

THE HYMENOPTERAN FAMILY SCELIONIDAE IN THE "CODRII" FOREST RESERVE, LOZOVA VILLAGE, REPUBLIC OF MOLDOVA

MARIANA GÎRNEȚ

Abstract. The insects of the *Scelionidae* (Hymenoptera) are an important component of the entomofauna of the ecosystems. They are numerous, populate the most various biotopes and play a distinct role in the process of formation and function of natural and anthropic ecosystems. The study of *Scelionidae* is necessary because these parasitical insects have an important role in the regulation of the number of many pests of cultured plants.

Key words: Scelionidae, Forest Reserve, eggs parasite.

Rezumat. Scelionidele (*Hymenoptera*, *Scelionidae*) din Rezervația Forestieră „Codrii” com. Lozova din Republica Moldova. Scelionidele (Hymenoptera) sunt un component important al entomofaunei ecosistemelor. Ele sunt numeroase, populează cele mai diverse biotopuri și joacă un rol deosebit în formarea și funcționarea ecosistemelor naturale și antropizate. Despre rolul lor în natură nu sunt cunoscute multe date, dar din punct de vedere economic, ele au cea mai mare importanță și perspectivă în reducerea numerică a dăunătorilor, care anual duc la scăderea esențială a recoltei.

Cuvinte cheie: Scelionidae, Rezervație forestieră, oofag.

INTRODUCTION

The insects of the *Scelionidae* (Hymenoptera) family are an important component of the entomofauna of the ecosystems. They are numerous, populate the most various biotopes and play a distinct role in the process of formation and function of natural and anthropic ecosystems.

The study of *Scelionidae* is necessary because these parasitical insects have an important role in the regulation of the number of many pests of cultured plants. Such investigations in the Republic of Moldova are necessary in the family of *Scelionidae*, where the anthropic impact, as the result of high density of population and intense economic activity of man, is great. There are not many data about the role of *Scelionidae* in nature, but from the economic point of view, they have the greatest importance and perspective in the reduction of the number of pests, which annually lead to an essential reduction of harvest. The most untouched side in this aspect remains the study of the whole spectrum of hosts, because according to data from literature, hosts are known of only 20.2% of species of *Scelionidae*.

The present studies were carried out in the "Codrii" Reserve, which has a special place among the protected areas of the Republic of Moldova. It is situated at a distance of 19 km to the north-west of Chisinau, near the village of Lozova, Straseni district, with the following geographical coordinates of the headquarters: 47°06' Northern latitude and 28°21' Eastern longitude.

The "Codrii" Reserve is placed in the highest part of Central Moldova, which differs from neighboring regions by geological structure, relief, climate, soil and vegetation.

Forest vegetation of the "Codrii" Reserve is represented by leafy forests of the type of Central European forests. The edifice of the "Codrii" is the beech (*Fagus sylvatica*), durmast (*Quercus petraea*) and the oak tree (*Quercus robur*), the last being the most often met in the depression. The durmast grows on sectors of medium or high altitude. The beech mostly occupies higher levels. The coedifice is the hornbeam (*Carpinus betulus*). Accompanying them are: the ash (*Fraxinus excelsior*), the linden (*Tilia tomentosa*), the maple (*Acer platanoides*), the sycamore maple (*Acer pseudoplatanus*), the sweet cherry (*Cerasus avium*), the elm (*Ulmus carpiniifolia*). On the second floor there grow the wild service tree (*Sorbus torminalis*), the common maple (*Acer campestre*), the forest pear (*Pyrus pyraeaster*) and the forest apple (*Malus sylvestris*) (according to POSTOLACHE, 1995).

The floristic composition and the structure of the underbrush depend on the degree of closing the crowning of the species of the underbrush more frequent are (*Cornus mas*), the hazelnut (*Corylus avellana*), hawthorn (*Crataegus curvisepala*, *Crataegus monogyna*), the European spindle (*Euonymus europaea*), (*Euonymus verucosa*), the cornel (*Swida sanguinea*) and the wayfaring tree (*Viburnum latana*).

The herbaceous cover is rich in Central-European and Under-Mediterranean species: the sedge (*Carex brevicollis*, *Carex pilosa*), (*Aegopodium podagraria*), (*Galeobdolon luteum*), (*Allium ursinum*), (*Melica uniflora*), (*Dactylis glomerata*) and ivy (*Hedera helix*).

