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Caption: front cover - *Spheg funerarius* © P.V. Cherenkov; back cover - *Trichrysis cyanea* © P.V. Cherenkov.



WASP FAUNA (HYMENOPTERA: BETHYLIDAE, CHRYSIDIDAE, DRYINIDAE, TIPHIIDAE, MUTILLIDAE, SCOLIIDAE, POMPILIDAE, VESPIDAE, SPHECIDAE, CRABRONIDAE & TRIGONALYIDAE) OF MORDOVIA STATE NATURE RESERVE AND ITS SURROUNDINGS IN RUSSIA

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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 Bethyidae, 31 in Chrysididae, two in Tiphiidae, two in Mutillidae, one in Scolidae, 28 in Pompilidae, 37 in Vespidae, nine in Sphecidae, 108 in Crabronidae, and one in Trigonalidae. 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 deformе*, and *Scolia hirta*, to the north.

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

Russian abstract: Аннотация: В статье приведены сведения о 249 видах из 11 семейств осообразных двух районов Мордовии (включая Мордовский заповедник) и трех районов Нижегородской области (включая г. Саров). Из них 31 вид является новым для Республики Мордовия. Фауна отдельных семейств ос Мордовского заповедника представлена 220 видами: Bethyidae – 1 вид, Chrysididae – 31, Tiphiidae – 2, Mutillidae – 2, Scolidae – 1, Pompilidae – 28, Vespidae – 37, Sphecidae – 9, Crabronidae – 108, Trigonalidae – 1. Биоразнообразие осообразных заповедника очень высокое. Из 283 видов ос Мордовии 220 видов (77,7%) обитают в его пределах. Приводятся такие характеристики видов, как географическое распространение, некоторые аспекты биологии. Отмечены факты расширения ареалов в северном направлении трех видов: *Priocnemis fastigiata*, *Sceliphron deformе* и *Scolia hirta*.

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

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**ЗАПОВЕДНАЯ
МОРДОВИЯ**



НАУЧНО-ИССЛЕДОВАТЕЛЬСКИЙ
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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; Četković 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 321.62km². 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 burnts. 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 (Pushta, 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

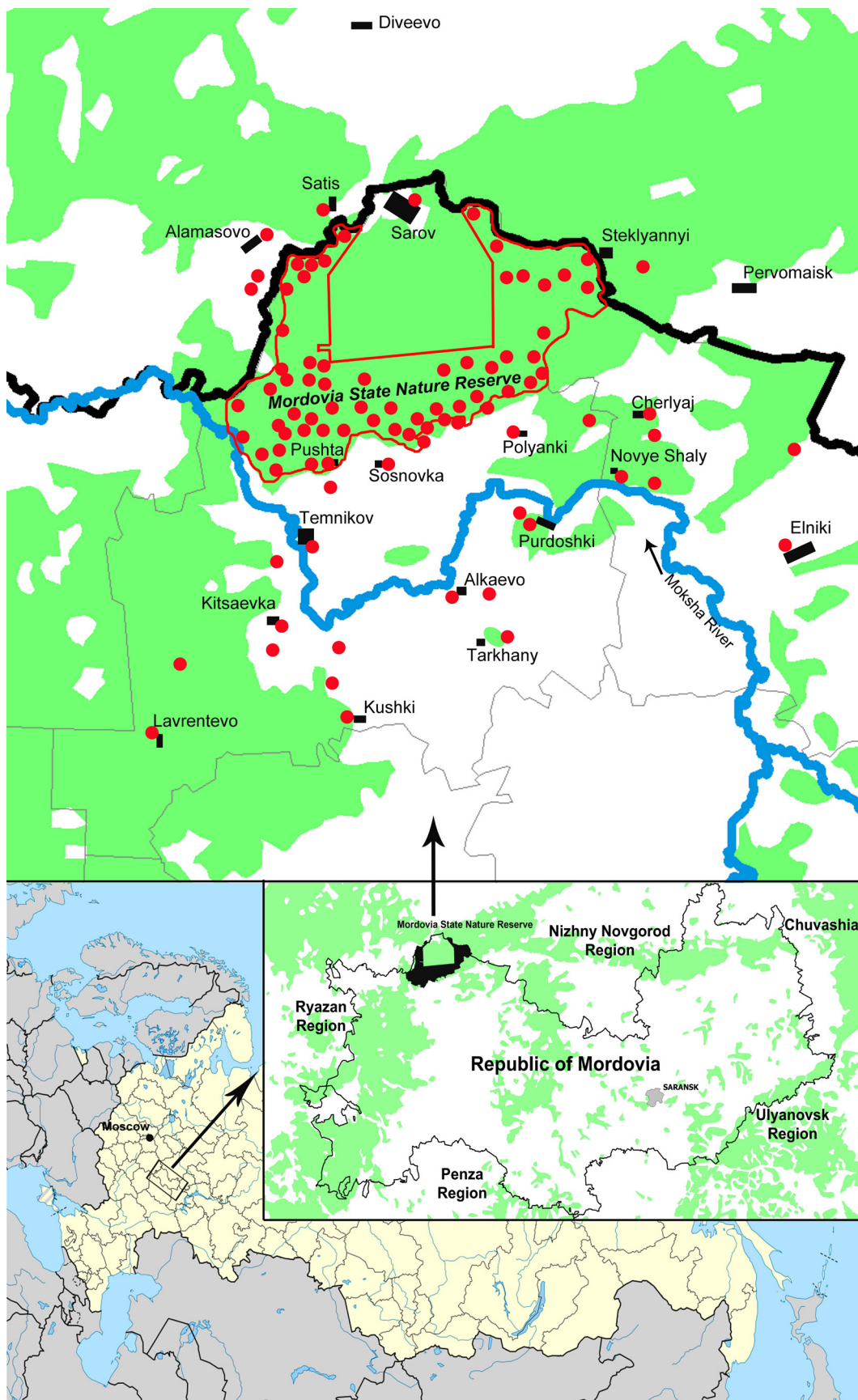


Figure 1. Map location of Mordovia State Nature Reserve and research sites (research sites of 2008, 2009, 2011–2017 are shown as red dots).



Image 1. Main biotopes of the Mordovia State Nature Reserve. A - floodplain meadow (quar. 401, © A.B. Ruchin), B - meadow near the Inorski cordon (© G.B. Semishin), C - sphagnum pine forest along sand dunes (quar. 336, © O.N. Artayev), D - birch forest (quar 420, © O.N. Artaev), E - glade (quar 446, © O.N. Artaev), F - pine forest with spruce (quar 383, © O.G. Grishutkin).

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 Chrysidoidea

Family Bethyridae

? *Epyris minor* Kieffer, 1906

Literature: Mokrousov et al. 2013.

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)

Literature: Mokrousov et al. 2013.

General distribution: Russia (the European part from 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

Literature: Ruchin & Antropov 2016.

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 centre and the south, including Crimea, Siberia, and Primorsky Krai), eastern Europe, Saudi Arabia, United Arab Emirates, Turkey, Turkmenistan, and Iran (Rosa et al. 2017a).

Remark: The species is confirmed in MSNR.

* *Elampus bidens* (Förster, 1853)

Material: RM: 1 female, 2.vii.2016, Temnikov Distr.,

Kushki (54°29'49" N 43°16'11"E).

