they change to a light gray color before the larvae hatch. A. argyrospila develops by giving two generations in one season. It was found that leaf beetles come out of hibernation early when the winter season is relatively warm and cause more damage to walnut leaves.

Figure 3. A. argyrospila worms infesting walnut leaves.

The worms of A. argyrospila are gray-green in color, the length of young worms is 6–10.2 mm, and the length of adult worms is 8.5–17 mm. in length. The head is black with a yellow stripe down the middle of the head. It was found that up to 4-5 caterpillars can damage one walnut leaf (see Fig. 3).

A. argyrospila worms wrap walnut leaves in the form of a tube, feed on the remaining part of the leaf inside the wrap, and turn into a tuber in the wrapped part of this leaf.

The pupal period lasts 7-10 days. The length of the cones reaches 10-13 mm, the color is dark brown or grayish yellow. There are 8-10 hairs on the upper part of each segment of the cones, and on both sides there are six elongated bumps (see Fig. 4).



A **B**

Figure 4. A is a mushroom inside a walnut leaf wrapper. Hairs (a) and ridges (b) of B-mushrooms.

After 2-3 days, butterflies emerge from the cones, feed on the nectar of various nearby flowers, mate, and the females begin laying eggs. It lays 5-6 eggs on the underside of leaves or in leaf bands. A. argyrospila butterfly is 11–13 mm long with shiny golden color, wingspan 15–20 mm. up to 100 m, his whiskers are stringy. The life span of the butterflies is 5-7 days, and they are distinguished from other long-lasting moths by the pale triangular shapes on the edges of their wings (see Fig. 5).

A **B**

Figure 5. A– A. argyrospila butterfly. B– A. walnut leaves infected with argyrospila.

Based on the obtained data, the phenological development of A. argyrospila can be compiled. Accordingly, A. argyrospila develops in two generations in the conditions of the Tashkent region (see Table 1). This is based on the above information.

It can be said based on the data of the phenological table

A. argyrospila winters in the Tashkent region as a worm in the village, i.e. without a worm inside the cocoon, until the first decade of April. Worms turn into cocoons in this month, and in the 1st decade of May, butterflies (imago or adults) begin to emerge, mate, and the females begin to lay eggs. At the end of the third decade of May, worms emerge from the eggs.

Vital Annex: International Journal of Novel Research in Advanced Sciences (IJNRAS)
Volume: 02 Issue: 08 | 2023 ISSN: 2751-756X
http://innosci.org

Table 1. ***Table of phenological development of A. argyrospila (2019-2021 in Bostonliq district of Tashkent region)***

March	April			May			June			July			August			September			October		
III	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III
(0)	(0)	(0)	(0)	(0)																	
				+	+																
					•	•	•														
						–	–	–	–												
								0	0	0	0										
											+	+	+								
													•	•	•						
														–	–	–	–	–			
																	0	0	(0)	(0)	(0)
FHY				458 °S						458 °S						916°S					
• egg; – worm; 0 mushroom; + butterfly (imago); (0) resting mushroom.																					

Feeding of worms continues until the end of June. A. argyrospila worms can damage an average of 3-5 fruits during a feeding period of 26-30 days. After that, the worms turn into sponges. After 15-19 days, i.e. on July 19-22, butterflies of the 2nd generation fly out of the cones and begin to lay eggs in pairs. In the same way, 2 generations of A. argyrospila continue to develop and stop feeding in the middle of September and go to the village. They spend the winter as a worm inside a cocoon, and in early spring, when the air temperature is 18-20oC, the relative humidity is 35-40%.

Nut worm - Archips argyrospila. Lepidoptera is a family of moths (butterflies), leaf-eaters are a family of Tortricidae. Synonyms: Retinia argyrospila Walker, Cacoecia columbiana Mc Dunnough, Tortrix furvana Robinson, Cacoecia vividana Dyar, Tortrix vsignatana Packard. It was found that this pest is causing widespread damage in the walnut groves located in the mountain and sub-mountain regions of our Republic. Our research was conducted in Bostonliq district of Tashkent region.

There are biological and chemical methods of control that are used against them and complement each other, taking into account the development of pests and the criterion of economic damage. Taking into account the above information, a chemical control method against A. argyrospila worm was carried out in our experiments.