MATERIALS AND METHODS

The material which constitutes the object of this work was collected in the year 2006 in the "Codrii" Reserve since the middle of May to the third decade of July. The collecting was produced by mowing the herbaceous vegetation with entomologic net and collecting small insects with the entomologic aspirator. The collected insects were kept in test tubes, previously disinfected. The mounted samples are kept in the collection of the museum of the Institute of Zoology, Academy of Sciences of Moldova.

RESULTS AND DISCUSSIONS

The *Scelionidae* family has been studied by many authors, such as MAYR, GIARD, 1895; KIEFFER, 1912; KOZLOV, KONONOVA, KIEFFER, 1926 from the practical point of view, because it is exclusively composed of parasitical insects, which in nature play an important role in regulating the number of various pests, the cultivated and wild plants.

Of those over 400 species registered in the European part of the former USSR on the territory of Moldova there have been identified about 120 species, among which hosts have been established for only 24 species (Table 1).

In figure 1 there are presented eggs deposited by insects of the *Pentatomoidae* family 100% infested by the *Telenomus chloropus* species of the *Scelionidae* family. The size of the *Scelionidae* eggs varies between 0.1 and 0.5 mm in length and 0.015 – 0.15 mm in width. In each egg of the *Pentatomoidae* there is deposited a single egg of the given species. The embryonic development lasts 22-28 hours, during which the parasite develops and reaches the volume of the egg. The metamorphosis is complete and the larva passes 4 stages of development, reaching maturity at about 10 days.

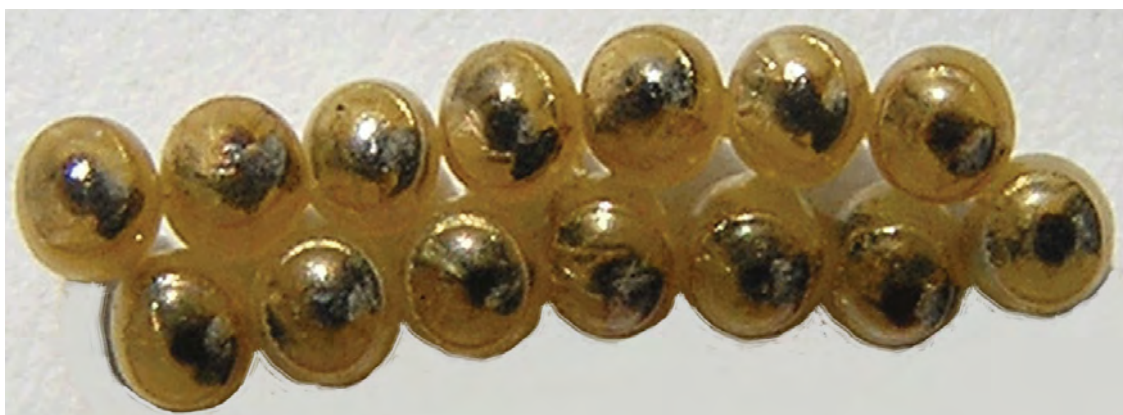


Figure 1. *Telenomus chloropus* (parasites in eggs of *Pentatomidae* family) (orig.)
Figure 1. *Telenomus chloropus* (parazitoizi ai ouălor familiei *Pentatomidae*) (orig.)

Within these studies on the territory of the "Codrii" Reserve, there have been collected 18 species of *Scelionidae*. Most of the species belong to the *Telenimini* tribe, the genera *Telenomus* (8 species), *Trissolcus* (4 species), which in nature participate in regulating the number of many pests of cultivated plants and of forest pests. These are followed by the *Gryon* genus (2 species), and the *Arodophagus*, *Apegus*, *Tiphodytes* *Teleas* genera - one species each.

As the result of the research conducted on the territory of the "Codrii" Reserve there have been collected the following species: *Telenomus corticatus* KOZLOV and KONONOVA, *T. aporus* KOPZLOV, *T. asperus* KOZLOV and KONONOVA, *T. othus* HAL., *T. harpyiae* MAYR, *T. acrobats* GIARD, *T. chloropus* THOMS., *T. heydeni* MAYR., *Teleas rugosus* KIEFF., *Trissolcus choaspes* NIXON, *T. festiva* VIKTOROV, *T. grandis* THOMS., *T. volgensis* VIKTOROV, *Gryon muscaeformis* NEES, *G. exculptus* FÖRST, *Arodophagus fasciatus* ASHM., *Apegus rufus* KOZLOV and KONONOVA, *Tiphodites gerriphagus* MARCHAL.

