Entomology and Applied Science Letters
Volume 6, Issue 2, Page No: 1-12

Available Online at: www.easletters.com

ISSN No: 2349-2864

Contribution to the Study of the Cantharoidea (Coleoptera: Drilidae, Lycidae, Lampyridae, Cantharidae) in the Republic of Mordovia (Russia)

Alexander B. Ruchin[1]*, Leonid V. Egorov[1,2]

[1] Joint Directorate of the Mordovia State Nature Reserve and National Park "Smolny", Saransk, Russia.
[2] State Nature Reserve "Prisursky", Cheboksary, Russia.

ABSTRACT

The study results of the Cantharoidea fauna (Drilidae, Lycidae, Lampyridae, Cantharidae) in the Republic of Mordovia from 2005 to 2018 are presented. The following thirty-six species have been found in the region: Drilidae – 1 species, Lycidae – 7 species, Lampyridae – 1 species, and Cantharidae – 27 species. For the first time for the Republic of Mordovia Erotides nasutus (Kiesenwetter, 1874), Pyropterus nigroruber (DeGeer, 1774), Cantharis terminata (Faldermann, 1835) and Rhagonycha fugax (Mannerheim, 1843) have been reported. Rhagonycha femoralis (Brulle, 1832) has been excluded from the fauna of Republic of Mordovia. Two species (Cantharis figurata, Cantharis nigra) are known only by literary data. Findings must be confirmed with new material. Lygistopterus sanguineus, Lampyris noctiluca, Cantharis fusca, Cantharis nigricans, Cantharis pellucida, Cantharis rustica, and Rhagonycha fulva are common species.

Keywords: *Coleoptera, Cantharoidea, Republic of Mordovia, Russia*.

HOW TO CITE THIS ARTICLE: Alexander B. Ruchin, Leonid V. Egorov; Contribution to the Study of the Cantharoidea (Coleoptera: Drilidae, Lycidae, Lampyridae, Cantharidae) in the Republic of Mordovia (Russia), Entomol Appl Sci Lett, 2019, 6 (2): 1-12.

Corresponding author: Alexander B. Ruchin
E-mail ✉ ruchin.alexander @ gmail.com
Received: 21/12/2018
Accepted: 03/05/2019

INTRODUCTION

Biodiversity conservation (biodiversity) is one of the most important contemporary environmental problems that have been actively discussed in recent decades [1-4]. Biological diversity is an indispensable condition for the dynamic biosphere stability, and its conservation is one of the most urgent problems of mankind [5, 6]. According to Rivers et al. (2014), and Mupepele et al., (2016), the biodiversity conservation, which has become global problem, requires continuous monitoring, accounting and protection at the regional level [7, 8]. Optimal management of biodiversity and its effective conservation can be based only on accurate data on the current state and trends in wildlife at the level of individual regions, knowledge of the mechanisms for the formation of diversity of biosystems, and assessments of its influence on biospheric processes [9-11].

The Republic of Mordovia is located at the junction of the forest and steppe zones; it has a variety of transitional ecosystems. Due to this, the Coleoptera fauna in this region is very diverse and unique. Over the past two decades, more than 2,600 Coleoptera species have been found in the entomofauna [12-21]. Among them there are many unexpected findings of species previously known only by one or two localities in Russia, as well as new species for Russia [22-25].

However, not all Coleoptera taxa of the fauna of the Republic of Mordovia have been fully studied yet. The Cantharoidea superfamily, including several families, is one of the under-researched groups. These beetles are predatory, moderately mobile, with a very soft elongated body, more or less flat and parallel. Beetles are found in many biotopes, they are somewhat poisonous [26, 27]. Larvae and imago of some species lead a predatory way of life; they destroy by aphids, scarabids, caterpillars of butterflies, larvae of beetles

and flies, others are mycetophagous [28-32]. There are 6 genera and 120 Drilidae species, 160 genera and 4,600 Lycidae species, 110 genera and 2,200 Lampyridae species, 160 genera and 5,100 Cantharidae species in the world fauna [33]. In Russia, there are 6 known species of Drilidae, 44 species of Lycidae, 12 species of Lampyridae and 213 species of Cantharidae, the distribution of which is still poorly understood [34].

MATERIALS AND METHODS

We have collected material for research during the 2005–2018 seasons (most intensively since 2011) using the generally accepted entomological methods of insect field studies [35]. Window traps were very effective for collecting Lycidae [36]. In general, we studied more than 550 examples. In the annotated list for each species, we indicated references to the literature on the view from the territory of Mordovia (if there is a reliable indication of the finding point), new places of collection (previously unpublished information), date of collection, number of equipment collected, collection name, notes (if there were any). If the collector's name was missing, the material was collected by the first author of the article. Also, we gave original information about biology, characteristics of species habitats, some observations in nature. The names of new species for the Republic of Mordovia are marked with an asterisk (*).

We cited the Cantharoidea nomenclature according to the "Catalog of Palaearctic Coleoptera" [34, 37-39]. Collection material is stored in the Museum of Mordovia State Nature Reserve (Pushta, Russia), the Biological Museum of Mordovia State University (Saransk) and the authors' personal collections.

The abbreviations accepted in the article: MSNR – Mordovia State Nature Reserve, NPS – National Park Smolny, example – ex. In the case of references to cordons and quarters in Mordovia State Nature Reserve and the National Park Smolny, their coordinates are given.

RESULTS AND DISCUSSION

List of species

CANTHAROIDEA

DRILIDAE Blanchard, 1845

Drilus concolor Ahrens, 1812

Ichalki District [40].

Biology. Discovered only once on the territory of the National Park "Smolny" in a broadleaf forest.

LYCIDAE Laporte de Castelnau, 1838

Erotinae LeConte, 1881

Aplatopterus rubens (Gyllenhal, 1817)

Temnikov District [41, 42].

Material. Temnikov District, MSNR, quarter 436, 54°44'15''N, 43°08'53''E, 29.VI.–13.VII.2017, 13–27.VII.2017, 2 ex., Egorov L.V., Semishin G.B., cordon Inorskiy, 54°44'15'' N, 43°08'53'' E, 12.V.2018, 1 ex., Semishin G.B [43].

Biology. In the Republic of Mordovia, it is known only in Mordovia State Nature Reserve. It is found in mixed forests.

**Erotides nasutus* (Kiesenwetter, 1874)

Material. Temnikov District, MSNR, quarter 19, 54°54'26'' N, 43°13'59'' E, 15.V.–27.VI.2018, 2 ex., Semishin G.B., Egorov L.V.

Biology. It was caught in the window traps in linden with alder, birch, aspen (nearby is a ripe pine forest).

Note. This is a very rare species. In Russia, it is known from the Far East (Primorye, Sakhalin, the Kuril Islands), and Southern Siberia; for the European part of Russia, it is specified from the Moscow region [34, 44, 45] and Chuvashia [46]. According to the oral report of S.K. Alekseev, samples were collected using window traps in the Kaluga Zaseki Reserve (Kaluga region). It is also common in Japan and Korea [34].

