This pencil and pen sketch by Priyanka Iyer, Zoo Outreach Organization is to celebrate Beetles. This group of insects, which includes both insects and isopods, is known for their diverse range of habitats, from land to water, and their important role in ecosystems. Beetles are ancient creatures, and their evolution has been crucial in the development of ecosystems, contributing to the diversity of life on Earth. In addition, beetles are considered pests, food, medicine, biodiversity indicators, and even inspiration for technologies, art, and entertainment. Their importance is further highlighted by their role in ancient cultures and their use as natural history illustrations.
Abstract: Information is presented on 249 vespine species from 11 families in two regions of Mordovia (including Mordovia State Nature Reserve (MSNR) and three districts of Nizhny Novgorod region (including Sarov) in Russia. Of these, 31 species are new to the Republic of Mordovia. Fauna of separate families of wasps in Mordovia State Nature Reserve is represented by 220 species: one species in Bethylidae, 31 in Chrysididae, two in Tiphiidae, two in Mutillidae, one in Scoliidae, 28 in Pompilidae, 37 in Vespidae, nine in Sphecidae, 108 in Crabronidae, and one in Trigonalyidae. The biodiversity of wasps in the reserve is very high. Of the 283 species of wasps in Mordovia, 220 (77.7%) are found within the reserve. Species characteristics such as geographic distribution and certain aspects of biology are also provided. There is an obvious extension of the ranges of three species, Priocnemis fastigiata, Sceliphron deforme, and Scolia hirta, to the north.

Keywords: Geographic distribution, Nizhny Novgorod region, range extension, Republic of Mordovia, Russia, Vespomorpha.


Ключевые слова: Мордовский заповедник, Республика Мордовия, Нижегородская область, осы, фауна, Hymenoptera.
INTRODUCTION

Hymenoptera is one of the largest groups of insects, including more than 153,000 species in the world fauna (Peters et al. 2017). This group includes Vespomorpha, one of the largest infraorders that comprises several superfamilies and more than 92,000 species (Aguiar et al. 2013). At the same time, the distribution of a huge number of these species is still poorly understood. New works are published all the time containing information on range refinement of already-described species (Ponomarenko & Olmi 2007; Mokrousov 2011; Ćetković et al. 2011; Antropov & Mokrousov 2016; Nemkov 2016, 2017a,b,c,d; Ruchin & Artaev 2016; Antropov 2017a,b; Danilov 2017; Danilov & Mokrousov 2017; Fateryga 2017; Lelej 2017; Lelej & Fadeev 2017; Loktionov & Lelej 2017; Mokrousov 2017b; Mokrousov & Lelej 2017; Rosa et al. 2017a) as well as descriptions of new species from the European part of Russia (Loktionov et al. 2016; Mokrousov 2017a; Rosa et al. 2017b). On the territory of the Republic of Mordovia (central part of Russia), however, this group of insects began to be studied actively only in recent years (Ruchin & Shibaev 2008; Ruchin et al. 2009; Mokrousov et al. 2009, 2013; Mokrousov 2010a,b; Ruchin & Kurmaeva 2010; Ruchin 2011, 2015; Ruchin & Lengesova 2012; Ruchin & Zryanin 2013; Ruchin & Antropov 2014, 2016; Ruchin & Egorov 2017).

The high species richness of this group and the mass nature and diversity of its representative’s biology make it one of the most significant among many terrestrial biocenoses. This article is devoted to the study of wasp fauna, a large group of stinging Hymenoptera, excluding bees (Apoidea: Apiformes) and ants (Formicoidea), inhabiting Mordovia State Nature Reserve (MSNR) and its surroundings in Russia.

MATERIAL AND METHODS

Mordovia State Nature Reserve is located in Temnikov District of the Republic of Mordovia on a forested right brink of the river Moksha and covers an area of 321.62 km². From the north, the border runs along the river Satis — the right tributary of Moksha, further to the east — along the river Arga, which flows into the Satis. The western border runs along the rivers Chernaya, Satis, and Moksha. From the south, the forest-steppe approaches, naturally delineating the boundary of the reserve (Image 1).

The forestland of the reserve belongs to the mixed coniferous-broad-leaved forest zone at the forest-steppe border. Forest communities occupy 89.3% of the total territory. Vegetation cover of MSNR in general has a taiga character with a definite gravitation towards a nemoral complex with vegetation fluctuations. Forest-steppe elements are typical for this territory. Pine Pinus sylvestris L. is the main forest-forming breed in the reserve. It forms pure or mixed plant communities in the southern, central, and western parts of MSNR. Birch Betula pendula Roth and birch groves are the second largest forest communities in the reserve. These are predominantly secondary communities at the sites of pine forest fellings and burns. Young birch forests are especially abundant in the area that suffered from wildfire in 2010. Linden groves are located mainly in the northern part of the reserve. These are secondary plant communities that arose on the site of pine forests and lime-spruce forests. Oak forests occupy a relatively small area of the reserve. They are common in the floodplain of Moksha in the western part of the reserve. Spruce (formed mainly by Picea abies L.) and alder forests (formed by Alnus glutinosa (L.) Gaertn.) are located mainly in the floodplains of the rivers and streams (Pusha, Vyaz-Pusta, Vorskliaj, and Arga) and occupy small areas. Plant communities of small-leaved species (birch, aspen, and alder) are often formed on the sites of burnt forests (Khapugin et al. 2016; Ruchin & Makarkin 2017). The main areas of floodplain meadows are located along the river Moksha in the southwest of MSNR. The territory of the reserve is nominally divided into quarters, which are numbered starting from the north and then from west to east. There are forest houses (cordons) in some places of the reserve, often situated next to large forest glades (Image 2).

The research material was collected from April to September in 2008, 2009, and 2011–2017 using the generally accepted entomologic methods of field research (Fasulati 1971). The bulk of the material was collected in the MSNR. Since the insects of the studied group are quite active and capable of moving, we also provide information about materials from the vicinity of MSNR, namely, from the territories of Temnikov and Elniki districts of the Republic of Mordovia, as well as Pervomaisk, Diveevsk, and Voznesenskoe districts of the Nizhny Novgorod region. All material was collected by the first author (in other cases, the collector is indicated separately). The determination of the material was held by A.V. Antropov. In total, more than 1,400 specimens were studied. About 60 quarters of the reserve were investigated.

The following annotated list contains for each
Figure 1. Map location of Mordovia State Nature Reserve and research sites (research sites of 2008, 2009, 2011–2017 are shown as red dots).
species the references to the literature on the species from the territory of MSNR and its surroundings, the new collecting grounds in the reserve and the surrounding area (unpublished data), date of collection, the number of specimens collected, the information on general distribution and biology (for some species), as well as remarks (if any). Due to the flat character of the landscape, we didn’t indicate altitude above sea level when we indicated coordinates. New records for the Republic of Mordovia are marked with an asterisk (*) and new records for the territory of the reserve with two asterisks (**). The question mark symbol (?) indicates the findings of species that require confirmation by modern material. The hyphen (-) symbol indicates the
species that were excluded from the wasp list fauna of the reserve for various reasons that are indicated as remarks. The abbreviations used in the list are as follows: RM - Republic of Mordovia, NNR - Nizhny Novgorod Region, MSNR - Mordovia State Nature Reserve, quar. - quarter, cord. - cordon, Distr. - district, ex. - exemplar (specimen). Latin species names are provided according to online resources (Catalogue of Life website 2018; Chrysis.net 2018; Fauna Europaea 2018).

**SPECIES LIST**

**Superfamily Chrysidioidea**

**Family Bethylidae**

? *Epyris minor* Kieffer, 1906


**General distribution:** Russia (the south of the European part), northern Africa, Romania, Czech Republic, Slovakia, and Hungary (Macek et al. 2007; Lelej & Fadeev 2017).

**Remark:** The species requires additional refinement of range in the European part of Russia.

**Family Chrysididae**

**Subfamily Cleptinae**

*Cleptes nitidulus* (Fabricius, 1793)


**General distribution:** Russia (the northwest till Crimea and northern Caucasus, and western Siberia), Europe, and Turkey (Rosa et al. 2017a).

**Biology:** It is a parasite of the larvae of the sawflies *Nematus* and *Euura* (Tenthredinidae).

**Subfamily Chrysidinae**

**Tribe Elampini**

*Elampus albipennis* Mocsáry, 1889


**Material:** RM: 1 female, 18.vii.2016, MSNR, quar. 278 (54°47′51″N & 43°12′27″E); 1 female, 18.vii.2016, quar. 303 (54°47′17″N & 43°12′32″E); 1 female, 9.vi.2016, quar. 331 (54°46′43″N & 43°12′37″E).

**General distribution:** Russia (European part from the northwest till Crimea and northern Caucasus, and eastern Europe, Saudi Arabia, United Arab Emirates, Turkey, Turkmenistan, and Iran (Rosa et al. 2017a).

**Remark:** The species is confirmed in MSNR.

* *Elampus constrictus* ( Förster, 1853 ) (= *Elampus ambiguus* Dahlbom, 1854)

**Material:** RM: 1 female, 18.vii.2016, MSNR, quar. 278 (54°47′51″N & 43°12′27″E); 1 female, 18.vii.2016, quar. 303 (54°47′17″N & 43°12′32″E); 1 female, 9.vi.2016, quar. 331 (54°46′43″N & 43°12′37″E).

**General distribution:** Russia (the European part from the northwest till Crimea and northern Caucasus, and European Mediterranean, Caucasian, Turkey, and Japan (Hokkaido, Honshu, Shikoku, and Kyushu)) (Rosa et al. 2017a).

**Elampus panzeri** (Fabricius, 1804)

**Material:** NNR: 1 ex., 27.v.2016, Sarov (54°55′08″ N 43°17′40″E), coll. P.V. Cherenkov.

**General distribution:** Russia (the whole European part, Siberia, and Primorsky Krai), Europe, Caucasus, Turkey, and northeastern China (Rosa et al. 2017a).

**Biology:** It is a brood parasite of digger wasps *Mimesa* (Crabronidae).

*Hedychridium coriaceum* (Dahlbom, 1854)

**Literature:** Mokrousov et al. 2013; Ruchin & Antropov 2014.

**General distribution:** Russia (the European part from the northwest till northern Caucasus and Urals), southern Siberia, and Primorsky Krai, Europe, and Turkey (Rosa et al. 2017a).

**Biology:** It is a brood parasite of digger wasps *Lindenius albilabris* (Fabricius, 1793) (Crabronidae).

* *Hedychridium elegantulum* du Buysson, 1887

**Literature:** Mokrousov et al. 2013 (as *Hedychridium elongatum* Du Buysson, 1887).

**General distribution:** Russia (the European part from the centre till northern Caucasus) and European Mediterranean (Rosa et al. 2017a).

**Biology:** It is a probable brood parasite of digger wasps *Miscophus bicolor* Jurine, 1807 (Crabronidae).

* *Hedychridium krajniki krajniki* Balthasar, 1946

**Literature:** Rosa et al. 2017b.

**General distribution:** Russia (the European part
from the centre till northern Caucasus) and European Mediterranean (Rosa et al. 2017a).

**Hedychridium roseum** (Rossi, 1790)

**Literature:** Mokrousov et al. 2013.

**General distribution:** Russia (the whole European part, Urals, Siberia, Amur region, Khabarovsk, and Primorye), Europe, Azerbaijan, Georgia, Abkhazia, and north-eastern China (Rosa et al. 2017a).

**Biology:** It is a brood parasite of digger wasps Astata boops (Panzer, 1804), Tachysphex pomphiliformis (Panzer, 1809), and, probably, Dryudella stigma (Panzer, 1809) and Harpactus tumidus (Panzer, 1801) (Crabronidae).  

**Hedychridium zelleri** (Dahlbom, 1845)

**Literature:** Mokrousov et al. 2013.

**General distribution:** Russia (from the west and the centre of the European part till northern Caucasus) and Europe (Rosa et al. 2017a).

**Biology:** It is a brood parasite of digger wasps Miscophus niger Dahlbom, 1844 and *M. concolor* Dahlbom, 1844 (Crabronidae).

*Hedychrum chalybaeum* Dahlbom, 1854

**Material:** RM: 1 female, 18.vii.2016, MSNR, quar. 303 (54°47’17”N & 43°12’32”E); 1 female, 18.vii.2016, quar. 331 (54°46’43”N & 43°12’37”E); 1 female, 23.vii.2016, Elniki Distr., Novoyamskaya Sloboda (54°44’24”N & 43°42’59”E); 1 female, 23.vii.2016, Malye Mordovskie Poshaty (54°41’00”N & 43°43’50”E).

**General distribution:** Russia (the European part, Siberia, Amur region, and Primorsky Krai), Europe, Caucasus, and Abkhazia (Rosa et al. 2017a).

**Biology:** It is a brood parasite of digger wasps Cerceris interrupta (Panzer, 1799) (Crabronidae).

**Hedychrum gerstaeckeri** Chevrier, 1869

**Literature:** Mokrousov et al. 2013.

**Material:** RM: 1 female, 24.vii.2016, Temnikov Distr., Polyanki (54°44’27”N & 43°29’04”E).

**General distribution:** Russia (the European part, Siberia, Amur region, Khabarovsk Krai, and Primorsky Krai), Europe, Georgia, central and northeastern China, and Japan (Rosa et al. 2017a).

**Biology:** It is a brood parasite of digger wasps Cerceris arenaria (Linnaeus, 1758), C. rybyensis (Linnaeus, 1771), C. quadristifasciata (Panzer, 1799), and C. quadriricta (Panzer, 1799) (Crabronidae) (Polodori et al. 2010).

*Hedychrum longicolle* Abeille de Perrin, 1877

**Material:** RM: 1 female, 19.vii.2015, Elniki Distr., Novye Shaly (54°42’13”N & 43°38’25”E); NNR: 1 ex., 18.vi.2015, Sarov (54°55’08” N 43°17’40”E), coll. P.V. Cherkenkov (Image 3).

**General distribution:** Russia (the centre and the south of the European part, including Crimea and northern Caucasus, Urals, western Siberia, and Primorsky Krai), west and south of Europe, north of Africa, Syria, Turkey, Georgia, Kazakhstan, Turkmenistan, and China (Rosa et al. 2017a).

**Biology:** It is a brood parasite of digger wasps (Crabronidae).

**Hedychrum nobile** (Scopoli, 1763)

**Literature:** Mokrousov et al. 2013; Ruchin & Antropov 2014.

**Material:** RM: 2 female, 12.vii.2014, MSNR, quar. 86 (54°53’38”N & 43°35’59”E); 1 female, 1 male, 11.vii.2015, quar. 301 (54°47’19”N & 43°10’36”E); 1 male, 16.vii.2015, quar. 442 (54°43’56”N & 43°15’02”E); 1 female, 18.vi.2016, 115 (54°51’46”N & 43°09’26”E); 1 female, 18.vi.2016, 358 (54°46’05”N & 43°11’44”E); 1 female, 20.vi.2015, Temnikov Distr., Russkoe Karaevo (54°40’55”N, 43°13’52”E); 5 female, 1 male, 15.viii.2015, Purdoshki (54°40’04”N & 43°32’33”E); 1 female, 1 male, 19.vii.2015, Elniki Distr., Novye Shaly (54°42’13”N & 43°38’25”E).

**General distribution:** Russia (the European part, including Crimea and northern Caucasus, Urals, western Siberia, and Primorsky Krai), Europe, Caucasus, and Abkhazia (Rosa et al. 2017a).

**Biology:** It is a brood parasite of digger wasps Cerceris arenaria (Linnaeus, 1758), C. rybyensis (Linnaeus, 1771), C. quadristifasciata (Panzer, 1799), and C. quadriricta (Panzer, 1799) (Crabronidae).
Hedychrum virens Dahlbom, 1854

**Literature:** Ruchin & Antropov 2016.

**Material:** RM: 1 male, 12.vii.2014, Ternnikov Distr., Alkaev (54°35′49″N & 43°22′35″E); 1 female, 15.viii.2015, Purdoshki (54°40′04″N & 43°32′33″E).

**General distribution:** Russia (the centre and the south of the European part, including Crimea, Urals, and western Siberia), west and south of Europe, the Middle East, Turkey, Azerbaijan, and Georgia (Rosa et al. 2017a).

**Biology:** It is a brood parasite of digger wasps Cerceris tuberculata (de Villers, 1789) (Crabronidae).

* Holopyga chrysonota ( Förster, 1853 )

**Material:** RM: 1 male, 16.vii.2016, MSNR, Pushta (54°42′50″N & 43°13′32″E).

**General distribution:** Russia (the European part, including Crimea and northern Caucasus, Urals, and Siberia), Mediterranean Europe, Caucasus, and northern China (Rosa et al. 2017a).

**Biology:** It is a brood parasite of digger wasps (Crabronidae).

Omalus aeneus (Fabricius, 1787)

**Literature:** Mokrousov et al. 2009.

**Material:** RM: 1 female, 13.vi.2016, MSNR, quar. 421 (54°43′52″N, 43°07′06″E).

**General distribution:** Russia (the European part from the northwest to the south, including Crimea and northern Caucasus, Urals, Siberia, Amur region, Khabarovsk Krai and Primorsky Krai, Sakhalin, and Kuril Islands), Europe, northern Africa, Georgia, Uzbekistan, northern and eastern China, Japan (Hokkaido, Honshu, and Kyushu), and North America as a result of accidental importation (Rosa et al. 2017a).

**Biology:** It is a brood parasite of digger wasps Psenulus pallipes (Panzer, 1798) (Crabronidae).

* Pseudoomalus auratus ( Linnaeus, 1758 )

**Literature:** Ruchin & Antropov 2016.

**General distribution:** Russia (the European part from the northwest till Crimea and the northern Caucasus, Urals, Siberia, Kamchatka, and Primorsky Krai), Europe, northern Africa, Caucasus, northern China, Korea, Japan (Hokkaido, Honshu), and North America as a result of accidental delivery (Rosa et al. 2017a).

**Biology:** It is a brood parasite of digger wasps Diodontus tristis (Vander Linden, 1829) (Crabronidae).

* Omalus biaccinctus ( du Buysson, 1893 )

**Material:** RM: 1 female, 18.vii.2016, MSNR, quar. 331 (54°46′43″N & 43°12′37″E).

**General distribution:** Russia (the European part from the northwest to the south, including Crimea), Europe, and the Middle East (Rosa et al. 2017a).

**Biology:** It is a brood parasite of digger wasps Passaloecus turionum Dahlbom, 1844, P. gracilis (Curtis, 1834), and P. eremita Kohl, 1893 (Crabronidae). Females lay eggs on live aphids at the wasps’ hunting grounds, but do not penetrate into their nests.

Philoctetes bidentulus (Lepeletier, 1806)

**Literature:** Mokrousov et al. 2013.

**General distribution:** Russia (the European part, including northern Caucasus, Urals, and Siberia), European Mediterranean, northern Africa, the Middle East, Turkey, and Caucasus (Rosa et al. 2017a).

**Biology:** It is a brood parasite of digger wasps Psenulus pallipes (Panzer, 1798) (Crabronidae).

Philoctetes sareptanus (Mocsáry, 1889)

**Literature:** Ruchin & Antropov 2016.

**Material:** RM: 1 female, 27.v.2016, MSNR, quar. 360 (54°46′13″N & 43°13′31″E); 1 female, 11.vi.2016, quar. 364 (54°46′24″N & 43°17′45″E).

**General distribution:** Russia (the European part, including northern Caucasus, Urals, Irkutsk region, and Khabarovsk Krai) and Iran (Rosa et al. 2017a).

**Remark:** The species is confirmed in MSNR.

Philoctetes truncatus (Dahlbom, 1831)

**Literature:** Feoktistov 2011 (as Chrysellampus truncatus Dahlb.).

**General distribution:** Russia (the centre and the east of the European part, Urals, and Siberia), Europe, and northern Africa (Rosa et al. 2017a).

**Biology:** It is a brood parasite of digger wasps Diodontus tristis (Vander Linden, 1829) (Crabronidae).

Philoctetes singularis (Curtis, 1834), and

P. lethifer (Shuckard, 1837), P. lugubris (Fabricius, 1793), and

Psenulus pallipes (Panzer, 1798) (Crabronidae). Females lay eggs on live aphids at the wasps’ hunting grounds, but do not penetrate into their nests.
Wasp fauna of Mordovia State Nature Reserve and its surroundings

Ruchin & Antropov

Pseudomalus pussillus (Fabricius, 1804)

**Literature:** Plavilshchikov 1964 (as Elampus pussillus F.); Mokrousov et al. 2013.

**Material:** RM: 1 female, 5.vii.2016, MSNR, quar. 324 (54°46′28″N & 43°05′40″E); 1 female, 21.v.2017, cord. Inorski (54°44′15″N & 43°08′53″E).

**General distribution:** Russia (the European part from the northwest till Crimea and northern Caucasus, Urals, and Siberia), Europe, northern Africa, Caucasus, and Kazakhstan (Rosa et al. 2017a).

**Biology:** It is a brood parasite of solitary wasps Passaloecus eremita Kohl, 1893, P. insignis (Vander Linden, 1829), and Pemphedron lethifer (Shuckard, 1837) (Crabronidae).

**Remark:** The species is confirmed in Mordovia.

Chrysisidae

? Chryssidea pumila (Klug, 1845)

**Literature:** Plavilshchikov 1964 (as Chrysogona pumila Kl.).

**General distribution:** Russia (the European part from the centre to northern Caucasus and Urals), south of Europe, and northern Africa (Rosa et al. 2017a).

**Remark:** The species requires further research to be confirmed in Mordovia.

Chrysis analis Spinola, 1808

**Literature:** Mokrousov et al. 2009; Feoktistov 2011.

**General distribution:** Russia (the European part from the northwest till Crimea and northern Caucasus, and Urals), south of Europe, and Caucasus (Rosa et al. 2017a).

**Biology:** It is a brood parasite of solitary wasps Osmia andrenoides Spinola, 1808 (Apidae, Megachilinae).

Chrysis bicolor Lepeletier de Saint Fargeau, 1806

**Literature:** Mokrousov et al. 2013; Ruchin & Antropov 2014.

**Material:** RM: 1 female, 28.vii.2015, MSNR, quar. 79 (54°53′11″N & 43°29′18″E); 1 female, 12.vii.2014, quar. 86 (54°53′38″N & 43°35′59″E); 1 female, 11.vii.2015, quar. 301 (54°47′19″N & 43°10′36″E); 1 female, 16.viii.2015, quar. 324 (54°46′28″N & 43°05′40″E); 1 female, 4.vii.2015, quar. 368 (54°46′37″N & 43°21′45″E); 1 female, 19.vii.2015, Elniki Distr., Novye Shaly (54°42′13″N & 43°38′25″E).

**General distribution:** Russia (the European part from the northwest till Crimea and northern Caucasus, Urals, Siberia, Amur region, Khabarovsk Krai and Primorsky Krai, and Sakhalin), Europe, northern Africa, and Caucasus (Rosa et al. 2017a).

**Biology:** It is a brood parasite of digger wasps Tachysphex obscuripennis (Schenck, 1857), T. pomphiliformis (Panzer, 1804), and Dinetus pictus (Fabricius, 1793) (Crabronidae).

* Chrysis cerastes Abeille, 1877

**Material:** RM: 1 female, 2.vii.2017, MSNR, cord. Inorski (54°44′15″N & 43°08′53″E).

**General distribution:** Russia (the European part from the north till northern Caucasus and Altai), south of Europe, Azerbaijan, and Caucasus (Rosa et al. 2017a).

**Biology:** It is a brood parasite of solitary Vespidae Syneuodynerus egregius (Herrich-Schäffer, 1839) (Vespidae, Eumeninae).

? Chrysis comparata Lepeletier de Saint Fargeau, 1806

**Literature:** Plavilshchikov 1964 (as Chrysis chevrieri Mock.).

**General distribution:** Russia (the European part from the centre till Crimea and northern Caucasus, and Urals), south of Europe, northern Africa, and Caucasus (Rosa et al. 2017a).

**Remark:** The species requires further research to be confirmed in Mordovia.

Chrysis fulgida Linnaeus, 1761

**Literature:** Ruchin & Antropov 2014, 2016.

**General distribution:** Russia (the European part from the northwest to northern Caucasus, Urals, Siberia, Amur region, Kamchatka, and Primorsky Krai), Europe, Caucasus, and northeastern China (Rosa et al. 2017a).

**Biology:** It is a brood parasite of the solitary Vespidae Symmorphus allobrogus (de Saussure, 1955), S. bifasciatus (Linnaeus, 1761), S. crassicornis (Panzer, 1798), S. murarius (Linnaeus, 1758) and, perhaps, Ancistrocerus parietum (Linnaeus, 1758) (Vespidae, Eumeninae).

Chrysis ignita Linnaeus, 1758

**Literature:** Redikortsev 1938; Plavilshchikov 1964; Mokrousov et al. 2009, 2013; Ruchin & Antropov 2014.

**Material:** RM: 1 female, 31.v.2015, MSNR, quar. 345 (54°47′13″N & 43°26′30″E); 1 female, 2.vii.2014, Pushta (54°42′50″N & 43°13′32″E); 1 female, 12.vii.2017, cord. Inorski (54°44′15″N & 43°08′53″E), coll. G.B. Semishin.

**General distribution:** Russia (the European part from the northwest till Crimea and northern Caucasus, Urals, Siberia, Amur region, Kamchatka, Khabarovsk and Primorye, and Sakhalin), Europe, northern Africa, India,
northern China, and Korea (Rosa et al. 2017a).

**Biology:** It is a brood parasite of solitary Vespidae *Ancistrocerus auctus* (Fabricius, 1793), *A. gazella* (Panzer, 1798), *A. nigricornis* (Curtis, 1826), *A. parietinus* (Linnaeus, 1761), *A. parietum* (Linnaeus, 1758), *A. scoticus* (Curtis, 1826), *A. trifasciatus* (Müller, 1776), and also, probably, *Gymnomerus laevipes* (Shuckard, 1837), *Euodynerus posticus* (Herrich-Schäffer, 1841), *Alodynerus delphinalis* (Giraud, 1866), and *Symmorphus bifasciatus* (Linnaeus, 1761) (Vespidae, Eumeninae).

*Chrysis longula* Abeille de Perrin, 1879

**Literature:** Ruchin et al. 2009.

**General distribution:** Russia (the European part from the northwest till Crimea and northern Caucasus, Urals, and Siberia), Europe, and central Asia (Rosa et al. 2017a).

**Biology:** It is a brood parasite of solitary Vespidae *Ancistrocerus antilope* (Panzer, 1798), *A. parietinus* (Linnaeus, 1761), *Euodynerus posticus* (Herrich-Schäffer, 1841), *Symmorphus cassicos* (Panzer, 1798), and *S. murinus* (Linnaeus, 1758) (Vespidae, Eumeninae).

*Chrysis rutilans* Olivier, 1790

**Material:** RM: 1 female, 22.vii.2017, Elniki Distr., Malye Mordovskie Poshaty (54°41’00"N & 43°43’50"E).

**General distribution:** Russia (the European part from the northwest till Crimea and northern Caucasus, Urals, Siberia, and Primorsky Krai), Europe, northern Africa, northern China, and Korea (Rosa et al. 2017a).

**Biology:** It is a brood parasite of solitary Vespidae *Gymnomerus laevipes* (Shuckard, 1837), *Juconcistocerus cospicus* Giordani Soika, 1970, and *Katanemos flavigularis* (Blüthgen, 1951) (Vespidae, Eumeninae).