For this purpose, in our experiments, walnut trees infected with A. argyrospila were treated with the following drugs in different dosages:

Difen super 55% n.kuk. (Thiamethoxim 350 g/k.+difenocanazol 200 g/kg.) 0.15–0.25 kg/ha., Roskypso OD (Thiocloprid 240 g/l.) 0.5–0.6 l/ha., Actinara 240 SC (Thiamethoxam 240 g/l) 0.15–0.25 l/ha, and Karat Gold 5% em.k. (Lambda-sigalothrin) 0.4-0.8 l/ha.

Vital Annex: International Journal of Novel Research in Advanced Sciences (IJNRAS)
Volume: 02 Issue: 08 | 2023 ISSN: 2751-756X
http://innosci.org

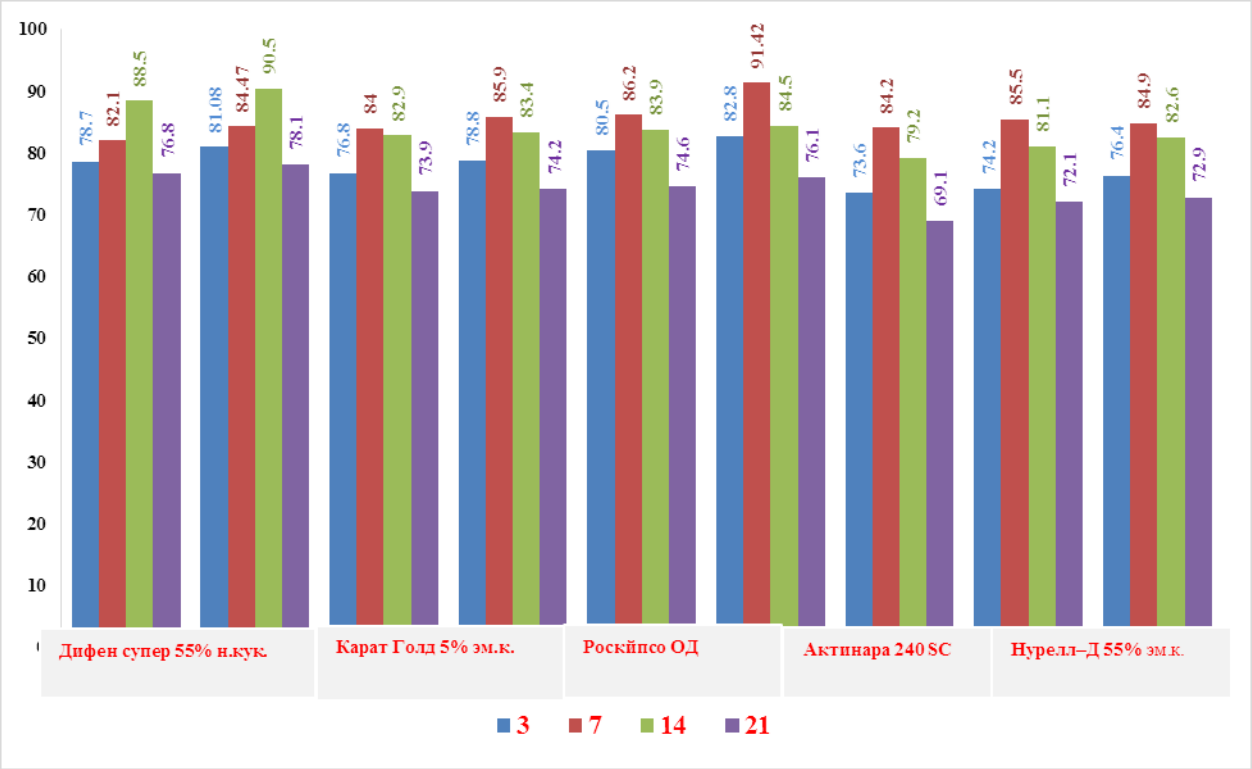


Figure 6. Biological efficacy of insecticides against walnut leaf-roller-Archips** argyrospila **W. (trubkavertka).

(Tashkent Region, Bostonliq District, Bostonliq Mountain Scientific Research Institute of Horticulture, Viticulture and Winery Research Institute named after Akademik M. Mirzayev, working fluid consumption 1000 l/ha, June, 2019-2021).

Difen super 55% drug 0.15-0.25 kg/ha in our field experiments conducted in April-June of 2019-2021 at the branch of "Scientific research institute of horticulture, viticulture and winemaking named after Academician M. Mirzayev" Bostonliq district, Tashkent region. biological efficiency reached 82.1-84.5% on the 7th day when used in the norm. In another variant, the drug Roskypso OD is 0.5–0.6 l/ha. 86.2-91.4% effective on the 7th day when applied in moderation. Actinara 240 SC drug 0.15–0.25 l/ha. and when used in moderation, it was 84.2-85.5% effective on the 7th day of calculation. Karat Gold 5% em.k. drug 0.4–0.8 l/ha. 84-85.9% effective on the 7th day when applied in moderation.