Platycis minuta [18]

Temnikov District [47].

Material. Temnikov District, MSNR, Pushta, 27.VII.–28.VIII.2018, 1 ex., Semishin G.B., Egorov L.V.

Biology. This species was noted twice in the flood-plain oak forest and in the pine-tree with a birch, spruce, aspen.

Dictyoptera aurora (Herbst, 1784)

Ichalki District [40]. Temnikov District [36, 42, 48-51].

Material. Temnikov District, MSNR, quarter 427, 14.V.1984, 1 ex. Volkov O.G., quarter 427, 54°44'42"N, 43°12'56"E, V.2014, 1 ex., quarter

86, 54°53'45'' N, 43°35'58'' E, 18.V.2018, 1 ex., Egorov L.V.; quarter 86, 54°53'45'' N, 43°35'58'' E, 17.V.–27.VI.2018, 5 ex., Semishin G.B., Egorov L.V.; quarter 406–383, 19.V.2018, 1 ex., Bolshakov L.V.; Pushta, 19.V.–26.VI.2018, 2 ex., Semishin G.B., Egorov L.V. Ardatov District, Turgenevo, 19.V.2008, 1 ex. Chamzinka District, Komsomolskiy, 9.VI.2009, 1 ex., Ryzhov M.K. Temnikov District, Temnikov, V.2009, 1 ex.

Biology. This species is found in mixed forests, spruce forests with pine, birch, riparian deciduous forests with a predominance of aspen.

**Pyropterus nigroruber* (DeGeer, 1774)

Material. Temnikov District, MSNR, quarter 19, 54°54'26'' N, 43°13'59'' E, 12–29.VII.2018, 1 ex., Semishin G.B., Egorov L.V.

Biology. Samples were collected in window traps in linden with alder, birch, aspen (nearby is a ripe pine forest).

Xylobanellus erythropterus (Baudi di Selve, 1872)

Temnikov District [36, 42, 47, 49, 50].

Material. Temnikov District, MSNR, quarter 34, 54°53'30'' N, 43°10'05'' E, VII.2014, 1 ex.; quarter 19, 54°54'26'' N, 43°13'59'' E, 27.VI.–12.VII.2018, 2 ex., Semishin G.B., Egorov L.V.; Pushta, 6–13.VII.2018, 2 ex., Semishin G.B., Egorov L.V.

Biology. In the Republic of Mordovia, this species is known only from the territory of Mordovia State Nature Reserve, where it lives in floodplain deciduous forests with a predominance of aspen, ripe pine forests with spruce, birch, aspen, floodplain oak forests, lindens with alder, birch, aspen.

Lycinae Laporte, 1838

Lygistopterus sanguineus (Linnaeus, 1758)

Ichalki District (Ruchin et al., 2007b). Temnikov District [48- 50, 52, 53]. Bolshie Berezniki District, Atyashevo District, Ichalki District [54, 55]. Saransk city [56]. Bolshie Berezniki District [57] Ichalki District, Temnikov District [58]. Temnikov District, Bolshie Berezniki District, Tengushevo District [36]. Ruzaevka District, Ichalki District, Ardatov District, Torbeevo District, Zubova Polyana District, Kochkurovo District, Krasnoslobodsk District, Temnikov District, Chamzinka District, Dubenki District[59].

Material. Atyurievo District, Russkaya Velyazma, 1.VII.2016, 4 ex. Krasnoslobodsk District, 5 km NE Staraya Avgura, 8.VII.2017, 1 ex. Temnikov District, MSNR, quarter 19, 54°54'26'' N, 43°13'59'' E, 8–27.VI.2018, 1 ex., Semishin G.B., Egorov L.V.; cordon Plotomoika, quarter 34, 54°53'30'' N, 43°10'05'' E, 28.VI.–12.VII.2018, 3 ex., Semishin G.B., Egorov L.V.

Biology. This is a common species. It is found in various types of forests (pine, alder, mixed, deciduous). Beetles are common on the inflorescences of *Aegopodium podagraria* L., *Anthriscus sylvestris* (L.) Hoffm. Sometimes the number of adults on *A. podagraria* can be 25–30 individuals per inflorescence.

LAMPYRIDAE Latreille, 1817

Lampyris noctiluca (Linnaeus, 1767)

Ichalki District [60]. Temnikov District [36, 42, 47-51] Republic of Mordovia [55].

Material. Bolshie Berezniki District, 9 km S Simkino, 27.VI.2005, 3 ex. Ichalki District, NPS, Lvovskoe forestry, Obrezki, 4.VI.2007, 1 ex., VI.2008, 2 ex., IV–V.2008, 5 ex., 21.V.2008, 1 ex. Ichalki District, NPS, 2 km NE Tashkino, IV–V.2008, 7 ex. Bolshoe Ignatovo District, NPS, Lesnoi, IV–V.2008, 8 ex. Lyambir District, Ekaterinovka, 29.V.2008, V.2008, 2 ex. Saransk city, 22.IV.2008, 1 ex. Torbeevo District, Vindrei, 6.VI.2008, 1 ex. Chamzinka District, Bolshoe Maresevo, 13.VI.2008, 1 ex. Ruzaevka District, Streletskaya Sloboda, 20.VI.2009, 3 ex. Temnikov District, MSNR, quarter 19, 54°54'26'' N, 43°13'59'' E, 8.VI.–12.VII.2018, 9 ex., Semishin G.B., Egorov L.V.; quarter 34, 54°53'30'' N, 43°10'05'' E, 8.VI.–12.VII.2018, 20 ex., Semishin G.B., Egorov L.V.; quarter 86, 54°53'45'' N, 43°35'58'' E, 6–27.VI.2018, 5 ex., Semishin G.B., Egorov L.V.; Pushta, 26.VI.–13.VII.2018, 2 ex., Semishin G.B., Egorov L.V.

Biology. This is a common species. It inhabits a wide variety of biotopes: spruce forests, mixed forests, pine forests of various types and ages, deciduous forests, forest plantations, forest shelter belts.

CANTHARIDAE Imhoff, 1856 (1815)

Cantharinae Imhoff, 1856 (1815)

Podabrus alpinus (Paykull, 1798)
Kochkurovo District, Chamzinka District [61]. Temnikov District[47].
Biology. This species is rare. It is believed that it inhabits deciduous and mixed forests.

Cantharis annularis Ménétriés, 1836
Republic of Mordovia [55, 62].
Material. Oktyabrskyi District, Monastyrskoe, 12.VI.2017, 1 ex.
Biology. This is a rare species. It was found in a small meadow area with growing *Salvia stepposa* Schost.

Cantharis figurata Mannerheim, 1843
Temnikov District[48].
Biology. In the Republic of Mordovia, this species is known only from Mordovia State Nature Reserve. The finding requires confirmation.