*Pseudochrysis neglecta* (Shuckard, 1836)


**General distribution:** Russia (the European part from the northwest till Crimea and northern Caucasus, Urals, Siberia, and Khabarovsk Krai), Europe, Turkey, Tajikistan, northwestern China, and North America (Rosa et al. 2017a).

**Biology:** It is a brood parasite of solitary Vespidae *Odynerus reniformis* (Gmelin, 1790), *O. spinipes* (Linnaeus, 1758), and, probably accidentally, *Ancistrocerus parietum* (Linnaeus, 1758) and *Gymnomerus laevipes* (Shuckard, 1837) (Vespidae, Eumeninae).

*Trichrys cyanea* (Linnaeus, 1758)


**Material:** RM: 1 male, 13.vi.2016, quar. 422 (54°43’55"N & 43°07’39"E); NNR: 1 ex., 14.vi.2015, Voznesenskoe Distr., Alamasovo (54°54’03"N & 43°08’56"E), coll. P.V. Cherenkov (Image 3).

**General distribution:** Russia (the European part from the northwest till Crimea and northern Caucasus, Urals, Siberia, and Primorsky Krai, and Sakhalin), Europe, northern Africa, central Asia, northern China, Korea, and Japan (Hokkaido & Honshu) (Rosa et al. 2017a).

**Biology:** It is a brood parasite of digger wasps *Trypoxylon figulus* (Linnaeus, 1758) and *Pemphredon rugifer* (Dahlbom, 1844) [Crabronidae], and *Auplopus carbonarius* (Scopoli, 1763) and *Deuteragenia* sp. (Pompilidae).

**Remark:** The species is confirmed in the territories adjacent to MSNR.

**Tribe Parnopini**

*Parnopes grandior* (Pallas, 1771)

**Literature:** Plavilshchikov 1964; Ruchin & Antropov 2014, 2016; Ruchin & Egorov 2017; Ruchin et al. 2019.


**General distribution:** Russia (the European part from the northwest till Crimea and northern Caucasus, Urals, and Siberia), Europe, northern Africa, central Asia, Azerbaijan, and Caucasus (Rosa et al. 2017a).

**Biology:** It is a brood parasite of digger wasps *Bembix rostrata* (Linnaeus, 1758) (Crabronidae).

**Family Dryinidae**

? *Gonatopus lunatus* Klug, 1810

**Literature:** Mokrousov et al. 2013.

**General distribution:** Russia (the European part from the centre to northern Caucasus, Urals, and Siberia), Europe, Morocco, the Middle East, Turkey, Kazakhstan, central Asia, Mongolia, and Korea (Lelej & Loktionov 2017).

**Biology:** It is a parasitoid of leafhoppers [Cicadellidae, Deltocephalinae, and Aphrodoidea] (Olmi 1994).

**Remark:** The species requires further research to be
confirmed in Mordovia. It is not yet registered in MSNR.

**Superfamily Vespoidea**

**Family Tiphidae**

**Tiphia femorata** Fabricius, 1775

**Literature:** Redikortsev 1938; Plavilshchikov 1964; Mokrousov et al. 2009, 2013; Feoktistov 2011; Ruchin & Antropov 2014.


**General distribution:** Russia (the European part from the northwest till Crimea and northern Caucasus, Urals, and Siberia), Europe, Turkey, Iran, Kazakhstan, and Kyrgyzstan (Lelej 2017).

**Biology:** It occurs from July to September. Parasite of larvae of Amphillophalom solstitialis (Linnaeus, 1758), Anisoplia austriaca Herbst, 1783, and some other Scarabaeidae.

**Tiphia minuta** Vander Linden, 1827

**Literature:** Ruchin & Antropov 2014.

**Material:** RM: 1 female, 23.vii.2016, Elniki Distr., Malye Mordovskie Poshaty (54°41'00"N & 43°43'50"E).

**General distribution:** Russia (the European part from the northwest to northern Caucasus, Altai, Irkutsk region, and Primorsky Krai) (Mokrousov & Lelej 2017).

**Biology:** It is a parasite of larvae of Scarabaeidae.

**Remark:** The species is confirmed in the territories adjacent to MSNR.

**Tiphia unicolor** Lepeletier de Saint Fargeau, 1845

**Literature:** Mokrousov et al. 2013.

**Material:** RM: 1 female, 11.vii.2015, MSNR, quar. 301 (54°47'19"N & 43°10'36"E); 1 male, 21.vii.2013, quar. 368 (54°46'37"N & 43°21'45"E); 1 female, 6.vii.2013, Temnikov Distr., Lavrentevo (54°29'44"N & 43°02'41"E); 1 female, 19.vii.2015, Elniki Distr., Malye Mordovskie Poshaty (54°41'00"N & 43°43'50"E).

**General distribution:** Russia (the centre and the south of the European part, northern Caucasus, and Altai), European Mediterranean, and Turkey (Mokrousov & Lelej 2017).

**Biology:** It is a parasite of larvae of Scarabaeidae.

**Family Mymaridae**

**Myrmosa atra** Panzer, 1801

**Literature:** Mokrousov et al. 2013.

**Material:** RM: 1 male, 4.vii.2015, MSNR, quar. 288 (54°48'27"N & 43°22'03"E); 2 male, 18.vii.2017, quar. 380 (54°45'06"N & 43°08'34"E).

**General distribution:** Russia (the European part from the northwest till Crimea and northern Caucasus, Urals, and Siberia), Europe, Turkey, Iran, Kazakhstan, and Kyrgyzstan (Lelej 2017).

**Biology:** It is a brood parasite of digger wasps Lindeniis aliblabris (Fabricius, 1793), L. panzerei (Vander Linden, 1829), Crabo peltarius (Schreber, 1784), Cossocerus palmipes (Linnaeus, 1767), C. wesaemi (Vander Linden, 1829), Diodontus tristis (Vander Linden, 1829), and Oxybelus unigulmis (Linnaeus, 1758) (Crabronidae).

**Smicromyris rufipes** (Fabricius, 1787)

**Literature:** Mokrousov et al. 2013.

**Material:** RM: 1 male, 3.vii.2016, MSNR, quar. 301 (54°47'06"N & 43°19'40"E).

**General distribution:** Russia (the European part from the northwest till Crimea, Urals, and Siberia) (Lelej 2017).

**Biology:** It is a brood parasite of spider wasps Evogetes [Pompilidae], of digger wasps Astata boops (Schrank, 1781), Tachysphex, Miscophus spurius (Dahlbom, 1832), Palarus variegatus (Fabricius, 1781), Oxybelus bipunctatus Olivier, 1812, O. unigulmis (Linnaeus, 1758), Cossocerus wesaemi (Vander Linden, 1829), and Cerceris arenaria (Linnaeus, 1758) (Crabronidae), as well as of solitary bees Halictus [Apidae, Halictinae] and Andrena (Apidae, Andreninae).
Family Scoliidae

*Scolia hirta* Schrank, 1781

**Literature:** Ruchin & Antropov 2016; Ruchin & Artaev 2016.


**General distribution:** Russia (the European part from the centre till Crimea and northern Caucasus, Urals, and Siberia), Europe, Cyprus, Israel, Turkey, Caucasus, Abkhazia, Iran, Turkmenistan, Uzbekistan, Kazakhstan, and Mongolia (Lelej & Mokrousov 2017; Mokrousov & Lelej 2017).

**Biology:** The hosts are flower chafers *Protaetia morio* (Fabricius, 1781), *P. speciosissima* (Scopoli, 1786), *P. splendidula* (Faldermann, 1835), *Cetonia aurata* (Linnaeus, 1761), *Liocola lugubris* Herbst, 1786, and *Tropinota hirta* (Poda, 1761) (Klausnitzer 2013). Predators are parasitic flies of Conopidae.

Family Pompilidae

Subfamily Ceropalminae

*Ceropales maculata* (Fabricius, 1775)

**Literature:** Redikortsev 1938; Plavilshchikov 1964; Mokrousov et al. 2013; Ruchin & Antropov 2016.

**Material:** RM: 1 female, 18.vii.2016, MSNR, quar. 358 (54°46′05″N & 43°11′44″E); 1 female, 24.vii.2016, quar. 398 (54°46′22″N & 43°25′48″E); 1 male, 19.vii.2016, quar. 330 (54°46′44″N & 43°11′09″E); 1 female, 6.viii.2017, quar. 419 (54°45′39″N & 43°22′50″E).

**General distribution:** Russia (the European part from the northwest till Crimea and northern Caucasus, Urals, Siberia, Amur and Magadan regions, Chukotka, Khabarovsk Krai and Primorsky Krai, Europe, northwestern Africa, the Middle East, Turkey, Iran, Kazakhstan, Tajikistan, Mongolia, northern China, Korea, and Japan (Hokkaido, Honshu, Shikoku, Kyushu, and Tsushima) (Loktionov & Lelej 2017).

**Biology:** Nests are in the shape of separate oval clay cells located in shelters under rocks, under bark, or in abandoned xylophagus tunnels. Prey: spiders from families Salticidae, Clubionidae, Oxyopidae, Gnaophosidae, Agelenidae, Thomisidae, Lycosidae, Segestroidea, and Anyphaenidae. During transportation, the female usually separates the legs of the victim. Predators: parasitoid wasps *Picardiella melanoleuco* (Gravenhorst, 1829) (Ichneumonidae).

*Calidurgus fasciellus* (Spinola, 1808)

**Literature:** Mokrousov et al. 2009, 2013.

**Material:** RM: 1 female, 17.vii.2016, MSNR, quar. 397 (54°46′17″N & 43°25′44″E); 1 female, 23.vii.2016, Elni Distr., Cherlyaj (54°45′53″N & 43°40′58″E); NNR: 1 female, 16.vii.2017, Voznesenskoe Distr., Zarya (54°50′08″N & 43°07′08″E); 1 male, 16.vii.2017, Svobodnyi (54°50′47″N & 43°07′48″E).

**General distribution:** Russia (the European part from the northwest to northern Caucasus, Urals, Altai, eastern Siberia, Amur region, Kamchatka, Khabarovsk Krai and Primorsky Krai, and Sakhalin), Europe, Cyprus, Turkey, Kazakhstan, Kyrgyzstan, Mongolia, and North America as a result of introduction (Loktionov & Lelej 2017).

**Biology:** Nests are in dense soil of open and forest biotopes. Prey: spiders *Meta* (Tetragnathidae), *Araneus alsine* (Walckenaer, 1802), *A. diadematus* (Linnaeus, 1758), and *Araniella cucurbitina* (Clerck, 1757) (Araneidae).

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*Cryptocheilus octomaculatus* (Rossi, 1790)

**Literature:** Plavilshchikov 1964 (as *Pomphilus*...
**Deuteragenia bifasciata** (Geoffroy, 1785)

**Literature:** Ruchin & Antropov 2014 (as *Dipogon bifasciatus* (Geoffroy, 1785)), 2016.

**Material:** RM: 1 female, 14.vi.2016, MSNR, quar. 384 (54°45'33"N & 43°12'44"E).

**General distribution:** Russia (the European part from the northwest till Crimea and northern Caucasus, and Urals), Europe, Cyprus, Turkey, and Kyrgyzstan (Eversmann 1849; Tobias 1978; Loktionov & Lelej 2017).

**Remark:** The species is confirmed in the territories adjacent to MSNR.

**Cryptocheilus versicolor** (Scopoli, 1763)

**Literature:** Mokrousov et al. 2013.

**Material:** RM: 1 female, 15.viii.2015, Temnikov Distr., Alkaevo (54°35'49"N & 43°22'35"E).

**General distribution:** Russia (the European part from the centre till Crimea and northern Caucasus, and Urals), Europe, Cyprus, Turkey, and Kyrgyzstan from the northwest to the southeast, Urals, Siberia, Amur and Magadan regions, Chukotka, Khabarovsk Krai and Primorsky Krai, Sakhalin, and Kuril Islands), Europe, Georgia, Kazakhstan, Kirghizia, Korea, and Japan (Hokkaido, Shikoku, and Kyushu) (Loktionov & Lelej 2017).

**Prey:** spiders *Lycosidae*, *Salticidae*, and *Pisauridae*.

**Remark:** It is distributed much more southerly. We exclude this species from the fauna of the reserve and the region.

**Diaea dorsata** (Fabricius, 1777)

**Biology:** They build nests in rotten wood and abandoned burrows of other insects. Prey: spiders *Clubionidae*, *Dysteridae*, *Salticidae*, and *Diaeidae dorsata* (Fabricius, 1777) (Thomisidae).

**Remark:** The species is confirmed in MSNR.

**Deuteragenia vechti** Day, 1979

**Literature:** Mokrousov et al. 2013; Ruchin & Antropov 2016.

**Material:** RM: 1 female, 10.vii.2014, MSNR, cord. Podrubnyi (54°45'08"N & 43°08'48"E); 1 female, 13.viii.2016, quar. 434 (54°43'13"N & 43°13'23"E); 1 female, 24.vii.2016, quar. 413 (54°46'37"N & 43°21'45"E); 1 female, 22.viii.2015, quar. 434 (54°45'04"N & 43°19'02"E); 1 female, 24.vii.2016, quar. 368 (54°46'37"N & 43°21'45"E); 1 female, 24.vii.2016, Temnikov Distr., Polyanki (54°44'27"N & 43°29'04"E); 1 female, 23.vii.2016, Elniki Distr., Malye Mordovskie Poshaty (54°41'00"N & 43°43'50"E).

**General distribution:** Russia (the European part from the northwest till Crimea, Urals, and Siberia). Europe, Turkey, Iran, Kazakhstan, and Kyrgyzstan (Loktionov & Lelej 2017).

**Biology:** Nests in the soil, often in existing cavities. Prey: spiders *Lycosidae*, *Salticidae*, and *Pisauridae*.
Wasp fauna of Mordovia State Nature Reserve and its surroundings

Ruchin & Antropov


* Priocnemis fastigiata Haupt, 1934

**Material:** RM: 1 female, 6.vii.2017, MSNR, quar. 420 (54°45′29″N & 43°24′19″E); 1 female, 23.vi.2016, Elniki Distr., Malye Mordovskie Poshaty (54°41′00″N & 43°43′50″E).

**General distribution:** Russia (the centre and the southeast of the European part), European Mediterranean, Austria, Hungary, and Turkey (Straka 2011; Loktionov & Lelej 2017).

**Remark:** The range extends to the northwest.

* Priocnemis gussakowskijii Wolf, 2004

**Literature:** Mokrousov et al. 2013 (as Priocnemis confusor Wahis, 2006).

**General distribution:** Russia (the centre and, perhaps, the south of the European part), Europe, Jordan, Turkey, and Kazakhstan (Loktionov & Lelej 2017).

* Priocnemis minuta (Vander Linden, 1827)

**Literature:** Mokrousov et al. 2013.

**General distribution:** Russia (the European part from the centre till Crimea and northern Caucasus, Buryatia, Amur region, and Primorsky Krai), Europe, Turkey, Cyprus, Kazakhstan, Kyrgyzstan, and Turkmenistan (Loktionov & Lelej 2017).

**Biology:** Nests in sandy soil. Prey: spiders Clubionidae, Gnaphosidae, and Thomisidae.

* Priocnemis parvula Dahlbom, 1845

**Literature:** Mokrousov et al. 2013.

**General distribution:** Russia (the European part from the northwest till Crimea and northern Caucasus, Siberia, Amur and Magadan regions, Khabarovsk Krai and Primorsky Krai, and Sakhalin), Europe, Tunisia, Jordan, Turkey, Uzbekistan, and Kyrgyzstan (Loktionov & Lelej 2017).

**Biology:** Nests in sandy soil. Prey: spiders Pardosa prativaga (L.Koch, 1870), P. pullata (Clerck, 1757), Xerolycosa miniata (C.L. Koch, 1834) [Lycosidae], Haplodrassus soerenseni (Strand, 1900) [Gnaphosidae], and Evarcha arcuata (Clerck, 1757) (Salticidae).

* Priocnemis perturbator (Harris, 1780)

**Literature:** Ruchin et al. 2009; Mokrousov et al. 2013; Ruchin & Antropov 2014.

**Material:** RM: 1 female, 25.v.2015, MSNR, quar. 342 (54°46′21″N & 43°23′23″E); 1 female, 10.v.2015, quar. 368 (54°46′37″N & 43°21′45″E); 3 female, 18.v.2014, 7.vi.2015, quar. 399 (54°46′40″N & 43°27′27″E); 1 female, 6.v.2015, quar. 431 (54°44′31″N & 43°17′14″E); 1 female, 16.v.2015, quar. 408 (54°44′57″N & 43°11′47″E); 1 female, 6.vi.2015, Temnikov Distr., Vesely (54°33′09″N & 43°01′19″E).

**General distribution:** Russia (the European part from the northwest till Crimea and northern Caucasus, Urals, Altai, and Irkutsk region), Europe, Cyprus, Turkey, Georgia, Iran, Uzbekistan, and Kyrgyzstan (Loktionov & Lelej 2017).

**Biology:** Nests in loose soil, often in existing cavities. Prey: spiders Trochosa terricola Thorell, 1856 (Lycosidae), Gnaphosidae, and Thomisidae, which female wasps place into the prepared cavity in the soil (Edwards & Telfer 2002).

* Priocnemis pusilla Schiødte, 1837

**Material:** RM: 1 female, 7.vii.2016, MSNR, quar. 411 (54°45′05″N & 43°14′54″E).

**General distribution:** Russia (the European part from the northwest till Crimea and northern Caucasus, Omsk region, and Krasnoyarsk territory), Europe, Turkey, Georgia, Iran, Kyrgyzstan, Turkmenistan, and Mongolia (Loktionov & Lelej 2017).

**Biology:** Nests in loose soil in existing cavities. Prey: spiders Clubionidae and Salticidae.

* Priocnemis schioedtei Haupt, 1927

**Literature:** Mokrousov et al. 2013.

**General distribution:** Russia (the European part from the northwest till Crimea and northern Caucasus), Europe, Turkey, Kazakhstan, and Mongolia (Loktionov & Lelej 2017).

**Biology:** Nests in loose soil in existing cavities. Prey: spiders Clubionidae, Gnaphosidae, Salticidae, and Lycosidae (Edwards & Telfer 2002).

* Priocnemis vulgaris (Dufour, 1841)

**Material:** RM: 1 female, 11.vi.2016, MSNR, quar. 389 (54°45′50″N & 43°17′50″E); 4 female, 13.vi.2016, quar. 435 (54°43′41″N & 43°07′59″E); 1 female, 26.vi.2016, quar. 403 (54°44′40″N & 43°06′57″E); 1 female, 13.vi.2016, Pushta (54°42′50″N & 43°13′32″E).

**General distribution:** Russia (the European part from the northwest to northern Caucasus), south of Europe, Turkey, Iran, Kazakhstan, Uzbekistan, Kyrgyzstan, and Tajikistan (Loktionov & Lelej 2017).

**Subfamily Pompilinae**

Anoplius concinnus (Dahlbom, 1829)

**Literature:** Mokrousov et al. 2013.

**General distribution:** Russia (the European part from the northwest till northern Caucasus, Altai, eastern Siberia, Amur region, and Khabarovsk Krai and Primorsky Krai), Europe, Cyprus, Israel, Turkey, Iran, Kazakhstan,
Uzbekistan, Kyrgyzstan, Turkmenistan, and Mongolia (Loktionov & Lelej 2017).

**Biological:** Nests in sandy soil, often under rocks. Prey: spiders Arctosa stigmata (Thorell, 1875), Pardosa amentata (Clerck, 1757), P. lugubris (Walkenaer), Pirata hygrophilus Thorell, 1872, P. piraticus (Clerck, 1757), Trochosa ruricola (De Geer, 1778), T. terricola Thorell, 1856 (Lycosidae), Dolomedes fimbriatus (Clerck, 1757) (Pisauridae), Heliophanus auratus C.L.Koch, 1835, H. dubius C.L. Koch, 1835, and Sitticus distinguendus (Simon, 1868) (Salticidae).

**Anoplius infuscatus** (Vander Linden, 1827)

**Literature:** Mokrousov et al. 2013.

**Material:** RM: 1 female, 23.vii.2017, MSNR, cord. Inorski (54°44′15″N & 43°08′53″E).

**General distribution:** Russia (the European part from the northwest till Crimea and northern Caucasus, Urals, Siberia, Amur region, Khabarovsk and Primorye territories, and Sakhalin), Europe, Cyprus, Egypt, Jordan, Turkey, Georgia, Iran, Kazakhstan, Uzbekistan, Kyrgyzstan, Turkmenistan, Mongolia, northern China, Korea, and Japan (Hokkaido, Honshu, and Kyushu) (Loktionov & Lelej 2017).

**Biological:** Nests in moist Sandy soil. Prey: spiders Trochosa ruricola (De Geer, 1778) (Lycosidae) and Xysticus (Thomisidae).

**Remark:** The species is confirmed in MSNR.

**Anoplius nigerrimus** (Scopoli, 1863)

**Literature:** Redikortsev 1938 (as Apoplius nigerrimus Scop.); Plavilshchikov 1964; Mokrousov et al. 2013.

**Material:** RM: 1 female, 24.vii.2016, MSNR, quar. 398 (54°46′22″N & 43°25′48″E).

**General distribution:** Russia (the European part from the northwest till Crimea and northern Caucasus, Urals, Altai, eastern Siberia, Amur region, Kamchatka, Khabarovsk Krai and Primorsky Krai, Sakhalin, and Kuril Islands), Europe, Turkey, Iran, Uzbekistan, Tajikistan, and North America as a result of accidental delivery (Loktionov & Lelej 2017).

**Biological:** Nests in the soil in existing cavities (hollow stems of plants, abandoned nests of insects, cracks in the soil, and empty shells of snails) or simply in the thickness of moss cover. Prey: spiders Pardosa, Trochosa ruricola (De Geer, 1778) (Lycosidae), Clubionidae, Gnaphosidae, and Pisauridae.

**Remark:** The species is confirmed in MSNR.
* Arachnospila minutula (Dahlbom, 1842)

**Material:** RM: 1 female, 13.vi.2016, MSNR, Pushka (54°42'50"N & 43°13'32"E).

**General distribution:** Russia (the European part from the northwest till Crimea and northern Caucasus, Urals, Altai, Buryatia, Transbaikalia, Amur region, and Khabarovsk Krai and Primorsky Krai), Europe, the Middle East, Turkey, Kazakhstan, Kyrgyzstan, and Mongolia (Loktionov & Lelej 2017).


Arachnospila spissa (Schoedte, 1837)

**Literature:** Mokrousov et al. 2013.

**Material:** RM: 1 female, 16.vii.2015, MSNR, quar. 442 (54°43'56"N & 43°15'02"E); 1 female, 15.vii.2017, quar. 324 (54°46'28"N & 43°05'40"E).

**General distribution:** Russia (the European part from the northwest to northern Caucasus, Altai, eastern Siberia, Amur and Magadan regions, and Sakhalin), Europe, the Middle East, Turkey, Kazakhstan, central Asia, Mongolia, and northern China (Loktionov & Lelej 2017).

**Biology:** Prey: spiders Lycosidae and Salticidae. Paralyzed prey is left in the burrow of a spider or hidden in the crevices of tree trunks or stumps.

* Arachnospila trivialis (Dahlbom, 1843)

**Material:** RM: 1 female, 4.vii.2017, MSNR, quar. 357 (54°46'07"N & 43°10'56"E); 1 female, 9.vi.2016, quar. 331 (54°46'43"N & 43°12'37"E); 1 female, 23.vi.2016, Elniki Distr., Malye Mordovskie Poshaty (54°41'00"N & 43°43'50"E).

**General distribution:** Russia (the European part from the northwest to northern Caucasus, Altai, Amur and Magadan regions, Kamchatka, and Chukotka), Europe, the Middle East, Turkey, Kazakhstan, Kyrgyzstan, Tajikistan, and Mongolia (Loktionov & Lelej 2017).


* Arachnospila wesmaeli (Thomson, 1870)

**Literature:** Redikortsev 1938 (as Psammochares wesmaeli Thomson); Plavilshchikov 1964 (as Psammochares wesmaeli Thoms.).

**General distribution:** Russia (the European part from the northwest to the centre and, probably, to the south, and Krasnoyarsk Krai), Europe, Kyrgyzstan, and Mongolia.

**Biology:** Prey: spiders Agelenidae, Clubionidae, Gnaphosidae, Lycosidae, Salticidae, and Thomisidae.

**Remark:** The species requires further research to be confirmed in Mordovia.

Parabatozonus lacerticida (Pallas, 1771)

**Literature:** Redikortsev 1938 (as Batozonus lacerticida Pall.); Plavilshchikov 1964 (as Batozonus lacerticida Pall.); Ruchin & Antropov 2014 (as Batozonellus lacerticida (Pallas, 1771)).

**Material:** RM: 1 female, 11.vii.2015, MSNR, quar. 116 (54°52'02"N & 43°10'25"E); 1 female, 28.vi.2015, cord. Inorski (54°44'15"N & 43°08'53"E); 1 female, 23.vi.2016, Elniki Distr., Malye Mordovskie Poshaty (54°41'00"N & 43°43'50"E); NNR: 2 ex., 27.vii.2014, Voznesenskoe Distr., Almasovo (54°54'03"N & 43°08'56"E), coll. P.V. Cherenkov.

**General distribution:** Russia (the European part from the northwest till Crimea and northern Caucasus, Urals, Altai, eastern Siberia, Amur region, and Khabarovsk Krai and Primorsky Krai), Europe, Morocco, Turkey, Georgia, Syria, Iran, Kazakhstan, Uzbekistan, Kirghizia, Turkmenistan, Mongolia, northeastern China, Korea, and Japan (Hokkaido and Honshu) (Loktionov & Lelej 2017).

**Biology:** Nests in sandy soil. Prey: spiders Araneus and Argyope (Araneidae).

Episyron rufipes (Linnaeus, 1758)

**Literature:** Mokrousov et al. 2013; Ruchin & Antropov 2016.

**General distribution:** Russia (the European part from the northwest till Crimea and northern Caucasus, Urals, eastern Siberia, Amur and Magadan regions, Kamchatka, Khabarovsk Krai and Primorsky Krai), Europe, Morocco, Turkey, Cyprus, Sudan, Ethiopia, Jordan, Yemen, Saudi Arabia, Syria, Iran, Kazakhstan, Uzbekistan, Kyrgyzstan, and Turkmenistan (Loktionov & Lelej 2017).

**Biology:** Nests in sandy soil. Prey: spiders, mainly Meta and Araneus (Araneidae), and sometimes Lycosidae.

Evagetes crassicornis (Shuckard 1837)

**Literature:** Mokrousov et al. 2013.

**General distribution:** Russia (the European part from the northwest to the centre and the east, Altai, eastern Siberia, Amur and Magadan regions, Chukotka, and Sakhalin), Europe, Morocco, Turkey, Georgia, Kazakhstan, Kyrgyzstan, Mongolia, and North America.
Wasp fauna of Mordovia State Nature Reserve and its surroundings

Ruchin & Antropov

Homonotus sanguinolentus (Fabricius, 1793)


General distribution: Russia (the European part from the northwest till Crimea and Magadan regions), Europe, Turkey, Syria, Iran, Kazakhstan, Kirghizia, and Turkmenistan (Loktionov & Lelej 2017).

Biology: Prey: spiders. Brood parasite of spider wasps Arachnospila aniceps (Wesmael, 1851), A. consobrina (Dahlbom, 1843), A. minutula (Dahlbom, 1842), A. trivialis (Dahlbom, 1843), and Anoplius nigerrimus (Scopoli, 1863) (Edwards & Telfer 2002).