General distribution: Russia (European part from the west and the centre, Siberia, and Amur region), the Mediterranean, Caucasus, Turkey, and Japan (Hokkaido, Honshu, Shikoku, and Kyushu) (Rosa et al. 2017a).

* *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, Urals, Altai, Buryatia, Transbaikalia, Amur region, and Primorsky Krai), Europe, northern Africa, and northern China (Móczár 1964; Rosa et al. 2017a).

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

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 bicolor* (Jurine, 1807), *M. equestris* (Fabricius, 1804), and *M. lutaria* (Fabricius, 1787) (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), Europe, and Turkey (Rosa et al. 2017a).

Biology: It is a brood parasite of digger wasps *Lindenus 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 northeastern China (Rosa et al. 2017a).

Biology: It is a brood parasite of digger wasps *Astata boops* (Schrank, 1781), *Tachysphex pompiliformis* (Panzer, 1804), 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, Mongolia, and central and northeastern China (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, eastern China, and Japan (Rosa et al. 2017a).

Biology: It is a brood parasite of digger wasps *Cerceris rbyensis* (Linnaeus, 1771) and *C. ruficornis* (Fabricius,

1793) (Crabronidae).

*** *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. Cherenkov (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, quar. 115 (54°51'46"N & 43°09'26"E); 1 female, 18.vii.2016, quar. 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, 9 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 from the northwest till Crimea, Urals, Tuva, and Siberia), Europe, Caucasus, and Abkhazia (Rosa et al. 2017a).

Biology: It is a brood parasite of digger wasps *Cerceris arenaria* (Linnaeus, 1758), *C. rbyensis* (Linnaeus, 1771), *C. quadrifasciata* (Panzer, 1799), and *C. quadricinta* (Panzer, 1799) (Crabronidae) (Polidori et al. 2010).

***Hedychrum rutilans* Dahlbom, 1854**

Literature: Mokrousov et al. 2013.

Material: NNR: 1 ex., 23.vi.2016, Sarov (54°55'08" N 43°17'40"E), coll. P.V. Cherenkov.

General distribution: Russia (the European part, including Crimea and northern Caucasus, Urals, and eastern Siberia), Europe, northern Africa, Turkey, Azerbaijan, and Georgia (Rosa et al. 2017a).

Biology: It is a brood parasite of digger wasps *Philanthus triangulum* (Fabricius, 1775) and *P. coronatus*

(Thunberg, 1784) (Crabronidae) (Polidori et al. 2010).

***Hedychrum virens* Dahlbom, 1854**

Literature: Ruchin & Antropov 2016.

Material: RM: 1 male, 12.vii.2014, Temnikov Distr., Alkaevo (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 *Passaloecus corniger* Shuckard, 1837, *P. eremita* Kohl, 1893, *P. gracilis* (Curtis, 1834), *P. singularis* Dahlbom, 1844, *P. turionum* Dahlbom, 1844, *Pemphredon 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.

Remark: The species is confirmed in MSNR.

*** *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* (Lepelletier, 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* Dhlb.).

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).

***Pseudomalus 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 *Passaloecus corniger* Shuckard, 1837, *P. eremita* Kohl, 1893, *P. insignis* (Vander Linden, 1829), *P. gracilis* (Curtis, 1834), *P. monilicornis* Dahlbom, 1842, *P. singularis* Dahlbom, 1844, *P. turionum* Dahlbom, 1844, *Pemphredon inornata* Say, 1824, *P. lethifer* (Shuckard, 1837), *P. lugens* Dahlbom, 1842, *P. lugubris* (Fabricius, 1793), *P. rugifer* (Dahlbom, 1844), and *Diodontus tristis*

(Vander Linden, 1829) (Crabronidae).

***Pseudomalus pussillus* (Fabricius, 1804)**

Literature: Plavilshchikov 1964 (as *Ellampus pusillus* 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 digger wasps *Passaloecus eremita* Kohl, 1893, *P. insignis* (Vander Linden, 1829), and *Pemphedron lethifer* (Shuckard, 1837) (Crabronidae).

Remark: The species is confirmed in MSNR.

Tribe Chrysidini

? *Chrysidea 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 andreoides* 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. pompiliformis* (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 *Syneodynerus 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.viii.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), *Allodynerus 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 crassicornis* (Panzer, 1798), and *S. murarius* (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, Caucasus, China, and Japan (Rosa et al. 2017a).

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

*** *Pseudochrysis neglecta* (Shuckard, 1836)**

Material: RM: 1 female, 31.v.2014, 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 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).

***Trichrysis cyanea* (Linnaeus, 1758)**

Literature: Mokrousov et al. 2009, 2013; Feoktistov 2011; Ruchin & Antropov 2014.

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, Amur region, Kamchatka, Khabarovsk Krai 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.

Material: RM: 1 female, 22.vii.2017, 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, 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 Aphrodinae] (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.

Material: RM: 1 female, 11.vii.2015, MSNR, 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 female, 27.vii.2014, quar. 384 (54°45'33"N & 43°12'44"E); 3 female, 12.vii.2014, 24.viii.2017, quar. 86 (54°53'38"N & 43°35'59"E); 1 female, 28.vii.2015, quar. 82 (54°53'12"N & 43°32'46"E); 5 female, 25.vii.2009, 23.viii.2017, 24.viii.2017, cord. Inorski (54°44'15"N & 43°08'53"E), coll. G.B. Semishin; 1 female, 19.vii.2016, quar. 330 (54°46'44"N & 43°11'09"E); 1 female, 24.vii.2016, quar. 399 (54°46'40"N & 43°27'27"E); 4 female, 24.viii.2017, quar. 368 (54°46'37"N & 43°21'45"E); 2 female, 1 male, 24.viii.2017, quar. 80 (54°53'11"N & 43°30'22"E); 1 female, 5.ix.2017, Pushta (54°42'50"N & 43°13'32"E); 1 female, 12.vii.2014, Temnikov Distr., Alkaevo (54°35'49"N & 43°22'35"E); 2 female, 24.vii.2016, Polyanki (54°44'27"N & 43°29'04"E); 2 female, 19.vii.2015, 22.vii.2017, Elniki Distr., Malye Mordovskie Poshaty (54°41'00"N & 43°43'50"E); 2 female, 19.vii.2015, 22.vii.2017, Novye Shaly (54°42'13"N & 43°38'25"E); 2 female, 23.vii.2016, Novoyamskaya Sloboda (54°44'24"N & 43°42'59"E); 2 female, 23.vii.2016, Cherlyaj (54°45'53"N & 43°40'58"E).

General distribution: Russia (the European part, Urals, eastern Siberia, and Amur region), Europe, northern Africa, Turkey, Iran, Tajikistan, Kyrgyzstan, Kazakhstan, Mongolia, and North America as a result of accidental importation (Mokrousov & Lelej 2017).

Biology: It occurs from July to September. Parasite of larvae of *Amphimallon solstiale* (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 Mutillidae

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 *Lindenius albilabris* (Fabricius, 1793), *L. panzeri* (Vander Linden, 1829), *Crabro peltarius* (Schreber, 1784), *Crossocerus palmipes* (Linnaeus, 1767), *C. wesmaeli* (Vander Linden, 1829), *Diodontus tristis* (Vander Linden, 1829), and *Oxybelus uniglumis* (Linnaeus, 1758) (Crabronidae).