Cantharis flavilabris Fallén, 1807
Temnikov District [36, 42, 47-51, 53]. Republic of Mordovia [55].
Material. Ichalki District, NPS, Obrezki, 21.VI.2008, 1 ex. Saransk city, 9.VIII.2008, 1 ex. Staroe Shaigovo District, Nikolskaya Salovka, 8.VII.2017, 1 ex. Krasnoslobodsk District, 5 km NE Staraya Avgura, 8.VII.2017, 1 ex.; Staraya Avgura, 1.VII.2018, 1 ex.
Biology. The species is found on the edges of deciduous forests, pine forests, and floodplain meadows.

Cantharis fusca Linnaeus, 1758
Ichalki District [63, 64]. Ruzaevka District [65]. Temnikov District [26, 36, 49, 42, 51]. Republic of Mordovia [55, 62].
Material. Lyambir District, Ekaterinovka, 29.V.2008, 1 ex. Ichalki District, NPS, Obrezki, 20.VI.2008, 1 ex. Atyurievo District, Chudinka, 07.VI.2008, 1 ex. Bolshie Berezniki District, Degilevka, 12.VI.2015, 1 ex. Insar District, Kochetovka, V-IX.2015, 1 ex. Ardatov District, Oktyabrskiy, 26.V.2017, 1 ex. Temnikov District, MSNR, cordon Plotomoika, 54°53'36"N. 43°09'41"E, 16.VI.2018, 1 ex. Ichalki District, NPS, Kemlyanskoe forestry, quarter 106, 54°43'38"N, 45°15'29"E, 8.VI.2018, 1 ex.
Biology. It lives in mixed and deciduous forests, pine forests with spruce, birch, and on steppificated slopes.

Cantharis livida Linnaeus, 1758
Ichalki District [22, 63]. Temnikov District [36, 42, 47, 50, 51, 53] Republic of Mordovia [55].
Material. Chamzinka District, Komsomolskiy, 31.V.2005, 2 ex. Saransk city, 15.VI.2004, 1 ex. Kochkurovo District, Starye Turdaki, 12.VI.2008, 3 ex. Bolshie Berezniki District, Degilevka, 12.VI.2015, 1 ex. Atyurievo District, Pichepolonga, 2.VII.2016, 1 ex. Lyambir District, Atemar, 24.VI.2017, 1 ex.; Novaya Uda, 24.VI.2017, 2 ex. Kovylkino District, Chepurnovka, 29.VI.2017, 1 ex. Elniki District, Malye Mordovskie Poshaty, 22.VII.2017, 1 ex. Staroe Shaigovo District, Nikolskaya Salovka, 8.VII.2017, 1 ex. Temnikov District, Temnikov, VI.2008, 1 ex. Temnikov District, MSNR, cordon Inorskiy, 54°44'15'' N, 43°08'53'' E, 29.V.2018, 1 ex.; quarter 368, 54°46'37''N, 43°21'45''E, 18.VI.2018, 1 ex.; cordon Srednyaya Melnitsa, 54°54'09''N, 43°13'53''E, 19.VI.2018, 3 ex., Semishin G.B.
Biology. This species is found in different biotopes: on the edges and glades of pine forests, alder-trees, mixed forests, on floodplain meadows, and steppe slopes. It flies into the light.

Cantharis nigra (DeGeer, 1774)
Republic of Mordovia [55].
Biology. Finding a form requires confirmation, as we have not found this species during many years of searching.

Cantharis nigricans O.F. Müller, 1776
Temnikov District [36, 42, 47-51, 53]
Material. Temnikov District, MSNR, quarter 445, 54°42'48"N, 43°12'19"E, 25.VI.1984, 1 ex., Volkov O.G., Pushta, 30.V.2008, 1 ex., quarter 368, 54°46'37''N, 43°21'45''E, 27.V.2018, 18.VI.2018, 8 ex.; quarter 381, 54°45'17"N, 43°09'52"E, 28.V.2018, 2 ex.; cordon Inorskiy, 54°44'15'' N, 43°08'53'' E, 29.V.2018, 14.VI.2018, 2 ex.; quarter 360, 54°46'13"N, 43°13'31"E, 15.VI.2018, 1 ex.; quarter 422, 54°43'55"N, 43°07'39"E, 21.VI.2018, 1 ex.; quarter 347, 54°47'34''N, 43°28'31''E, 23.VI.2018, 3 ex.; quarter 349, 54°47'47"N, 43°31'04"E, 23.VI.2018, 1 ex.; quarter 332, 54°46'44"N, 43°13'20"E, 23.VI.2018, 3 ex.; cordon Srednyaya Melnitsa, 54°54'09''N, 43°13'53''E, 19.VI.2018, 3 ex., Semishin G.B. Lyambir District, Ekaterinovka, 29.V.2008, 2.VI.2009, 2 ex. Atyurievo District, Chudinka, 7.VI.2008, 1 ex. Zubova Polyana Dis-

trict, Vysha, 8.VI.2008, 1 ex.; Udevo, 8.VI.2008, 1 ex.; Yavas, 22.VI.2018, 1 ex. Temnikov District, Veselyi, 25.V.2013, 1 ex. Elniki District, Novye Shaly, 26.V.2013, 1 ex. Ruzaevka District, Boldovo, 4.VI.2016, 1 ex.; Khovanshchina, 12.VI.2017, 1 ex. Insar District, Vasina Polyana, 4.VI.2016, 1 ex.; Novlei, 27.V.2017, 1 ex. Krasnoslobodsk District, 5 km NE Staraya Avgura, 8.VII.2017, 1 ex. Ichalki District, NPS, Kemlyanskoe forestry, quarter 94, 54°44'24"N, 45°24'20"E, 8.VI.2018, 1 ex., quarter 106, 8.VI.2018, 3 ex., quarter 22, 54°47'47"N, 45°21'28"E, 6.VI.2018, 3 ex.; Lvovskoe forestry, quarter 70, 54°49'11"N, 45°22'35"E, 7.VI.2018, 1 ex.

Biology. This is one of the most common species. It lives in a wide variety of biotopes of open and closed landscapes. It flies to the light.

Cantharis obscura Linnaeus, 1758

Ichalki District [61]. Temnikov District [49].

Material. Dubenki District, Yavleika, 11.VI.2017, 1 ex. Temnikov District, MSNR, quarter 86, 54°53'45'' N, 43°35'58'' E, 17.V.2018, 1 ex., Egorov L.V.

Biology. This is a rare species. It was found in pine forests with birch and spruce, and on steppificated slopes with limestone outcrops.

Cantharis pallida Goeze, 1777

Ichalki District [61]. Temnikov District [36, 42, 47-51, 53].

Material. Torbeevo District, Vindrei, 6.VI.2008, 1 ex. Lyambir District, Ekaterinovka, 2.VI.2009, 1 ex. Temnikov District, Veselyi, 25.V.2013, 1 ex. Temnikov District, MSNR, cordon Srednyaya Melnitsa, 54°54'09''N, 43°13'53''E, 19.VI.2018, 3 ex., Semishin G.B. Ichalki District, NPS, Kemlyanskoe forestry, quarter 94, 8.VI.2018, 1 ex., quarter 22, 54°47'47"N, 45°21'28"E, 6.VI.2018, 1 ex.