Family Vespidae

Subfamily Eumeninae

Ancistrocerus antilope (Panzer, 1798)

Literature: Redikortsev 1938 (as Odynerus antilope Panz.); Plavilshchikov 1964 (as Odynerus antilope Panz.); Mokrousov et al. 2013; Ruchin & Antropov 2014.


General distribution: Russia (the European part from the northwest till Crimea and northern Caucasus, Amur region, and Primorsky Krai), Europe, Turkey, Caucasus, Afghanistan, India, Kazakhstan, Kyrgyzstan, Mongolia, northeastern China, Japan (Hokkaido and Honshu), and North America (Fatyeryga 2017).

Biology: Nests in existing cavities (in the stems of plants, on clay slopes, and in old nests of other Hymenoptera). Prey: caterpillars of various Lepidoptera, less often false larvae of sawflies (Tenthredinidae), larvae of snout beetles (Curculionidae), and leaf beetles (Chrysomelidae). Predators: emerald wasps Chrysis longula Abeille de Perrin, 1879 and Ch. pseudobrevitarsis Linsenmaier, 1951 (Chrysididae).

Ancistrocerus auctus (Fabricius 1793)


General distribution: Russia (the European part from the centre till Crimea and northern Caucasus and Urals), south of Europe, Israel, Jordan, Turkey, Caucasus, Kazakhstan, central Asia, Syria, Iraq, and Iran (Fatyeryga 2017).

Biology: Nests in existing cavities (in the stems of plants, on clay slopes, and in old nests of other Hymenoptera). Prey: caterpillars of various Lepidoptera, less often false larvae of sawflies (Tenthredinidae) and larvae of snout beetles (Curculionidae) and leaf beetles (Chrysomelidae). Predators: emerald wasps Chrysis ignita (Linnaeus, 1758) (Chrysididae).

Ancistrocerus gazella (Panzer, 1798)

Literature: Redikortsev 1938 (as Odynerus gazella Panz.); Plavilshchikov 1964 (as Odynerus gazella Panz.).

Material: RM: 1 male, 16.vii.2015, MSNR, quar. 442 (54°43′56″N & 43°15′02″E).

General distribution: Russia (the European part from the centre till Crimea and northern Caucasus), Europe, northern Africa, Israel, Cyprus, Turkey, Caucasus, Iran, Afghanistan, and Pakistan. Acclimatized in North America and New Zealand as a result of accidental importation (Fatyeryga 2017).

Biology: Nests in existing cavities (in the stems of plants, on clay slopes, and in old nests of other Hymenoptera). Prey: caterpillars of various Lepidoptera, less often false larvae of sawflies Tenthredinidae and larvae of snout beetles (Curculionidae) and leaf beetles (Chrysomelidae). Predators: emerald wasps Chrysis ignita (Linnaeus, 1758) and Ch. schencki Linsenmaier, 1968.

Remark: The species is confirmed in MSNR.

Ancistrocerus ichneumonideus (Ratzeburg, 1844)


General distribution: Russia (the European part from the northwest to the northern Caucasus, Urals, Altai, and eastern Siberia), Europe, Turkey, Caucasus, Kazakhstan, and Mongolia (Fatyeryga 2017).

Biology: Nests in existing cavities (in the stems of plants, on clay slopes, and in old nests of other Hymenoptera). Prey: caterpillars of various Lepidoptera, less often false larvae of sawflies (Tenthredinidae) and larvae of snout beetles (Curculionidae), and leaf beetles (Chrysomelidae). Predators: emerald wasps Chrysis ignita (Linnaeus, 1758) and Ch. pseudobrevitarsis Linsenmaier, 1951 (Chrysididae).

*Pompilus cinereus* (Fabricius, 1775)


General distribution: Russia (the European part from the northwest till Crimea and Irkutsk and Magadan regions), Europe, Turkey, Syria, Iran, Kazakhstan, Kirghizia, and Turkmenistan (Loktionov & Lelej 2017).

Biology: Prey: spiders. Nests in existing cavities (in the stems of plants, on clay slopes, and in old nests of other Hymenoptera). Prey: caterpillars of various Lepidoptera, less often false larvae of sawflies (Tenthredinidae) and larvae of snout beetles (Curculionidae) and leaf beetles (Chrysomelidae). Predators: emerald wasps Chrysis longula Abeille de Perrin, 1879 and Ch. pseudobrevitarsis Linsenmaier, 1951 (Chrysididae).
Hymenoptera). Prey: caterpillars of various Lepidoptera, less often false larvae of Tenthetredinidae and larvae of Curculionidae and Chrysomelidae.

**Ancistrocerus nigricornis** (Curtis, 1826)


**Material:** RM: 1 female, 23.viii.2015, MSNR, quar. 387 (54°45′43″N & 43°15′46″E); 1 female, 10.v.2015, quar. 447 (54°43′14″N & 43°13′39″E); 12.v.2016, 1 female, quar. 408 (54°44′57″N & 43°11′47″E); 2 female, 28.iv.2016, 6.vii.2017, quar. 420 (54°45′29″N & 43°24′19″E); 1 female, 24.vii.2016, quar. 398 (54°46′22″N & 43°25′48″E); 2 female, 2 male, 23.viii.2016, quar. 85 (54°53′29″N & 43°35′00″E); 1 male, 10.viii.2016, quar. 440 (54°43′56″N & 43°13′15″E); 3 female, 21.v.2016, 21.v.2017, cord. Inorski (54°44′15″N & 43°08′53″E); 1 female, 9.v.2015, cord. Podrubnyi (54°47′51″N & 43°08′48″E); 1 female, 18.v.2014, cord. Polyanski (54°46′36″N & 43°28′47″E); 1 female, 23.vii.2016, Elniki Distr., Novoyomskaya Sloboda (54°44′24″N & 43°42′59″E).

**General distribution:** Russia (the European part from the northwest till Crimea and northern Caucasus, Urals, Siberia, Amur region, Khabarovsk Krai andPrimorsky Krai, and Sakhalin), Europe, northern Africa, Turkey, Caucasus, Kazakhstan, Iran, Mongolia, northeastern China, and Japan (Hokkaido and Honshu) (Fateryga 2017).

**Biology:** Nests in existing cavities (in the stems of plants, on clay slopes, and in old nests of other Hymenoptera). Prey: caterpillars of various Lepidoptera, less often false larvae of sawflies (Tenthredinidae) and larvae of snout beetles (Curculionidae) and leaf beetles (Chrysomelidae). Predators: emerald wasps *Chrysis ignita* (Linnaeus, 1758), *C. Impressa* Schenck, 1856, and *C. longula* Abeille de Perrin, 1879 (Chrysidae).

**Ancistrocerus parietum** (Linnaeus, 1758)

**Literature:** Plavishchikov 1964 (as Odynerus parietum L.); Ruchin et al. 2009; Mokrousov et al. 2009.

**General distribution:** Russia (the European part from the northwest till Crimea and northern Caucasus, Urals, Siberia, Amur region, Khabarovsk Krai and Primorsky Krai, and Sakhalin), Europe, northern Africa, Turkey, Caucasus, Kazakhstan, and central Asia, Iran, Mongolia, and northern China. Acclimatized in North America as a result of accidental importation (Fateryga 2017).

**Biology:** Nests in existing cavities (in the stems of plants, on clay slopes, and in old nests of other Hymenoptera). Prey: caterpillars of various Lepidoptera, less often false larvae of sawflies (Tenthredinidae) and larvae of snout beetles (Curculionidae) and leaf beetles (Chrysomelidae). Predators: emerald wasps *Chrysis borealis* Paukkunen, Ødegaard & Soon, 2015, *C. fulgida* Linnaeus, 1761, *C. Ignita* (Linnaeus, 1758), *C. ruddii* Shuckard, 1837, *C. sexdentata* Christ, 1791, and *Pseudochrysis neglecta* (Shuckard, 1836) (Chrysidae).

**Ancistrocerus trifasciatus** (Müller, 1776)

**Literature:** Redikorshev 1938 (as Odynerus trifasciatus F.); Plavishchikov 1964 (as Odynerus trifasciatus F.); Ruchin et al. 2009; Mokrousov et al. 2013; Ruchin & Antropov 2014.

**Material:** RM: 1 female, 15.viii.2014, MSNR, quar. 420 (54°45′29″N & 43°24′19″E); 1 female, 12.vi.2016, quar. 413 (54°45′12″N & 43°16′54″E); 1 female, 1.vii.2016, quar. 329 (54°46′36″N & 43°10′39″E); 1 female, 15.viii.2014, cord. Taratinski (54°44′43″N & 43°05′14″E); 1 female, 4.vii.2017, cord. Podrubnyi (54°47′51″N & 43°08′48″E); 1 male, 18.vi.2017, cord. Drozhdenovski (54°44′31″N & 43°17′24″E); NNR: 1 ex., 22.vii.2017, Voznesenskoe Distr., Alamasovo (55°54′03″N & 43°08′56″E), coll. P.V. Cherenkov (Image 4).

**General distribution:** Russia (the European part from the northwest till Crimea and northern Caucasus, Urals, Siberia, Amur region, Kamchatka, Khabarovsk Krai and Primorsky Krai, Sakhalin, and Kuril Islands), Europe,
Turkey, Caucasus, Kazakhstan, Kyrgyzstan, Mongolia, northeastern China, Korea, and Japan (Hokkaido and Honshu) (Fateryga 2017).


**Discoelius zonalis** (Panzer, 1801)

**Literature:** Redikortsev 1938 (as *Discoelius naryshkini* F. Mor.); Plavilshchikov 1964 (as *Discoelius naryshkini* F. Mor.); Ruchin & Antropov 2016.

**General distribution:** Russia (the European part from the centre till Crimea and northern Caucasus, Urals, Siberia, Primorsky Krai, and Kuril Islands), Europe, Caucasus, Turkey, Iran, Mongolia, central and eastern China, Korea, and Japan (Hokkaido, Honshu, Shikoku, Kyushu, and Kyushu) (Fateryga 2017).

**Biological:** Nests in the abandoned tunnels of the beetle larvae in the wood. Prey: small caterpillars (Geometridae, Tortricidae, Pyralidae, Alucitidae, Pyraustidae), less often false larvae of sawflies (Pamphiliidae). Predators: emerald wasps *Chrysis brevitarsis* Thomson, 1870 and *C. equestris* Dahlbom, 1854 (Chrysididae).

**Eumenes coarctatus** (Linnaeus, 1758)

**Literature:** Ruchin & Antropov 2016.

**Material:** RM: 1 female, 19.vii.2016, MSNR, quar. 330 (54°46′44″N & 43°11′09″E); 1 male, 24.vii.2016, quar. 398 (54°46′22″N & 43°25′48″E); 1 male, 10.viii.2016, quar. 427 (54°44′30″N & 43°12′49″E); 1 female, 15.vi.2017, Temnikov Distr., Tyuveevo (54°39′45″N & 43°14′43″E).

**General distribution:** Russia (the European part from the northwest till Crimea and northern Caucasus, Urals, Altai, eastern Siberia, Amur region, Khabarovsk Krai and Primorsky Krai, and Kuril Islands), Europe, Israel, Turkey, Caucasus, Iran, Kazakhstan, central Asia, Mongolia, China, Korea, and Japan (Kyushu) (Fateryga 2017).

**Biological:** Nests of clay in the shape of a pot on branches of bushes, stones, and walls of buildings, sometimes in groups. Prey: small caterpillars (Geometridae, Tortricidae, Pyralidae, Alucitidae, and Pyraustidae), less often false larvae of sawflies (Cimbeidae). Predators: emerald wasps *Hedychrum rutilans* Dahlbom, 1854 and *Chrysis ruddi* Shuckard, 1837 (Chrysididae).

**Eumenes pedunculatus** (Panzer, 1799)


**General distribution:** Russia (the European part from the northwest till Crimea and northern Caucasus, Urals, Altai, eastern Siberia, Amur region, Khabarovsk Krai and Primorsky Krai, and Kuril Islands), Europe, Israel, Turkey, Caucasus, Iran, Kazakhstan, central Asia, Mongolia, China, Korea, and Japan (Kyushu) (Fateryga 2017).

**Biological:** Nests of clay in the shape of a pot on branches of bushes, stones, and walls of buildings, sometimes in groups. Prey: small caterpillars (Geometridae, Tortricidae, Pyralidae, Alucitidae, and Pyraustidae), less often false larvae of sawflies (Cimbeidae). Predators: emerald wasps *Chrysis impressa* Schenck, 1856, *C. inaequalis* Dahlbom, 1845, and *C. splendidula* Rossi, 1790 (Chrysididae).

**Remark:** The species is confirmed in MSNR.
Wasp fauna of Mordovia State Nature Reserve and its surroundings

Biology: Nests of clay in the shape of a pot on branches of bushes, stones, and walls of buildings, sometimes in groups. Prey: small caterpillars (Geometridae, Tortricidae, Pyralidae, Alucitidae, and Pyraustidae), less often false larvae of sawflies (Cimbicidae).

** Euodynerus notatus ** (Jurine, 1807)


General distribution: Russia (the European part from the northwest till Crimea and northern Caucasus, Urals, Altai, eastern Siberia, and also, perhaps, the Far East (Amur and Magadan regions, Khabarovsk Krai and Primorsky Krai, and Sakhalin), Europe, northern Africa, Caucasus, Turkey, Iran, Kazakhstan, Mongolia, and, possibly, northern China (Fateryga 2017).


Euodynerus quadrisfasciatus (Fabricius, 1793)


General distribution: Russia (the European part from the northwest till Crimea and northern Caucasus, Urals, Siberia, Amur and Magadan regions, Khabarovsk Krai and Primorsky Krai, Sakhalin, and Kuril Islands), Europe, northern Africa, Caucasus, Turkey, Iran, Kazakhstan, Mongolia, northeastern China, Korea, and Japan (Hokkaido and Honshu) (Fateryga 2017).

Biology: Nests in hollow stems of plants, tunnels of bark beetles, and in old nests of Hymenoptera (including in the ground). Prey: caterpillars of Tortricidae, Pyralidae, Gelechiidae, Pyraustidae, and of other families, less often larvae of leaf beetles (Chrysomelidae). Predators: emerald wasps *Chrysis graelsii* Guérin-Méneville, 1842 and *C. pseudobrevitarsis* Linsenmaier, 1951 (Chrysididae).

Gymnomenus laeipes (Shuckard, 1837)


General distribution: Russia (the European part from the northwest till Crimea and northern Caucasus, Urals, Siberia, Amur region, Primorsky Krai, and Sakhalin), Europe, northern Africa, Caucasus, Turkey, Iran, Kazakhstan, and Mongolia (Fateryga 2017).


Microdynerus parvulus (Herrich-Schäffer 1838)


General distribution: Russia (the European part from the northwest till Crimea and northern Caucasus, Urals, and Altai), Europe, Caucasus, Turkey, Iran, Kazakhstan, and Uzbekistan (Fateryga 2017).


Odynerus reniformis (Gmelin, 1790)


Material: RM: 1 male, 18.vi.2017, MSNR, cord. Drozhdenovski (54°44′31″N & 43°17′24″E); 1 female, 30.vi.2015, Temnikov Distr., Nizhnie Borki (54°39′24″N & 43°28′31″E); 1 male, 13.viii.2015, Elniki Distr., Malye Mordovskie Poshaty (54°41′00″N & 43°43′50″E); NNR: 1 male, 4.vii.2017, Voznesenskoe Distr., Zarya (54°50′08″N & 43°07′08″E).

General distribution: Russia (the European part from the northwest to the centre and the east, Urals, and Siberia), Europe, northern Africa, Israel, Turkey, and Kazakhstan (Fateryga 2017).

Biology: Nests in the soil, with a long curved tube of clay lumps in front of the entrance, both on vertical and horizontal surfaces. Prey: larvae of snout beetles *Phytotonus* (Curculionidae) and leaf beetles (Chrysomelidae) and small caterpillars Microlepidoptera. Predators: emerald wasps *Chrysis mediadentata* Linsenmaier, 1951, *C. ruddii* Shuckard, 1837, *C. viridula* Linnaeus, 1761, and *Pseudochrysis neglecta* (Shuckard, 1836) (Chrysididae).

Remark: The species is confirmed in MSNR.

Odynerus similimus F. Morawitz, 1867


General distribution: Russia (the European part from the northwest till Crimea and northern Caucasus, Urals, and Siberia), west and east of Europe, Israel, Caucasus,
Turkey, Kazakhstan, Turkmenistan, and Mongolia (Fateryga 2017).

**Biology:** Nests in the soil, with a long curved tube of clay lumps in front of the entrance. Prey: larvae of snout beetles (Curculionidae).

*Stenodynerus bluethgeni* van der Vecht, 1971

**Material:** RM: 1 male, 4.viii.2013, MSNR, quar. 330 (54°46′44″N & 43°11′09″E).

**General distribution:** Russia (the European part from the northwest till Crimea and northern Caucasus, Urals, Novosibirsk region, Krasnoyarsk Krai, and Irkutsk region), south of Europe, Caucasus, Turkey, Iran, Kazakhstan, Turkmenistan, and northern China (Fateryga 2017).

*Stenodynerus picticus* (Thomson, 1874)

**Material:** RM: 1 female, 9.vi.2016, MSNR, quar. 331 (54°46′43″N & 43°12′37″E).

**General distribution:** Russia (the European part from the northwest to the centre, Urals, Siberia, Amur and Magadan regions, Kamchatka, Khabarovsk Krai and Primorsky Krai, and Sakhalin), Europe, Turkey, Kazakhstan, and Mongolia (Fateryga 2017).

**Biology:** Nests in a variety of existing cavities (galls, hollow stems of plants, and in the old tunnels of beetles in the wood). Prey: caterpillars of Torticidae, Psychidae, Blastobasidae, Eucosmidae, Gelechiidae, Lithocolletidae, and Pyralidae, less often larvae of leaf beetles (Chrysomelidae).

*Stenodynerus xanthomelas* (Herrich-Schäffer, 1839)

**Literature:** Ruchin & Antropov 2014, 2016.

**Material:** RM: 1 female, 17.vi.2016, MSNR, quar. 330 (54°46′44″N & 43°11′09″E); 1 female, 12.vi.2016, quar. 413 (54°45′12″N & 43°16′54″E); 1 male, 12.vi.2016, quar. 430 (54°44′34″N & 43°16′00″E); 1 female, 15.vii.2017, quar. 324 (54°46′28″N & 43°05′40″E).

**General distribution:** Russia (the European part from the centre till Crimea and northern Caucasus and Altai), south of Europe, Caucasus, Turkey, Iran, and northeastern China (Fateryga 2017).

**Biology:** Nests in a variety of existing cavities (galls, hollow stems of plants, and in the old tunnels of beetles in the wood). Prey: caterpillars of Torticidae, Psychidae, Blastobasidae, Eucosmidae, Gelechiidae, Lithocolletidae, and Pyralidae, less often larvae of leaf beetles (Chrysomelidae).

**Remark:** The species is confirmed in MSNR.

*Symmorphus connexus* (Curtis, 1826)

**Literature:** Ruchin & Antropov 2014, 2016.

**Material:** RM: 1 male, 28.vii.2015, MSNR, quar. 82 (54°43′12″N & 43°32′46″E); 1 female, 27.v.2014, Pushta (54°42′50″N & 43°13′32″E); 1 male, 23.iii.2016, Elniki Distr., Cherlyaj (54°45′53″N & 43°40′58″E).

**General distribution:** Russia (the European part from the northwest till Crimea and northern Caucasus, Urals, Siberia, Amur region, Khabarovsk Krai and Primorsky Krai, and Sakhalin), Europe, Turkey, Caucasus, Kazakhstan, central Asia, Mongolia, China, Korea, and Japan (Hokkaido and Honshu) (Fateryga 2017).

**Biology:** Nests in a variety of existing cavities (galls, hollow stems of plants, and in the old nests of other Hymenoptera in soil and wood). Prey: caterpillars of Lithocolletidae, Tischeriidae, Stigmellidae, Cosmopterygidae, and Heliozelidae. Preys mostly on larvae of *Phratora* species, sometimes catching *Linaeidea* and *Plagiodera* as well (Budriené 2003).

**Predators:** emerald wasps *Chrysis angustula* Schenck, 1856, *C. fulgida* Linnaeus, 1761, and *C. ignita* (Linnaeus, 1758) (Chrysididae).

**Symmorphus bifasciatus** (Linnaeus, 1761)

**Literature:** Redikortsev 1938 (as *Odynerus sinuatus* F. and *O. bifasciatus* L.); Plavishchikov 1964 (as *Discoelius sinuatus* F., *Odynerus bifasciatus* L. and *Odynerus diunatus* F.); Ruchin et al. 2009; Mokrousov et al. 2009, 2013; Ruchin et al. 2009; Feoktistov 2011 (as *Symmorphus mutinensis* Bald.); Ruchin & Antropov 2014.

**Material:** RM: 1 female, 24.vii.2016, MSNR, quar. 398 (54°46′22″N & 43°25′48″E); 1 female, 6.viii.2017, quar. 397 (54°46′17″N & 43°25′44″E); 1 male, 15.vi.2014, quar. 408 (54°44′57″N & 43°11′47″E); 1 male, 13.vi.2016, quar. 435 (54°43′41″N & 43°07′59″E); 1 female, 1 male, 9.vi.2014, 16.vi.2014, Pushta (54°42′50″N & 43°13′32″E); 1 male, 23.vii.2016, Elniki Distr., Cherlyaj (54°45′53″N & 43°40′58″E).

**General distribution:** Russia (the European part from the northwest till Crimea and northern Caucasus, Urals, Siberia, Amur region, Khabarovsk Krai and Primorsky Krai, and Sakhalin), Europe, Turkey, Caucasus, Kazakhstan, central Asia, Mongolia, China, Korea, and Japan (Hokkaido and Honshu) (Fateryga 2017).

**Biology:** Nests in a variety of existing cavities (galls, hollow stems of plants, and in the old nests of other Hymenoptera in soil and wood). Prey: caterpillars of Lithocolletidae, Tischeriidae, Stigmellidae, Cosmopterygidae, and Heliozelidae. Preys mostly on larvae of *Phratora* species, sometimes catching *Linaeidea* and *Plagiodera* as well (Budriené 2003).

**Predators:** emerald wasps *Chrysis angustula* Schenck, 1856, *C. fulgida* Linnaeus, 1761, and *C. ignita* (Linnaeus, 1758) (Chrysididae).

**Symmorphus crassicornis** (Panzer, 1798)


**Material:** RM: 1 male, 28.vii.2015, MSNR, quar. 82 (54°43′12″N & 43°32′46″E); 1 female, 27.v.2014, Pushta
Wasp fauna of Mordovia State Nature Reserve and its surroundings Ruchin & Antropov

General distribution: Russia (the European part from the northwest till Crimea and northern Caucasus, Urals, and Siberia), Europe, Turkey, Caucasus, Kazakhstan, central Asia, Iran, Mongolia, India, ? northeastern China (Fateryga 2017).

Biology: Nests in a variety of existing cavities (galls, hollow stems of plants, and in the old nests of other Hymenoptera in soil and wood). Prey: caterpillars of Lithocolletidae, Tischeriidae, Stigmellidae, Cosmopterygidae, Heliozelidae, or larvae of snout beetles (Curculionidae) and leaf beetles (Chrysomelidae) (Budriéné 2003). Predators: emerald wasps Chrysis fulgida Linnaeus, 1761, C. iris Christ, 1791, and C. longula Abeille de Perrin, 1879 (Chrysidae).

* Symmorphus fuscipes (Herrich-Schäffer, 1838)

Material: RM: 2 female, 14.vi.2016, MSNR, quar. 384 (54°45’33″N & 43°12’44″E); 1 female, 11.vi.2016, quar. 368 (54°46’37″N & 43°21’45″E); 1 female, 12.vi.2016, quar. 430 (54°44’34″N & 43°16’00″E); 2 male, 9.vi.2016, quar. 358 (54°46’05″N & 43°11’44″E); 1 male, 18.vi.2016, quar. 383 (54°45’36″N & 43°11’48″E).

General distribution: Russia (the European part from the northwest to the centre, Urals, Siberia, and Magadan regions, Primorsky Krai, and Sakhalin), south of Europe, Azurbayjan, Kazakhstan, Mongolia, and northeastern China (Fateryga 2017).

Biology: Nests in a variety of existing cavities (galls, hollow stems of plants, and in the old nests of other Hymenoptera in soil and wood). Prey: caterpillars of Lithocolletidae, Tischeriidae, Stigmellidae, Cosmopterygidae, Heliozelidae, or (more often) larvae of snout beetles (Curculionidae) and leaf beetles (Chrysomelidae) (Chrysidae).

**Symmorphus gracilis** (Brullé, 1832)


General distribution: Russia (the European part from the centre till Crimea and northern Caucasus), Europe, Israel, Lebanon, Turkey, Caucasus, Kazakhstan, Turkmenistan, Tajikistan, and Iran (Fateryga 2017).

Biology: Nests in a variety of existing cavities (galls, hollow stems of plants, and in the old nests of other Hymenoptera in soil and wood). Prey: caterpillars of Lithocolletidae, Tischeriidae, Stigmellidae, Cosmopterygidae, Heliozelidae, or (more often) larvae of snout beetles (Curculionidae) and leaf beetles (Chrysomelidae).

**Symmorphus murarius** (Linnaeus, 1758)

Literature: Feoktistov 2011.

Material: RM: 2 female, 25.v.2015, MSNR, quar. 276 (54°47’45″N & 43°10’28″E); 1 female, 11.vi.2015, quar. 301 (54°47’19″N & 43°10’36″E); 1 female, 1 male, 21.vi.2015, quar. 360 (54°46’13″N & 43°13’31″E); 4 male, 21.vi.2015, quar. 381 (54°45’17″N & 43°09’52″E); 1 male, 31.v.2015, quar. 398 (54°46’22″N & 43°25’48″E); 1 female, 9.vi.2016, quar. 331 (54°46’43″N & 43°12’37″E); 1 female, 18.vii.2016, quar. 383 (54°45’36″N & 43°11’48″E).

General distribution: Russia (the European part from the northwest till Crimea and northern Caucasus, Urals, Tomsk region, eastern Siberia, and Primorsky Krai), Europe, northern Africa, Turkey, Caucasus, Kazakhstan, central Asia, Iran, and Korea (Fateryga 2017).

Biology: Nests in a variety of existing cavities (galls, hollow stems of plants, and in the old nests of other Hymenoptera in soil and wood). Prey: caterpillars of Lithocolletidae, Tischeriidae, Stigmellidae, Cosmopterygidae, and Heliozelidae, or larvae of snout beetles (Curculionidae) and leaf beetles (Chrysomelidae) (Budriéné 2003). Predators: Chrysis fulgida Linnaeus, 1761, C. iris Christ, 1791, and C. longula Abeille de Perrin, 1879 (Chrysidae).

Remark: The species is confirmed in MSNR.

**Polistes albellus** Giordani Soika, 1976

Literature: Ruchin et al. 2009 (as Polistes nimpha (Christ, 1791), part.); Mokrousov et al. 2013 (as Polistes bischoffi Weyrauch, 1937); Ruchin & Antropov 2014 (as Polistes biglumis (Linnaeus, 1758)).


General distribution: Russia (the European part from the centre to the south, Urals, Siberia, and Primorsky Krai), south of Europe, Kazakhstan, and Mongolia (Antropov 2017a).