Smicromyrme rufipes (Fabricius, 1787)

Literature: Mokrousov et al. 2013.

Material: RM: 1 male, 3.vii.2016, MSNR, quar. 338 (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 *Evagetes* [Pompilidae], of digger wasps *Astata boops* (Schrank, 1781), *Tachysphex*, *Miscophus spurius* (Dahlbom, 1832), *Palarus variegatus* (Fabricius, 1781), *Oxybelus bipunctatus* Olivier, 1812, *O. uniglumis* (Linnaeus, 1758), *Crossocerus wesmaeli* (Vander Linden, 1829), and *Cerceris arenaria* (Linnaeus, 1758) (Crabronidae), as well as of solitary bees *Halictus* [Apidae, Halictinae] and *Andrena* (Apidae, Andreninae).

Family Scoliidæ***Scolia hirta* Schrank, 1781**

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

Material: RM: 1 ex., 15.vii.2017, MSNR, Pushta (54°42'50"N & 43°13'32"E); NNR: 6.viii.2014, 8.viii.2014, 9.ix.2017, Sarov (54°55'08" N 43°17'40"E), 4 ex., coll. P.V. Cherenkov (Image 3).

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 Ceropalinae*****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, Sakhalin, and Kuril Islands), Europe, northern Africa, Cyprus, Armenia, Azerbaijan, Georgia, Israel, Lebanon, Jordan, Turkey, Syria, Iran, Iraq, Turkmenistan, Kazakhstan, Kyrgyzstan, Mongolia, China, Korea, and Japan (Honshu) (Loktionov & Lelej 2017).

Biology: Brood parasite of spider wasps *Priocnemis exaltata* (Fabricius, 1775), *Agenioideus cinctellus* (Spinola, 1807), *Anoplius infuscatus* (Vander Linden, 1827), *A. nigerrimus* (Scopoli, 1763), *A. viaticus* (Linnaeus, 1758), *Arachnospila anceps* (Wesmael, 1851), *A. rufa* (Haupt, 1927), *Auplopus carbonarius* (Scopoli, 1763), and *Episyron rufipes* (Linnaeus, 1758) (Pompilidae).

Subfamily Pepsinae***Auplopus carbonarius* (Scopoli, 1763)**

Literature: Mokrousov et al. 2013; Ruchin &

Antropov 2014.

Material: RM: 1 female, 15.vi.2016, MSNR, quar. 429 (54°44'31"N & 43°14'59"E); 1 female, 28.vi.2015, quar. 249 (54°49'39"N & 43°32'08"E); 1 female, 16.vii.2017, cord. Podrubnyi (54°47'51"N & 43°08'48"E); 1 female, 19.v.2014, cord. Podrubnyi, 1 female, 6.viii.2017, cord. Inorski (54°44'15"N & 43°08'53"E), coll. G.B. Semishin; 12 female, 19.v.2014, 18.vii.2014, 19.vii.2015, 5.vii.2016, 21.vii.2016, 23.vii.2016, 5.viii.2016, 11.vii.2017, 23.vii.2017, 24.vii.2017, 5.ix.2017, 18.ix.2017, Pushta (54°42'50"N & 43°13'32"E).

General distribution: Russia (the European part, Altai, western and eastern Siberia, Amur and Magadan regions, and 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, Gnaphosidae, Agelenidae, Thomisidae, Lycosidae, Segestroodae, and Anyphaenidae. During transportation, the female usually separates the legs of the victim. Predators: parasitoid wasps *Picardiella melano-leuca* (Gravenhorst, 1829) (Ichneumonidae).

***Caliadurgus fasciatellus* (Spinola, 1808)**

Literature: Mokrousov et al. 2009, 2013.

Material: RM: 1 female, 17.viii.2014, MSNR, quar. 397 (54°46'17"N & 43°25'44"E); 1 female, 23.vii.2016, Elniki 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).

– *Cryptocheilus octomaculatus* (Rossi, 1790)

Literature: Plavilshchikov 1964 (as *Pompilus*

quadripunctatus F.).

General distribution: Russia (the European part (the south, northern Caucasus, and Crimea)) (Tobias 1978); Europe (western, southern, and eastern), Morocco, Algeria, Tunisia, Turkey, Cyprus, Syria, Israel, Iran, Kyrgyzstan, Turkmenistan, and Tajikistan (Ghahari et al. 2014; Loktionov & Lelej 2017).

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

***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 (Eversmann 1849; Tobias 1978; Loktionov & Lelej 2017).

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

***Deuteraenia 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, Urals, Siberia, Amur and Magadan regions, Khabarovsk Krai and Primorsky Krai, and Sakhalin), Europe, Georgia, Kazakhstan, Kirghizia, Korea, and Japan (Hokkaido, Honshu, Shikoku, and Kyushu) (Loktionov & Lelej 2017).

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

Remark: The species is confirmed in MSNR.

***Deuteraenia vechti* Day, 1979**

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

Material: RM: 1 female, 10.vii.2014, MSNR, cord. Inorski (54°44'15"N & 43°08'53"E), coll. G.B. Semishin.

General distribution: Russia (the European part from the northwest to the southeast, Urals, Siberia, Amur and Magadan regions, Chukotka, Khabarovsk Krai and Primorsky Krai, Sakhalin, and Kuril Islands), Europe, Kazakhstan, Kyrgyzstan, and Japan (Hokkaido, Honshu) (Loktionov & Lelej 2017).

Biology: They build nests in abandoned xylophagous

tunnels in wood. Prey: spiders Clubiona (Clubionidae).

***Priocnemis agilis* (Shuckard, 1837)**

Literature: Mokrousov et al. 2013.

General distribution: Russia (the European part from the northwest till Crimea and northern Caucasus, Altai, and Irkutsk region), Europe, Cyprus, Turkey, Uzbekistan, Kazakhstan, and Kyrgyzstan.

***Priocnemis cordivalvata* Haupt, 1927**

Literature: Redikortsev 1938 (*Priocnemis cordivalvatus* Hpt.); Plavilshchikov 1964 (*Priocnemis cordivalvatus* Hpt.); Mokrousov et al. 2013.

General distribution: Russia (the European part from the northwest to northern Caucasus, Krasnoyarsk Krai, and Irkutsk region), Europe, central Asia, and Mongolia (Loktionov & Lelej 2017).

***Priocnemis coriacea* Dahlbom, 1843**

Literature: Ruchin et al. 2009.

Material: RM: 1 male, 11.v.2016, MSNR, quar. 448 (54°42'37"N & 43°12'29"E).

General distribution: Russia (the European part from the centre till Crimea and northern Caucasus, and Urals), Europe, and Turkey (Loktionov & Lelej 2017).

Biology: Prey: spiders Lycosidae and Gnaphosidae.

Remark: The species is confirmed in MSNR.

***Priocnemis exaltata* (Fabricius, 1775)**

Literature: Redikortsev 1938 (*Priocnemis gibbus* Scop.); Plavilshchikov 1964 (*Priocnemis exultatus* Pz., *Priocnemis gibbus* Scop.); Mokrousov et al. 2013; Ruchin & Antropov 2014.