Biology. This is a frequent species living in deciduous and mixed forests, birch forests, sapspruce forests with birch, and floodplain oak forests. It flies to the light.

Cantharis pellucida Fabricius, 1792

Ichalki District [63, 64]. Temnikov District [36, 42, 47-51, 53]. Republic of Mordovia [62]

Material. Ichalki District, NPS, Lvovskoe forestry, quarter 53, 54°49'49"N, 45°22'40"E, 21.V.2008, 1 ex., quarter 70, 54°49'11"N, 45°22'35"E, 7.VI.2018, 1 ex.; Kemlyanskoe forestry, quarter 22, 54°47'47"N, 45°21'28"E, 6.VI.2018, 1 ex. Bolshoe Ignatovo District, NPS, 4 km S Barakhmany, 22.V.2008, 1 ex. Temnikov District, MSNR, cordon Valzenskiy, 54°43'12"N, 43°14'01"E, 3.VI.1984, 1 ex., Volkov O.G.; Pushta, 30.V.2008, 1 ex., quarter 420, 54°45'29''N, 43°24'19''E, 18.V.2018, 1 ex.; quarter 86, 54°53'38''N, 43°35'59''E, 18.V.2018, 1 ex., Egorov L.V.; quarter 440, 54°43'56"N, 43°13'15"E, 26.V.2018, 1 ex.; quarter 418, 54°45'43"N, 43°22'08"E, 27.V.2018, 1 ex.; quarter 381, 54°45'17"N, 43°09'52"E, 28.V.2018, 1 ex.; quarter 360, 54°46'13"N, 43°13'31"E, 15.VI.2018, 1 ex.; quarter 349, 54°47'47"N, 43°31'04"E, 23.VI.2018, 1 ex.; cordon Drozhdenovskiy, 54°44'31''N, 43°17'24''E, 24.VI.2018, 1 ex.; cordon Inorskiy, 54°44'15'' N, 43°08'53'' E, 29.V.2018, 1 ex. Staroe Shaigovo District, Staroe Akshino, 11.V.2008, 2 ex. Ardatov District, Turgenevo, 19.V.2008, 1 ex.; Oktyabrskiy, 19.V.2008, 1 ex. Lyambir District, Ekaterinovka, V.2008, 1 ex. Torbeevo District, Vindrei, 6.VI.2008, 2 ex. Zubova Polyana District, Udevo, 8.VI.2008, 1 ex.; Yavas, 22.VI.2018, 1 ex. Saransk city, 31.V.2009, 1 ex. Temnikov District, Veselyi, 25.V.2013, 6.VI.2015, 2 ex.

Biology. It is a common species. It is found in a wide variety of biotopes.

Cantharis rufa Linnaeus, 1758

Ichalki District [63, 64]. Temnikov District [36, 42, 47, 50, 51, 53]. Republic of Mordovia [62]

Material. Krasnoslobodsk District, Selishchi, 5.VI.2009, 1 ex. Dubenki District, 8 k SE Engalychevo, 1.VII.2009, 1 ex. Bolshie Berezniki District, 9 km S Simkino, 29.VI.2009, 1 ex.; Degilevka, 12.VI.2015, 1 ex. Kadoshkino District, Latyshovka, 4.VI.2016, 1 ex. Ruzaevka District, Khovanshchina, 12.VI.2017, 1 ex.

Biology. It is a common species. It lives on the edges and glades of pine forests, mixed and deciduous forests, on meadows and steppificated slopes. It flies to the light.

Cantharis rustica Fallén, 1807

Ichalki District [61]. Temnikov [36, 42, 51]. Republic of Mordovia [55, 62].

Material. Bolshie Berezniki District, 9 km S Simkino, 30. IV.2008, 18.VII.2009, 2 ex., Lobachev E.A.; Permisi, 5.VI.2016, 1 ex.; Nerlei, 5.VI.2016,

1 ex. Lyambir District, Ekaterinovka, 29.V.2008, 1 ex. Chamzinka District, Bolshoe Maresevo, 13.VI.2008, 2 ex. Staroe Shaigovo District, Lesnichestvo, 17.V.2008, 1 ex. Ardatov District, Svetotekhnika, 18.V.2008, 1 ex.; Oktyabrskiy, 19.V.2008, 1 ex. Kochkurovo District, Starye Turdaki, VI-VII.2008, 1 ex. Ichalki District, Khanineevka, 12.VI.2009, 1 ex. Kochkurovo District, Kochkurovo, VII.2009, 1 ex., Timoshkina L. Kadoshkino District, Latyshovka, 4.VI.2016, 1 ex. Insar District, Kochetovka, 4.VI.2016, 1 ex.; Vasina Polyana, 4.VI.2016, 1 ex. Ruzaevka District, Khovanshchina, 12.VI.2017, 2 ex.; Palaevka, 10.VI.2017, 1 ex. Dubenki District, Krasnye Luga, 11.VI.2017, 1 ex. Temnikov District, MSNR, Pushta, IV–V.2008, 2 ex., quarter 418, 54°45'43"N, 43°22'08"E, 27.V.2018, 1 ex.; quarter 368, 54°46'37''N, 43°21'45''E, 27.V.2018, 1 ex.

Biology. This is one of the most common species. It lives in a wide variety of biotopes of open and closed landscapes.

**Cantharis terminata* Faldermann, 1835

Material. Ardatov District, Olevka, 26.V.2017, 1 ex.

Biology. This single example was found in a meadow near a deciduous forest.

Note. This species is found in Chuvashia [66], Moscow and Lipetsk regions [34].

Cantharis lateralis Linnaeus, 1758

Temnikov District [36, 42, 47, 49, 50, 53]

Material. Bolshie Berezniki District, 9 km S Simkino, 29.VI.2009, 1 ex.; 6 km SE Permisi, 12.VI.2015, 2 ex. Chamzinka District, Gorbunovka, 24.VI.2016, 1 ex. Lyambir District, Atemar, 24.VI.2017, 2 ex.

Biology. It lives in mixed forests, in floodplain meadows, and is also found on steppificated slopes.

Rhagonycha atra (Linnaeus, 1767)

Republic of Mordovia [55].

Material. Temnikov District, MSNR, quarter 36, 16.V.2018, 1 ex., Egorov L.V.; quarter 86, 54°53'45'' N, 43°35'58'' E, 6–27.VI.2018, 1 ex., Semishin G.B., Egorov L.V.

Biology. We found it twice in a linden with birch and spruce and in a pine forest with spruce, isolated birches.

Rhagonycha elongata (Fallén, 1807)

Temnikov District [14, 36, 42, 47, 48]

Material. Temnikov District, MSNR, quarter 449, 13.VI.1973, 1 ex. (V.F. Feoktistov); quarter 86, 54°53'45'' N, 43°35'58'' E, 6–27.VI.2018, 1 ex., Semishin G.B., Egorov L.V.