Biology: Nests in the shape of a horizontal or inclined open bottom comb structure on a single column on the.
stems of plants or under stones. Prey: small caterpillars of Geometridae and Tortricidae.

**Polistes dominula** (Christ, 1791)

**Literature:** Plavilshchikov 1964 (as *Polistes gallicus* L.); Ruchin et al. 2009 (as *Polistes dominulus* (Christ, 1791)); Ruchin & Antropov 2014.

**Material:** NNR: 1 ex., 28.v.2017, Sarov (54°55′08″ N 43°17′40″ E), coll. P.V. Cherenkov.

**General distribution:** Russia (the European part from the northwest till Crimea and northern Caucasus, Urals, and Altai), Europe, northern Africa, Israel, Jordan, Turkey, Georgia, Armenia, Kazakhstan, central Asia, Iran, Afghanistan, Pakistan, India, Mongolia, and northwestern China. Acclimatized in the Canary Islands, North and South America, and Australia (Antropov 2017a).

**Biology:** Nests in the shape of a horizontal or inclined open bottom comb structure on a single column on the stems of plants or in shelters, on several columns. Prey: caterpillars of Geometridae and Tortricidae (Hughes et al. 2003).

**Polistes nimpha** (Christ, 1791)

**Literature:** Redikortsev 1938 (*Polistes opinabilis* Kohl); Plavilshchikov 1964 (*Polistes opinabilis* Kohl); Ruchin et al. 2009; Mokrousov et al. 2013 (*Polistes nimphus* (Christ, 1791)); Ruchin & Antropov 2014.

**Material:** RM: 1 female, 28.vii.2015, MSNR, quar. 79 (54°53′11″ N & 43°29′18″ E); 2 male, 16.viii.2015, quar. 324 (54°46′28″ N & 43°05′40″ E); 1 female, 5.vii.2015, quar. 403 (54°44′40″ N & 43°06′57″ E); 1 female, 7.vii.2015, quar. 430 (54°44′34″ N & 43°16′00″ E); 1 female, 20.vi.2014, quar. 434 (54°45′04″ N & 43°19′02″ E); 1 female, 24.v.2015, quar. 448 (54°42′37″ N & 43°12′29″ E); 1 female, 29.v.2016, quar. 35 (54°53′19″ N & 43′11′11″ E); 1 male, 23.viii.2016, quar. 59 (54°54′14″ N & 43°34′57″ E); 1 male, 23.viii.2016, quar. 85 (54°53′29″ N & 43°35′00″ E); 1 female, 18.vi.2016, quar. 197 (54°50′05″ N & 43°09′09″ E); 1 female, 18.vi.2016, quar. 275 (54°47′46″ N & 43°08′34″ E); 1 female, 5.vii.2016, quar. 324 (54°46′28″ N & 43°05′40″ E); 1 female, 11.vi.2016, quar. 368 (54°46′37″ N & 43°21′45″ E); 1 female, 19.vi.2016, quar. 401 (54°44′30″ N & 43°05′15″ E); 2 male, 20.viii.2016, quar. 417 (54°45′23″ N & 43°20′56″ E); 1 male, 3.ix.2016, quar. 421 (54°43′52″ N, 43°07′06″ E); 1 male, 10.viii.2016, quar. 427 (54°44′30″ N & 43°12′49″ E); 3 female, 26.v.2016, 13.viii.2016, quar. 446 (54°43′13″ N & 43°13′23″ E); 4 female, 6.ix.2014, 28.vi.2015, 11.vi.2015, cord. Inorski (54°44′15″ N & 43°08′53″ E); 2 female, 19.vi.2016, cord. Podrubnyi (54°47′51″ N & 43°08′48″ E); 1 female, 19.vi.2016, cord. Taratinski (54°44′43″ N & 43°05′14″ E); 3 female, 1.ix.2014, 19.v.2016, 21.v.2016, Pushta (54°42′50″ N & 43°13′32″ E); 1 female, 17.v.2014, Temnikov Distr., Tretyakovko (54°31′44″ N & 43°13′18″ E); 3 male, 5.vii.2015, 15.vii.2015, Akalveo (54°35′49″ N & 43°22′35″ E); 1 female, 1 male, 24.vii.2016, Polyani (54°44′27″ N & 43°29′04″ E); 5 female, 1 male, 19.vii.2015, 23.vii.2016, 22.vii.2017, Elniki Distr., Malye Mordovskie Poshaty (54°41′00″ N & 43°43′50″ E); 1 male, 23.vii.2016, Cherljay (54°45′53″ N & 43°40′58″ E); NNR: 1 ex., 23.ix.2017, Voznesenskoe Distr., Alamasovo (54°54′03″ N & 43°08′56″ E), coll. P.V. Cherenkov (Image 4).

**General distribution:** Russia (the European part from the northwest till Crimea and the northern Caucasus, Urals, Siberia, Amur region, and Khabarovsk Krai), Europe, northern Africa, Israel, Jordan, Turkey, Georgia, Azerbaijan, Armenia, Kazakhstan, Kyrgyzstan, Iraq, Iran, Pakistan, India, Mongolia, and northeastern China (Antropov 2017a).

**Biology:** Nests in the shape of a horizontal or inclined open bottom comb structure on a single column on the stems of plants or in shelters, on several columns (Kozyra & Baraniak 2016). Prey: caterpillars of Geometridae and Tortricidae.

**Subfamily Vespipinae**

**Vespa crabro** Linnaeus, 1758

**Literature:** Redikortsev 1938; Plavilshchikov 1964; Ruchin et al. 2009; Mokrousov et al. 2013.

**Material:** RM: 1 ex., 24.v.2015, quar. 448 (54°42′37″ N & 43°12′29″ E); 1 ex., 10.viii.2016, quar. 427 (54°44′30″ N & 43°12′49″ E); 1 ex., 28.vi.2015, quar. 79 (54°53′11″ N & 43°29′18″ E); 1 ex., 16.viii.2015, quar. 324 (54°46′28″ N & 43°05′40″ E); 1 ex., 19.vii.2016, cord. Podrubnyi (54°47′51″ N & 43°08′48″ E); 2 ex., 28.vi.2015, 11.v.2015, cord. Inorski (54°44′15″ N & 43°08′53″ E); 1 ex., 19.vi.2016, cord. Taratinski (54°44′43″ N & 43°05′14″ E); 1 ex., 18.vi.2017, cord. Drozhdhenovski (54°44′31″ N & 43°17′24″ E); 3 ex., 27.v.2014, 1.ix.2014, Pushka (54°42′50″ N & 43°13′32″ E); 1 ex., 17.v.2014, Temnikov Distr., Tretyakovko (54°31′44″ N & 43°13′18″ E); 1 ex., 15.vii.2015, Akalveo (54°35′49″ N & 43°22′35″ E); 1 ex., 22.vii.2017, Elniki Distr., Malye Mordovskie Poshaty (54°41′00″ N & 43°43′50″ E); 1 ex., 23.vii.2016, Cherljay (54°45′53″ N & 43°40′58″ E); NNR: 1 ex., 4.vii.2017, Voznesenskoe Distr., Zarya (54°50′08″ N & 43°07′08″ E); 1 ex., 23.vii.2017, Diveevo Distr., Satis (54°55′25″ N & 43°13′24″ E); 1 ex., 6.viii.2014, Sarov (54°55′08″ N 43°17′40″ E), coll. P.V. Cherenkov (Image 3).

**General distribution:** Russia (the European part from
the northwest till Crimea and northern Caucasus, Urals, Siberia, Amur region, Khabarovsk Krai and Primorsky Krai, and Sakhalin), Europe, Turkey, Azerbaijan, Georgia, Kazakhstan, Turkmenistan, Iran, Mongolia, China, Korea, and Japan (Hokkaido and Honshu). Acclimatized in North America and Guatemala as a result of accidental importation (Antropov 2017a).

**Biology:** As a rule, nests are in shelters, in hollows of trees and in attics. The shell of the nest is relatively fragile since the material is wood fibres of decayed stumps and trunks. In closed hollows, the outer shell can be absent. Prey: various insects from large Diptera to honey bees and male bumblebees. The family development cycle is long, from May to October.

*Dolichovespula media* (Retzius, 1783)

**Literature:** Redikortsev 1938 (as *Vespa media* Deg.); Plavilshchikov 1964 (as *Vespa media* Deg.); Ruchin et al. 2009; Mokrousov et al. 2013.

**Material:** RM: 1 female, 31.vi.2015, MSNR, quar. 345 (54°47′13″N & 43°26′30″E); 1 male, 18.vii.2016, quar. 383 (54°45′36″N & 43°11′48″E); 1 male, 6.viii.2017, quar. 397 (54°46′17″N & 43°25′44″E); 1 female, 22.vii.2017, Elniki Distr., Malye Mordovskie Poshaty (54°41′00″N & 43°43′50″E).

**General distribution:** Russia (the European part from the northwest till Crimea and northern Caucasian, Urals, Siberia, Amur region, ? Kamchatka, Khabarovsk Krai and Primorsky Krai, Sakhalin, and Kuril Islands), Europe, Morocco, Turkey, Georgia, Syria, Kazakhstan, Mongolia, northeastern China, Korea, and Japan (Hokkaido and Honshu). Accidentally imported introduced to New Zealand (Antropov 2017a).

**Biology:** Nests have thick gray outer shell, openly hanging in the middle or upper tiers of branches of trees and shrubs or under the eaves of buildings. An immature nest has a more or less long entry tube. Prey: mostly various Diptera. The family development cycle is short, from the end of May to August.

*Dolichovespula saxonica* (Fabricius, 1793)

**Literature:** Mokrousov et al. 2009, 2013; Feoktistov 2011; Ruchin & Antropov 2013.

**Material:** RM: 1 female, 1 male, 28.vii.2015, MSNR, quar. 79 (54°53′11″N & 43°29′18″E); 1 female, 28.vii.2015, quar. 82 (54°53′12″N & 43°32′46″E); 1 female, 4.vii.2015, quar. 288 (54°48′27″N & 43°22′03″E); 2 female, 10.v.2015, quar. 366 (54°46′37″N & 43°19′49″E); 1 female, 21.vi.2015, quar. 381 (54°45′17″N & 43°09′52″E); 2 female, 9.v.2015, 5.vii.2015, quar. 403 (54°44′40″N & 43°06′57″E); 1 female, 12.vii.2014, quar. 86 (54°53′38″N & 43°35′59″E); 1 female, 4.v.2016, quar. 380 (54°45′06″N & 43°08′34″E); 1 female, 2 male, 15.v.2016, 18.vii.2016, quar. 383 (54°45′36″N & 43°11′48″E); 1 female, 13.vi.2016, quar. 435 (54°43′41″N & 43°07′59″E); 1 female, 2 male, 10.vi.2016, 24.vii.2016, quar. 440 (54°43′56″N & 43°13′15″E); 3 female, 1.viii.2017, quar. 111; 5.vii.2015, 23.viii.2017, 4 female, cord. Inorski (54°44′15″N & 43°08′53″E), coll. G. B. Semishin; 2 female, 11.vii.2015, 20.v.2017, cord. Podrubnyi (54°47′51″N & 43°08′48″E); 1 female, 9.vi.2016, cord. Novenkovski (54°55′53″N & 43°25′18″E); 3 female, 22.vi.2014, 8.v.2015, 5.vi.2016, Pushta (54°42′50″N & 43°13′32″E); NNR: 2 female, 1.viii.2017, Pervomaisk Distr., 6 km southwest of Lesozavod (54°54′32″N & 43°38′11″E).

**General distribution:** Russia (the European part from the northwest till Crimea and northern Caucasian, Urals, Siberia, Amur and Magadan regions, Chukotka, Kamchatka, Khabarovsk Krai and Primorsky Krai, Sakhalin, and Kuril Islands), Europe, Turkey, Kazakhstan, Iran, Mongolia, southwestern and northern China, Korea, and Japan (Hokkaido and Honshu) (Antropov 2017a).

**Biology:** Quite common, sometimes abundant species. Nests have gray smooth outer shell, openly hanging on branches of trees or bushes or in shelters (in household outbuildings and attics). An immature nest does not have an entry tube. Prey: mostly various dipterans. The family development cycle is short, from May to August.

*Dolichovespula sylvestris* (Scopoli, 1763)

**Literature:** Plavilshchikov 1964 (as *Vespa silvestris* Scop.); Mokrousov et al. 2009, 2013.

**Material:** RM: 2 female, 18.vi.2016, MSNR, quar. 197 (54°50′05″N & 43°09′09″E); 1 male, 24.vi.2016, quar. 398 (54°46′22″N & 43°25′48″E); 1 female, 1 male, 19.vii.2015, 23.vi.2016, Elniki Distr., Malye Mordovskie Poshaty (54°41′00″N & 43°43′50″E); 1 male, 23.vi.2017, Novoyamskaya Sloboda (54°44′24″N & 43°42′59″E); 1 male, 23.vi.2016, Cherlyaj (54°45′53″N & 43°40′58″E).

**General distribution:** Russia (the European part from the northwest till Crimea and northern Caucasian, Urals, Siberia, Amur region, and Khabarovsk Krai and Primorsky Krai), Europe, Morocco, Turkey, Armenia, Georgia, Kazakhstan, Kyrgyzstan, Uzbekistan, Syria, Iran, Afghanistan, Pakistan, India, Mongolia, and China (Antropov 2017a).

**Biology:** Nests have gray loose outer shell, openly hanging in the lower tier of branches of bushes or stems of grass. An immature nest does not have an entry tube.
Prey: mostly various dipterans. The family development cycle is short, from May to early August (Edwards & Telfer 2002). The species prefers coniferous forests (Dvořák 2007).

**Vespula germanica** (Fabricius, 1793)

**Literature:** Plavilshchikov 1964 (as *Pseudovespa germanica* F.); Mokrousov et al. 2009; Ruchin & Antropov 2014.


**General distribution:** Russia (the European part from the northwest till Crimea and northern Caucasus, Urals, Siberia, Amur region, Khabarovsk Krai and Primorsky Krai, Sakhalin, and Kuril Islands), Europe, Turkey, Georgia, Kazakhstan, Uzbekistan, Kyrgyzstan, Turkmenistan, Iran, Mongolia, Nepal, China, Korea, and Japan (Hokkaido, Honshu, and Shikoku) (Antropov 2017a).

**Biology:** Nests are as a gray undulating outer shell, located mainly in cavities under the roots of trees or in abandoned mammal burrows. An immature nest does not have an entrance tube. Prey: various Diptera. The family development cycle is short, from May till late August.

**Vespula vulgaris** (Linnaeus, 1758)

**Literature:** Redikortsev 1938; Plavilshchikov 1964 (as *Pseudovespa vulgaris* L.); Ruchin et al. 2009; Mokrousov et al. 2009.


**General distribution:** Russia (the European part from the northwest till Crimea and northern Caucasus, Urals, Siberia, Amur and Magadan regions, Chukotka, Kamchatka, Khabarovsk Krai and Primorsky Krai, Sakhalin, and Kuril Islands), Europe, Turkey, Georgia, Kazakhstan, Uzbekistan, Kyrgyzstan, Turkmenistan, Iran, Mongolia, Nepal, China, Korea, and Japan (Hokkaido, Honshu, and Shikoku) (Antropov 2017a).

**Vespula rufa** (Linnaeus, 1758)

**Literature:** Ruchin et al. 2009; Feoktistov 2011 (as *Paravespula rufa* L.); Ruchin & Antropov 2014.

**Material:** RM: 1 female, 20.vi.2015, MSNR, quar. 345 (54°47'13"N & 43°26'30"E); 1 female, 23.vii.2015, quar. 360 (54°46'13"N & 43°13'31"E); 1 female, 10.v.2014, quar. 408 (54°44'57"N & 43°11'47"E); 1 female, 23.viii.2016, quar. 85 (54°53'29"N & 43°35'00"E); 1 female, 3.vii.2016, quar. 283 (54°48'08"N & 43°17'28"E); 1 female, 10.vii.2016, quar. 427 (54°44'30"N & 43°12'49"E); 1 female, 31.vii.2015, Pusha (54°42'50"N & 43°13'32"E); 1 female, 21.v.2017, Temnikov Distr., Russkoe Karaev (54°40'55"N, 43°13'52"E); 1 female, 23.vii.2016, Eloniki Distr., Cherljav (54°45'53"N & 43°40'58"E).

**General distribution:** Russia (the European part from the northwest till Crimea and northern Caucasus, Urals, Siberia, Amur and Magadan regions, Chukotka, Kamchatka, Khabarovsk Krai and Primorsky Krai, Sakhalin, and Kuril Islands), Europe, Turkey, Georgia, Kazakhstan, Uzbekistan, Kyrgyzstan, Turkmenistan, Iran, Mongolia, Nepal, China, Korea, and Japan (Hokkaido, Honshu, and Shikoku) (Antropov 2017a).
Wasp fauna of Mordovia State Nature Reserve and its surroundings

Ruchin & Antropov

General distribution: Russia (the European part from the northwest till Crimea and northern Caucasus, Urals, Siberia, Amur region, and Primorsky Krai), Europe, Turkey, Kazakhstan, Iran, Mongolia, northern and southwestern China, and North America (Danilov 2017).

Biology: Nests in dense sandy soil, often in groups. Prey: caterpillars of Geometridae and Noctuidae, and extremely rarely false larvae of Tentredinidae (Kazenas 2001). Predators: flies Metopia argyrocephala (Meigen, 1824) (Sarcophagidae) and twisted-wing parasites Paraxenos sphecidarum (Dufour, 1837) (Stylopidae).

Amphiphiila sabulosa (Linnaeus, 1758)


Material: RM: 2 female, 23.viii.2015, MSNR, quar. 360 (54°46′13″N & 43°13′31″E); 1 female, 17.vii.2014, quar. 397 (54°46′17″N & 43°25′44″E); 1 male, 20.vi.2015, quar. 345 (54°47′13″N & 43°26′30″E); 1 male, 21.vi.2015, quar. 381 (54°45′17″N & 43°09′52″E); 1 male, 5.vii.2015, quar. 403 (54°44′40″N & 43°06′57″E); 1 male, 5.vii.2015, quar. 405; 1 male, 12.vii.2014, quar. 86 (54°53′38″N & 43°35′59″E); 1 female, 23.viii.2016, quar. 85 (54°53′29″N & 43°35′00″E); 1 female, 18.vii.2016, quar. 331 (54°46′43″N & 43°12′37″E); 1 male, 1.vii.2016, quar. 379 (54°45′17″N & 43°07′51″E); 1 male, 7.vii.2016, quar. 386 (54°45′40″N & 43°14′48″E); 1 female, 6.vii.2017, quar. 420 (54°45′29″N & 43°24′19″E); 2 female, 12.ix.2017, quar. 60 (54°53′08″N & 43°09′57″E); 1 male, 13.vii.2017, quar. 347 (54°47′34″N & 43°28′31″E); 1 male, 13.vii.2017, quar. 357 (54°46′07″N & 43°10′56″E); 2 male, 13.vii.2017, quar. 319 (54°48′09″N & 43°28′25″E); 1 female, 24.vi.2016, Temnikov Distr., Polyanki (54°44′27″N & 43°29′04″E); 1 female, 23.vi.2016, Elniki Distr., Cherlyaj (54°45′53″N & 43°40′58″E); 1 male, 22.vii.2017, Novoyamskaya Sloboda (54°44′24″N & 43°42′59″E).

General distribution: Russia (the European part from the northwest till Crimea and northern Caucasus, Urals, Siberia, Magadan region, Kamchatka, and Khabarovsk Krai and Primorsky Krai), Europe, northern Africa, Turkey, Syria, Iran, Kazakhstan, central Asia, Mongolia, and northern China (Danilov 2017).


Amphiphiila cabepesiris (Lateille, 1809)


General distribution: Russia (the European part from the northwest till Crimea and northern Caucasus, Urals, Siberia, Amur region, and Primorsky Krai), Europe, northern Africa, Turkey, Kazakhstan, central Asia, Mongolia, northern China, and Korea (Danilov 2017).


Amphiphiila pubescens Curtis, 1836


General distribution: Russia (the European part from the northwest till Crimea and northern Caucasus, Urals, Siberia, Amur region, and Khabarovsk Krai and Primorsky Krai), Europe, Turkey, Kazakhstan, Iran, Mongolia, northern and southwestern China, and North America (Danilov 2017).

Amphiphiila terminata F. Smith, 1856

Literature: Feoktistov 2011.

General distribution: Russia (the European part from the northwest till Crimea and northern Caucasus, Urals, Siberia, Amur region, and Primorsky Krai), Europe, Turkey, Kazakhstan, Iran, Mongolia, northern and southwestern China, and North America (Danilov 2017).
from the centre till Crimea, Urals, and Siberia), Europe, northern Africa, Turkey, Kazakhstan, central Asia, Mongolia, and northern China (Yildirim et al. 2016; Danilov 2017).

**Biology:** Nests in dense sandy soil. Prey: caterpillars of geometer moths (Geometridae).

**Remark:** Confirmation of the species in Mordovia requires more material.

**Podalonia affinis** (W. Kirby, 1798)

**Literature:** Redikortsev 1938; Plavilshchikov 1964 (as *Psammophila affinis* Kby.); Mokrousov et al. 2013.

**General distribution:** Russia (the European part from the northwest till Crimea and northern Caucasus, Urals, Siberia, Amur region, and Khabarovsk Krai and Primorsky Krai), north and east of Europe, northern Africa, Israel, Jordan, Turkey, Caucasus, Kazakhstan, central Asia, Iran, Mongolia, southwestern and northern China, and Korea (Danilov 2017).

**Biology:** Nests in coarse-grained or dense sandy soil. Prey: caterpillar of owlet moths *Agrotis* (Noctuidae) living in the ground. Predators: some Ichneumonidae (Casiraghi et al. 2001a).

**Podalonia hirsuta** (Scopoli, 1763)

**Literature:** Redikortsev 1938 (as *Ammophila hirsuta* Scop.); Plavilshchikov 1964 (as *Psammophila hirsuta* Scop.); Ruchin et al. 2009; Mokrousov et al. 2009.

**Material:** RM: 1 female, 11.vii.2015, MSNR, quar. 301 (54º47’19”N & 43º10’36”E); 1 female, 14.v.2016, quar. 278 (54º47’51”N & 43º12’27”E); 1 female, 15.v.2016, quar. 276 (54º47’45”N & 43º10’28”E); 2 female, 23.vii.2016, quar. 85 (54º53’29”N & 43º35’00”E); 1 male, 18.vii.2016, quar. 278 (54º47’51”N & 43º12’27”E); 1 male, 18.vii.2016, quar. 303 (54º47’17”N & 43º12’32”E); 1 male, 18.vii.2016, quar. 331 (54º46’43”N & 43º12’37”E); 1 female, 14.v.2017, quar. 327; 1 female, 15.v.2017, quar. 302 (54º47’15”N & 43º11’26”E); NNR: 1 ex., 16.vii.2017, Voznesenskoe Distr., Alamasovo (54º54’03”N & 43º08’56”E), coll. P.V. Cherenkov.

**General distribution:** Russia (the European part from the centre to northern Caucasus), south of Europe, Africa, Israel, Jordan, Turkey, Kazakhstan, central Asia, Syria, Iraq, Iran, Afghanistan, India, Pakistan, Mongolia, and northwest of China (Murai & Amr 2011). As a result of accidental importation, acclimatized in the Canary Islands and Australia (Danilov 2017).

**Remark:** Confirmation of the species in Mordovia requires more material.

**Subfamily Sceliphrinae**

**SceIIPhron deforme** (F. Smith, 1856)

**Literature:** Ćetković et al. 2011; Mokrousov et al. 2013; Ruchin & Antropov 2014.


**General distribution:** Russia (the European part from the centre to northern Caucasus, Urals, Novosibirsk region, Krasnoyarsk Krai, Amur region, and Khabarovsk Krai and Primorsky Krai), southeastern Europe, Kazakhstan, Uzbekistan, Kyrgyzstan, Tajikistan, Mongolia, China, Korea, Japan (Hokkaido, Honshu, Shikoku, Kyushu, and ZyuKyju), India, and southeastern Asia (Danilov 2017).

**Biology:** Nests are placed in various shelters, built of clay cells molded into a single layer without covering by a common shell, but surrounded by a roll of clay. In the reserve it is found in residential and commercial premises. This species often makes nests over windows, in door jams, under eaves, and under roofs. Prey: spiders of medium size, usually the most common and available in the habitat (Gepp 2003).

**SceIIPhron destillatorium** (Illiger, 1807)

**Literature:** Mokrousov et al. 2013; Ruchin & Antropov 2014.

**Material:** RM: 1 female, 3.vii.2014, MSNR, cord. Inorski (54º54’03”N & 43º08’56”E), coll. P.V. Cherenkov.

**General distribution:** Russia (the European part from the centre till Crimea and northern Caucasus, Urals, Novosibirsk region, Krasnoyarsk Krai, Amur region, and Khabarovsk Krai and Primorsky Krai), southeastern Europe, Kazakhstan, Uzbekistan, Kyrgyzstan, Tajikistan, Mongolia, China, Korea, Japan (Hokkaido, Honshu, Shikoku, Kyushu, and ZyuKyju), India, and southeastern Asia (Danilov 2017).

**Biology:** Nests are placed in various shelters, built of clay cells molded into a single layer without covering by a common shell, but surrounded by a roll of clay. In the reserve it is found in residential and commercial premises. This species often makes nests over windows, in door jams, under eaves, and under roofs. Prey: spiders of medium size, usually the most common and available in the habitat (Gepp 2003).

**General distribution:** Russia (the European part from the centre till Crimea and northern Caucasus, Urals, Altai, and Transbaikalia), south of Europe, northern Africa, Israel, Turkey, Kazakhstan, central Asia, Syria, Iran, Afghanistan, Mongolia, and China (Danilov 2017).

**Biology:** Nests of clay cells molded into a few layers, covered by a common shell, in open spaces or in shelters. Prey: spiders of medium size, usually the most common and available in the habitat (Gepp 2003).

**Subfamily Sphecinae**

**Tribe Pryonichini**

*Prionyx nudatus* (Kohl, 1885).

**Literature:** Ruchin & Antropov 2014.

**General distribution:** Russia (the European part from the centre till Crimea and northern Caucasus, Urals, Novosibirsk region, Altai, and Tuva), south and east of Europe, northern Africa, Turkey, Kazakhstan, central Asia, Iran, Afghanistan, and northern China (Danilov 2017).

**Biology:** Nests in dense clay soil. Prey: imago or older larva of locusts (Acrididae).

**Subfamily Sphecinae**

**Tribe Sphecini**

*Sphex funerarius* Gussakovskij, 1934

**Material:** RM: 1 female, 13.vii.2015, MSNR, quar. 434 (54°55′08″ N 43°17′40″E), coll. P.V. Cherenkov (Image 4).

**General distribution:** Russia (the European part from the centre till Crimea and northern Caucasus, Urals, Siberia, and Khabarovsk Krai), Europe, northern Africa, Turkey, Kazakhstan, central Asia, Iran, Afghanistan, Mongolia, and northern China (Danilov 2017).

**Biology:** Nests in dense sandy soil. Prey: nymphs. Predators: emerald wasps *Hedychridium cupreum* (Dahlbom, 1845), *H. femoratum* (Dahlbom, 1854), and *Holopyga metallica* (Dahlbom, 1854) (Chrysididae).