Material: RM: 1 female, 18.vii.2016, MSNR, quar. 331 (54°46'43"N & 43°12'37"E); 1 female, 9.viii.2014, quar. 413 (54°45'12"N & 43°16'54"E); 1 female, 22.viii.2015, quar. 434 (54°45'04"N & 43°19'02"E); 2 female, 11.vii.2015, cord. Podrubnyi (54°47'51"N & 43°08'48"E); 1 female, 13.viii.2016, quar. 446 (54°43'13"N & 43°13'23"E); 1 female, 24.viii.2017, 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.

*** *Priocnemis fastigiata* Haupt, 1934**

Material: RM: 1 female, 6.viii.2017, MSNR, quar. 420 (54°45'29"N & 43°24'19"E); 1 female, 23.vii.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 gussakowskiji* 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).

***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 schiødtei* 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).

Biology: Nests in sandy soil, often under rocks. Prey: spiders *Arctosa stigmata* (Thorell, 1875), *Pardosa amentata* (Clerck, 1757), *P. lugubris* (Walckenaer), *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.viii.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, Irkutsk Region, Amur region, Khabarovsk Krai and Primorsky Krai, Sakhalin, and Kuril Islands), Europe, Cyprus, Algeria, Egypt, Jordan, Iran, Turkmenistan, Uzbekistan, Kyrgyzstan, Mongolia, northern China, Korea, and Japan (Hokkaido, Honshu, Shikoku, Kyushu, and Ryukyu) (Loktionov & Lelej 2017).

Biology: 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 *Apoplous 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).

Biology: 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.

***Anoplius viaticus* (Linnaeus, 1758)**

Literature: Redikortsev 1938 (as *Apoplous fuscus* F.);

Plavilshchikov 1964 (as *Anoplius fuscus* F.); Mokrousov et al. 2009; Feoktistov 2011; Ruchin & Antropov 2014.

Material: RM: 1 female, 20.iv.2014, MSNR, quar. 434 (54°45'04"N & 43°19'02"E); 1 female, 27.v.2016, quar. 360 (54°46'13"N & 43°13'31"E); 1 female, 15.v.2017, quar. 302 (54°47'15"N & 43°11'26"E); 2 male, 1.vii.2016, quar. 379 (54°45'17"N & 43°07'51"E); 1 female, 13.viii.2016, quar. 446 (54°43'13"N & 43°13'23"E); 3 female, 11.v.2015, 14.V.2017, cord. Inorski (54°44'15"N & 43°08'53"E); 1 female, 12.v.2013, Temnikov Distr., Kitsaevka (54°36'04"N & 43°10'03"E); 1 male, 24.vii.2016, Polyanki (54°44'27"N & 43°29'04"E); 1 male, 22.vii.2017, 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 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).

Biology: Prey: spiders *Alopecosa pulverulenta* (Clerck, 1775), *A. aculeata* (Clerck, 1775), *A. cuneata* (Clerck, 1775), *Dolomedes*, *Pisaura mirabilis* (Clerck, 1775) (Pisauridae), *Arctosa*, *Pardosa paludicola* (Clerck, 1775), *P. lugubris* (Walckenaer, 1802), *P. palustris* (Linnaeus, 1758), *Pirata piraticus* (Clerck, 1757), *Trochosa terricola* Thorell, 1856, *T. ruricola* (De Geer, 1778), *T. spinipalpis* (F.O. Pickard-Cambridge, 1895) (Lycosidae), *Drassodes lapidosus* (Walckenaer, 1802), *Haplodrassus signifer* (C.L. Koch, 1839) (Gnaphosidae), *Aelurillus*, *Evarcha arcuata* (Clerck, 1757) (Salticidae), *Agelena* (Agelenidae), *Agroeca brunnea* (Blackwall, 1833) (Liocranidae), and *Thanatus formicinus* (Clerck, 1757) (Philodromidae).

***Arachnospila anceps* (Wesmael, 1851)**

Literature: Mokrousov et al. 2013.

General distribution: Russia (the European part from the northwest till Crimea and northern Caucasus, Altai, eastern Siberia, Amur and Magadan regions, Kamchatka, and Chukotka), Europe, Turkey, Syria, Iran, Kazakhstan, Kyrgyzstan, and Mongolia (Loktionov & Lelej 2017).

Biology: Nests in loose soil. Prey: spiders Agelenidae, Clubionidae, Gnaphosidae, Lycosidae, Salticidae, and Thomisidae. Predators: brood parasites *Ceropaes maculata* (Fabricius, 1775) and *Evagetes crassicornis* (Shuckard, 1837).

*** *Arachnospila minutula* (Dahlbom, 1842)**

Material: RM: 1 female, 13.vi.2016, MSNR, 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, Buryatia, Transbaikalia, Amur region, and Khabarovsk Krai and Primorsky Krai), Europe, the Middle East, Turkey, Kazakhstan, Kyrgyzstan, and Mongolia (Loktionov & Lelej 2017).

Biology: Nests in loose soil. Prey: Agelenidae, Clubionidae, Gnaphosidae, Lycosidae, Salticidae, and Thomisidae.

***Arachnospila spissa* (Schioedte, 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.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, Amur and Magadan regions, Kamchatka, and Chukotka), Europe, the Middle East, Turkey, Kazakhstan, Kyrgyzstan, Tajikistan, and Mongolia (Loktionov & Lelej 2017).

Biology: Nests in the soil. Prey: spiders Agelenidae, Clubionidae, Gnaphosidae, Lycosidae, Salticidae, and Thomisidae. Predators: brood parasites *Evagetes crassicornis* (Shuckard, 1837) (Pompilidae).

? *Arachnospila wesmaeli* (Thomson, 1870)

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

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.vii.2016, Elniki Distr., Malye Mordovskie Poshaty (54°41'00"N & 43°43'50"E); NNR: 2 ex., 27.vii.2014, Voznesenskoe Distr., Alamasovo (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, Cyprus, 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 *Argiope* (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, and Sakhalin), 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

(Loktionov & Lelej 2017).

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

***Homonotus sanguinolentus* (Fabricius, 1793)**

Literature: Mokrousov et al. 2013.

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

Biology: Prey: spiders *Chiracanthium* (Clubionidae).

*** *Pompilus cinereus* (Fabricius, 1775)**

Material: RM: 1 female, 2.vii.2016, Temnikov Distr., Kushki (54°29'49" N 43°16'11"E).

General distribution: Russia (the European part from the northwest till Crimea and northern Caucasus, Amur region, and Primorsky Krai), Europe, Algeria, Tunisia, Egypt, Israel, Cyprus, Turkey, Pakistan, northern and southeastern China, Korea, Japan (Honshu, Kyushu, and Ryukyu), and Afrotropical, Oriental, and Australian regions (Loktionov & Lelej 2017).

Biology: Nests in sandy soil. Prey: spiders *Zoropsis* [Zoropsidae], *Aelurillus* [Salticidae], *Xysticus* [Thomisidae], *Chiracanthium*, *Zora* [Clubionidae], *Arctosa*, *Alopecosa*, *Lycosa*, *Xerolycosa*, *Pirata*, *Trochosa* [Lycosidae], *Araneus*, and *Dolomedes* (Araneidae).

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.