Biology. This is a rare species. We recorded it repeatedly only on the territory of Mordovia State Nature Reserve in mixed forests, pine forests and spruce forests with pine and birch. It flies to the light.

**Rhagonycha fugax* Mannerheim, 1843

Temnikov District [36, 42, 47, 49-51, 53]. Republic of Mordovia [62]. In all publications, named erroneously as *Rhagonycha femoralis* (Brulle, 1832). *Rh. femoralis* is excluded from the fauna of the Cantharidae of Mordovia.

Material. Temnikov District, MSNR, Pushta, 30.V.2008, 2 ex., cordon Srednyaya Melnitsa, 54°54'09''N, 43°13'53''E, 15–16.V.2018, 19.VI.2018, 3 ex., Egorov L.V., Semishin G.B.; quarter 381, 54°45'17"N, 43°09'52"E, 28.V.2018, 1 ex. Temnikov District, Temnikov, 1.VI.2008, 2 ex. Zubova Polyana District, Mordovskaya Polyana, 7.VI.2008, 1 ex. Ichalki District, NPS, Kemlyanskoe forestry, quarter 94, 54°44'24"N, 45°24'20"E, 8.VI.2018, 1 ex., quarter 22, 54°47'47"N, 45°21'28"E, 6.VI.2018, 1 ex.

Biology. This is a common species. It often lives near forest stations or in forests (in clearings, roads, glades). It flies to the light.

Rhagonycha fulva (Scopoli, 1763)

Temnikov District [36, 42, 47, 49-51]. Republic of Mordovia [55].

Material. Chamzinka District, Komsomolskiy, 5.VII.2006, 2 ex. Kochkurovo District, Mordovskoe Davydovo, 23.VII.2008, 2 ex., Kurmaeva D.K.; Muran, 29.VII.2017, 1 ex.; Starye Turdaki, 8.VII.2008, 1 ex. Ardatov District, Probuzhdenie, 2.VII.2008, 1 ex. Zubova Polyana District, Zhuravkino, 16.VII.2008, 1 ex.; Kargashino, 29.VII.2009, 1 ex.; Vadovo-Sosnovka, 30.VII.2009, 4 ex.; 8 km SW Vysha, 31.VII.2009, 1 ex.; Tenishevo, 2.VIII.2015, 1 ex. Staroe Shaigovo District, Konopat, 9.VII.2016, 1 ex.; Lesnichestvo, 16.VII.2009, 2 ex.; Ingener-Pyatina, 10.VII.2016, 1 ex.; Staroe Shaigovo, 30.VII.2017, 1 ex. Oktyabrsky District, Monastyrskoe, VI-X.2014, 1 ex. Tengushevo District, 6 km W Ba-

rashevo, 18.VII.2015, 2 ex.; Barashevo, 18.VII.2015, 1 ex.; Klemeshchei, 18.VII.2015, 2 ex. Atyurievo District, Russkaya Velyazma, 2.VII.2016, 1 ex.; Strelnikovo, 2.VII.2016, 2 ex. Elniki District, Svobodnyi, 31.VII.2008, 1 ex.; Malye Mordovskie Poshaty, 19.VII.2015, 22.VII.2017, 3 ex.; Novye Shaly, 22.VII.2017, 1 ex.; Novaya Yamskaya Sloboda, 22.VII.2017, 1 ex.; Cherlyai, 23.VII.2016, 1 ex. Ruzaevka District, Yakovshchina, 26.VI.2016, 1 ex. Ichalki District, NPS, Kemlyanskoe forestry, quarter 66, 54°45'09"N, 45°13'47"E, 27.VII.2017, 1 ex., quarter 90, 54°44'48"N, 45°19'30"E, 25.VII.2017, 1 ex., quarter 105, 54°43'35"N, 45°14'54"E, 12.VII.2018, 1 ex.; Barakhanovskoe forestry, quarter 113, 54°44'20"N, 45°28'25"E, 10.VII.2018, 1 ex. Temnikov District, MSNR, quarter 37, 54°53'41''N, 43°13'17''E, 8–17.VII.2018, 1 ex.; cordon Srednyaya Melnitsa, 54°54'09''N, 43°13'53''E, 8.VII.2018, 1 ex.; quarter 434, 54°45'04"N, 43°19'02"E, 22.VII.2018, 2 ex.

Biology. This is one of the most common species. It lives on the edges and glades of pine forests, mixed and deciduous forests, on meadows and steppe slopes. It is often found on the inflorescences of plants from the Umbelliferae and Compositae bloodlines.

Rhagonycha lignosa (O.F. Müller, 1764)
Temnikov District [36, 42, 47, 50, 51, 53]

Material. Temnikov District, Veselyi, 25.V.2013, 1 ex. Temnikov District, MSNR, quarter 19, 54°54'26'' N, 43°13'59'' E, 8–27.VI.2018, 1 ex., Semishin G.B., Egorov L.V.

Biology. It lives in deciduous forests, birch forests, and edges of mixed forests.

Rhagonycha nigripes W. Redtenbacher, 1842
Republic of Mordovia [55]

Material. Temnikov District, MSNR, quarter 381, 54°45'17"N, 43°09'52"E, 28.V.2018, 1 ex.

Biology. We recorded it only once in a mixed forest in Mordovia State Nature Reserve.

Rhagonycha nigriventris Motschulsky, 1860
Saransk city [61]. Temnikov District [36, 42, 47, 50, 51].

Material. Temnikov District, MSNR, cordon Inorskiy, 54°44'15'' N, 43°08'53'' E, 29.V.2018, 1 ex.; cordon Srednyaya Melnitsa, 54°54'09''N, 43°13'53''E, 19.VI.2018, 6 ex., Semishin G.B. Ichalki District, NPS, Kemlyanskoe forestry, quarter 22, 54°47'47"N, 45°21'28"E, 6.VI.2018, 1 ex.

Biology. This is a common species. We recorded it in mixed and deciduous forests, pine forests and spruce forests with pine, birch. It flies to the light.

Rhagonycha testacea (Linnaeus, 1758)
Lyambir District, Zubova Polyana District [61], Temnikov District [36, 42, 47, 51, 53].

Material. Lyambir District, Ekaterinovka, 2.VI.2009, 1 ex. Saransk city, 31.V.2009, 1 ex. Bolshie Berezniki District, Nerlei, 5.VI.2016, 1 ex. Insar District, Novlei, 27.V.2017, 1 ex. Temnikov District, MSNR, cordon Novenkiy, 54°42'32"N, 43°12'47"E, 19.V.2018, 1 ex., Egorov L.V.; quarter 418, 54°45'43"N, 43°22'08"E, 27.V.2018, 1 ex.; quarter 435, 54°43'41"N, 43°07'59"E, 14.VI.2018, 1 ex.; Pushta, 54°42'45'' N, 43°13'16'' E, 19.V.–26.VI.2018, 2 ex., Semishin G.B., Egorov L.V.