**Remark:** The species is confirmed in MSNR.

**Subfamily Bembicinae**

**Tribe Alysontini**

*Didineis lunicornis* (Fabricius, 1798) (= *Didineis kozhevnikovi* Kokujev, 1906)

**Literature:** Mokrousov et al. 2013.

**General distribution:** Russia (centre, south, and east of the European part and Urals), Europe, northern Africa, and Abkhazia (Nemkov 2017b).

**Biology:** Nests in dense soil. Prey: Auchenorrhyncha and, probably, Heteroptera.

**Tribe Bembicini**

*Bembix rostrata* (Linnaeus, 1758)

**Literature:** Redikortsev 1938 (as *Bembex rostrata* L.);
Plavilshchikov 1964 (as *Bembex rostrata* L.); Mokrousov et al. 2013; Ruchin & Antropov 2014.


**General distribution**: Russia (the European part from the northwest till Crimea and northern Caucasus, Urals, and Siberia), Europe, Turkey, Azerbaijan, Kazakhstan, Uzbekistan, Turkmenistan, Tajikistan, Afghanistan, and Mongolia, and northern China (Nemkov 2017b).

**Biology**: Nests in dense (clay or gravel) soil. Prey: nymphs of leafhoppers, mainly *Aphrophora Philaeus* (Aphrophoridae).

*Gorytes laticinctus* (Lepeletier de Saint Fargeau, 1832)

**Literature**: Redikortsev 1938 (as *Gorytes laticinctus* Schr.); Plavilshchikov 1964 (as *Gorytes laticinctus* Shuck.). Mokrousov et al. 2013; Ruchin & Antropov 2014.


**General distribution**: Russia (the European part from the northwest till Crimea and Altaï), Europe, northern Africa, Turkey, Kazakhstan, and Uzbekistan (Nemkov 2017b).


*Gorytes neglectus* Handlirsch, 1895


**General distribution**: Russia (the European part from the northwest to the centre, Siberia, Khabarovsk Krai and Primorsky Krai, and Sakhalin), northeast of Europe, Turkey, Kazakhstan, and Korea (Nemkov 2017b).

*Gorytes pleuripunctatus* (A. Costa, 1859)

**Material**: RM: 1 male, 22.vi.2017, Elniki Distr., Novoyamskaya Sloboda (54°44′24″N & 43°42′59″E).

**General distribution**: Russia (the European part from the centre till Crimea and northern Caucasus and Urals), south of Europe, northern Africa, Israel, Turkey, Georgia, Azerbaijan, Armenia, Kazakhstan, and Syria (Nemkov 2017b).

*Argogorytes fargeii* (Shuckard, 1837)

**Material**: RM: 1 male, 31.v.2014, Elniki Distr., Malye Mordovaevskie Poshaty (54°41′00″N & 43°43′50″E).

**General distribution**: Russia (the European part from the north till Crimea, Urals, and Siberia), Europe, Israel, Turkey, Armenia, Kazakhstan, Mongolia, and northeastern China (Nemkov 2017b).

**Biology**: Nests in dense (clay, gravel, or coarse skeletal) soil. Prey: nymphs of leafhoppers Jassidae.

*Argogorytes mystaceus* (Linnæus, 1761)


**Material**: RM: 1 female, 12.vi.2016, MSNR, quar. 413 (54°45′12″N & 43°16′54″E); 1 female, 12.vi.2016, quar. 430 (54°44′34″N & 43°16′00″E); 1 female, 13.vi.2016, quar. 421 (54°43′52″N, 43°07′06″E); 1 female, 13.vi.2016, quar. 422 (54°43′55″N & 43°07′39″E); 1 female, 13.vii.2017, quar. 347 (54°47′34″N & 43°28′31″E); 1 female, 11.vii.2015, cord. Podrubnyi (54°47′51″N & 43°08′48″E).

**General distribution**: Russia (the European part from the north to the centre and the east, Urals, Altai, Krasnoyarsk Krai, and Irkutsk region), Europe, Turkey, and Kazakhstan (Nemkov 2017b).

**Biology**: Nests in dense (clay or gravel) soil. Prey: nymphs of leafhoppers, mainly *Aphrophora Philaeus* (Aphrophoridae).

*Gorytes pleuripunctatus* (Fabricius, 1804)

**Literature**: Redikortsev 1938; Plavilshchikov 1964; Mokrousov et al. 2013; Ruchin & Antropov 2014.

**Material**: RM: 3 male, 28.vii.2015, MSNR, quar. 82 (54°53′12″N & 43°32′46″E); 1 male, 11.vii.2015, quar. 115 (54°51′46″N & 43°09′26″E); 2 male, 11.vii.2015, quar. 301 (54°47′19″N & 43°10′36″E); 1 male, 5.vi.2015,
Wasp fauna of Mordovia State Nature Reserve and its surroundings

Ruchin & Antropov


Gorytes quinquecinctus (Fabricius, 1793)

**Literature:** Redikortsev 1938 (as Gorytes quadrincinctus F.); Plavilshchikov 1964 (as Gorytes quadrincinctus F.); Mokrousov et al. 2013.

**Material:** RM: 1 male, 28.vii.2015, MSNR, quar. 82 (54°53′12″N & 43°32′46″E); 1 male, 12.vii.2014, quar. 86 (54°53′38″N & 43°35′59″E); 1 male, 11.vii.2015, quar. 115 (54°51′46″N & 43°09′26″E); 1 female, 3 male, 20.vii.2014, quar. 276 (54°47′45″N & 43°10′28″E); 6 male, 20.vii.2014, 11.vii.2015, quar. 301 (54°47′19″N & 43°10′36″E); 1 female, 27.vii.2014, quar. 384 (54°45′33″N & 43°12′44″E); 2 male, 13.vii.2015, quar. 434 (54°45′04″N & 43°19′02″E); 1 male, 19.vii.2016, quar. 330 (54°46′44″N & 43°11′09″E); 2 female, 18.vii.2016, quar. 331 (54°46′43″N & 43°12′37″E); 1 male, 4.vii.2017, quar. 357 (54°46′07″N & 43°10′56″E); 1 male, 8.vii.2014, cord. Inorski (54°44′15″N & 43°08′53″E); 1 female, 15.viii.2014, cord. Taratinski (54°44′43″N & 43°05′14″E); 1 female, 23.vii.2016, Elniki Distr., Novoyamovskaya Sloboda (54°44′24″N & 43°42′59″E); 4 male, 23.vii.2016, 22.vii.2017, Malye Mordovskie Poshaty (54°41′00″N & 43°43′50″E); 2 male, 23.vii.2016, Cherlyaj (54°45′53″N & 43°40′58″E); NNR: 2 male, 4.vii.2017, Voznesenskoe Distr., Zarya (54°50′08″N & 43°07′08″E).

**General distribution:** Russia (the European part from the northwest till Crimea and northern Caucasus, Urals, Siberia, European part, northern Africa, Turkey, Buryatia, and Transbaikalia), south of Europe, Turkey, Kazakhstan, and Turkmenistan (Nemkov 2017b).


Harpactus lunatus (Dahlbom, 1832)

**Literature:** Mokrousov et al. 2013.

**General distribution:** Russia (the European part from the north to the centre and the east, Altai, Krasnoyarsk Krai, Irkutsk region, and Yakutia), Europe, and Kazakhstan (Nemkov 2017b).


Harpactus morawitzi Radoszkowski, 1884

**Literature:** Mokrousov et al. 2013.

**General distribution:** Russia (the European part from the centre to northern Caucasus, Irkutsk region, Buryatia, and Transbaikalia), south of Europe, Turkey, Kazakhstan, and Turkmenistan (Nemkov 2012, 2017b).

**Biology:** Nests in sandy soil, more often along the banks of rivers and streams. Prey: larvae and imagos of leafhoppers and jumping plant lice (Cicadellidae, Psyllidae, Jassidae, and Fulgoridae). Predators: emerald wasps *Spinolia unicolor* (Dahlbom, 1831) (Chrysidae).

* Bembecinus hungaricus (Frivaldsky, 1876)

**Material:** RM: 1 female, 2.vii.2016, Temnikov Distr., Kushki (54°29′49″ N 43°16′11″E); NNR: 1 female, 16.vii.2017, Voznesenskoe Distr., Svobodnyi (54°50′47″N & 43°07′48″E).

**General distribution:** Russia (the European part from the centre till Crimea and northern Caucasus), south of Europe, Turkey, Abkhazia, and Kazakhstan (Nemkov 2012, 2017b).

**Biology:** Nests in sandy soil, more often along the banks of rivers and streams. Prey: larvae and imagos of leafhoppers and jumping plant lice (Cicadellidae, Psyllidae, Jassidae, and Fulgoridae). Predators: emerald wasps *Spinolia unicolor* (Dahlbom, 1831) (Chrysidae).

Bembecinus tridentis (Fabricius, 1781)

**Literature:** Mokrousov et al. 2013; Ruchin & Antropov 2014.

**Material:** RM: 1 male, 2 female, 11.vii.2015, 3.viii.2015, 18.vi.2016, MSNR, quar. 115 (54°51′46″N & 43°09′26″E); 1 female, 11.vii.2015, quar. 142 (54°51′12″N & 43°09′21″E); 1 male, 28.vii.2015, cord. Inorski (54°44′15″N & 43°08′53″E); 1 female, 24.vi.2014, Pushhta (54°42′50″N & 43°13′32″E); 1 female, 1 male, 7.vii.2013, Temnikov Distr., Tarkhany; 2 male, 6.vii.2013, Lavrentovo (54°29′44″N & 43°02′41″E); 1 female, 24.vi.2016, Polyanki (54°44′27″N & 43°29′04″E); 1 male, 2.vii.2016, Kushki (54°29′49″ N 43°16′11″E); 3 female, 19.vii.2015, 22.vii.2017, Elniki Distr., Malye Mordovskie Poshaty (54°41′00″N & 43°43′50″E); 1 male, 22.vii.2017, Novye Shaly (54°42′13″N & 43°38′25″E).

**General distribution:** Russia (the European part from...

**Stizus perriisi** Dufour, 1838


*General distribution:* Russia (the European part from the northwest till Crimea and northern Caucasus, Urals, Altaï, Transbaikalia, and Primorsky Krai), Europe, Turkey, Armenia, Kazakhstan, Uzbekistan, Kyrgyzstan, northern China, Korea, and Japan (Honshu) (Nemkov 2017b).

*Biology:* Nests in dense clay or sandy soil. Prey: nymphs and imagos of grasshoppers (Tettigoniidae) and locusts (Acrididae).

**Remark:** Confirmation of the species in Mordovia requires more material.

*Brachystegus scalaris* (Illiger, 1807)


*General distribution:* Russia (the European part from the centre till Crimea and northern Caucasus, Altai), south of Europe, northern Africa, Yemen, Turkey, Georgia, Kazakhstan, Uzbekistan, Kyrgyzstan, Tajikistan, and Iran (Nemkov 2017b).

*Biology:* Brood parasite of digger wasps *Tachytes panzeri* (Dufour, 1841) (Crabronidae).

*Nysson dimidiatus* Jurine, 1807


*General distribution:* Russia (from the northwest to northern Caucasus, Altai, Irkutsk region, Transbaikalia, Amur and Magadan regions, and Sakhalin), Europe, Armenia, Kazakhstan, central Asia, and Mongolia (Nemkov 2017b).

*Biology:* Brood parasite of *Harpactus* and *Bembecinus* (Crabronidae) (Olberg 1959).

*Nysson fulvipes* A. Costa, 1859


*General distribution:* Russia (the European part from the centre to northern Caucasus), south of Europe, northern Africa, Israel, Turkey, Abkhazia, and Kazakhstan (Nemkov 2017b).

*Biology:* Brood parasite of *Gorytes, Harpactus,* and *Argogorytes* (Crabronidae) [Blösch 2000].

*Nysson maculosus* (Gmelin, 1790)

*Literature:* Redikorskev 1938 (as *Nysson maculatus* E.); Plavilshchikov 1964 (as *Nysson maculatus* F.); Mokrousov et al. 2013; Ruchin & Antropov 2016.

*General distribution:* Russia (the European part from the northwest till Crimea, Urals, Siberia, Amur region, Khabarovsk Krai and Primorsky Krai, and Sakhalin), Europe, northern Africa, Turkey, Georgia, Armenia, Kazakhstan, Uzbekistan, Tajikistan, Mongolia, northern China, and Korea (Nemkov 2017b).

*Biology:* Brood parasite of digger wasps *Gorytes quadrifasciatus* (Fabricius, 1804), *Harpactus lunatus* (Dahlbom, 1832), *H. tumidus* (Panzer, 1801), and *Lestiphorus bicinctus* (Rossi, 1794).

*Nysson spinosus* (J. Forster, 1771)


*Material:* RM: 1 male, 21.vi.2015, MSNR, quar. 360 (54°46′13″ N & 43°13′31″ E); 1 female, 2 male, 29.v.2015, 13.vi.2016, quar. 421 (54°43′52″ N, 43°07′06″ E); 1 male, 26.v.2015, quar. 447 (54°43′14″ N & 43°13′39″ E); 2 male, 5.vi.2015, quar. 448 (54°42′37″ N & 43°12′29″ E); 1 female, 13.vi.2016, quar. 422 (54°43′55″ N & 43°07′39″ E); 2 male, 1 female, 13.vi.2016, quar. 435 (54°43′41″ N & 43°07′59″ E); 1 male, 10.vi.2016, quar. 440 (54°43′56″ N & 43°13′15″ E); 1 male, 12.vi.2016, quar. 413 (54°45′12″ N & 43°16′54″ E); 1 male, 14.vi.2016, quar. 384 (54°45′33″ N & 43°12′44″ E); 1 female, 15.vii.2017, quar. 324 (54°46′28″ N & 43°05′40″ E); 1 female, 8.vi.2014, cord. Inosker (54°44′15″ N & 43°08′53″ E).

*General distribution:* Russia (the European part from the northwest to northern Caucasus, Siberia, Amur region, Khabarovsk Krai and Primorsky Krai, Sakhalin, and Kuril Islands), Europe, Turkey, Azerbaijan, Kazakhstan, Iran, and Japan (Honshu) (Nemkov 2017b).

*Biology:* Brood parasite of digger wasps *Argogorytes fargeii* (Shuckard, 1837), *A. mystaceus* (Linnaeus, 1761), *Gorytes laticinctus* (Lepeletier de Saint Fargeau, 1832), and *G. quadrifasciatus* (Fabricius, 1804).

*Subfamily Crabroninae*

*Tribe Crabronini*

*Entomognathus brevis* (Vander Linden, 1829)


*General distribution:* Russia (the European part...
from the northwest till Crimea and northern Caucasus, Urals, Altai, Irkutsk region, Yakutia, Amur region, and Khabarovsk Krai and Primorsky Krai), Europe, northern Africa, Israel, Turkey, Georgia, Kazakhstan, Uzbekistan, Turkmenistan, Tajikistan, Syria, Iran, Mongolia, northern China, and Japan (Hokkaido and Honshu) (Antropov 2017b).

**Biology:** Nests in the soil. Prey: leaf beetles of the genus *Chaetocnema*, less often *Crepidotera*, *Cryptocephalus*, *Longitarsus*, and *Aphthoma* (Chrysomelidae).

**Crabro cribriarius** (Linnaeus, 1758)

**Literature:** Redikortsev 1938; Plavilshchikov 1964; Mokrousov et al. 2013.

**Material:** RM: 1 male, 11.vii.2015, MSNR, quar. 301 (54°47′19″N & 43°10′36″E); 1 male, 21.vi.2015, quar. 384 (54°45′33″N & 43°12′44″E); 1 female, 18.vii.2016, quar. 331 (54°46′43″N & 43°12′37″E); 2 male, 19.vi.2016, quar. 330 (54°46′44″N & 43°11′09″E); 1 female, 24.vii.2016, quar. 398 (54°46′22″N & 43°25′48″E); 2 male, 4.vii.2017, quar. 357 (54°46′07″N & 43°10′56″E); 1 female, 11.vii.2015, cord. Podrubnyi (54°47′51″N & 43°08′48″E); 1 female, 23.vii.2016, Elniki Distr., Novoyamskaya Sloboda (54°44′24″N & 43°42′59″E); 1 male, 23.vii.2016, Cherlyaj (54°45′53″N & 43°40′58″E).

**General distribution:** Russia (the European part from the northwest till Crimea and northern Caucasus, Urals, Siberia, Amur region, Khabarovsk Krai and Primorsky Krai, and Sakhalin), Europe, Kazakhstan, Mongolia, and Korea (Antropov 2017b).

**Biology:** Nests in the soil. Prey: various flies. Predators: emerald wasps *Pseudomallus auratus* (Linnaeus, 1758) and *Trichrysis cyanea* (Linnaeus, 1758) (Chrysidae) and velvet ants *Myrmosa atrorufa* Panzer, 1801 and *Paramyrmmosa brunnipes* (Lepeletier, 1845) (Mutilidae).

**Crabro scutellatus** (von Scheven, 1781)

**Literature:** Plavilshchikov 1964; Mokrousov et al. 2013.

**Material:** RM: 1 female, 21.vi.2015, MSNR, quar. 408 (54°44′57″N & 43°11′47″E); 1 female, 19.vi.2016, quar. 401 (54°44′30″N & 43°05′15″E); 1 male, 28.vi.2015, cord. Inorski (54°44′15″N & 43°08′33″E); NNR: 2 female, 16.vii.2016, Voznesenskoe Distr. Svobody (54°50′47″N & 43°07′48″E).

**General distribution:** Russia (the European part from the northwest till Crimea and northern Caucasus, Urals, Siberia, Amur region, Khabarovsk Krai and Primorsky Krai, and Sakhalin), Europe, Kazakhstan, Mongolia, and eastern China (Antropov 2017b).


**Crossocerus annulipes** (Lepeletier et Brullé, 1835)

**Literature:** Mokrousov et al. 2013.

**General distribution:** Russia (the European part from the northwest till Crimea and northern Caucasus, Urals, Altai, Irkutsk region, Amur region, and Primorsky Krai), Europe, northern Africa, Israel, Turkey, Abkhazia, Kazakhstan, Uzbekistan, Kyrgyzstan, Mongolia, and North America (Antropov 2017b).

**Biology:** Nests in abandoned tunnels of xylophagous insects in wood or in hollow stems. Prey: dipterans.

**Crossocerus assimilis** (F. Smith, 1856)

**Literature:** Mokrousov et al. 2013.

**General distribution:** Russia (the European part from the centre to the northern Caucasus, Urals, Altai, Irkutsk region, Transbaikalia, Amur region, Khabarovsk Krai and Primorsky Krai, Sakhalin, and Kuril Islands), Europe, Turkey, Kazakhstan, Mongolia, Korea, and Japan (Honshu) (Antropov 2017b).

**Biology:** Forest species. Nests in the wood of deciduous tree species. Prey: small flies of the genus...
**Phora** (Phoridae).

**Crossocerus barbipes** (Dahlbom, 1845)

**Literature:** Mokrousov et al. 2013.

**General distribution:** Russia (the European part from the northwest to the centre and the east, Urals, Siberia, Khabarovsk Krai and Primorsky Krai, Sakhalin, and Kuril Islands), Japan, Turkey, Kazakhstan, Mongolia, southwestern China, Korea, Japan (Hokkaido, Honshu, Yakushima, and Ryukyu), and North America (Antropov 2017b).

**Biology:** Nests in wood. Prey: leafhoppers *Empoasca* and *Typhlocyba* (Cicadellidae).

**Crossocerus cetratus** (Shuckard, 1837)

**Literature:** Mokrousov et al. 2013.

**Material:** RM: 1 female, 24.vi.2016, MSNR, quar. 399 (54°00'46"N & 43°27'27"E).

**General distribution:** Russia (the European part from the northwest till Crimea and northern Caucasus, Urals, Altai, Irkutsk region, Primorsky Krai, Sakhalin, and Kuril Islands), Europe, Turkey, Kazakhstan, Mongolia, southwestern China, Korea, and Japan (Hokkaido and Honshu) (Antropov 2017b).

**Biology:** Forest species. Nests in abandoned tunnels of xylophagous insects in wood and in branches of plants with a soft core. Prey: small dipterans (Bibionidae, Ceratopogonidae, Chironomidae, Empididae, Micetophilidae, and Stratiomyiidae).

**Crossocerus elongatulus** (Vander Linden, 1829)

**Literature:** Mokrousov et al. 2013.

**General distribution:** Russia (the European part from the northwest till Crimea and northern Caucasus, Urals, Altai, Krasnoyarsk Krai, Irkutsk region, Primorsky Krai, Sakhalin, and Kuril Islands), Asia, Europe, northern Africa, Turkey, Kazakhstan, Mongolia, northeastern China, and Korea (Hokkaido) (Antropov 2017b).


**Remark:** Confirmation of the species in Mordovia requires more material.

**Crossocerus megacephalus** (Rossi, 1790)

**Literature:** Mokrousov et al. 2009.

**General distribution:** Russia (the European part from the northwest till Crimea and northern Caucasus, Urals, Tomsk region, Altai, Irkutsk and Amur regions, and Primorsky Krai), Europe, northern Africa, Turkey, Kazakhstan, Tajikistan, Iran, India, Mongolia, northwestern China, and Japan (Hokkaido) (Antropov 2017b).

**Biology:** Nests in abandoned tunnels of xylophagous insects in dry wood. Prey: small dipterans. Predators: ichneumons *Tryphon signator* Gravenhorst 1829 (Ichneumonidae) and parasitic flies (Tachinidae).

**Remark:** Confirmation of the species in Mordovia requires more material.

**Crossocerus ovalis** Lepeletier de Saint Fargeau et Brullé, 1835

**Literature:** Feoktistov 2011.

**General distribution:** Russia (the European part from the northwest to the centre and the east, Urals, Altai, Krasnoyarsk Krai, Irkutsk region, Primorsky Krai, Sakhalin, and Kuril Islands), Asia, Europe, northern Africa, Kazakhstan, Turkmenistan, Mongolia, northeastern China, and Korea (Antropov 2017b).

**Biology:** Nests in loose soil. Prey: various aphids (Aphidae).

**Remark:** Confirmation of the species in Mordovia requires more material.
Crossocerus podagricus (Vander Linden, 1829)

**Literature:** Ruchin & Antropov 2014.

**Material:** RM: 1 female, 5.vii.2015, MSNR, quar. 413 (54°45′12″N & 43°16′54″E); 1 female, 5.vii.2015, MSNR, quar. 413 (54°45′12″N & 43°16′54″E).

**General distribution:** Russia (the European part from the northwest till Crimea and northern Caucasus, Urals, Tomsk region, Altai, Krasnoyarsk Krai, Irkutsk region, Transbaikalia, Amur region, Khabarovsk Krai and Primorsky Krai, and Sakhalin), Europe, northern Africa, Turkey, Kazakhstan, Uzbekistan, India, Mongolia, China, Korea, and Japan (Hokkaido, Honshu, Shikoku, and Kyushu) (Antropov 2017b).

**Biology:** Nests are linear or include several branches in abandoned tunnels of xylophagous insects in wood or in hollow stems. Prey: dipterans (Chironomidae, Culicidae, Dolichopodidae, Ephydridae, Helomyzidae, Lauxaniidae, Muscidae, Rhagionidae, and Syrphidae (Sphaerophoria scripta (Linnaeus, 1758)), sometimes small lepidopterans (Lepidoptera) and caddisflies (Trichoptera).

* Crossocerus vagabundus (Panzer, 1798)

**Material:** RM: 1 female, 15.vi.2016, MSNR, quar. 429 (54°44′31″N & 43°14′59″E).

**General distribution:** Russia (the European part from the northwest till Crimea and northern Caucasus, Urals, Tomsk region, Altai, Krasnoyarsk Krai, Irkutsk region, Transbaikalia, Amur region, Kamchatka, Khabarovsk Krai and Primorsky Krai, and Sakhalin), Europe, northern Africa, Turkey, Kazakhstan, Uzbekistan, India, Mongolia, China, Korea, and Japan (Hokkaido, Honshu, Shikoku, and Kyushu) (Antropov 2017b).

**Biology:** Nests are linear or include several branches in abandoned tunnels of xylophagous insects in wood or in hollow stems. Prey: dipterans (Chironomidae, Culicidae, Dolichopodidae, Ephydridae, Helomyzidae, Lauxaniidae, Muscidae, Rhagionidae, and Syrphidae (Sphaerophoria scripta (Linnaeus, 1758)), sometimes small lepidopterans (Lepidoptera) and caddisflies (Trichoptera).

* Crossocerus wesmaeli (Vander Linden, 1829)

**Material:** RM: MSNR, quar. 401 (54°44′30″N & 43°05′15″E), 19.vi.2016, 1 female.

**General distribution:** Russia (the European part from the northwest to northern Caucasus, Urals, Tomsk region, Altai, Irkutsk region, Amur region, Kamchatka, Primorie Territory, Sakhalin, and Kuril Islands), Europe, northern Africa, Turkey, Kazakhstan, Uzbekistan, and Tajikistan (Antropov 2017b).

**Biology:** Nests are linear or include several branches in abandoned tunnels of other insects. Prey: various small dipterans (Agromyzidae, Ceratopogonidae, Chironomidae, Chloropidae, Dolichopodidae, Empididae, Ephydridae, Lauxaniidae, Lonchaeidae, Muscidae, Simuliidae (Simulium equinum (Linnaeus, 1758)), Tephritidae, and Tipulidae), as an expection leafroller moths (Tortricidae) and even worker ants Myrmica rubra (Linnaeus 1758) (Formicidae).

**Ectemnius borealis** (Zetterstedt, 1838)

**Literature:** Mokrousov et al. 2013; Ruchin & Antropov 2014.


**Biology:** Nests are linear or include several branches in abandoned tunnels of other insects. Prey: various small dipterans (Agromyzidae, Ceratopogonidae, Chironomidae, Chloropidae, Dolichopodidae, Empididae, Ephydridae, Lauxaniidae, Lonchaeidae, Muscidae, Simuliidae (Simulium equinum (Linnaeus, 1758)), Tephritidae, and Tipulidae), as an expection leafroller moths (Tortricidae) and even worker ants Myrmica rubra (Linnaeus 1758) (Formicidae).
Wasp fauna of Mordovia State Nature Reserve and its surroundings

Ruchin & Antropov

Ectemnius cephalotes (Olivier, 1792)


**Material:** RM: 1 female, 4.vii.2015, MSNR, quar. 288 (54°48′27″N & 43°22′03″E); 1 female, 7.ix.2014, quar. 420 (54°45′29″N & 43°24′19″E); 1 female, 24.viii.2017, quar. 368 (54°46′37″N & 43°21′45″E); 2 female, 5.vii.2014, 16.vii.2015, Pushta (54°42′50″N & 43°13′32″E).

**General distribution:** Russia (the European part from the northwest till Crimea and northern Caucasus, Urals, Altai, and Primorsky Krai), Europe, northern Africa, Turkey, Syria, Kazakhstan, and North America (Antropov 2017b).

**Biology:** Gnaws nests in rotten wood. They often settle in groups in which different females can use a common entrance. Prey: various flies (Calliphoridae, Muscidae, Syrphidae, Tabanidae) (Giovanni et al. 2017).

Ectemnius continuus (Fabricius, 1804)

**Literature:** Redikortsev 1938 (as *Crabro vagus* L.); Plavilshchikov 1964 (as *Crabro vagus* L.); Ruchin et al. 2009; Mokrousov et al. 2013; Ruchin & Antropov 2014.

