

**NATURAL CULTURES OF BEETLE BEETLES (COLEOPTERA: MELOIDAE) OF HARMFUL LOCUST EGGS**

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<https://doi.org/10.5281/zenodo.7368701>

**Abstract.** *This article describes the species composition and practical significance of the blister beetles in the natural areas of northeastern Uzbekistan. As a result of the research, it was found that the number of species of blister beetles in the studied areas is 7. Larvae of species of the family Meloidae feed on harmful locust eggs, reducing their number to 31.5%. In addition to being a pest of pasture and cultivated crops, beetle venom has a negative impact on humans and livestock. It has been studied that blister beetles can cause severe poisoning and even death of livestock when eaten with hay.*

**Keywords:** *meloidae, fauna, species, cantharidin, entomophagous, Lower Amudarya biosphere reserve, locust, dominant species.*

**INTRODUCTION**

The global climate change and processes happening in natural landscapes in the world have a negative impact on insect biodiversity, which is increasing year by year. The biological diversity of insects is of paramount importance in ecological, genetic, social, economic, scientific, cultural, educational and aesthetic terms. More than 1.5 million species of insects are known on our planet and they are widespread in tropical climates. More than 16,000 species of insects are known in Uzbekistan (Azimov et al. 1993). The blister beetles we studied have the following classification [9].

Insecta: A class of insects

Coleoptera: An order of hard-winged insects

Polyphaga: suborder

Tenebrionoidea: main family

Meloidae Gyllenhaal, 1810: Blister beetles family

Meloidae includes a family of blister beetles consisting of four subfamilies, about 2,500 species belonging to 120 genera [1,2,3,4]. The lifestyle of some adults of the blister beetles is active at night, but most of them are active during the day. Because adults are colorful, they are usually conspicuous. Imagoes are phytophagous and feed on plants. Most adult representatives consume only parts of the flower, but some, especially *Mylabris*, also eat the leaves [5,6,7]. Some feed on cultivated crops. Species of the family Meloidae, often cause great damage to alfalfa, beets, potatoes, tomatoes and other crops. Because beetles move in groups, their attacks can have local devastating consequences.

It is also known from the common name of blister beetles that their hemolymph causes the formation of blisters when they come in contact with human skin. If the blisters are not large, they do not require any treatment other than first aid. Cantharidine taken orally or subcutaneously is highly toxic to mammals. The source of cantharidin is the most widely used

species of the *Mylabris* and *Epicauta* genera. In adult beetles (by dry mass) the recorded content of cantharidine ranges from 1% to 5.4%.

Poisoning is associated with several species of blister beetles. If horse owners use alfalfa as a source of hay, blister beetles are considered a potential threat. Blister beetles rarely cause large amounts of poisoning from pastures where the spread of locust populations is observed.

### MATERIALS AND METHODS

Experiments were conducted between 2020 and 2021 to determine if the Asian locust imago was infested with entomophages.

The Republic of Karakalpakstan has more than 3 million hectares of land where locusts can spread, and its geographical structure includes seasonal and stable lakes, tugai, shrubs and deserts.

There are about 100 species of locusts in the country, three of which are considered dangerous. Among them are swarms of Asian locusts, Italian prussians and large saxophone locusts.

Asian locusts are mainly stable and there are natural places of Asian locusts in the reed fields near the lakes in the Aral Sea region of the Republic: Sudoche, Khoja qal'tiq, Maxpal, Talliq, Muynoq zaliv, Buzatov, Saribas, Tigrovoy khvost, Qaramush-1, va Qaramush-2, Biyabay, Maypost, Aqdarya, Jaltirbas, Seksen, Bayeke aydin, va 6-Qarauy, and in the reed fields around these lakes the larvae of Asian locusts are spreading every year.

The research was conducted based on the methods of Bondarenko (2010), Golub (2012) [2, 3, 4,5,10,12].