Material: RM: 1 female, 13.v.2014, MSNR, quar. 360 (54°46'13"N & 43°13'31"E); 1 female, 9.vi.2016, quar. 331 (54°46'43"N & 43°12'37"E); 1 male, 31.v.2014, cord. Taratinski (54°44'43"N & 43°05'14"E); 1 female, 29.vi.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, Khabarovsk Krai and Primorsky Krai, and Sakhalin), Europe, Turkey, Caucasus, Afghanistan, India, Kazakhstan, Kyrgyzstan, Mongolia, northeastern China, Japan (Hokkaido and Honshu), and North America (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), 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)**

Literature: Mokrousov et al. 2013.

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 (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) (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 (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 Curculionidae and Chrysomelidae. Predators: emerald wasps *Chrysis ignita* (Linnaeus, 1758) and *Ch. schencki* Linsenmaier, 1968.

Remark: The species is confirmed in MSNR.

***Ancistrocerus ichneumonideus* (Ratzeburg, 1844)**

Literature: Ruchin & Antropov 2016.

General distribution: Russia (the European part from the northwest to the northern Caucasus, Urals, Altai, and eastern Siberia), Europe, Turkey, Caucasus, Kazakhstan, and Mongolia (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 Tenthredinidae and larvae of Curculionidae and Chrysomelidae.

***Ancistrocerus nigricornis* (Curtis, 1826)**

Literature: Redikortsev 1938 (as *Odynerus callosus* Thoms.); Plavilshchikov 1964 (as *Odynerus callosus* Thms.); Mokrousov et al. 2009, 2013; Ruchin et al. 2009; Ruchin & Antropov 2014.

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.viii.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., 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, Khabarovsk Krai and Primorsky Krai, and Sakhalin), Europe, northern Africa, Kazakhstan, central Asia, Iran, India, 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. Schencki* Linsenmaier, 1968, and *C. terminata* Dahlbom, 1854 (Chrysididae).

***Ancistrocerus parietinus* (Linnaeus, 1761)**

Literature: Mokrousov et al. 2013.

Material: RM: 11 female, 28.vii.2015, MSNR, quar. 79 (54°53'11"N & 43°29'18"E); 1 female, 13.vii.2017, cord. Inorski (54°44'15"N & 43°08'53"E), coll. G.B. Semishin; 4 female, 12–16.v.2014, 27.v.2014, Pushta (54°42'50"N & 43°13'32"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, Turkey, Caucasus, Kazakhstan, Iran, Mongolia, Korea, and Japan

(Hokkaido) (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 (Chrysididae).

***Ancistrocerus parietum* (Linnaeus, 1758)**

Literature: Plavilshchikov 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, ? 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) (Chrysididae).

***Ancistrocerus trifasciatus* (Müller, 1776)**

Literature: Redikortsev 1938 (as *Odynerus trifasciatus* F.); Plavilshchikov 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 (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 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).

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 angustula* Schenck, 1856, *C. ignita* (Linnaeus, 1758), *C. impressa* Schenck, 1856, *C. mediata* Linsenmaier, 1951, *C. schencki* Linsenmaier, 1968, *C. solida* Haupt, 1957, and *C. subcoriacea* Linsenmaier, 1959 (Chrysididae).

***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 Ryukyu) (Fateryga 2017).

Biology: Nests in the abandoned tunnels of the beetle larvae in the wood. Prey: small caterpillars (Cochylidae, Pyralidae, Tortricidae, Gelechiidae, Eucosmidae, and Pyraustidae), less often false larvae of sawflies (Pamphilidae). 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, Siberia, Amur and Magadan regions, and Khabarovsk Krai and Primorsky Krai), Europe, northern Africa, Israel, Jordan, Cyprus, Turkey, Syria, Iran, Kazakhstan, central Asia, Mongolia, China, and Japan (Honshu, Shikoku, and Kyushu) (Fateryga 2017).

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, Pyraustidae, and

others), less often false larvae of sawflies (Cimbicidae). Predators: emerald wasps *Chrysis impressa* Schenck, 1856, *C. inaequalis* Dahlbom, 1845, and *C. splendidula* Rossi, 1790 (Chrysididae).

Remark: The species is confirmed in MSNR.

***Eumenes coronatus* (Panzer, 1799)**

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

Material: RM: 1 female, 22.viii.2015, MSNR, quar. 342 (54°46'21"N & 43°23'23"E); 1 female, 4.viii.2017, quar. 413 (54°45'12"N & 43°16'54"E); 1 female, 13.vii.2017, quar. 347 (54°47'34"N & 43°28'31"E); 1 female, 4.viii.2017, cord. Inorski (54°44'15"N & 43°08'53"E), coll. G.B. Semishin; 1 male, 7.viii.2017, cord. Pavlovski (54°45'15"N & 43°24'03"E), coll. G.B. Semishin; 1 female, 20.vii.2017, 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, 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).

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). Predators: emerald wasps *Hedychrum rutilans* Dahlbom, 1854 and *Chrysis ruddii* Shuckard, 1837 (Chrysididae).

***Eumenes pedunculatus* (Panzer, 1799)**

Literature: Mokrousov et al. 2009, 2013; Feoktistov 2011; Ruchin & Antropov 2014.

Material: RM: 1 female, 24.viii.2017, MSNR, quar. 80 (54°53'11"N & 43°30'22"E); 1 male, 20.viii.2016, quar. 417 (54°45'23"N & 43°20'56"E); 1 male, 13.viii.2016, quar. 446 (54°43'13"N & 43°13'23"E); 1 male, 6.viii.2017, quar. 419 (54°45'39"N & 43°22'50"E); 1 male, 2.vii.2017, cord. Inorski (54°44'15"N & 43°08'53"E); 1 male, 21.v.2017, Temnikov Distr., Russkoe Karaevo (54°40'55"N, 43°13'52"E); 1 male, 15.vi.2017, Tyuveevo (54°39'45"N & 43°14'43"E); 3 male, 23.vii.2016, 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 to the centre and the east, Urals, Siberia, Primorsky Krai, and Sakhalin), Europe, Turkey, Kazakhstan, Mongolia, and southwestern China

(Fateryga 2017).

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)**

Material: RM: 1 female, 18.vi.2017, MSNR, 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, 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).

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-Ménéville, 1842, *C. pseudobrevitarsis* Linsenmaier, 1951, *C. sexdentata* Christ, 1791, *C. solida* Haupt, 1957, and *C. zetterstedti* Dahlbom, 1845 (Chrysididae).

***Euodynerus quadrifasciatus* (Fabricius, 1793)**

Literature: Ruchin & Antropov 2016.

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, 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-Ménéville, 1842 and *C. pseudobrevitarsis* Linsenmaier, 1951 (Chrysididae).

***Gymnomerus laevipes* (Shuckard, 1837)**

Literature: Ruchin & Antropov 2016.

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).

Biology: Nests in hollow stems of herbaceous plants or in branches of bushes with a soft core. Prey: larvae of snout beetles *Phytonomus* (Curculionidae) and, probably, caterpillars of Microlepidoptera. Predators: emerald wasps *Chrysis ignita* (Linnaeus, 1758), *C. indigotea* Dufour & Perris, 1840, *C. rutilans* Olivier, 1791, *C. splendidula* Rossi, 1790, and *Pseudochrysis neglecta* (Shuckard, 1836) (Chrysididae).

***Microdynerus parvulus* (Herrich-Schäffer 1838)**

Literature: Mokrousov et al. 2013.

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).