**Material:** RM: 1 female, 1 male, 28.vii.2015, MSNR, quar. 79 (54°53′11″N & 43°29′18″E); 2 female, 13.viii.2015, quar. 249 (54°49′39″N & 43°32′08″E); 1 female, 1.vii.2016, quar. 379 (54°45′17″N & 43°07′51″E); 1 male, 15.vii.2017, quar. 324 (54°46′28″N & 43°05′40″E); 1 female, 6.vii.2017, quar. 397 (54°46′17″N & 43°25′44″E); 1 female, 13.viii.2016, quar. 446 (54°43′13″N & 43°13′23″E); 1 female, 17.vii.2014, cord. Poyanski (54°46′36″N & 43°28′47″E); 1 male, 12.ix.2017, cord. Plotomoka (54°53′36″N & 43°09′41″E); 1 female, 10.viii.2014, Temnikov Distr., Tretyakovo (54°31′44″N & 43°13′18″E); 1 female, 24.vi.2016, Polyanki (54°44′27″N & 43°29′04″E); 1 male, 23.vii.2016, Elniki Distr., Cherlyaj (54°45′53″N & 43°40′58″E); NNR: 1 female, 1.viii.2017, Pervomaisk Distr., 6km southwest of Lesozavod (54°54′32″N & 43°38′11″E).

**General distribution:** Russia (the European part from the northwest till Crimea and northern Caucasus, Urals, Siberia, Amur region, Kamchatka, Khabarovsk Krai and Primorsky Krai, Sakhalin, and Kuril Islands), Europe, northern Africa, Israel, Jordan, Turkey, Georgia, Azerbaijan, Syria, Kazakhstan, central Asia, Iraq, Iran, Mongolia, southwestern and northern China, Korea, and Japan (Hokkaido, Honshu, Shikoku, and Kyushu).

As a result of accidental importation, the species acclimatized in North America, Cuba, Guatemala, and...
Venezuela (Antropov 2017b).

**Biology:** The species gnaws nests in rotten wood or in dry branches with a soft core. Prey: various flies (Anthomyiidae, Calliphoridae, Muscidae, Rhagionidae, Sciomyzidae, Stratiomyidae, Sypriidae, Tabanidae, Tachinidae, and Therevidae) (Giovanni et al. 2017). Predators: ichneumons Caenocryptus inflatus (Thomson, 1884) and Hoplocryptus confector (Gravenhorst, 1829) (Ichneumonidae) and parasitic flies Macronychia aurata (Coquillett, 1902) (Sarcophagidae).

**Ectemnius dives** (Lepeletier de Saint Fargeau & Brullé, 1835)

**Literature:** Plavilshchikov 1964 (as Crabro dives Lep.); Mokrousov et al. 2013.

**Material:** RM: 1 male, 12.vi.2013, MSNR, cord. Podrubnyi (54°47’51”N & 43°08’48”E).

**General distribution:** Russia (the European part from the northwest till Crimea and northern Caucasus, Urals, Siberia, Amur region, Khabarovsk Krai and Primorsky Krai, Sakhalin, and Kuril Islands), Europe, northern Africa, Israel, Turkey, Georgia, Kazakhstan, southwestern China, Korea, Japan (Hokkaido and Honshu), and North America (Antropov 2017b).

**Biology:** The species gnaws nests in rotten wood. Prey: various flies (Syrphidae and Tachinidae). Predators: emerald wasps Chrysis grohmanni Dahlbom, 1854 (Chrysidae) and ichneumons Perithous mediator (Fabricius, 1804) (Ichneumonidae).

**Remark:** The species is confirmed in MSNR.

**Ectemnius fassorius** (Linnaeus, 1758)

**Literature:** Mokrousov et al. 2013; Ruchin & Antropov 2014.

**Material:** RM: 1 female, 28.vii.2015, MSNR, quar. 82 (54°53’12”N & 43°32’46”E); 1 female, 28.vii.2015, quar. 82 (54°53’12”N & 43°32’46”E); 1 female, 9.viii.2014, quar. 389 (54°45’50”N & 43°17’50”E); 1 female, 1 male, 17.vi.2014, quar. 408 (54°44’57”N & 43°11’47”E); 2 male, 18.vii.2016, quar. 383 (54°45’36”N & 43°11’48”E); 2 female, 15.viii.2014, 16.viii.2014, cord. Taratinski (54°44’43”N & 43°05’14”E); 1 male, 11.vii.2015, cord. Podrubnyi (54°47’51”N & 43°08’48”E); 1 female, 7.vii.2016, quar. 387 (54°45’43”N & 43°15’46”E); 1 female, 7.vii.2015, quar. 399; 1 male, 21.v.2015, quar. 408 (54°44’57”N & 43°11’47”E); 1 female, 5.vi.2015, quar. 448 (54°42’37”N & 43°12’29”E); 1 male, 11.vii.2015, quar. 142 (54°51’12”N & 43°09’21”E); 1 male, 21.vi.2015, quar. 384 (54°45’33”N & 43°12’44”E); 2 female, 23.viii.2015, quar. 387 (54°45’43”N & 43°15’46”E); 1 female, 7.vii.2015, quar. 399; 1 male, 21.v.2015, quar. 408 (54°44’57”N & 43°11’47”E); 1 female, 5.vi.2015, quar. 448 (54°42’37”N & 43°12’29”E); 1 male, 11.vii.2015, quar. 142 (54°51’12”N & 43°09’21”E); 2 male, 2 female, 25.v.2014, 19.vii.2016, cord. Podrubnyi (54°47’51”N & 43°08’48”E); 1 female, 6.vii.2013, Temnikov Distr., Lavrentevo (54°29’44”N & 43°02’41”E); 1 female, 19.vii.2015, Elniki Distr., Malye Mordovskie Poshaty (54°41’00”N & 43°43’50”E).

**General distribution:** Russia (the European part from the northwest till Crimea and northern Caucasus, Urals, Siberia, Amur region, Khabarovsk Krai and Primorsky Krai, Sakhalin, and Kuril Islands), Europe, Turkey, Kazakhstan, Kyrgyzstan, Iran, Mongolia, northeastern China, Korea, Japan (Hokkaido and Honshu), Africa, and North America (Antropov 2017b).

**Biology:** Gnaws nests in rotten wood. Prey: various dipterans (Calliphoridae, Empididae, Muscidae,
Wasp fauna of Mordovia State Nature Reserve and its surroundings

Ruchin & Antropov

Stratiomyidae, Sphaerophoria scripta (Linnaeus, 1758) (Syrrphidae), and Therevidae. Predators: chalcid wasps Pteromalus and Habritys brevicornis (Ratzeburg, 1844) [Pteromalidae], ichneumons Perithorus mediator (Fabricius, 1804) (Ichneumonidae), and parasitic flies Eustalomyia hilaris (Fallen, 1823) (Anthomyiidae).

**Ectemnius lituratus** (Panzer, 1805)

**Literature:** Plavilshchikov 1964 (Crabro lituratus Panz.); Mokrousov et al. 2013.

**Material:** RM: 1 female, 1 male, 13.vi.2015, MSNR, quar. 434 (54°45′04″N & 43°19′02″E); 1 female, 2 male, 15.viii.2014, cord. Taratinski (54°44′43″N & 43°05′14″E); 1 male, 11.vii.2015, cord. Podrubny (54°47′51″N & 43°08′48″E).

**General distribution:** Russia (the European part from the centre till Crimea and northern Caucasus and Urals), Europe, northern Africa, Turkey, Kazakhstan, and Iran (Antropov 2017b).

**Biology:** The species gnaws nests in rotten wood. Prey: dipterans (Anthomyiidae and Sarcophagidae) (Giovanni et al. 2017).

**Ectemnius nigritarsus** (Herrich-Schäffer, 1841)

**Literature:** Mokrousov et al. 2013.

**General distribution:** Russia (the European part from the centre till Crimea, Urals, Kemerovo region, Altai, Amur region, and Primorsky Krai), Europe, Georgia, Turkey, India, Sri Lanka, Korea, Japan (Hokkaido and Honshu), southeastern Asia, and Australia (Antropov 2017b).

**Biology:** Gnaws nests in rotten wood. Prey: various dipterans (Anthomyiidae, Muscidae, Syrphidae, Tachinidae, and Therevidae).

**Ectemnius rubicola** (Dufour et Perris, 1840)

**Literature:** Redikortsev 1938 (as Crabro larvatus Wesm.); Plavilshchikov 1964 (as Crabro larvatus Venn.); Ruchin & Antropov 2016.

**Material:** RM: 1 female, 12.vi.2016, MSNR, quar. 430 (54°44′34″N & 43°16′00″E).

**General distribution:** Russia (the European part from the northwest till Crimea and northern Caucasus, Urals, Altai, Kemerovo, Irkutsk and Amur regions, Primorsky Krai, Sakhalin, and Kuril Islands), Europe, Turkey, Kazakhstan, Iran, and Japan (Hokkaido, Honshu, Shikoku, and Kyushu) (Antropov 2017b).

**Biology:** The species gnaws nests in shoots with soft core of both dry and live plants, hollow stems of herbaceous plants, or rotten wood. Prey: various dipterans (Ogcodes gibbosus (Linnaeus, 1758) (Acroceridae), Anthomyiidae, Cyrtidae. Dolichopodidae, Muscidae, Stratiomyidae, Syrphidae, Tachinidae, and Trypetidae) and sometimes mayflies (Ephemeroptera).

Predators: emerald wasps Trichyris cyanea (Linnaeus, 1758) (Chrysididae), velvet ants Cystomutila ruficeps (Smith, 1855) and Myrmosa brunnipes (Lepeletier de Saint Fargeau, 1845) (Mutillidae), chalcid wasps Torymus cupreus (Spinola 1808) (Torymidae) and Eurytoma nodularis Boheman, 1836 (Eurytomidae), as well as ichneumons Endasys sugiharai (Uchida, 1936), Hoplocryptus, Kaltenbachia, and Scambus (Ichneumonidae).

**Remark:** The species is confirmed in MSNR.

**Ectemnius ruficornis** (Zetterstedt, 1838)

**Literature:** Redikortsev 1938 (as Crabro plumifrons Thom.); Mokrousov et al. 2013.

**Material:** RM: 1 female, 5.vi.2015, MSNR, quar. 434 (54°45′04″N & 43°19′02″E); 1 male, 21.vi.2015, quar. 360 (54°46′13″N & 43°13′31″E); 1 male, 5.vi.2015, quar. 448 (54°42′37″N & 43°12′29″E); 1 male, 18.vii.2016, quar. 383 (54°45′36″N & 43°11′48″E); 1 male, 11.vi.2016, quar. 389 (54°45′50″N & 43°17′50″E); 1 male, 15.vi.2016, quar. 429 (54°44′31″N & 43°14′59″E); 1 female, 2 male, 11.vii.2015, 19.vii.2016, cord. Podrubny (54°47′51″N & 43°08′48″E).

**General distribution:** Russia (the European part from the northwest till Crimea and northern Caucasus, Urals, Siberia, Amur region, Kamchatka, Khabarovsk Krai and Primorsky Krai, Sakhalin, and Kuril Islands), Europe, Turkey, Kazakhstan, Mongolia, Korea, Japan (Hokkaido, Honshu, and Ryukyu), southeastern Asia, and North America (Antropov 2017b).

**Biology:** Nests in rotten wood. Prey: various dipterans (Anthomyiidae, Dolichopodidae, Muscidae, and Syrphidae (Episyphrus balteatus (De Geer, 1776) and Syrphus torus Osten Sacken, 1875))). Predators: emerald wasps Pseudomalus auratus (Linnaeus, 1758) (Chrysididae) and ichneumons Perithous scurrus japonicus Uchida, 1928 (Ichneumonidae).

**Remark:** The species is confirmed in MSNR.

**Ectemnius spinipes** (A. Morawitz, 1866)

**Literature:** Ruchin et al. 2009; Mokrousov et al. 2013; Ruchin & Antropov 2014.

**Material:** RM: 1 male, 13.vi.2016, MSNR, quar. 421 (54°43′52″N, 43°07′06″E); 1 male, 18.vii.2016, quar. 383 (54°45′36″N & 43°11′48″E); 2 male, 13.vi.2016, cord. Inorski (54°44′15″N & 43°08′53″E).

**General distribution:** Russia (the European part from the centre till Crimea and northern Caucasus, Urals,
Siberia, Amur region, Khabarovsk Krai and Primorsky Krai, and Sakhalin), Europe, Turkey, Azerbaijan, Kazakhstan, Turkmenistan, Mongolia, northeastern China, Korea, and Japan (Hokkaido and Honshu) (Antropov 2017b).


**Lestica alata (Panzer, 1797)**

**Material:** RM: 1 female, 15.viii.2015, Temnikov Distr., Purdoshki (54°40′04″N & 43°32′33″E).

**General distribution:** Russia (the European part from the northwest till Crimea and northern Caucasus, Urals, Siberia, Amur region, and Khabarovsk Krai and Primorsky Krai), Europe, northern Africa, Turkey, Kazakhstan, Kyrgyzstan, Mongolia, north of India, northern China, Korea, and Japan (Hokkaido and Honshu) (Antropov 2017b).

**Biography:** Nests in the soil. Prey: various small lepidopterans (Agriphila geniculea (Haworth, 1811), Agriphila tristellus (Denis et Schiffermüller, 1775), Chrysochthia culmella Linnaeus, 1758), Crambus pascuellus Linnaeus, 1758 (Crambidae), Geometridae, Noctuidae, Pyralidae, and Tortricidae.

**Lestica camelus (Eversmann, 1849)**

**Literature:** Mokrousov et al. 2013.

**Material:** RM: 1 female, 13.viii.2015, MSNR, quar. 400 (54°47′18″N & 43°29′06″E); 1 female, 9.viii.2014, quar. 413 (54°45′12″N & 43°16′54″E); 1 female, 18.vii.2016, quar. 383 (54°45′36″N & 43°11′48″E); 1 male, 1.vii.2016, quar. 406 (54°45′07″N & 43°09′54″E); 2 female, 1.viii.2017, quar. 111 (54°52′59″N & 43°33′01″E); 1 male, 2.vii.2016, cord. Inorski, Malye Mordovskie Poshaty (54°44′15″N & 43°08′53″E); 1 female, 22.vii.2015, Elniki Distr., Malye Mordovskie Poshaty (54°41′00″N & 43°43′50″E); NNR: 1 male, 1.vii.2017, 6km southwest of Lesozavod (54°54′32″N & 43°38′11″E).

**General distribution:** Russia (the centre and the east of the European part, Urals, Siberia, and Primorsky Krai), Turkey, Kazakhstan, Mongolia, southwestern and northeastern China, Korea, and Japan (Hokkaido and Honshu) (Antropov 2017b).

**Biography:** Nests in the abandoned tunnels of xylophagous insects in dry wood. Prey: various leafroller moths (Tortricidae).

**Lestica clypeata (Schreber, 1759)**

**Literature:** Mokrousov et al. 2013; Ruchin & Antropov 2014.

**Material:** RM: 1 female, 28.vii.2015, MSNR, quar. 79 (54°53′11″N & 43°29′18″E); 3 female, 28.vii.2015, quar. 82 (54°53′12″N & 43°32′46″E); 8 female, 1 male, 11.vii.2015, 18.vi.2016, 12.ix.2017, quar. 115 (54°51′46″N & 43°09′26″E); 1 female, 13.viii.2015, quar. 249 (54°49′39″N & 43°32′08″E); 3 female, 13.viii.2015, quar. 274; 6 female, 20.vii.2014, 11.vii.2015, quar. 301 (54°47′19″N & 43°10′36″E); 1 female, 4.vii.2015, quar. 368 (54°46′37″N & 43°21′45″E); 1 female, 23.viii.2015, quar. 387 (54°45′43″N & 43°15′46″E); 1 female, 9.vii.2014, quar. 389 (54°45′50″N & 43°17′50″E); 1 female, 9.viii.2014, quar. 413 (54°45′12″N & 43°16′54″E); 2 female, 1 male, 20.vii.2014, 4.vii.2017, quar. 276 (54°47′45″N & 43°10′28″E); 1 male, 27.vii.2014, quar. 360 (54°46′13″N & 43°13′31″E); 3 male, 27.vii.2014, 21.vi.2015, 14.vi.2016, quar. 384 (54°45′33″N & 43°12′44″E); 2 male, 17.vi.2014, 11.vii.2017, quar. 408 (54°44′57″N & 43°11′47″E); 1 male, 13.vii.2015, quar. 434 (54°45′04″N & 43°19′02″E); 1 male, 5.vii.2015, quar. 405; 1 male, 16.vii.2015, quar. 442 (54°43′56″N & 43°15′02″E); 1 male, 23.vi.2013, quar. 431 (54°44′31″N & 43°17′14″E); 1 female, 1 male, 15.vi.2016, quar. 429 (54°44′31″N & 43°14′59″E); 2 male, 18.vi.2016, quar. 61; 1 female, 1 male, 1.vii.2016, quar. 329 (54°46′36″N & 43°10′39″E); 1 male, 7.vii.2016, quar. 361; 3 male, 1.vii.2016, quar. 379 (54°45′17″N & 43°07′51″E); 1 female, 18.vii.2016, quar. 331 (54°46′43″N & 43°12′37″E); 5 female, 3 male, 18.vii.2016, quar. 358 (54°46′05″N & 43°11′44″E); 2 female, 2 male, 18.vii.2016, quar. 383 (54°45′36″N & 43°11′48″E); 1 female, 2 male, 4.vii.2017, quar. 357 (54°46′07″N & 43°10′56″E); 2 male, 13.vii.2017, quar. 319 (54°48′09″N & 43°28′25″E); 1 female, 1 male, 18.vii.2017, quar. 380 (54°45′06″N & 43°08′34″E); 1 female, 1.vii.2017, quar. 111; 3 male, 9.vi.2013, 11.vii.2015, 4.vi.2017, cord. Podrubnyi (54°47′51″N & 43°08′48″E); 2 male, 28.vi.2015, 17.vii.2013, cord. Inorski (54°44′15″N & 43°08′53″E).

**General distribution:** Russia (the European part from the northwest till Crimea and northern Caucasus, Urals, Siberia, and Primorsky Krai), Europe, northern Africa, Israel, Lebanon, Turkey, Georgia, Kazakhstan, Uzbekistan, Kirghizia, Turkmenistan, Syria, Iraq, and Iran (Antropov 2017b).

**Biography:** Nests in the abandoned tunnels of xylophagous insects. Prey: various lepidopterans (Crambidae, Noctuidae, Sesiididae, and Streblidae) and sometimes dipterans (Empididae, Muscidae, and Syrphidae). Predators: emerald wasps Chrysis fasciata Olivier, 1790 (Chrysididae) and digger wasps Palarus.
variegatus (Fabricius, 1781) (Crabronidae).

** ** *Lessica subtetranea* (Fabricius, 1775)

*Material*: RM: 1 male, 18.vi.2016, MSNR, quar. 197 (54°50′05″N & 43°09′09″E).

*General distribution*: Russia (the European part from the northwest till Crimea and northern Caucasus, Urals, and Altai), Europe, northern Africa, Turkey, Kazakhstan, Kyrgyzstan, Tajikistan, Iran, and northern China (Antropov 2017b).


*Lindenius albilabris* (Fabricius, 1793)


*Biology*: Nests in dense gravel or sandy soil. Prey: heteropterans *Miris* (Miridae) or small dipterans (Chloropidae, Dolichopodidae, and Muscidae). Predators: emerald wasps *Hedychridium coriaceum* (Dahlbom, 1854) (Chrysididae) and velvet ants *Myrmosa atrata* Panzer, 1801 (Mutillidae).

*Lindenius panzeri* (Vander Linden, 1829)


*General distribution*: Russia (the European part from the centre to northern Caucasus, Urals, Siberia, Amur region, and Khabarovsk Krai and Primorsky Krai), Europe, northern Africa, Turkey, Kazakhstan, Uzbekistan, Kyrgyzstan, Turkmenistan, Iran, Afghanistan, Mongolia, and northeastern China (Antropov 2017b).


*Lindenius pygmaeus* (Rossi, 1794)


*General distribution*: Russia (the European part from the centre to northern Caucasus and Urals), Europe, northern Africa, Israel, Jordan, Turkmenistan, Syria, Kazakhstan, central Asia, Iran, and Afghanistan (Antropov 2017b).

*Biology*: Nests in dense soil. Prey: small hymenopterans (Braconidae, Formicidae, Ichneumonidae, and Pteromalidae) and sometimes dipterans (Ceratopogonidae and Lycoriidae).

*Remark*: The species is confirmed in MSNR.

** Tribe Larrini **

*+ Tachysphex ferrugineus* Pulawski, 1971


*General distribution*: Russia (the European part from the centre to northern Caucasus), eastern Europe, Turkey, and Kazakhstan (Antropov 2017b).

*Tachysphex fulvitarsis* (Costa, 1867)


*Material*: RM: 1 male, 4.viii.2015, MSNR, quar. 86 (54°53′38″N & 43°35′59″E).

*General distribution*: Russia (the European part from the centre till Crimea and northern Caucasus, Urals, Siberia, Amur region, and Primorsky Krai), Europe, northern Africa, Israel, Jordan, Turkey, Syria, Kazakhstan, Uzbekistan, Turkmenistan, and Tajikistan (Antropov 2017b).


*Remark*: The species is confirmed in MSNR.

*Tachysphex helveticus* Kohl, 1885


*General distribution*: Russia (the European part from the centre to northern Caucasus, Urals, Altai, eastern Siberia, and Primorsky Krai), Europe, northern Africa, Jordan, Turkey, Kazakhstan, and Mongolia (Antropov 2017b).


*Tachysphex obscuripennis* (Schenck, 1857)


*General distribution*: Russia (the European part from...
the centre till northern Caucasus and Altai), Europe, Morocco, Lebanon, and Turkey (Antropov 2017b).

**Biology:** Nests in soil. Prey: cockroaches *Ectobius lapponicus* (Linnaeus, 1758) and *E. pallidus* (Olivier, 1789) (Ectobiidae). Predators: emerald wasps *Chrysis bicolor* Lepeletier de Saint Fargeau, 1806 and *Hedychridium ardens* (Coquebert, 1801) (Chrysididae).

**Remark:** The species is confirmed in MSNR.

*Tachysphex pomphiliformis* (Panzer, 1805)

**Literature:** Mokrousov et al. 2013; Ruchin & Antropov 2014.

**Material:** RM: 1 male, 19.vii.2015, Elniki Distr., Malye Mordovskie Poshaty (54°41’00”N & 43°43’50”E).

**General distribution:** Russia (the European part from the north till Crimea and northern Caucasus, Urals, Siberia, Amur and Magadan regions, Kamchatka, Khabarovsk Krai and Primorsky Krai, and Sakhalin), Europe, northern Africa, Turkey, Kazakhstan, Uzbekistan, Turkmenistan, Tajikistan, Iran, Pakistan, India, Mongolia, northern China, Korea, and North America (Antropov 2017b).


**Remark:** The species is confirmed in MSNR.

*Tribe Miscophini*

*Miscophus ater* Lepeletier, 1845

**Literature:** Mokrousov et al. 2013.

**General distribution:** Russia (the centre and south of the European part, Altai, Irkutsk region, Amur region, and Primorsky Krai), Europe, northern Africa, Turkey, Azerbaijan, Kazakhstan, and Iran (Antropov 2017b).

**Biology:** Nests in sandy soil. Prey: nymphs of grasshoppers *Oedipoda* spp. or *Stenobothrus* sp. (Acrididae). Predators: brood parasites *Brachystegus scalaris* (Illiger, 1807) and female digger wasps *Palarus variegatus* (Fabricius, 1781) (Crabronidae).

**Remark:** The species is confirmed in the territories adjacent to MSNR.

*Miscophus bicolor* Jurine, 1807

**Literature:** Mokrousov et al. 2013.

**General distribution:** Russia (the European part from the centre to northern Caucasus, Urals, Altai, eastern Siberia, Amur region, Khabarovsk Krai and Primorsky Krai, and Sakhalin), Europe, northern Africa, Turkey, Syria, Abkhazia, Kazakhstan, Iran, Mongolia, and Korea (Antropov 2017b).

**Biology:** Nests in sandy soil. Prey: juvenile spiders *Salticidae* and *Theridiidae*.

**Remark:** The species is confirmed in MSNR.

*Miscophus concolor* Dahlbom, 1844

**Literature:** Mokrousov et al. 2013.

**General distribution:** Russia (the European part from the centre to northern Caucasus, Urals, Altai, eastern Siberia, Amur region, Khabarovsk Krai and Primorsky Krai, and Sakhalin), Europe, northern Africa, Turkey, Syria, Abkhazia, Kazakhstan, Iran, Mongolia, and Korea (Antropov 2017b).

**Biology:** Nests in sandy soil. Prey: juvenile spiders *Salticidae* and *Stemonophantes*.
lineatus (Linnaeus, 1758) (Linyphiidae). Predators: emerald wasps *Hedychridium zelleri* (Dahlbom, 1845) (Chrysididae).

**Miscophus johni** Mokrousov, 2004

**Literature:** Mokrousov et al. 2013.

**General distribution:** Russia (the centre of the European part) and southeast of Europe (Antropov 2017).

* Nitela spinolae* Latreille, 1809

**Literature:** Plavilshchikov 1964 (as *Nitela spinolai* Dahlb.).

**General distribution:** Russia (the European part from the north to northern Caucasus), Europe, northern Africa, Turkey, and Japan (Hokkaido) (Antropov 2017b).

**Biology:** Nests in hollow stalks of cereals, in abandoned tunnels of xylophagous insects in dry wood, or in galls of gallflies *Andricus kollari* (Hartig, 1843) (Cynipidae). Prey: aphids [Aphididae] or nymphs of jumping plant lice (Psyllidae) and dust lice (Psocidae).

**Predators:** velvet ants *Smicromyrmex sicanus* (De Stefani, 1887) (Mutiliidae).

**Remark:** Confirmation of the species in Mordovia requires more material.

**Tribe Oxybelini**

*Oxybelus argentatus* Curtis, 1833

**Literature:** Ruchin & Antropov 2016.

**General distribution:** Russia (the European part from the north to the southeast, Ural, Altai, Irkutsk region, Transbaikalia, and Primorsky Krai), Europe, and Mongolia (Antropov 2017b).

**Biology:** Nests in dense sandy soil. Prey (which is delivered to the nest punctured by sting): dipterans, mostly *Acrosathe annulata* (Fabricius, 1805), *Thereva fulva* (Meigen, 1804), and *Th. nobilitata* (Fabricius, 1775) (Therevidae). Predators: parasitic flies *Metopia argyrocephala* (Meigen, 1824) and *M. campestris* (Fallen, 1810) (Sarcophagidae), velvet ants *Smicromyrmex rufipes* (Fabricius, 1787) (Mutiliidae), and female digger wasps *Palarus variatus* (Fabricius, 1781) (Crabronidae).

*Oxybelus bipunctatus* Olivier, 1812

**Literature:** Mokrousov et al. 2013.

**Material:** RM: 2 male, 12.vi.2013, 1.vii.2016, MSNR, cord. Podrubnyi (54°47′51″N & 43°08′48″E); 1 male, 24.vi.2014, Pushita (54°42′50″N & 43°13′32″E).

**General distribution:** Russia (the European part from the north to the southeast, Ural, Altai, Irkutsk region, Buryatia, Amur region, Primorsky Krai, and Sakhalin), Europe, northern Africa, Turkey, Syria, Iran, Kazakhstan, Uzbekistan, Turkmenistan, Mongolia, Korea, and North America (Antropov 2017b).