As the result of the investigations conducted by VIKTOROV G. A. 1962, 1960; MASNER L., KOZLOV M. A., KONONOVA S. V. 1990 there were identified the hosts for 13 species of *Scelionidae*. In table 1 the list of *Scelionidae* species discovered in the "Codrii" Reserve is presented and their hosts according to the studied literature.

Table 1. The list of species and their host species according to Kozlov M.A. and Kononova S. V.

Tabel 1. Lista speciilor de scelionide și gazdelor lor conform Kozlov M.A. și Kononova S.V.

The species of <i>Scelionidae</i>	The host species	Source of information
<i>Telenomus harpyiae</i> MAYR	<i>Dicranura vinula</i> L.	MAYR, 1879; KIEFFER, 1912, 1926; КОЗЛОВ, 1967, 1971, 1972
<i>T. acrobates</i> GIARD	<i>Chrisopa perla</i> L., <i>Ch. formosa</i> BRAUER	GIARD, 1895; KIEFFER, 1926; PRINZIPI, 1947; КОЗЛОВ, 1967, 1971, 1978
<i>T. chloropus</i> THOMS.	<i>Eurygaster rintangiceps</i> PUT. <i>Eu. maura</i> L., <i>Eu. austriaca</i> SCHRANK, <i>Dolycoris baccarum</i> L., <i>Carpocoris fuscispinus</i> BOH., <i>Graphosoma liniatum</i> L., <i>Palomena prasina</i> L., <i>P. viridissima</i> PODA., <i>Aelia furcula</i> FIEB., <i>A. rostrata</i> BOH., <i>Piezodorus rubrofasciatus</i> FABR., <i>Eysarcoris ventralis</i> WESTW.	MAYR, 1879; СОКОЛОВ 1904; ASHMEAD, 1904; ВАСИЛЬЕВ 1913; KIEFFER, 1926; ОБРОВОЛЬСКИЙ, 1913; MANNINGER, 1934; NIXON, 1939; КУЛАКОВ, 1940, 1949; РУБЦОВ, 1944; МЕЙЕР, 1940, 1949; ЩЕПЕТИЛЬНИКОВА, 1958; ВИКТОРОВ, 1960, 1962, 1964, 1967, 1979; КОЗЛОВ, 1967, 1971, 1978

<i>T. heydeni</i> MAYR.	<i>Palomena prasina</i> L., <i>Rhaphigaster nebulosa</i> PODA, <i>Eu. maura</i> L., <i>Arma custos</i> F., <i>P. viridissima</i> PODA.	KIEFFER, 1926; КОЗЛОВ, 1965, 1966, 1967, 1978; КОНОНОВА, 1973
<i>Teleas rugosus</i> KIEFF.	genus <i>Amara</i> BON., <i>Harpalus</i> LATR., <i>Zabrus tenebrioides</i> GZ.	KIEFFER, 1926
<i>Trissolcus choaspes</i> NIXON	<i>Aelia acuminata</i> L.	NIXON, 1939; КОЗЛОВ, ЛЕ, 1977, 1978
<i>T. festivaе</i> VIKTOROV	<i>Eurydema ornata</i> L., <i>E. oleracea</i> L. In laboratory <i>Carpocoris pudicus</i> Poda	ВИКТОРОВ, 1964, 1967; КОЗЛОВ, 1968; БУЛЕЗА, 1973; КОЗЛОВ, ЛЕ, 1977, 1978
<i>T. grandis</i> THOMS	<i>Eurygaster integriceps</i> PUT., <i>Eu. austriaca</i> SCHRANK, <i>Eu. maura</i> L., <i>Dolycoris baccarum</i> L., <i>Carpocoris pudicus</i> PODA, <i>Aelia acuminata</i> L., <i>Ae. cognata</i> Fieb., <i>Ae. germari</i> KUESTER, <i>Eurydema ventralis</i> KOL. <i>Palomena prasina</i> L.	KIEFFER, 1926; NIXON, 1939; МЕЙЕР, 1940; ТАЛИЦКИЙ, 1940
<i>T. volgensis</i> VIKTOROV	<i>Eurygaster integriceps</i> PUT., <i>Dolycoris baccarum</i> L., <i>Carpocoris fuscispinus</i> BOH.	ВИКТОРОВ, 1964 А, 1967; КОЗЛОВ, 1968, 1971; КОЗЛОВ, ЛЕ, 1977, 1978
<i>Gryon muscaeformis</i> NEES,	<i>Coreus marginatus</i> L., <i>Gonocerus acuteangulatus</i> GZ	КОЗЛОВ, 1971, 1978; КОЗЛОВ, КОНОНОВА, 1990; MINEO, 1975
<i>G. exculptus</i> FÖRST	<i>Coreus marginatus</i> L.	КОЗЛОВ, 1971, 1978; КОЗЛОВ, КОНОНОВА, 1990; MINEO, 1975
<i>Arodofhagus fasciatus</i> ASHM.	<i>Mezira granulata</i> SAY.	
<i>Tiphodytes gerriphagus</i> MARCHAL	<i>Gerris</i> sp.	