Biology: Nests in hollow stems of herbaceous plants or in branches of bushes with a soft core. Prey: small larvae of snout beetles (Curculionidae). Predators: emerald wasps *Chrysis gracillima* Förster, 1853 (Chrysididae).

***Odynerus reniformis* (Gmelin, 1790)**

Literature: Mokrousov et al. 2009.

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 *Phytonomus* (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 simillimus* F. Morawitz, 1867**

Literature: Ruchin & Antropov 2014.

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 Tortricidae, 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 Tortricidae, Psychidae, Blastobasidae, Eucosmidae, Gelechiidae, Lithocolletidae, and Pyralidae, less often larvae of leaf beetles (Chrysomelidae).

Remark: The species is confirmed in MSNR.

Symmorphus bifasciatus (Linnaeus, 1761)

Literature: Redikortsev 1938 (as *Odynerus sinuatus*

F. and *O. bifasciatus* L.); Plavilshchikov 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 *Linnaeidea* and *Plagiodera* as well (Budrienė 2003). Predators: emerald wasps *Chrysis angustula* Schenck, 1856, *C. fulgida* Linnaeus, 1761, and *C. ignita* (Linnaeus, 1758) (Chrysididae).

** *Symmorphus connexus* (Curtis, 1826)

Material: RM: 1 male, 13.vi.2016, MSNR, quar. 421 (54°43'52"N, 43°07'06"E).

General distribution: Russia (the north and the centre of the European part and Altai), Europe, Caucasus, Turkey, and Kazakhstan (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). Predators: emerald wasps *Chrysis angustula* Schenck, 1856 (Chrysididae).

Symmorphus crassicornis (Panzer, 1798)

Literature: Mokrousov et al. 2009, 2013; Feoktistov 2011; Ruchin & Antropov 2014.

Material: RM: 1 male, 28.vii.2015, MSNR, quar. 82 (54°53'12"N & 43°32'46"E); 1 female, 27.v.2014, Pushta

(54°42'50"N & 43°13'32"E).

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) (Budrienė 2003). Predators: emerald wasps *Chrysis fulgida* Linnaeus, 1761, *C. iris* Christ, 1791, and *C. longula* Abeille de Perrin, 1879 (Chrysididae).

*** *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.vii.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, Amur 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).

***Symmorphus gracilis* (Brullé, 1832)**

Literature: Ruchin & Antropov 2016.

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.vii.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) (Budrienė 2003). Predators: *Chrysis fulgida* Linnaeus, 1761, *C. iris* Christ, 1791, and *C. longula* Abeille de Perrin, 1879 (Chrysididae).

Remark: The species is confirmed in MSNR.

Subfamily Polistinae

*** *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)).

Material: RM: 1 female, 29.v.2016, MSNR, quar. 142 (54°51'12"N & 43°09'21"E); 1 female, 15.vii.2017, quar. 324 (54°46'28"N & 43°05'40"E); 1 female, 12.ix.2017, quar. 115 (54°51'46"N & 43°09'26"E); 1 female, 12.vii.2016, Temnikov Distr., Alkaevo (54°35'49"N & 43°22'35"E); 1 female, 22.vii.2017, Elniki Distr., Novye Shaly (54°42'13"N & 43°38'25"E); 1 female, 22.vii.2017, Malye Mordovskie Poshaty (54°41'00"N & 43°43'50"E); NNR: 1 female, 4.vii.2017, Voznesenskoe Distr., Zarya (54°50'08"N & 43°07'08"E).

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 *Pollistes 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 (*Pollistes opinabilis* Kohl); Ruchin et al. 2009; Mokrousov et al. 2013 (*Pollistes 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.ix.2015, quar. 430 (54°44'34"N & 43°16'00"E); 1 female, 20.iv.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.v.2015, cord. Inorski (54°44'15"N & 43°08'53"E); 2 female, 19.vii.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., Tretyakovo (54°31'44"N & 43°13'18"E); 3 male, 5.viii.2015, 15.viii.2015, Alkaevo (54°35'49"N & 43°22'35"E); 1 female, 1 male, 24.vii.2016, Polyanki (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, Cherlyaj (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 Vespinae

***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.vii.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. Drozhdenovski (54°44'31"N & 43°17'24"E); 3 ex., 27.v.2014, 1.ix.2014, Pushta (54°42'50"N & 43°13'32"E); 1 ex., 17.v.2014, Temnikov Distr., Tretyakovo (54°31'44"N & 43°13'18"E); 1 ex., 15.viii.2015, Alkaevo (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, Cherlyaj (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.viii.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.); Pavilshchikov 1964 (as *Vespula 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 Caucasus, 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 2014.

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.vii.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 Caucasus, 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: Pavilshchikov 1964 (as *Vespula sylvestris* 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.vii.2016, quar. 398 (54°46'22"N & 43°25'48"E); 1 female, 1 male, 19.vii.2015, 23.vii.2016, Elniki Distr., Malye Mordovskie Poshaty (54°41'00"N & 43°43'50"E); 1 male, 23.vii.2016, 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, 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.

Material: RM: 1 female, 12.ix.2017, MSNR, quar. 115 (54°51'46"N & 43°09'26"E); 2 female, 9.ix.2016, 12.ix.2017, cord. Plotomoika (54°53'36"N & 43°09'41"E); 3 female, 17.vii.2017, 5.ix.2017, 29.ix.2017, Pushta (54°42'50"N & 43°13'32"E); 1 female, 23.vii.2016, Elniki Distr., Cherlyaj (54°45'53"N & 43°40'58"E); NNR: 1 ex., 31.viii.2014, 4.x.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, northern Africa, Israel, Jordan, Lebanon, Turkey, Armenia, Georgia, Kazakhstan, Uzbekistan, Turkmenistan, Tajikistan, Syria, Iraq, Iran, Afghanistan, Pakistan, India, Mongolia, China, and Korea. The species was accidentally introduced with commercial cargo to Iceland, Madeira, Azores and Canary Islands, South Africa, Australia, Tasmania, New Zealand, Fr. Ascension, Fr. Norfolk, Hawaii, and northern (USA and Canada) and southern (Argentina and Chile) America.

Biology: Nests have a gray undulating outer shell, with short posts on the outside, located mainly in underground cavities (abandoned mammalian burrows) or under buildings. The species is quite common in the reserve. As in other parts of the range (Dvořák 2007), it prefers glades, clearings, meadows, and forest edges. An immature nest does not have an entrance tube. Prey: various Diptera. The family development cycle is long, from May to October (Edwards & Telfer 2002).

***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.viii.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.viii.2016, quar. 427 (54°44'30"N & 43°12'49"E); 1 female, 31.vii.2015, Pushta (54°42'50"N

& 43°13'32"E); 1 female, 21.v.2017, Temnikov Distr., Russkoe Karaevo (54°40'55"N, 43°13'52"E); 1 female, 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 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).

Biology: Round nests have a gray loose 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.