**Biology:** Nests in loose sandy soil, sometimes in small groups. Prey: various dipterans *Calythea nigricans* (Robineau-Desvoidy, 1830) (Anthomyiidae), *Pollenia rudis* (Fabricius, 1794) (Calliphoridae), *Fannia incisurata* (Zetterstedt, 1838) (Fannidae), *Hydrotaea armipes* (Fallén, 1825), *Myospila meditabunda* (Fabricius, 1781) (Muscidae), *Leucostoma aterrimum* (Villers, 1789), *Strongygaster triangulifer* (Loew, 1863) (Tachinidae), as well as Chloropidae, Dolichopodidae, Lonchaeidae, Milichiidae, Pipunculidae, Platypezidae, Rhagionidae, Sarcophagidae, Stratiomyidae, Syrphidae, and Therevidae. Predators: emerald wasps *Hedychridium ardens* (Coquebert, 1801) (Chrysididae), velvet ants *Smicromyrmex lewisi* Mickel, 1935 and *Smicromyrmex rufipes* (Fabricius, 1787) (Mutiliidae), and chalcid wasps *Perlampus ruficornis* (Fabricius, 1793) (Perlampidae), and parasitic flies *Phrosinella fulvicornis* (Coquillet, 1895), *Senotainia trilineata* (Wulp, 1890), *Sphecapata conica* Fallen, 1810, and *Taxigramma multipunctata* (Rondani, 1859) (Sarcophagidae).

*Oxybelus haemorrhoidalis* Olivier, 1812

**Literature:** Mokrousov et al. 2013.

**General distribution:** Russia (the European part from the northwest to the south, Urals, Novosibirsk region, Altai, Amur region, and Khabarovsk Krai and Primorsky Krai), Europe, northern Africa, Israel, Turkey, Azerbaijan, Kazakhstan, Kyrgyzstan, Uzbekistan, Turkmenistan, Syria, Iran, Mongolia, northern China, Korea, and Japan (Honshu) (Antropov 2017b).

**Biology:** Nests in sandy soil. Prey: flies *Musca domestica* Linnaeus, 1758, *Stomoxys calcitrans* (Linnaeus, 1758) (Muscidae), *Sarcophila latifrons* (Fallen, 1817), and *Metopia staegeri* (Rondani, 1859) (Sarcophagidae). Predators: parasitic flies *Metopia staegeri* (Rondani, 1859) (Sarcophagidae) and digger wasps *Palarus variatus* (Fabricius, 1781) (Crabronidae).

**Remark:** Confirmation of the species in Mordovia requires more material.

*Oxybelus mandibularis* Dahlbom, 1845

**Material:** RM: 1 male, 1.vii.2016, MSNR, quar. 379 (54°45′17″N & 43°07′51″E); 1 male, 4.vi.2017, quar. 357 (54°46′07″N & 43°10′56″E).

**General distribution:** Russia (the European part from the centre to the southeast, Urals, Tomsk region, Altai, Irkutsk region, Buryatia, Amur region, Primorsky territory, and Sakhalin), Europe, northern Africa, Turkey,
Wasp fauna of Mordovia State Nature Reserve and its surroundings

Ruchin & Antropov


Kazakhstan, Kyrgyzstan, Uzbekistan, Turkmenistan, and Mongolia (Antropov 2017b).

**Biology:** Nests in sandy soil. Prey: flies from the family Muscidae. Predators: emerald wasps *Hedychridium coriaceum* (Dahlbom, 1854) (Chrysidae).

**Oxybelus quatuordecimnotatus** Jurine, 1807

**Literature:** Mokrousov et al. 2013.

**Material:** RM: 1 male, 20.vi.2015, Temnikov Distr., Russkoe Karaevo (54°40′55″N, 43°13′52″E).

**General distribution:** Russia (the European part from the northwest till Crimea, Urals, Tomsk region, Altai, Krasnoyarsk Krai, Irkutsk region, and Khabarovsk Krai and Primorsky Krai), Europe, northern Africa, Saudi Arabia, Oman, Yemen, Israel, Jordan, Turkey, Syria, Kazakhstan, central Asia, Iran, Afghanistan, Pakistan, Mongolia, and southwestern and northeastern China (Antropov 2017b).

**Biology:** Nests in sandy or rocky-sandy soil. Prey: dipterans, mostly *Asilidae*, *Therevidae*, as well as *Bellardia corsicana* (Fallen, 1811) (Calliphoridae), *Tolmerus atricapillus* (Fallen, 1814) (Asilidae), *Drosophila* (Drosophilidae), *Phytomyza* (Agromyzidae), *Sapromyza* (Lauxaniidae), and *Physiphora* (Ulidiidae).

**Oxybelus trispinosus** (Fabricius, 1787)

**Literature:** Redikortsev 1938 (as *Oxybelus nigripes* Ol.); Plavilshchikov 1964 (as *Oxybelus nigripes* Ol.); Mokrousov et al. 2013.

**General distribution:** Russia (the European part from the centre till northern Caucasus, Urals, Altai, Irkutsk region, Buryatia, and Khabarovsk Krai and Primorsky Krai), Europe, northern Africa, Turkey, and Kazakhstan (Antropov 2017b).


**Oxybelus uniglumis** Linnaeus, 1758

**Literature:** Mokrousov et al. 2013.

**General distribution:** Russia (the European part from the northwest till Crimea, Urals, Siberia, Kamchatka, Sakhalin, and Kuril Islands), Europe, northern Africa, Turkey, Kazakhstan, Kyrgyzstan, Tajikistan, Mongolia, northeastern China, and North America (Antropov 2017b).


*Oxybelus variegatus* Wesmael, 1852

**Material:** RM: 1 female, 7.vii.2013, Temnikov Distr., Tarkhany.

**General distribution:** Russia (the European part from the centre till Crimea, Urals, and Altai), Europe, Turkey, Kazakhstan, Kyrgyzstan, Uzbekistan, Turkmenistan, Iran, and Afghanistan (Antropov 2017b).

**Biology:** Nests in soil of different density, from clayey-stony to sandy. Prey: house flies *Musca domestica* Linnaeus, 1758 (Muscidae).

**Remark:** The species is confirmed in the territories adjacent to MSNR.

**Tribe Palarini**

**Palarus variegatus** (Fabricius, 1781)

**Literature:** Mokrousov et al. 2013.

**Material:** RM: 1 female, 12.vii.2015, Elniki Distr., Novye Shaly (54°42′13″N & 43°38′25″E).

**General distribution:** Russia (the European part from the centre till Crimea and northern Caucasus, Urals, Altai, Krasnoyarsk Krai, and Transbaikalia), south of Europe, northern Africa, Turkey, Armenia, Georgia, Kazakhstan, Uzbekistan, Turkmenistan, Tajikistan, Afghanistan, Pakistan, Mongolia, northern China, and India (Antropov 2017b).

**Biology:** Nests in dense clay or rocky-sandy soil. Prey: various bees (Apidae) (*Ammobates, Andrena, Apis, Camptopeum, Chelostoma, Colletes, Dasypoda, Halictus, Hylaeus, Lasioglossum, Megachile, Melitta, Nomada,
Nomia, Osmia, Panurgus, Sphecodes, Tetralonia, and Threus), wasps Mutila and Myrmosa (Mutilidae), Myzizin and Tipha (Tiphidae), Scolia, Trielis and male Campsoscolia (Scoliidae), Eumenus, Odynerus, Polistes, Pterotechus and Vespula (Vespidae), Ammophila, Podalonia and Prionyx (Sphecidae), Alysson, Astata, Bembecinus, Cerceris, Crabro, Diodontus, Dryudella, Ectennius, Lestica, Liris, Oxybelus, Pemphredon, Philanthus, Pison, Tachysphex, Tachytes and male Larra (Crabronidae), as well as parasitic hymenopterans Leucospis (Leucospididae), Amblyteles, Barylypa, and Ichneumon (Ichneumonidae). Predators: velvet ants Smicromyrmex rufipes (Fabricius, 1787) (Mutillidae) and Ichneumon (Ichneumonidae). Nests in hollow stems of plants or in abandoned tunnels of xylophagous insects in wood. Prey: juvenile spiders of various families.  

**Remark:** The species is confirmed in the territories adjacent to MSNR.

**Tribe Trypoxylini**

*Trypoxylon deceptorium* Antropov, 1991

**Literature:** Mokrousov et al. 2013; Ruchin & Antropov 2016.

**General distribution:** Russia (the European part from the centre till Crimea and northern Caucasus and Altai), Europe, northern Africa, Israel, Lebanon, Turkey, Caucasus, Syria, Iran, Kazakhstan, central Asia, and Mongolia (Antropov 2017b).  

**Biology:** Nests in hollow stems of plants (Bogusch et al. 2015). Prey: juvenile spiders of various families. Predators: chalcid wasps Melittobia acasta (Walker, 1839) (Eulophidae) and ichneumons Ariranis coxator (Tschek, 1871), Ephialtes, and Perithous (Ichneumonidae) (Olberg 1959).

*Trypoxylon figulos* (Linnaeus, 1758)

**Literature:** Mokrousov et al. 2009, 2013.

**Material:** RM: 2 female, 27.vii.2014, 14.vi.2015, MSNR, quar. 420 (54°45’29”N & 43°24’19”E); 1 male, 21.vi.2015, quar. 384 (54°45’33”N & 43°12’44”E); 1 male, 18.vi.2017, cord. Drozhdenovski (54°44’31”N & 43°17’24”E).

**General distribution:** Russia (the European part from the northwest till Crimea and northern Caucasus, Urals, Siberia, and Primorsky Krai), Europe, northern Africa, Turkey, Kazakhstan, Kyrgyzstan, Uzbekistan, Tajikistan, Mongolia, northern China (Hokkaido and Honshu), and North America (Antropov 2017).

**Biology:** Nests in hollow stems of plants or in abandoned tunnels of xylophagous insects in wood. Prey: juvenile spiders Araneus diadematus Clerck, 1757, A. marmoreus Clerck, 1757, A. quadratus Clerck, 1757, Araniella, Larinioides cornutus (Clerck, 1757), Mangora acalypha (Walckenaer, 1802), Metellina segmentata (Clerck, 1757), Neoscona adianta (Walckenaer, 1802), S. nitidula C.L. Koch, 1844 and Zilla (Araneidae), Dictyna arundinacea (Linnaeus, 1758) (Dictynidae), Agyna rurestris (C.L. Koch, 1836), Bathypantes, Entelecara erythropus (Westring, 1851), Kaestneria dorsalis (Wider, 1834), Linyphia triangularis (Clerck, 1757), Neiriene montana (Clerck, 1757), N. radiata (Walckenaer, 1841) (Linyphiidae), Salticus scenicus (Clerck, 1757), Synageles venator (Lucas, 1836) (Salticidae), Tetragnatha [Tetragnathidae], Enoplognatha ovata (Clerck, 1757), Neottiura bimaculata (Linnaeus, 1767), Parasteatoda simulans (Thorell, 1875), P. tepidarium (C.L. Koch, 1841), Platnickina tincta (Walckenaer, 1802), Simition simile (C.L. Koch, 1836), Theridion pictum (Walckenaer, 1802), Th. sisypium (Clerck, 1757), Th. varians Hahn, 1833 (Theridiidae), and Xysticus (Thomisidae) (Giovanni et al. 2017). Predators: emerald wasps Chrysia fasciata Olivier, 1790, C. fulgida Linnaeus, 1761, h. ignita (Linnaeus, 1758), C. obtusidens Dufour et Perris, 1840, C. splendida Rossi, 1790, C. viridula Linnaeus, 1761, Elampus panzeri (Fabricius, 1804), Pseudomalus auratus (Linnaeus, 1758), P. pusillus (Fabricius, 1804) and Trichrysis cyanae (Linnaeus, 1758) (Chrysidae), chalcid wasps Melittobia acasta (Walker, 1839) (Eulophidae), Eurytoma nodularis Boheman, 1836 and E. verticillata (Fabricius, 1798) (Eurytomidae), and Monodontomerus vicicellae (Walker, 1847) (Torymidae), ichneumons Gasteruption assessor (Linnaeus, 1758), G. jaculator (Linnaeus, 1758) and G. opacum (Tournier, 1877) (Gasteruptionidae), Ariranis heliophilus (Tschek,1870), Isadelphus armatus (Gravenhorst, 1829), Nematopodius formosus Gravenhorst, 1829, Perithous divinator (Rossi, 1790), P. scura (Panzer, 1804). Poemenia notata Holmgren, 1859, Polyphincta, Stenodontus marginellus (Gravenhorst, 1829), and Townesia tenuiventris (Holmgren, 1860) (Ichneumonidae), as well as parasitic flies Eustolomyia hiliaris (Fallen, 1823) ( Anthomyiidae), Amobia signata (Meigen 1824), Metopia argyrocephala (Meigen, 1824), and Mitrogramma punctatum (Meigen, 1824) (Sarcophagidae) and skin beetles Megatoma undata (Linnaeus, 1758) (Dermestidae) (Olberg 1959).  

? *Trypoxylon fronticorne* Gussakowskij, 1936

**Literature:** Feoktistov 2011.

**General distribution:** Russia (the centre and the east of the European part, Krasnoyarsk Krai, and Irkutsk region), Europe, Belarus, Ukraine, Azerbaijan, Armenia,
Turkey, Kazakhstan, India, and Nepal (Antropov 2017b).

**Biology:** Nests in existing cavities (in hollow stems of plants and in the tunnels and nests of other insects in wood and shoots with a soft core). Prey: various small spiders, mostly juvenile.

**Remark:** Confirmation of the species in Mordovia requires more material.

**Trypoxylon medium de Beaumont, 1945**

**Literature:** Mokrousov et al. 2013.

**General distribution:** Russia (the European part from the centre to the south and east, Altai, and Krasnoyarsk Krai), Europe, Ukraine, Belarus, Estonia, Turkey, and Kazakhstan (Antropov 2017b).

**Biology:** Nests in existing cavities (in hollow stems of plants and in the tunnels and nests of other insects in wood and shoots with a soft core). Prey: various small spiders, mostly juvenile. Predators: emerald wasps *Trichrysis cyanea*.

**Trypoxylon minus de Beaumont, 1945**

**Literature:** Mokrousov et al. 2013.

**Material:** RM: 1 male, 12.vi.2016, MSNR, quar. 413 (54°45′12″N & 43°16′54″E).

**General distribution:** Russia (the European part from the centre till Crimea and the east and Altai), Europe, Turkey, and Kazakhstan (Antropov 2017b).

**Biology:** Nests in hollow stems or abandoned tunnels of xylophagous insects in wood. Prey: juvenile spiders *Entelecara* and *Lepthyphantes* (Linyphiidae), as well as *Parasteatoda tepidariorum* (C.L. Koch, 1841) and *Theridion varians* Hahn, 1833 (Theridiidae). Predators: chalcid wasps *Melittobia acasta* (Walker, 1839), *Tetrastrichus* (Eulophidae) and *Eurytoma* (Eurytomidae), ichneumons *Ephialtes*, *Peritoul* (Ichneumonidae), and parasitic flies *Cacoxenus indagator* Loew, 1858 (Drosophilidae) (Olberg 1959).

**Remark:** The species is confirmed in MSNR.

**Subfamily Mellininae**

*Mellinus arvensis* (Linnaeus, 1758)

**Literature:** Redikortsev 1938; Plavilshchikov 1964; Mokrousov et al. 2009, 2013; Ruchin & Antropov 2014.

**Material:** RM: 1 female, 4.ix.2015, MSNR, quar. 420 (54°45′29″N & 43°24′19″E); 1 female, 24.viii.2017, quar. 368 (54°46′37″N & 43°21′45″E); 2 female, 18.ix.2017, Pushhta (54°42′50″N & 43°13′32″E).

**General distribution:** Russia (the European part from the northwest till Crimea and northern Caucasus, Urals, Altai, and Irkutsk region), Europe, Turkey, and Kazakhstan (Nemkov 2017d).

**Biology:** Nests usually in dense sandy soil. Prey: dipterans Anthomyiidae, Calliphoridae, Muscidae, Sarcophagidae, Syrphidae, Tabanidae, and Tachinidae. Predators: velvet ants *Sarcophyra rufipes* (Fabricius, 1787) (Mutiliidae) and parasitic flies *Macronychia griseola* (Fallen, 1820), *Metopia argyrocephala* (Meigen, 1824), *Sphecapata conica* Fallen, 1810, and *Paramacronychia* (Sarcophagidae).

? *Mellinus crabronesus* (Thunberg, 1791)

**Literature:** Plavilshchikov 1964 (as *Mellinus sabulosus* F.)

**General distribution:** Russia (the European part from the northwest to the southeast, Urals, Altai, eastern Siberia, Amur region, and Primorsky Krai), Europe, Turkey, Kazakhstan, Kyrgyzstan, Mongolia, northern China, and Korea (Nemkov 2017d).

**Biology:** Nests in sandy soil, often in groups along the banks of water bodies. Prey: flies Anthomyiidae, Muscidae, and Syrphidae.

**Remark:** Confirmation of the species in Mordovia requires more material.

**Subfamily Pemphredoninae**

**Tribe Pemphredonini**

*Diodontus luperus* Shuckard, 1837

**Literature:** Mokrousov et al. 2013.

**General distribution:** Russia (the European part from the north to northern Caucasus and Altai), Europe, Turkey, and Kazakhstan (Nemkov 2017c).


**Remark:** The species is confirmed in MSNR.
Passaloecus corniger Shuckard, 1837

Material: RM: 2 female, 14.vi.2016, MSNR, quar. 384 (54°45′33″N & 43°12′44″E); 1 female, 11.vi.2016, quar. 389 (54°45′50″N & 43°17′50″E); 1 female, 1.vii.2016, quar. 379 (54°45′17″N & 43°07′51″E); 1 female, 9.vi.2016, quar. 358 (54°46′05″N & 43°11′44″E); 1 female, 3.vii.2016, quar. 338 (54°47′06″N & 43°19′40″E); 3 female, 13.vii.2017, quar. 319 (54°48′09″N & 43°28′25″E).

General distribution: Russia (the European part from the north till the centre and the east, Urals, Tomsk region, Altai, Irkutsk, Amur and Magadan regions, Kamchatka, Primorsky Krai, and Sakhalin), Europe, and Turkey (Mokrousov 2017).

Biology: Nests in soil. Prey: nymphs and imagos of aphids. This species kills victims by clenching its mandibles.

Diodontus minutus (Fabricius, 1793)


General distribution: Russia (the European part from the northwest till Crimea and northern Caucasus, Urals, Siberia, and Primorsky Krai), Europe, northern Africa, Israel, Kuwait, Turkey, Syria, Kazakhstan, central Asia, Iraq, Iran, Mongolia, northern China, Korea, and North America (Mokrousov 2017).

Biology: Nests in dense soil, often within the walls of forest cliffs. Prey: nymphs and imagos of aphids (Edwards & Telfer 2002). This species kills victims by clenching its mandibles. Predators: emerald wasps *Chrysis lanceolata* and *C. leachii* and velvet ants *Myrmosa atra* Panzer, 1801 and *Smicromyrmex sicanus* (De Stefani, 1887).

Passaloecus borealis Dahlbom, 1844


General distribution: Russia (the European part from the northwest till Crimea and northern Caucasus, Khabarovsky Krai and Primorsky Krai, and Sakhalin), Europe, Kazakhstan, and North America (Mokrousov 2017).

Biology: Nests in existing tubular cavities, usually in tunnels of Anobiidae in wood. Prey: nymphs and imagos of aphids. This species kills victims by clenching its mandibles.

Passaloecus gracilis (Curtis, 1834)


General distribution: Russia (the European part from the centre till Crimea and northern Caucasus, Urals, and Altai), Europe, northern Africa, Turkey, Abkhazia, Kazakhstan, Uzbekistan, Iran, and North America (Mokrousov 2017).

Biology: Nests in existing tubular cavities (in tunnels of xylophagous insects in wood, in dry shoots of plants with a soft core, and in hollow stalks of reeds). Prey: nymphs and imagos of aphids. This species kills victims by clenching its mandibles, but it also often steals aphids from the nests of other wasps. Predators: emerald wasps *Omalus aeneus* (Fabricius, 1787), *Pseudomalus auratus* (Linnaeus, 1758), and *P. violaceus* (Scopoli, 1763) (Chrysidae).

** Passaloecus gracilis (Curtis, 1834) **

Material: RM: 1 female, 15.viii.2015, Temnikov Distr., Purdoshik (54°40′04″N & 43°32′33″E).

General distribution: Russia (the European part from the northwest till Crimea and northern Caucasus, Urals, Siberia, Amur and Magadan regions, Kamchatka, Khabarovsk Krai and Primorsky Krai, Sakhalin, and Kuril Islands), Europe, northern Africa, Turkey, Abkhazia, Kazakhstan, central Asia, Mongolia, northern China, Japan (Honshu) (Mokrousov 2017).

Biology: Nests in existing tubular cavities (in tunnels of xylophagous insects in wood, in dry shoots of plants with a soft core, and in hollow stalks of reeds). Prey: nymphs and imagos of aphids. This species kills victims by clenching its mandibles, and it also often steals aphids from the nests of other wasps. Predators: emerald wasps *Omalus aeneus* (Fabricius, 1787), *Pseudomalus auratus* (Linnaeus, 1758) and *P. violaceus* (Scopoli, 1763) (Chrysidae).

Pemphredon fabriicii (M. Müller, 1911)


General distribution: Russia (the European part from the centre to northern Caucasus), south of Europe, Turkey, Kazakhstan, and Japan (Honshu) (Mokrousov 2017).

Biology: Nests in rotten wood, in tunnels of xylophagous insects, sometimes in hollow stems of plants or in shoots with a soft core. Prey: various aphids (Bogusch et al. 2015).

Pemphredon inornata Say, 1824


Material: RM: 1 female, 15.viii.2015, Temnikov Distr., Purdoshik (54°40′04″N & 43°32′33″E).

General distribution: Russia (the European part from the northwest till Crimea and northern Caucasus, Urals, Siberia, Amur and Magadan regions, Kamchatka, Khabarovsk Krai and Primorsky Krai, Sakhalin, and Kuril Islands), Europe, northern Africa, Turkey, Abkhazia, Kazakhstan, central Asia, Mongolia, northern China, Japan (Honshu) (Mokrousov 2017).
Korea, Japan (Hokkaido and Honshu), North America (Mokrousov 2017).

**Biology:** Nests in rotten wood, in tunnels of xylophagous insects, sometimes in hollow stems of plants, in shoots with a soft core, or in galls of flies Lipara (Chloropidae). Prey: the most common and accessible aphids in the biotope. This species paralyzes prey with its sting or kills it by clenching its mandibles. Predators: emerald wasps Pseudomalus auratus (Linnaeus, 1758) (Chrysididae).

**Remark:** The species is confirmed in the territories adjacent to MSNR.

**Pemphredon lethifer** (Shuckard, 1837)

**Literature:** Ruchin & Antropov 2016.

**General distribution:** Russia (the European part from the north till Crimea and northern Caucasus, Urals, Novosibirsk region, Altai, Amur region, Khabarovsk Krai and Primorsky Krai, Sakhalin, and Kuril Islands), Europe, northern Africa, Israel, Turkey, Abkhazia, Azerbaijan, Kazakhstan, Kyrgyzstan, Uzbekistan, Iraq, Iran, Afghanistan, Mongolia, China, Korea, Japan (Hokkaido and Honshu), and North America (Mokrousov 2017).

**Biology:** Nests in rotten wood, in tunnels of xylophagous insects, sometimes in hollow stems of plants, in shoots with a soft core, or in galls of flies Lipara (Chloropidae). Prey: the most common and accessible aphids in the biotope. This species paralyzes prey with its sting or kills it by clenching its mandibles. Predators: emerald wasps Omalus aeneus (Fabricius, 1787) (Chrysididae).

**Remark:** Confirmation of the species in Mordovia requires more material.

**Pemphredon lugens** Dahlbom, 1843

**Literature:** Mokrousov et al. 2009; Feoktistov 2011.

**General distribution:** Russia (the European part from the northwest till Crimea and northern Caucasus, Urals, Siberia, Magadan region, Kamchatka, Khabarovsk Krai and Primorsky Krai, Sakhalin, and Kuril Islands), Europe, Turkey, Kazakhstan, Kyrgyzstan, Uzbekistan, Mongolia, northern China, Korea, Japan (Hokkaido and Honshu), and North America (Dollfuss 1995; Mokrousov 2017).

**Biology:** Nests in rotten wood, in tunnels of xylophagous insects, sometimes in hollow stems of plants, in shoots with a soft core, or in galls of flies Lipara (Chloropidae). Prey: the most common and accessible aphids in the biotope. This species paralyzes prey with its sting or kills it by clenching its mandibles. Predators: emerald wasps Pseudomalus triangulifer (Abeille de Perrin, 1877) and P. violaceus (Scopoli, 1763) (Chrysididae).

**Pemphredon rugifer** (Dahlbom 1844)

**Material:** RM: MSNR, Pushta (54°42′50″N & 43°13′32″E), 17.vi.2016, 1 female.

**General distribution:** Russia (the European part from the centre to northern Caucasus, Urals, Novosibirsk region, Altai, Krasnoyarsk territory, and Sakhalin), Europe, Turkey, Kazakhstan, southwestern and northeastern China, Korea, Japan (Honshu), and North America (Dollfuss 1995; Mokrousov 2017).

**Biology:** Nests in rotten wood, in tunnels of xylophagous insects. Prey: the most common and accessible aphids in the biotope. This species paralyzes prey with its sting or kills it by clenching its mandibles. Predators: emerald wasps Trichrysis cyanea.

**Spiolomena troglodytes** (Vander Linden, 1829)

**Literature:** Mokrousov et al. 2013.

**General distribution:** Russia (the European part from the northwest till Crimea and northern Caucasus, Urals, and Primorsky Krai), Europe, northern Africa, Israel, Turkey, Abkhazia, Georgia, Kazakhstan, Uzbekistan, Kyrgyzstan, Tajikistan, and North America (Mokrousov 2017).

**Biology:** Nests in tunnels of xylophagous insects in wood, hollow stems of reeds, or shoots with a soft core. Prey: nymphs of thrips.

**Stigmus pendulus** Panzer, 1804

**Literature:** Ruchin & Antropov 2016.

**General distribution:** Russia (the European part from the centre to northern Caucasus and Urals) and Europe (Mokrousov 2017).

**Biology:** Nests in tunnels of xylophagous insects in wood or in shoots with a soft core. Prey: aphids and,
probably, jumping plant lice.

**Tribe Psenini**

**Mimesa equestris** (Fabricius, 1804)

**Literature:** Mokrousov et al. 2013.

**Material:** RM: 1 female, 10.viii.2016, MSNR, quar. 440 (54°43′56″N & 43°13′15″E).

**General distribution:** Russia (the European part from the northwest to the centre and the east, Urals, Siberia, Magadan region, Khabarovsk Krai and Primorsky Krai, and Sakhalin), Europe, Turkey, Kazakhstan, and Korea (Mokrousov 2017).

**Biology:** Nests in sandy soil, often in groups. Prey: nymphs and imagos of Auchenorrhyncha. Predators: emerald wasps *Elampus panzeri* (Fabricius, 1804) (Crysididae).