Biology. This is a common species. It is found in birch forests, floodplain oak forests, mixed forests, pine forests with spruce, birch, aspen, on floodplain meadows and on the outskirts of wetlands.

Silinae Mulsant, 1862

Silis ruficollis (Fabricius, 1775)
Temnikov District [36, 47, 53].

Biology. It was recorded repeatedly only in the territory of the Mordovia reserve in the pine-spruce forests with birch, on the edges of pine forests with spruce, birch.

Malthininae Kiesenwetter, 1852

Malthinus fasciatus (A.G. Olivier, 1790)
Temnikov District [51, 53].

Biology. It was recorded only on the territory of Mordovia State Nature Reserve in mixed forests.

Malthinus flaveolus (Herbst, 1786)
Temnikov District [42, 48, 50, 51]

Biology. It was recorded only on the territory of the Mordovia Reserve in ripe pine forests with spruce, birch, aspen, in floodplain deciduous forests with a predominance of aspen.

Malthinus frontalis (Marsham, 1802)
Temnikov District [50].
Biology. It was caught once only on the territory of Mordovia State Nature Reserve in a ripe pine forest with spruce, birch, aspen.

Thus, the Cantharoidea fauna of the Republic of Mordovia includes 36 species: Drilidae - one species, Lycidae - seven species, Lampyridae - one species and Can-tharidae - 27 species. For two species (*Cantharis figurata, Cantharis nigra*), known only by literary data, confirmation of the findings is required from the territory of the republic. *Lygistopterus san-guineus*, *Lampyris noctiluca*, *Cantharis fusca*, *Cantharis nigricans*, *Cantharis pellucida*, *Can-tharis rustica*, *Rhagonycha fulva* can be named as common and numerous species.

In general, the number of Cantharoidea species in Mordovia is comparable to that in the regions of the European part of Russia for which information was published (Table 1). However, as in many other regions (except for the Moscow region), the fauna of the subfamily Malthininae remains poorly understood, and it is difficult to determine. The number of species may be subsequently increased precisely by obtaining new data about this group.

Table 1. The number of Cantharoidea species in some regions of the European part of Russia (according to published data)

	Drilidae	Lycidae	Lampyridae	Cantharidae	In total
Udmurtia Republic [67]	0	5	1	25	31
Lipetsk Region [68]	1	3	1	27	32
Orenburg Region [69]	0	4	1	17	22
Perm krai [70]	0	0	0	15	15
Vladimir Region [71-73]	0	4	1	26	31
Chuvashia Republic (information of the second author)	1	6	1	27	35
Moscow Region [74]	1	7	1	48	57

ACKNOWLEDGEMENTS

The authors are grateful to G.B. Semishin (Saransk), D.K. Kurmaeva (Saransk), E.A. Lobachev (Saransk), L. Timoshkina (Saransk), and M.K. Ryzhov (Chamzinka, Mordovia) for kindly shared materials to be processed, as well as S.V. Kazantsev (Moscow) for valuable comments on the manuscript.

REFERENCES

1. Schlesinger WH, Clark JS, Mohan JE, Mohan JE, Reid CD. 2001. Global environmental change – effects on biodiversity. Conservation Biology: Research Priorities for the Next Decade. 175-223.
2. Brummitt N, Lughadha, EN. 2003. Biodiversity: where's hot and where's not. Conservation Biology 17(5): 1442-1448. DOI: 10.1046/j.1523-1739.2003.02344.x
3. Brooks TM, Mittermeier RA, Da Fonseca GA, Gerlach J, Hoffmann M, Lamoreux JF, Mittermeier CG, Pilgrim JD, Rodrigues AS. 2006. Global biodiversity conservation priorities. Science 313 (5783): 58–61.
4. Grebennikov KA. 2016. Study of biodiversity of nature reserves of the Russia in the digital age: experience and perspectives. Nature Conservation Research 1(2): 1–10. http://dx.doi.org/10.24189/ncr.2016.012
5. Kottawa-Arachchi JD, Wijeratne M.A. 2017. Climate change impacts on biodiversity and ecosystems in Sri Lanka: a review. Nature Conservation Research. Vol. 2(3). P. 2–22. http://dx.doi.org/10.24189/ncr.2017.042
6. Spake R, Doncaster CP. 2017. Use of meta-analysis in forest biodiversity research: key challenges and considerations. Forest Ecology and Management 400: 429-437. https://doi.org/10.1016/j.foreco.2017.05.059
7. Rivers MC, Brummitt NA, Lughadha EN, Meagher TR. 2014. Do species conservation assessments capture genetic diversity? Global Ecology and

Conservation 2: 81-87. DOI: 10.1016/j.gecco.2014.08.005

8. Mupepele AC, Walsh JC, Sutherland WJ, Dormann CF. 2016. An evidence assessment tool for ecosystem services and conservation studies. Ecological Applications 26(5): 1295-1301. https://doi.org/10.1890/15-0595
9. Yuan S, Huang M, Wang XS, Ji LQ, Zhang YL. 2014. Centers of endemism and diversity patterns for typhlocybine leafhoppers (Hemiptera: Cicadellidae: Typhlocybinae) in China. Insect Science 21(4): 523-536. DOI: 10.1111/1744-7917.12040
10. Sarvalingam A, Rajendran A. 2016. Rare, endangered and threatened (RET) climbers of Southern Western Ghats, India. Revista Chilena de Historia Natural 89: 9. DOI: 10.1186/s40693-016-0058-6
11. Thormann B, Ahrens D, Armijos DM, Peters MK, Wagner T, Wagele JW. 2016. Exploring the leaf beetle fauna (Coleoptera: Chrysomelidae) of an Ecuadorian Mountain forest using DNA barcoding. PLOS ONE 11(2): e0148268. DOI: 10.1371/journal.pone.0148268
12. Egorov LV, Ruchin AB. 2010. A new record of Stephanocleonus microgrammus (Gyll.) (Coleoptera, Curculionidae) from the center of European part of Russia. Euroasian Entomological Journal. 9(4): 650. [Russian].
13. Ruchin AB, Kurmaeva DK. 2010. On rare insects of Mordovia included in the Red Book of the Russian Federation. Entomological Review 90(6): 712-717. DOI: 10.1134/S0013873810060060
14. Legalov AA, Egorov LV, Ruchin AB. 2014. First record of Mesauletobius pubescens (Kiesenwetter, 1851) (Coleoptera, Rhynchitidae) in Russia. Euroasian Entomological Journal 13(4): 400. [Russian].
15. Ruchin AB, Egorov LV. 2017b. Overview of insect species included in the Red Data Book of Russian Federation in the Mordovia State Nature Reserve. Nature Conservation Research 2(Suppl. 1): 2–9. doi: 10.24189/ncr.2017.016 [Russian].
16. Ruchin AB, Egorov LV. 2018a. Discovery of Allonyx quadrimaculatus (Schaller, 1783) (Coleoptera Cleridae Clerinae) in Russia. Redia. 101: 143-146. http://dx.doi.org/10.19263/REDIA-101.18.19
17. Ruchin AB, Egorov LV. 2018b. Fauna of longicorn beetles (Coleoptera: Cerambycidae) of Mordovia. Russian Entomological Journal. Vol. 27. No. 2. P. 161–177. doi: 10.15298/rusentj.27.2.07
18. Ruchin AB, Egorov LV. 2018d. On distribution of Mimela holosericea (Fabricius, 1787) (Insecta, Scarabaeoidea, Scarabaeidae, Rutelinae) in Russia and adjacent territories. Journal of Entomological and Acarological Research 50: 7390. doi:10.4081/jear.2018.7390
19. Ruchin AB, Egorov LV, Semishin GB. 2018a. Fauna of click beetles (Coleoptera: Elateridae) in the interfluve of Rivers Moksha and Sura, Republic of Mordovia, Russia. Biodiversitas 19(4): 1352-1365. DOI: 10.13057/biodiv/d190423
20. Ruchin AB, Egorov LV, Sazhnev AS, Polumordvinov OA, Ishin RN. 2019a. Present distribution of Protaetia fieberi (Kraatz, 1880) (Insecta, Coleoptera, Scarabaeidae) in the European part of Russia. Biharean Biologist 13: e181206.
21. Ruchin AB, Egorov LV, Semishin GB. 2019b. Ladybird beetles fauna (Coleoptera: Coccinellidae) of the Republic of Mordovia, Russia. Biodiversitas. 20(2): 316-327. DOI: 10.13057/biodiv/d200203
22. Ruchin AB, Egorov LV. 2017a. New and interesting species of Coleoptera in the Republic of Mordovia. Eversmannia. № 51–52: 21–26. [Russian].
23. Ruchin AB, Egorov LV. 2018c. Leptura aurulenta (Coleoptera, Cerambycidae), a new record of a very rare species in Russia. Nature Conservation Research 3(1): 88–91. http://dx.doi.org/10.24189/ncr.2018.003
24. Tomaszewska W., Egorov L.V., Ruchin A.B., Vlasov D.V. 2018. First record of Clemmus troglodytes (Coleoptera: Coccinelloidea, Anamorphidae) for the