Material: RM: 1 female, 28.vii.2015, MSNR, quar. 82 (54°53'12"N & 43°32'46"E); 1 female, 20.vii.2015, quar. 301 (54°47'19"N & 43°10'36"E); 1 female, 22.viii.2015, quar. 342 (54°46'21"N & 43°23'23"E); 3 female, 24.viii.2014, 10.v.2015, quar. 368 (54°46'37"N & 43°21'45"E); 1 female, 22.viii.2015, quar. 396; 1 female, 26.v.2015, quar. 447 (54°43'14"N & 43°13'39"E); 1 female, 12.vii.2014, quar. 86 (54°53'38"N & 43°35'59"E); 1 female, 15.v.2015, 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); 1 female, 13.viii.2016, quar. 446 (54°43'13"N & 43°13'23"E); 1 female, 21.v.2017, quar. 421 (54°43'52"N, 43°07'06"E); 1 female, 13.vii.2014, cord. Novenkovski (54°55'53"N & 43°25'18"E); 1 female, 16.v.2014, cord. Srednayay Melnitsa (54°54'09"N & 43°13'53"E), coll. L.V. Egorov; 2 female, 11.v.2015, 28.vi.2015, cord. Inorski (54°44'15"N & 43°08'53"E); 2 female, 16.vii.2016, 31.v.2016, Pushta (54°42'50"N & 43°13'32"E); 1 female, 23.vii.2016, Elniki Distr., Cherlyaj (54°45'53"N & 43°40'58"E); NNR: 1 ex., 6.viii.2014, Sarov (54°55'08" N 43°17'40"E), coll. P.V. Cherenkov; 1 ex., 7.ix.2014, Voznesenskoe Distr., Alamasovo (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, Siberia, Amur and Magadan regions, Chukotka, Kamchatka, Khabarovsk Krai and Primorsky Krai, Sakhalin, and Kuril Islands), Europe, Turkey,

Georgia, Kazakhstan, Kyrgyzstan, Iran, India, Mongolia, southwestern and northeastern China, Korea, and Japan (Hokkaido and Honshu). As a result of accidental importation, it acclimatized in Iceland, Australia, New Zealand, Mauri, and Hawaii (Antropov 2017a).

Biology: Nests have an ochreish undulating outer shell, without any posts on the outside, located mainly in underground cavities (abandoned mammalian burrows) or in wall cavities and under buildings. An immature nest does not have an entrance tube. Prey: various Diptera. The family development cycle is long, from May to October (Edwards & Telfer 2002). It is the most widespread and numerous species of social wasps in the reserve.

Superfamily Apoidea

Family Sphecidae

Subfamily Ammophilinae

Ammophila campestris (Latreille, 1809)

Literature: Mokrousov et al. 2013.

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).

Biology: Nests in clay or dense sandy soil. Prey: caterpillars of Geometridae, Pieridae, and Noctuidae and false larvae of sawflies (Tentredinidae). Predators: flies *Metopia* (Sarcophagidae).

Ammophila pubescens Curtis, 1836

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. 142 (54°51'12"N & 43°09'21"E); 1 female, 18.vi.2016, quar. 115 (54°51'46"N & 43°09'26"E); 1 male, 13.vii.2017, quar. 319 (54°48'09"N & 43°28'25"E); 4.vi.2017, 1 female, cord. Inorski, coll. G.B. Semishin, 2.vii.2017, 1 male, cord. Inorski (54°44'15"N & 43°08'53"E); 1 female, 22.vii.2017, Elniki Distr., Novoyamskaya Sloboda (54°44'24"N & 43°42'59"E); 2 female, 1 male, 31.v.2014, 22.vii.2017, Malye Mordovskie Poshaty (54°41'00"N & 43°43'50"E); NNR: 3 female, 4.vii.2017, 16.vii.2017, Voznesenskoe Distr., Zarya (54°50'08"N & 43°07'08"E); 1 female, 16.vii.2017, Svobodnyi (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, and Khabarovsk Krai 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).

Ammophila sabulosa (Linnaeus, 1758)

Literature: Pavilshchikov 1964; Ruchin et al. 2009; Mokrousov et al. 2009, 2013; Ruchin & Antropov 2014.

Material: RM: 2 female, 23.viii.2015, MSNR, quar. 360 (54°46'13"N & 43°13'31"E); 1 female, 17.viii.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.viii.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.vii.2016, Temnikov Distr., Polyanki (54°44'27"N & 43°29'04"E); 1 female, 23.vii.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).

Biology: Nests in dense sandy soil, sometimes on steep slopes with coarse-grained soil. Prey: large naked caterpillars of Geometridae, Limntriidae, Pieridae, Notodontidae, and Noctuidae (Casiraghi et al. 2001b; Kazenas 2001). Predators: some Ichneumonidae (Casiraghi et al. 2001a).

? *Ammophila terminata* F. Smith, 1856

Literature: Feoktistov 2011.

General distribution: Russia (the European part

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 owl 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 (54°47'19"N & 43°10'36"E); 1 female, 14.v.2016, quar. 278 (54°47'51"N & 43°12'27"E); 1 female, 15.v.2016, quar. 276 (54°47'45"N & 43°10'28"E); 2 female, 23.viii.2016, quar. 85 (54°53'29"N & 43°35'00"E); 1 male, 18.vii.2016, quar. 278 (54°47'51"N & 43°12'27"E); 1 male, 18.vii.2016, quar. 303 (54°47'17"N & 43°12'32"E); 1 male, 18.vii.2016, quar. 331 (54°46'43"N & 43°12'37"E); 1 female, 14.v.2017, quar. 327; 1 female, 15.v.2017, quar. 302 (54°47'15"N & 43°11'26"E); NNR: 1 ex., 16.vii.2017, Voznesenskoe Distr., Alamasovo (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, and Siberia), Europe, northern Africa, Israel, Lebanon, Turkey, Caucasus, Kazakhstan, central Asia, Iran, Afghanistan, Pakistan, India, Mongolia, and western and northern China (Danilov 2017).

Biology: Hibernates in the imago stage. Nests in coarse-grained or dense sandy soil. Prey: caterpillars, mainly *Cucullia* and *Agrotis* (Noctuidae), sometimes *Epinephela* (Satyridae). Predators: parasitic flies *Miltogramma punctatum* Meigen, 1824, *Taxigramma*

stictica (Meigen, 1830) (Sarcophagidae), and twisted-wing parasites *Paraxenos sphecidarum* (Dufour, 1837) (Stylopidae). There are cases of stealing prey from other nests.

? *Podalonia tydei* (Le Guillou, 1841)

Literature: Plavilshchikov 1964 (as *Psammophila tydei* Guill.).

General distribution: Russia (the European part from the centre till Crimea and 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

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

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

Material: RM: 1 male, 9 female, 7.vii.2014, 8.vii.2014, 26.vii.2017, 6.viii.2017, MSNR, cord. Inorski (54°44'15"N & 43°08'53"E), coll. G.B. Semishin; 1 female, 1 male, 16.vii.2017, cord. Podrubnyi (54°47'51"N & 43°08'48"E); 2 female, 1 male, 4.viii.2017, 7.viii.2017, cord. Pavlovski (54°45'15"N & 43°24'03"E), coll. G.B. Semishin; 2 female, 1 male, 20.v.2014, 13.vii.2014, 31.v.2014, Pushta (54°42'50"N & 43°13'32"E).

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 Zyukyu), 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 jambs, under eaves, and under roofs. Prey: spiders of medium size, usually the most common and available in the habitat (Gepp 2003).

***Sceliphron destillatorium* (Illiger, 1807)**

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

Material: RM: 1 female, 3.vii.2014, MSNR, cord.