For the species *Telenomus corticatus* KOZLOV and KONONOVA, *T. aporus* KOZLOV, *T. asperus* KOZLOV and KONONOVA, *T. othus* HAL., *Apepus rufus* KOZLOV and KONONOVA hosts have not been found yet.

As a result of study of the literature of speciality it was established that the *Scelionidae* parasite on the representatives of 16 genera, 3 orders (*Heteroptera*, *Neuroptera*, *Lepidoptera*) and 8 families (*Gerridae*, *Miridae*, *Pentatomidae*, *Blissinae*, *Chrysopidae*, *Lymantridae*, *Notodontidae* and *Lasiocampidae*).

In the Republic of Moldova there have been conducted research of the most important entomophagy of the *Braconidae*, *Heloridae*, *Tetrastichinae*, *Ichneononidae* and other families by V. TALITSKII, V.S. KUSLITSKII, V. ADASHKEVICI and other entomologists. Within these researches there was partially studied the fauna of the *Scelionidae*. In 1990 there was published a preventive list of them, which contained 4 subfamilies, 23 genera and 120 species.

The study of the *Scelionidae* is necessary both taking into account their important role in regulating the number of various pests, and the elaboration of using them in the biological protection of plants. But the integral study of the problem (fauna, biology, trophic specialization and establishing the role of the species in regulating the number of pests) will allow a more profound knowledge about this group.

The protection of natural ecosystems and the conservation of their biodiversity is the best foundation for distinguishing and studying various biological means of control, which are the most favorable, the most acceptable and convenient from all points of view when it deals with the vitality of nature and the prosperity of human life.

BIBLIOGRAPHY

- GIARD A. 1895. *Sur quelques espèces nouvelles d'Hyménoptères parasites*. Bull. Soc. Entomol. France. **1**: 74–80.
- KIEFFER J. J. 1912. *Proctotrupidae*. In. André Edm., André Em. *Species des Hyménoptères d'Europe et d'Algérie*. Paris. **11**: 7–85.
- KIEFFER J. J. 1926. *Scelionidae*. Das Tierreich. Berlin. Leipzig: 557p.
- MAYR G. 1879. *Über die Schlupfwespengattung Telenomus*. Verh. zool. Bot. Ges. Wien. **29**: S. 697–714.
- POSTOLACHE G.G. 1995. *Vegetația Republicii Moldova*. Chișinău: 338p.
- ВИКТОРОВ Г. А. 1962. Причины низкой численности вредной чернотелки (*Eurygaster integriceps* Put.) в некоторых районах Закавказья. Зоол. Журн.. **41** (1): 70–71.
- КОЗЛОВ М.А. 1965. Материалы по фауне паразитических перепончатокрылых подсем. *Teleasinae* и *Telenominae* (Hymenoptera, Scelionidae) СССР. Энтомол. обозр. **44** (3): 616–624.
- КОЗЛОВ М.А., КОНОНОВА С. В. 1990. Сцелионины фауны СССР. (Hymenoptera, Scelionidae, Scelioninae). Ленинград. Наука: 344.

- КОЗЛОВ М.А., КОНОНОВА С. В. 1990. *Сцелионины фауны СССР. (Hymenoptera, Scelionidae, Scelioninae)*. Ленинград. Наука: 344р.
- ТАЛИЦКИЙ В. И. 1940. *Размножение и применение теленомуса для борьбы с клопом – черепашкой*. Киев: 72р.
- ТАЛИЦКИЙ В.И. КУСЛИЦКИЙ В.С. 1990. *Паразитические перепончатокрылые (Hymenoptera) Молдавии*. Кишинев: 304р.

Gârnet Mariana - Institute of Zoology of ASM,
Academiei str.1, 2028 Chişinău, Moldova Republic
e-mail: gmariana_83@yahoo.com