**Remark:** The species is confirmed in MSNR.

**Mimesa lutaria** (Fabricius, 1787)

**Literature:** Redikortsev 1938 (as *Psen shuckardi* Dalb.); Plavilshchikov 1964 (as *Psen shuckardi* Wesm.).

**Material:** RM: 1 female, 7.vii.2016, MSNR, quar. 361 (54°46′17″N & 43°15′47″E).

**General distribution:** Russia (the European part from the northwest to the centre and the east, Urals, Altai, eastern Siberia, Amur and Magadan regions, Kamchatka, Khabarovsk Krai and Primorsky Krai, Sakhalin, and Kuril Islands), Europe, Turkey, Kazakhstan, Uzbekistan, Kyrgyzstan, Mongolia, northeastern China, Korea, Japan (Hokkaido, Honshu, and Shikoku), and North America (Mokrousov 2017).

**Biology:** Nests in sandy soil, often in groups. Prey: nymphs and imagos of Auchenorrhyncha. Predators: emerald wasps *Elampus panzeri* (Fabricius, 1804) (Crysididae).

**Remark:** The species is confirmed in MSNR.

**Mimumesa atratina** (F. Morawitz, 1891)

**Literature:** Mokrousov et al. 2013; Ruchin & Antropov 2014.

**Material:** RM: 2 female, 13.vii.2017, MSNR, quar. 319 (54°48′09″N & 43°28′25″E); 1 female, 3.vi.2015, Pushta (54°42′50″N & 43°13′32″E).

**General distribution:** Russia (the European part from the northwest to northern Caucasus, Urals, Siberia, Magadan region, Kamchatka, Khabarovsk Krai and Primorsky Krai, Sakhalin, and Kuril Islands), Europe, Turkey, Kazakhstan, Kyrgyzstan, Mongolia, northern China, Korea, Japan (Honshu and Kyushu), and North America (Mokrousov 2017).

**Biology:** Nests in existing tubular cavities in wood and in stems of plants, as well as in soil. Prey: small leafhoppers.

**Remark:** The species is confirmed in MSNR and its adjacent territories.

**Mimumesa beaumonti** (van Lith, 1949)

**Literature:** Mokrousov et al. 2013.

**Material:** RM: 1 female, 10.vii.2016, MSNR, quar. 440 (54°43′56″N & 43°13′15″E).

**General distribution:** Russia (the European part from the northwest to the centre and the east, Urals, Tomsk and Irkutsk regions, and Primorsky Krai), south of Europe, and Kazakhstan (Mokrousov 2017).

**Biology:** Nests in rotten wood and in abandoned tunnels of xylophagous insects. Prey: small leafhoppers.

**Remark:** The species is confirmed in MSNR.

**Mimumesa dahlbomi** (Wesm., 1852)

**Literature:** Mokrousov et al. 2013.

**Material:** RM: 2 female, 17.vii.2016, MSNR, quar. 330 (54°46′44″N & 43°11′09″E); 1 male, 29.v.2016, quar. 115 (54°51′46″N & 43°09′26″E); 1 male, 18.vii.2016, quar. 303 (54°47′17″N & 43°12′32″E).

**General distribution:** Russia (the European part from the northwest till Crimea and northern Caucasus, Urals, Altai, Irkutsk, Amur and Magadan regions, Kamchatka, Khabarovsk Krai and Primorsky Krai, Sakhalin, and Kuril Islands), Europe, Turkey, Kazakhstan, Kyrgyzstan, Mongolia, China, Korea, and Japan (Honshu) (Mokrousov 2017).

**Biology:** Nests in rotten wood and in abandoned tunnels of xylophagous insects. Prey: small leafhoppers Delphacidae, Fulgoridae, and Jassidae.

**Remark:** The species is confirmed in MSNR.

**Mimumesa unicolor** (Vander Linden, 1829)

**Literature:** Redikortsev 1938 (as *Psen unicolor* Wesm.); Plavilshchikov 1964 (as *Psen unicolor* Wesm.); Mokrousov et al. 2013.

**Material:** RM: 1 female, 23.v.2016, Elniki Distr., Malye Mordovskie Poshaty (54°30′15″N & 43°13′12″E); 1 female, 29.v.2016, quar. 303 (54°47′17″N & 43°12′32″E).

**General distribution:** Russia (the European part from the northwest till Crimea and northern Caucasus, Urals, and Siberia), Europe, Israel, Turkey, Azerbaijan, Kazakhstan, central Asia, Iraq, Afghanistan, Pakistan, and China (Mokrousov 2017).

**Biology:** Nests in soil, on clay cliffs or steep bare slopes. Prey: small leafstones (Rhynchota and Auchenorrhyncha) (Giovanni et al. 2017). Predators: emerald wasps *Chrysis succincta* Linnaeus, 1767, *Hedychridium ardens* (Coquebert, 1801), *Holopyga..."
gloriosa (Fabricius, 1793), and *Pseudomalus auratus* (Linnaeus, 1758).

**Remark:** The species is confirmed in the territories adjacent to MSNR.

? *Psen ater* (Olivier, 1792)

**Literature:** Redikortsev 1938 (as *Psen ater* Panz.); Plavilischikov 1964 (as *Psen ater* F.).

**General distribution:** Russia (the European part from the centre till Crimea, Urals, Altai, eastern Siberia, Amur region, Khabarovsk Krai and Primorsky Krai, and Kuril Islands), Europe, Turkey, Kazakhstan, Uzbekistan, Mongolia, northern China, Korea, and Japan (Hokkaido, Honshu, Shikoku, and Kyushu) (Mokrousov 2017).

**Biology:** Nests in sandy or clayey soil. Prey: leafstones. Predators: velvet ants *Mutilla* (Mutillidae) and ichneumons *Perithous mediator* (Fabricius, 1804) (Ichneumonidae).

**Remark:** Confirmation of the species in Mordovia requires more material.

*Psenulus exaratus* (Eversmann, 1849)

**Literature:** Ruchin & Antropov 2016.

**General distribution:** Russia (the European part from the centre till Crimea, Urals, western Siberia, Irkutsk and Amur regions, and Primorsky Krai), south of Europe, Abkhazia, Georgia, Kazakhstan, India, southeastern Asia, Turkey, Iran, Kazakhstan, northern and southwestern China, Korea, Japan (Hokkaido and Honshu), and North America (Mokrousov 2017).

*Psenulus fuscipennis* (Dahlbom, 1843)

**Literature:** Mokrousov et al. 2013.

**Material:** RM: 2 female, 5.vi.2015, MSNR, quar. 434 (54°45′04″N & 43°19′02″E); 1 male, 18.vii.2016, quar. 278 (54°47′51″N & 43°12′27″E); 1 female, 28.vi.2015, cord. Inorski (54°44′15″N & 43°08′53″E); 1 female, 1 male, 25.v.2014, cord. Podrubny (54°47′51″N & 43°08′48″E); 2 female, 16.vii.2016, 17.vii.2017, Pushata (54°42′50″N & 43°13′32″E).

**General distribution:** Russia (the European part from the north till Crimea and northern Caucasus, Urals, Siberia, Amur region, and Primorsky Krai), south of Europe, Russia (the European part from the northwest till Crimea and northern Caucasus, Urals, Tomsk region, Altai, Irkutsk and Amur regions, Kamchatka, Khabarovsk Krai and Primorsky Krai, Sakhalin, and Kuril Islands), Europe, Abkhazia, Armenia, Turkey, Iran, Kazakhstan, northern and southwestern China, Korea, Japan (Hokkaido and Honshu), and North America (Mokrousov 2017).

**Biology:** Nests in the existing tunnels of xylophagous insects in wood and in dry hollow or soft-core plant stems. Prey: nymphs and imagos of aphids. Predators: emerald wasps of the genera *Elampus*, *Omalus*, *Philoctetes*, and *Pseudomalus* (Chrysididae) and ichneumons *Perithous divinator* (Rossi, 1790) and *Perithous mediator* (Fabricius, 1804) (Ichneumonidae).

**Remark:** The species is confirmed in MSNR.

**Subfamily Philanthinae**

**Tribe Cercerini**

*Cerceris arenaria* (Linnaeus, 1758)

**Literature:** Redikortsev 1938; Plavilischikov 1964; Mokrousov et al. 2013; Ruchin & Antropov 2014.

**Material:** RM: 1 male, 19.vii.2015, Elniki Distr., Malye Mordovskie Poshaty (54°41′00″N & 43°43′50″E).

**General distribution:** Russia (the European part from the northwest till Crimea and northern Caucasus, Urals, Siberia, Amur region, and Primorsky Krai), Europe, northern Africa, Israel, Turkey, Caucasus, Kazakhstan, central Asia, Iran, Mongolia, northeastern China, Korea, and Japan (Honshu and Ryukyu) (Danilov & Mokrousov 2017).

Cerceris interrupta (Panzer, 1799)

**Literature:** Ruchin et al. 2009.

**Material:** RM: 1 female, 23.vii.2016, Elniki Distr., Malye Mordovskie Poshaty (54°41′00″N & 43°43′50″E); NNR: 1 ex., 16.viii.2014, Sarov (54°55′08″N 43°17′40″E), coll. P.V. Cherenkov (Image 3).

**General distribution:** Russia (the European part from the centre till Crimea and northern Caucasus, Urals, Novosibirsk region, Altai, and Krasnoyarsk Krai), south of Europe, Turkey, and Kazakhstan (Danilov & Mokrousov 2017).

**Biology:** Nests in dense soil. Prey: small snout beetles (Curculionidae) and rarely seed beetles (Bruchidae). Predators: emerald wasps Hedychrum niemelai Linsenmaier, 1959 (Chrysidae).

Cerceris ruficornis (Fabricius, 1793)

**Literature:** Ruchin & Antropov 2014.

**Material:** RM: 1 male, 11.vii.2015, MSNR, quar. 115 (54°51′46″N & 43°09′26″E); 1 female, 1 male, 11.vii.2015, quar. 142 (54°51′12″N & 43°09′21″E); 1 female, 11.vii.2015, quar. 301 (54°47′19″N & 43°10′36″E); 1 male, 18.vii.2016, quar. 331 (54°46′43″N & 43°12′37″E); 1 male, 1.vii.2016, quar. 379 (54°45′17″N & 43°07′51″E); 1 male, 4.vii.2017, quar. 276 (54°47′45″N & 43°10′28″E).

**General distribution:** Russia (the European part from the north till Crimea and the east, Urals, Siberia, Khabarovsky Krai, and Sakhalin), Europe, northern Africa, Turkey, Kazakhstan, Uzbekistan, Kyrgyzstan, Taldikistan, Iran, northern China, and Korea (Danilov & Mokrousov 2017).


**Remark:** The species is confirmed in MSNR.

Cerceris rybyensis (Linnaeus, 1771)


**Material:** RM: 1 male, 3.vii.2016, MSNR, quar. 429 (54°44′31″N & 43°14′59″E); 1 male, 24.vi.2015, Pushta (54°42′50″N & 43°13′32″E); 2 male, 19.vii.2015, Elniki Distr., Malye Mordovskie Poshaty (54°41′00″N & 43°43′50″E); 1 female, 22.vii.2017, Novoyamskaya (54°47′45″N & 43°10′28″E).

**General distribution:** Russia (the European part from the northwest till Crimea and northern Caucasus, Urals, Siberia, Primorye, and Sakhalin), Europe, northern Africa, Turkey, Georgia, Azerbaijan, Syria, Kazakhstan, Uzbekistan, Turkmenistan, Tajikistan, Iran, India, Korea, Elniki Distr., Novoye Shaly (54°42′13″N & 43°38′25″E).


**Material:** RM: 1 male, 19.vii.2016, MSNR, quar. 330 (54°46′44″N & 43°11′09″E); 1 male, 18.vii.2016, quar. 331 (54°46′43″N & 43°12′37″E); 1 female, 22.vii.2017, Elniki Distr., Novoye Shaly (54°42′13″N & 43°38′25″E).

**General distribution:** Russia (the European part from the northwest till Crimea and northern Caucasus, Urals, and Siberia), Europe, northern Africa, Turkey, Azerbaijan, and Kazakhstan (Danilov & Mokrousov 2017).

and Japan (Honshu) (Danilov & Mokrousov 2017).

**Biology:** Nests in dense sandy or clayey soil, often in groups. Prey: bees of genera *Halictus*, *Andrena*, *Panurgus*, *Prosopis*, and *Sphecodes*. Predators: emerald wasps *Hedychrum gerstaeckeri* Chevrier, 1869, *H. niemelai* Linsenmaier, 1959, *H. nobile* (Scopoli, 1763), and *Chrysis ignita* (Linnaeus, 1758) (Chrysididae), velvet ants *Paramyrmosa brunnipes* (Lepeletier, 1845) (Mutillidae), and parasitic flies *Metopia leucocephala* (Rossi, 1790) and *Pterella grisea* (Meigen, 1824)


Wasp fauna of Mordovia State Nature Reserve and its surroundings
Ruchin & Antropov


Sarov (54°54′N & 43°17′E) (Conopidae), and skin beetles (*Dasylabris maura* (Linnaeus, 1758)) (Staphylinidae).  

**Philanthus triangulum** (Fabricius, 1775)

**Literature:** Redikortsev 1938; Plavilshchikov 1964; Mokrousov et al. 2009, 2013; Ruchin & Antropov 2014.

**Material:** RM: 1 male, 11.vii.2015, MSNR, quar. 301 (54°47′19″N & 43°10′36″E); 1 female, 24.viii.2017, quar. 85 (54°53′29″N & 43°35′00″E); 1 female, 24.vii.2016, quar. 86 (54°53′38″N & 43°35′59″E); 20.vi.2015, 1 male, Pushta (54°42′50″N & 43°13′32″E); 24.vii.2016, 1 male, Temnikov Distr., Polyanki (54°44′27″N & 43°29′04″E); NNR: 23.vii.2016, 1 ex., Sarov (54°55′08″N 43°17′40″E), coll. P.V. Cherенков.

**General distribution:** Russia (the European part from the northwest till Crimea and northern Caucasus, Urals, and western Siberia), Europe, Africa, Israel, Jordan, Yemen, Saudi Arabia, Turkey, Abkhazia, Georgia, Azerbaijan, Kazakhstan, central Asia, Iraq, Iran, and Afghanistan (Danilov & Mokrousov 2017).

**Biology:** Nests in dense sandy and sandy loam soil, usually in groups. Prey: honey bees (*Apis mellifica* Linnaeus, 1758) or, as an exception, solitary bees, for example, *Andrena* and *Halictus* (Rathmayer, 1962). Predators: emerald wasps (*Chrysis ignita* (Linnaeus, 1758)), *Hedychrum gerstaecheri* Chtвrier, 1869, *H. rutilans* Dahlbom, 1854, *Pseudomalus auratus* (Linnaeus, 1758) (Chrysidae), velvet ants (*Dasylabris maura* (Linnaeus, 1758)) (Mutilidae), parasitic flies (*Senotainia albifrons* (Rondani, 1859), *Phyllomyes pictipennis* Loew, 1824, *Metopia leucocephala* (Rossi, 1790), *Sphecapata conica* Fallen, 1810 (Sarcophagidae), *Physoscepha chrysorrhoea* (Meigen, 1824) and *Ph. vittata* (Fabricius, 1794) (Conopidae), and skin beetles (*Dermestes murinus* Linnaeus, 1758) (Dermestidae) (Polidori et al. 2010).

**Philanthus venustus** (Rossi, 1790)

**Literature:** Ruchin & Antropov 2014.

**General distribution:** Russia (the European part from the centre and east till Crimea and northern Caucasus and Urals), south of Europe, northern Africa, Israel, Turkey, Syria, Kazakhstan, and Mongolia (Danilov & Mokrousov 2017).

**Remark:** Confirmation of the species in the territories adjacent to MSNR requires more material.

**Superfamily Trigonalyoidea**

**Family Trigonalyidae**

**Pseudogonialis hahnii** (Spinola,1840)

**Literature:** Ruchin et al. 2009; Feoktistov 2011 (as *Pseudogonialis hahnii* Spinola).

**General distribution:** Russia (the European part, Altai, Irkutsk region, Transbaikalia, Amur region, and Primorsky Krai), Europe, Ukraine, Turkey, Kazakhstan, Iran, Mongolia, and northern China (Schnee 2011).

**Biology:** Parasites of sawfly larvae and caterpillars of butterflies (Schnee 2011).

**RESULTS AND DISCUSSION**

Thus, we summarized data on 249 vespine species of 11 families from two regions of Mordovia (including MSNR) and three districts of Nizhny Novgorod region (including the city of Sarov). Of these, 31 species are new to the Republic of Mordovia. In recent years, the fauna of Nizhny Novgorod region was studied quite intensively (Mokrousov 2011; Nemkov 2016). The areas adjacent to the reserve areas of Nizhny Novgorod region, however, were so far poorly explored. We provide information on 30 species of wasps occurring in these areas, of which two species were not yet recorded in the reserve.

As of 2015, 179 species of wasps were recorded in MSNR (Redikortsev 1938; Plavilshchikov 1964; Ruchin et al. 2009; Ruchin 2011, 2015; Mokrousov et al. 2009, 2013; Ruchin, Antropov, 2014, 2016). At present, the fauna of separate families of wasps in MSNR is represented by 220 species: one species in Bethylidae, 31 in Chrysididae, two in Tiphidae, two in Mutilidae, one in Scoliidae, 28 in Pompilidae, 37 in Vespidae, nine in Sphecidae, 108 in Crabronidae, and one in Trigonalyidae.

Unfortunately, in the 20th Century, the authors of publications on fauna of MSNR limited themselves to bringing up short lists of wasps without specifying important characteristics such as the place and date of collection, as well as the sex and the number of material studied. This complicates the comparison of the species composition, biotopic confinement, and verification of finds in certain habitats. Therefore, a number of species are indicated so far only on the basis of these literary sources. Among them, in particular, are such species whose modern ranges include the territory of Mordovia: *A. wesmaeli* (Redikortsev, 1938), *P. ater* (Redikortsev, 1938; Plavilshchikov, 1964), *Ch. pumilla*, *C. comparata*, *P. tydei*, *N. spinolae*, *M. crabronae* (Plavilshchikov, 1964), *A. terminata*, *C. ovalis*, and *T. fronticorne* (Feoktistov 2011).

At the same time, some of the species included in these lists, according to modern data, clearly do not occur in the territory of Mordovia, since their range in the European part of Russia is limited to the south,
including Crimea and northern Caucasus. Such species include C. octomaculatus (Ghahari et al. 2014; Loktionov & Lelej 2017). It is most likely that these records were based on incorrect definition of the source material. Therefore, we excluded this species from the MSNR list of wasp fauna.

In recent years, the list of wasps species recorded in MSNR and adjacent territories significantly expanded. Many species from the list, however, are still known only by single specimens. To such species we refer, in particular, C. megacephalus (Mokrousov et al. 2009), E. minor, G. lunatus, P. gussakowskijii, P. minuta, P. parvul, P. schioedtei, A. concinnus, A. anceps, H. sanguinolentus, A. auctus, M. parvulus, D. lineata, N. dimidiatus, N. fulvipes, C. annulipes, C. elongatulus, C. exiguis, O. haemorrhoidalis, P. fabricii, S. troglodytes (Mokrousov et al. 2013), O. similimus (Ruchin & Antropov 2014), A. ichneumonides, E. quadrifasciatus, G. laevipes, S. gracillis, P. lethifer, S. pendulus, and P. exaratus (Ruchin & Antropov 2016). Records of these species are undoubtful.

The most common in the reserve are species of the families Chrysididae (Hedychrum nobile, Chrys bicolor, C. ignita, and Trichrysis cyanea), Tiphidae (Tiphia femorata), Pompilidae (Auplopus carbonarius, Priocnemis exaltata, P. perturbator, and Anoplius viaticus), Vespidae (Ancistrocerus trifasciatus, Eumenes coronatus, E. pedunculatus, Symmorphus bifasciatus, S. minor, Polistes albellus, P. nimpha (dominant), Vespa crabro, Dolichovespula saxonica, Vespula germanica, and V. vulgaris), and Sphecidae (Ammophila pubescens, A. sabulosa, Podalonia hirsuta, Argogorytes mystaceus, Gorytes quadrifasciatus, G. quinquecinicus, Bembecinus tridens, Nysson spinosus, Crabro cribriarius, Ectemnius borealis, E. continuus, E. lapidarius, Lestica clypeata (dominant), and Cerceris quinquefasciata).

In a recent publication on European paper wasps (Polistes) of the gallicus-group (Neumeyer et al. 2015), the status of an independent species was given to Polistes albellus Giordani Soika, 1976, originally described as a subspecies of P. foederatus Kohl, 1898 and included in the list of lower synonyms P. gallicus (Linnaeus, 1767). For a long time, P. albellus, distributed from the centre and east of the European part and south of western Siberia of Russia to Mongolia, was confused with similar species P. bischoffi Weyrauch, 1937 and P. biglumis (Linnaeus, 1758), which in Russia are found mainly in northern Caucasus. Therefore, we excluded the previously mentioned P. bischoffi and P. biglumis (Mokrousov et al. 2013; Ruchin & Antropov 2014) from the MSNR list of wasp fauna.

Of particular interest is S. deforme, an eastern Asian species that in recent years showed an expansion of the range to the northwest (Raspus 2010; Četković et al. 2011). Judging by the many-year collections, there is a noticeable increase in its population in Mordovia in comparison with the native species, S. destillatorium. Similarly, P. fastigiata, noted in Mordovia for the first time, which was previously known to the north no further than the Rostov region (Savraskaya & Lidzhiev 2017), possibly also expands its area to the northwest. Additional material, however, is required to confirm this.

The rare species listed in the Red Book of the Russian Federation (2001) include P. grandior. Ten-year studies in MSNR show that the number of Parnopes is very low (Ruchin & Egorov 2017). Perhaps the overgrowth of glades and ravines with shrub vegetation and, as a consequence, degradation of host-wasps colonies, have a negative impact on this population (Orlovský et al. 2010). A similar situation is observed for the Apollo Butterfly Parnassius apollo (Linnaeus, 1758), whose habitat in the reserve is lost precisely because of the same reasons (Ruchin & Grishutkin 2018). In the case of Parnopes, however, the situation is not that bad, as very suitable habitats for host-wasps appeared during the fires of 2010. Another rare species that requires further study is S. hirta. This species as well as P. fastigiata gradually expand their range to the north (Ruchin & Artaev 2016).

A significant majority of the identified representatives of the emerald wasp family are brood parasites of digger wasps (Crabronidae) while some are brood parasites of the solitary Vespidae. We point out that in the overwhelming majority of cases, the hosts of the emerald wasps were also revealed during the course of research. The strength of brood parasite-host relations indicates the stability of biocenoses in MSNR.

Digger wasps (Sphecidae and Crabronidae) make up an important part of the Aculeata fauna (53.2%), counting 117 species. In forest biotopes, the prevailing species were compared to the terrestrial species (67.5%) as xylophile and rubicone (21.4%). Species of the genera Passaloecus and Trypoxylon make their nests in the wood in the finished galleries of wood-destroying insects while species of the genera Crossocerus and Ectemnius complete the galleries in the wood with their mouth organs. Almost all species nesting in the soil choose open sites with sparse vegetation, more or less flat (dry glades, roadsides and clearings, open areas with sandy face, and slopes of small pits). Sand is a drier
Wasp fauna of Mordovia State Nature Reserve and its surroundings
Ruchin & Antropov

Table 1. Contribution of MSNR to the vespine diversity of Mordovia.

<table>
<thead>
<tr>
<th>Families</th>
<th>Number of species in MSNR</th>
<th>Number of species in Mordovia (this study)</th>
<th>Vespine diversity of the reserve and the region (in %)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bethylidae</td>
<td>1</td>
<td>1</td>
<td>100</td>
</tr>
<tr>
<td>Chrysididae</td>
<td>31</td>
<td>41</td>
<td>75.6</td>
</tr>
<tr>
<td>Dryinidae</td>
<td>0</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Tiphinae</td>
<td>2</td>
<td>5</td>
<td>40.0</td>
</tr>
<tr>
<td>Mutillidae</td>
<td>2</td>
<td>3</td>
<td>66.7</td>
</tr>
<tr>
<td>Scoliidae</td>
<td>1</td>
<td>2</td>
<td>50.0</td>
</tr>
<tr>
<td>Pompilidae</td>
<td>28</td>
<td>38</td>
<td>73.7</td>
</tr>
<tr>
<td>Vespidae</td>
<td>37</td>
<td>47</td>
<td>78.7</td>
</tr>
<tr>
<td>Sphecidae</td>
<td>9</td>
<td>12</td>
<td>75.0</td>
</tr>
<tr>
<td>Crabronidae</td>
<td>108</td>
<td>132</td>
<td>81.8</td>
</tr>
<tr>
<td>Trigonalyidae</td>
<td>1</td>
<td>1</td>
<td>100</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>220</strong></td>
<td><strong>283</strong></td>
<td><strong>77.7</strong></td>
</tr>
</tbody>
</table>

and generally more favorable nesting substrate than clayey soil. Therefore, the greatest species diversity of digger wasps is typical for the central and eastern parts of the reserve, but not for the floodplain meadows of the western part where the grass cover is very dense. Some species of the Sphecidae family that were found in the adjacent territories were not recorded as part of the reserve fauna. This reduction is usually due to the overgrowth of biotopes necessary for Sphecidae (Kula & Tyrner 2003).

Most of the identified species of Sphecidae prey on Lepidoptera, Hymenoptera, and Aranei. In the Crabronidae family, a significant number of species consume medium and small spiders, whose fauna in the reserve is rich enough (Mikhailov & Trushina 2013; Ruchin et al. 2013). Some Crabronidae hunt for Diptera, Heteroptera, Homoptera (Cicadellidae, Psyllidae, Jassidae, and Fulgoridae), and Orthoptera.

MSNR is one of the oldest in Russia (Vargot 2016). According to paleoecological reconstructions (Novenko et al. 2017), since 5,000 years ago broad-leaved forests prevailed in suitable ecotopes on the territory of the reserve. Significant territories were also covered with pine forests, possibly with very little participation of spruce. Pine forests grew on poor sandy soils and in poorly drained habitats. This fully corresponds to the location of mixed coniferous-broad-leaved forests zone in the south. In addition, the territory refers to landscapes of the marshy woodland type, which are extrazonal boreal geosystems. Recent records of invertebrates from the territory of the reserve are very interesting and confirm its uniqueness (Mokrousov et al. 2011; Ruchin et al. 2013; Chikhlyaev & Ruchin 2014; Legalov et al. 2014; Egorov & Shapovalov 2017; Chursina & Ruchin 2018a, 2018b; Ruchin & Egorov 2018a, 2018b; Ruchin & Egorov 2018d; Ruchin et al. 2018. 2019; Ruchin & Mikhailenko 2018; Tomaszewska et al. 2018). Such an advantageous geographic location of the reserve at the edge of the forest-steppe and forest zone also significantly affects the species diversity and generally contributes to the biodiversity of the vespine species in the Republic of Mordavia Mordovia Republic (Table 1). Of the 283 species of wasps in Mordovia, 220 species (77.7%) are found within MSNR.

REFERENCES


Wasp fauna of Mordovia State Nature Reserve and its surroundings

Ruchin & Antropov


Monograph

Wasp fauna (Hymenoptera: Bethylidae, Chrysididae, Dryinidae, Tiphiidae, Mutillidae, Scoliidae, Pompilidae, Vespidae, Sphecidae, Crabronidae & Trigonalyidae) of Mordovia State Nature Reserve and its surroundings in Russia