fauna of Russia // Nature Conservation Research. 3(3). P 103–105. http://dx.doi.org/10.24189/ncr.2018.016

25. Zemoglyadchuk AV, Ruchin AB, Egorov LV. 2019. The annotated list of pintail beetles (Coleoptera, Mordellidae) of the Republic of Mordovia, with short review of the family in European Russia. Zoologicheskii Zhurnal 98: …. (in press).
26. Deyrup M, Deyrup L. 2012. The diversity of insects visiting flowers of Saw Palmetto (Arecaceae). Florida Entomologist 95(3): 711-730. https://doi.org/10.1653/024.095.0322
27. Hernández CXP, Caballero SZ. 2016. Temporal variation in the diversity of Cantharidae (Coleoptera), in seven assemblages in tropical dry forest in Mexico. Tropical Conservation Science 9 (1): 439-464.
28. Traugott M. 2002. Dispersal power, home range and habitat preference of cantharid larvae (Coleoptera: Cantharidae) in arable land. European Journal of Soil Biology 38: 79–83.
29. Traugott M. 2003. The prey spectrum of larval and adult Cantharis species in arable land: An electrophoretic approach. Pedobiologia 47(2): 161-169. https://doi.org/10.1078/0031-4056-00179
30. Dapkus D, Tamutis V. 2008. Assemblages of beetles (Coleoptera) in a peatbog and surrounding pine forest. Baltic J. Coleopterol. 8 (1): 31-40.
31. Fanti F, Di Taddeo V, Bocci M. 2017. Description of the larva of Lygistopterus anorachilus Ragusa, 1883 (Coleoptera: Lycidae). Baltic J. Coleopterol. 17(2): 137-145.
32. Rodwell LE, Day JJ, Foster CW, Holloway GJ. 2018. Daily survival and dispersal of adult Rhagonycha fulva (Coleoptera: Cantharidae) in a wooded agricultural landscape. European Journal of Entomology 115: 432–436. doi: 10.14411/eje.2018.043
33. Bouchard P, Smith ABT, Douglas H, Gimmel ML, Brunke AJ, Kand K. (2017) Biodiversity of Coleoptera. 337–417. In: Insect Biodiversity: Science and Society. Vol. 1 (Second Edition). John Wiley & Sons Ltd. DOI 10.1002/9781118945568.ch11
34. Kazantsev SV. 2011. An annotated checklist of Cantharoidea (Coleoptera) of Russia and adjacent territories. Russian Entomological Journal 20(4): 387-410.
35. Fasulati KK. 1971. Field studying of land invertebrates. Prod. 2. Moscow: Vysshaya Shkola. [Russian].
36. Egorov LV, Ruchin AB, Semishin G.B. 2016. Some data concerning the Coleoptera fauna of the Mordovia State Nature Reserve. Information 5. Proceedings of the Mordovia State Nature Reserve 16: 293–364. [Russian].
37. Bocáková M, Bocák L. 2007. Lycidae. In: Löbl I., Smetana A. (Eds): Catalogue of Palaearctic Coleoptera. Vol. 4. Stenstrup: Apollo Books. P. 211–224.
38. Geisthardt M, Satô M. 2007. Lampyridae. In: Löbl I., Smetana A. (Eds): Catalogue of Palaearctic Coleoptera. Vol.4. Stenstrup: Apollo Books. P. 225–234.
39. Kazantsev SV, Brancucci M. 2007. Cantharidae. In: Löbl I., SmetanaA. (Eds): Catalogue of Palaearctic Coleoptera. Vol. 4. Stenstrup: Apollo Books. P. 234–298.
40. Egorov LV, Ruchin AB. 2009a. Additions to Coleoptera fauna of National Park “Smolny” (Republic of Mordovia). Vestnik of the Chuvash State Pedagogical University 1 (61): 63-69. [Russian].
41. Ruchin AB, Egorov LV, Artaev ON, Nikolaeva AM. 2016. New data on rare species of invertebrates and vertebrates of Mordovia. Proceedings of the Mordovia State Nature Reserve. 16: 405-418. [Russian].
42. Egorov LV, Ruchin AB, Semishin GB. 2017. Some data concerning the Coleoptera fauna of the Mordovia State Nature Reserve. Information 6. Proceedings of the Mordovia State Nature Reserve 18: 81–143. [Russian].
43. Egorov LV, Semishin GB. 2016.Coleoptera collected by window traps in the Mordovia State Nature Reserve. Information1. Proceedings of the

Mordovia State Nature Reserve 17: 70–78. [Russian].