Nurell-D used in our model variant is 55% em.c. drug 1.0 l/ha. 84.9% effective on day 7 of the variant used (see Figure 6).

In our control variant, the number of A. argyrospila worms reached 34 to 40 per 10 walnut leaves, and this situation led to a 25-30% decrease in walnut yield. According to this result, it was found that if A. argyrospila worms are not controlled, their number increases dramatically and negatively affects the productivity of walnuts.

CONCLUSION

In conclusion, according to the results of the research, A. argyrospila develops and causes more damage in disease-resistant varieties of common walnut than in disease-resistant varieties.

Correct timing of application of chemical agents against A. argyrospila allows to drastically reduce the amount of the pest.

The use of chemical agents reduced the number of A. argyrospila and led to the death of worms. After harvesting, the biological efficiency in the harvested crop compared to the control was 73.9–91.4%.

Difen super 55% preparation 0.25 kg/ha. In the normal season, healthy grown fruits made up 90.5% of the total harvest.

Roskypso OD preparation 0.6 l/ha. In the normal season, healthy fruits made up 91.4% of the total harvest.

Thus, Difen super 55% preparation against A. argyrospila is applied at 0.15–0.25 kg/ha, and Roskypso OD preparation at 0.5–0.6 l/ha. it is recommended to use in norms.

Reference List

1. Данилевский А.С., Кузнецов В.И., Фалькович М.И. Листовёртки (*Lepidoptera, Tortricidae*) горных районов южного Казахстана //Тр. инст. зоол. ТХVIII. Алма–Ата: Изд. АНКазССР, 1962.–С. 11–65.
2. Ходжаев Ш.Т. Пути снижения пестицидной нагрузки в земледелии Узбекистана. Ташкент: «Знание», 1991. 19–с.
3. Ходжаев Ш.Т., Эшматов О.Т., Хашимов Х., Дурдиев К. Пиретроиды –новая группа инсектицидов для борьбы с вредителями хлопчатника //Обз. информация. Ташкент: УзНИИНТИ, 1984. 38–с.
4. Xo‘jayev Sh.T. Insektitsid, akaritsid, biologik faol moddalar va fungitsidlarni sinash bo‘yicha uslubiy ko‘rsatmalar (II–nashr).–Toshkent: Kom–DAR, 1994 va 2004. 103–b.
5. Ченкин А.Ф. Методика определения экономической эффективности использования в сельском хозяйстве результатов НИИ и опытно–конструкторских работ, новой техники, изобретений и рационализаторских предложений НТС МСХ СССР.–М.: ВНИИТЭИСХ, 1979.–№7. 27–с.
6. Nazarov Sh.R., Jalilov A. “O‘zbekiston sharoitida oddiy (grek) yong‘oq (*Juglans regia*) ga zarar keltiruvchi tangaqanotli (*Lepidoptera*) lar turkumiga mansub zararkunandalarining bioekologik xususiyatlari.” / “Mintaqalararo mevachilik va uzumchilikning holati, muammolari, istiqbollari” Xalqaro ilmiy–amaliy anjumani materiallari to‘plami 2018–yil 10–sentyabr. B. 325–329.
7. Nazarov Sh.R., Mamatov K.Sh. “Turli guruxlarga mansub insektitsidlarning yong‘oq bargo‘rar qurti–*Archips argyrospila* W. ga qarshi biologik samaradorligi” // “Agro kimyo himoya va o‘simliklar karantini” 2020 №5 (8) B. 71–73.
8. Nazarov Sh.R., Shukurov X., Abduraxmanova J., Umarov Z., Lapasov S. Effects and control measures of walnut gall (or wool)–*Aceria erinea* N. And wart–*Aceria tristriata* N. mites. ACADEMICIA: An International Multidisciplinary Research Journal ISSN: 2249–7137 Vol. 10, Issue 12, December 2020 P. 47–53. Impact Factor: SJIF 2020 = 7.13 https://saarj.com DOI NUMBER: 10.5958/2249–7137.2020.01686.9.
9. Ozolin, 1990, https://en.wikipedia.org/wiki/Juglans_(genus) Accessed26.03.2017.