The collected materials were stored in plastic containers with 96% alcohol. MBS-109 binoculars, Motik V 1-220A -1, SZM-161-TL, P122 DISSECTING MICROSCOPE microscopes and Power Shot A 2500 Canon cameras were also used.

### OBTAINED RESULTS

Seven species of blister beetles belonging to the genera *Mylabris* FABRICIUS, 1775, *Hycleus* Latreille 1816, *Epicauta* Dejean, 1834 were identified in the areas we studied. Of these, *Hycleus polymorphus* was found only in the Kyzylkum region, and *Hycleus atratus* in the Ustyurt Plateau (Table 1).

*Mylabris variabilis*, *Hycleus atratus*, *Epicauta erythrocephala* species have been noted as common species. *Hycleus polymorphus* was first recorded for the fauna of Uzbekistan.

In addition, the larvae of some species of the Meloidae family, including the eggs of several harmful locust species, feed on them to a certain extent, reducing them naturally [8].

Research was conducted to collect Asian locust egg pods and determine if they were infested by entomophagous. During the study of the location where locusts lay their eggs, it was found that under natural conditions, some of the nests were destroyed by rodents or birds. They were found to find nests, dig them out of the ground, and finish eating the eggs. Of the 270 nests found, 4.8 percent were destroyed by wildlife (Table 2). A total of 8,973 live eggs of Asian locusts were found in a total of 270 nests collected and studied in the Aral Sea region. The density of the nests is 4.9 pcs/m<sup>2</sup>.

Despite chemical treatment against locusts, winter stocks of pests have been preserved. It is in these areas that large numbers of Asian locust nests have been found. The average density of nests in the surveyed areas was 4.9 per 1 sq/m<sup>2</sup>.

The number of collected nests was determined, and parasite-infected nests were isolated. They were observed under binoculars and the amount of infected eggs was determined. The number of live eggs is 11797. The average number of eggs in one nest is 43.7. The number of nests infected with parasites was 79, which was 29.2% (Table 1).

**Table 1. Results of analysis of infestation of Asian locust’s nests with entomophagous lesions**

№	Collected area, region	Number of nests, pieces				Live eggs, pieces	
		Total	Infested by animals		Infested by pests		
			Pieces	%	Pieces		%
1	Sudoche, Koja qolliq	5	2		3		277
2	Qaramush-1, Qaramush -2	26	8		9		5506
3	Muynoq zaliv	12	-		4		524
4	Jaltirbas	7	3		13		2490
<b>Total</b>		70	13		79		11797

It was also noted that 4.8 percent of the eggs were destroyed by animals. Thus, the total damage to the nests was 33.8%.

Infestation of Italian Prussian beetles by larvae of blister beetles was also carried out in Bashirchiel, Kegeyli districts. The study area is 72,000 hectares. The choice of this particular area is due to the fact that the density of oasis locust imago in this area was higher than other areas, egg nests laid by locusts that did not die after chemical treatment and developed to the state of imago were studied. The first experimental area was chosen around Lake Dautkol. (Coordinates -42°53'43.1"N, 59°21'09.6"E). The density of locust nests was observed at 15 per 10 sq.m. Infection of the natural population of oasis locust eggs with bristle beetles accounted for 32.8%.

According to the data obtained, a single species of the parasite-entomophagous was found in the collected nests and it was determined that it was a species of *Mylabris FABRICIUS*, 1775 and *Epicauta Dejean*, 1834 genus (Coleoptera: Meloidae).

Thus, the infestation of Asian locusts with bristle beetles was found to be 29.2%, and the infestation of eggs of the natural population of oasis locusts was up to 32.8%.

In short, the larvae of all bristle beetles are specialized predators. Larvae of species of the family Meloidae feed on harmful locust eggs, reducing them to 31.5%. In addition to being a pest of pasture and cultivated crops, beetle venom has a negative impact on humans and livestock. When fed with hay, bristle beetles can cause severe poisoning and even death of livestock.

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