44. Nikitsky NB, Osipov IN, Chemeris MV, Semenov VB, Gusakov AA. 1996. Coleoptera-xylobionts, mycetobionts and leaf-horned beetles of the Prioksko-Terrasny Biosphere Reserve (with an overview of the fauna of these groups in the Moscow Region). Moscow. [Russian].
45. Nikitsky NB, Vlasov DV. 3. Description of the main collection sites of beetles (with the names of the most rare taxa). In: Coleoptera (Insecta, Coleoptera) of the Moscow Region: Part 1: monograph / ed. N.B. Nikitsky and B.R. Stryganova. Moscow; Berlin: Direct Media, 2016a. Pp. 17–77.
46. Egorov LV, Mandelshtam MY. 2018. Materials to the knowledge of the coleoptera fauna of the state natural reserve "Prisursky". Report 7. Scientific works of the state natural reserve "Prisursky". 33: 136–176.
47. Egorov LV, Ruchin AB, Semishin G.B. 2015. Some data concerning the Coleoptera fauna of the Mordovia State Nature Reserve. Information 4. Proceedings of the Mordovia State Nature Reserve 14: 82–156. [Russian].
48. Feoktistov VF. 2011. The list of insect species discovered for the first time in the Mordovia State Nature Reserve and in adjacent territories. Mordovia University Bulletin 4: 83-89. [Russian].
49. Egorov LV, Ruchin AB. 2013. Some data concerning the Coleoptera fauna of the Mordovia State Nature Reserve. Information 2. Proceedings of the Mordovia State Nature Reserve 11: 133–192. [Russian].
50. Egorov LV, Ruchin AB. 2014. Some data concerning the Coleoptera fauna of the Mordovia State Nature Reserve. Information 3. Proceedings of the Mordovia State Nature Reserve 12: 26–78. [Russian].
51. Egorov LV, Ruchin AB, Semishin GB. 2018. Some data concerning the Coleoptera fauna of the Mordovia State Nature Reserve. Information 7. Proceedings of the Mordovia State Nature Reserve 20: 52–97. [Russian].
52. Plavilshchikov NN. 1964. A list of insect species found in the Mordovia State Nature Reserve. Proceedings of the Mordovia State Nature Reserve 2: 105-134. [Russian].
53. Egorov LV., Ruchin AB. 2012. Some data concerning the Coleoptera fauna of the Mordovia State Nature Reserve. Proceedings of the Mordovia State Nature Reserve 10: 4–57. [Russian].
54. Red Data Book of the Republic of Mordovia. 2005. Vol. 2: Animals. Publisher of the Mordovia State University, Saransk. [Russian].
55. Timraleev ZA, Kamenev AG, Bardin OD. 2007. Insects of Mordovia. Part II. Coleoptera. Saransk. [Russian]
56. Semishin GB. 2009. Some materials on the findings of beetles (Coleoptera) in the Republic of Mordovia. Mordovia University Bulletin 1: 253-255. [Russian]
57. Bieńkowski AO, Orlova-Bienkowskaja MJ. 2008. Records of protected Coleoptera species in the Republic of Mordovia. In: Rare animals of the Republic of Mordovia: materials for maintenance of Red Data Book of the Republic of Mordovia for 2008. Publisher of the Mordovia State University, Saransk. [Russian].
58. Ruchin AB, Egorov LV, Semishin GB. 2018b. Materials about the findings of rare species of animals of Mordovia. Proceedings of the Mordovia State Nature Reserve. 20: 152–161. [Russian]
59. Egorov LV, Ruchin AB. 2009b. About status of some beetle species (Insecta, Coleoptera) in the Red Data Book of the Republic of Mordovia. In: Rare animals of the Republic of Mordovia: materials for maintenance of Red Data Book of the Republic of Mordovia for 2009. Publisher of the Mordovia State University, Saransk. p. 21-39. [Russian].
60. Ruchin AB. 2008. List of insect species of the National Park «Smolny». Proceedings of the National Park «Smolny» 1: 151-180. [Russian]
61. Ruchin AB, Egorov LV, Alekseev SK, Kurmaeva DK, Ryzhov MK, Semishin GB.

2009. New species of beetles (Insecta: Coleoptera) in fauna of the Republic of Mordovia. Proceedings of the Kaluga Society for Study of Nature of the Local Area 9: 73-86. [Russian].

62. Timraleev ZA. 1992. Harmful and useful insects of grain crops of the South of the non-Chernozem zone of Russia. Saransk. [Russian]
63. Andreichev AV, Loginova NG. 2005. On the entomofauna of Lvovskoe forestry. XXXIII Ogaryov Readings. Saransk: Publ. of Mordov. University. [Russian].
64. Ruchin AB, Loginova NG, Kurmaeva DK. 2007a. The entomofauna of two forestries of National Park «Smolny». In: Fauna and ecology of insects, Vol. 1. Publisher «Tsentr valeologii vuzov Rossii», Rostov-on-Don. [Russian].
65. Antsiferova TA, Dobrosmyslov PA. 1966. Entomofauna of oats-vetch-phacelium and oats-vetch mixtures in the Mordovian ASSR. In: Ecological-faunistical relationships of selected groups of invertebrates and vertebrates. Mordovia Book Publishing House, Saransk. [Russian].
66. Egorov LV. To the beetle fauna (Insecta, Coleoptera) of the Kozlovsky district of the Chuvash Republic. Ecological Bulletin of the Kozlovsky district. 2003. Vol. 1. P. 35–40.
67. Dedyukhin SV, Nikitsky NB, Semenov VB. 2005. Checklist of beetles (Insecta, Coleoptera) of Udmurtia. Euroasian Entomological Journal 4(4): 293-315. [Russian].
68. Tsurikov MV. 2009. Beetles of the Lipetsk region. Voronezh. [Russian].
69. Kozminykh VO, Shapovalov AM, Rusakov AV, Nemkov VA. 2009. The biological diversity of beetles (Insecta: Coleoptera) in Orenburg region: materials to the regional cadastre. Vestnik of the Orenburg State University. 12 (106): 37-41. [Russian].
70. Kozminykh VO. 2003. Biodiversity of beetles (Insecta: Coleoptera) of the Perm Region. In: Ecological problems of protected areas of Russia. Tolyatti. 211-215. [Russian].
71. Semenov VB. 2009. An annotated checklist of beetles (Insecta, Coleoptera) Central Meshchera. Moscow: KMK Sci. Press Ltd. 168 p. [Russian].
72. Semenov VB. 2010. An annotated checklist of beetles (Coleoptera) of Central Meshchera. Addition 1. Eversmannia. 23-24: 26-39. [Russian].
73. Semenov VB. 2013. An annotated checklist of beetles (Coleoptera) of Central Meshchera. Addition 2. Eversmannia. 35: 7-11. [Russian].
74. Nikitsky NB, Vlasov DV. 6. Taxonomic structure of the fauna. Coleoptera (Insecta, Coleoptera) of the Moscow Region. In: Coleoptera (Insecta, Coleoptera) of the Moscow Region: Part 1: monograph / ed. N.B. Nikitsky and B.R. Stryganova. Moscow; Berlin: Direct Media, 2016b. Pp. 81–118.