Inorski (54°44'15"N & 43°08'53"E), coll. G.B. Semishin; 2 female, 19.vii.2015, 22.vii.2017, 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, and Transbaikalia), south of Europe, northern Africa, Israel, Turkey, Kazakhstan, central Africa, 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 sandy soil. Prey: imago or older larva of locusts (Acrididae).

Tribe Sphecini

Sphex funerarius Gussakovskij, 1934

Material: NNR: 2 ex., 5.viii.2014, 11.viii.2014, Sarov (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, Israel, Turkey, Georgia, Kazakhstan, central Asia, Syria, Iran, Afghanistan, Mongolia, and northern China (Danilov 2017).

Biology: Nests in dense sandy or clay soil. Prey: grasshoppers *Decticus verrucivorus* (Linnaeus, 1758), *Phaneroptera phalcata* (Poda, 1761), *Platypleis grisea* (Fabricius, 1781), *P. intermedia* (Audinet-Serville, 1838), *Tettigonia albifrons* (Fabricius, 1775), and *T. viridissima* (Linnaeus, 1758) (Tettigoniidae).

Family Crabronidae

Subfamily Astatinae

Astata boops (Schrank, 1781)

Literature: Mokrousov et al. 2013.

Material: RM: 1 female, 13.vii.2015, MSNR, quar. 434 (54°45'04"N & 43°19'02"E); 1 male, 28.vii.2015, quar. 79 (54°53'11"N & 43°29'18"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, and Khabarovsk Krai and Primorsky Krai), Europe, northern Africa, Israel, Yemen, Oman, Turkey, Abkhazia, Kazakhstan, Uzbekistan, Turkmenistan, Tajikistan, Iraq, Iran, Afghanistan, India, Mongolia, northern China, and Korea (Murai & Amr 2011; Nemkov 2017a).

Biology: Nests in dense soil. Prey: larvae of the late stages of heteropterans Cydnidae and Pentatomidae. Predators: emerald wasps *Hedychridium roseum* (Rossi, 1790), *H. rossicum* Gussakovskij, 1948, and *Holopyga generosa* (Förster, 1853) (Chrysididae).

Dryudella lineata Mocsáry, 1879

Literature: Mokrousov et al. 2013.

General distribution: Russia (from the centre to the south of the European part), east of Europe, and Kazakhstan (Nemkov 2017a).

** *Dryudella stigma* (Panzer, 1809)

Literature: Mokrousov et al. 2013.

Material: RM: 1 female, 18.vii.2016, MSNR, quar. 303 (54°47'17"N & 43°12'32"E).

General distribution: Russia (the European part from the northwest to the centre and east, Altai, eastern Siberia, and Primorsky Krai), Europe, and Kazakhstan (Nemkov 2017a).

Biology: Nests in dense sandy soil. Prey: nymphs of Heteroptera, mostly Lygaeidae. 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 Alysonini

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.

Material: RM: 1 male, 12.vii.2014, MSNR, quar. 86 (54°53'38"N & 43°35'59"E); 1 female, 24.viii.2017, quar. 347 (54°47'34"N & 43°28'31"E); 2 male, 8.vi.2014, 28.vi.2015, cord. Inorski; 1 male, 27.vii.2017, cord. Inorski (54°44'15"N & 43°08'53"E), coll. G.B. Semishin; 1 male, 13.vii.2014, cord. Novenkovski (54°55'53"N & 43°25'18"E); 1 male, 20.vi.2015, Temnikov Distr., Russkoe Karaevo (54°40'55"N, 43°13'52"E); 1 female, 2.vii.2016, Kushki (54°29'49" N 43°16'11"E); 2 female, 23.vii.2016, 22.vii.2017, Elniki Distr., Malye Mordovskie Poshaty (54°41'00"N & 43°43'50"E); 1 female, 23.vii.2016, Novoyamskaya Sloboda (54°44'24"N & 43°42'59"E); 1 male, 22.vii.2017, Novye Shaly (54°42'13"N & 43°38'25"E); NNR: 1 male, 16.vii.2017, Voznesenskoe Distr., Svobodnyi (54°50'47"N & 43°07'48"E); 1 ex., 8.viii.2014, Sarov (54°55'08" N 43°17'40"E), coll. P.V. Cherenkov (Images 3 & 4).

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

Biology: Nests in loose sandy soil. Prey: dipterans Tabanidae, Syrphidae, Muscidae, Calliphoridae, Sarcophagidae, and Antomyiidae. Predators: emerald wasps *Parnopes grandior* (Pallas, 1771), dipterans *Petrorossia hesperus* Rossi, 1790 (Bombyliidae), *Metopia leucocephala* (Rossi, 1790), *Senotainia conica* (Fallen, 1810), and *Physocephala chrysorrhoea* (Meigen, 1824) (Sarcophagidae).

* *Argogorytes fargeii* (Shuckard, 1837)

Material: RM: 1 male, 31.v.2014, Elniki Distr., Malye Mordovskie 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 (Linnaeus, 1761)

Literature: Mokrousov et al. 2009, 2013; Feoktistov 2011; Ruchin & Antropov 2014.

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 Philaenus* (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.

Material: RM: 1 ex., 2.vi.2017, MSNR, cord. Inorski (54°44'15"N & 43°08'53"E), coll. G.B. Semishin (Image 4).

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

Biology: Nests in sandy soil. Prey: larvae and imago of leafhoppers. Predators: digger wasps *Nysson trimaculatus* (Rossi, 1790) (Crabronidae).

* *Gorytes neglectus* Handlirsch, 1895

Material: RM: 1 female, 2.vi.2017, MSNR, cord. Inorski (54°44'15"N & 43°08'53"E), coll. G.B. Semishin.

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.vii.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).

Gorytes quadrifasciatus (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.vii.2015,

quar. 405; 6 male, 18.vii.2016, quar. 331 (54°46'43"N & 43°12'37"E); 2 male, 18.vii.2016, quar. 358 (54°46'05"N & 43°11'44"E); 1 male, 24.viii.2017, quar. 86 (54°53'38"N & 43°35'59"E); 1 female, 11.viii.2014, Temnikov Distr., Tatarskoe Karaevo (54°42'17"N & 43°13'49"E); 1 female, 24.vii.2016, Polyanki (54°44'27"N & 43°29'04"E); 1 male, 23.vii.2016, 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, Khabarovsk Krai and Primorsky Krai, and Sakhalin), Europe, northern Africa, Turkey, Kazakhstan, Kyrgyzstan, Mongolia, and Korea (Nemkov 2017b).

Biology: Nests in sandy or clay soil. Prey: nymphs and imagoes of leafhoppers, mainly *Philaenus* (Cercopidae). Predators: digger wasps *Nysson maculosus* (Gmelin, 1790) and *N. trimaculatus* (Rossi, 1790) (Crabronidae).

***Gorytes quinquecinctus* (Fabricius, 1793)**

Literature: Redikortsev 1938 (as *Gorytes quadricinctus* F.); Plavilshchikov 1964 (as *Gorytes quadricinctus* 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.vi.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., Novoyamskaya 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.viii.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, and Siberia), Europe, northern Africa, Turkey, Azerbaijan, Kazakhstan, Uzbekistan, Kirghizia, Syria, and Iran (Nemkov 2017b).

Biology: Nests in sandy soil. Prey: nymphs and

imagoes of leafhoppers.

***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).

Biology: Nests in sandy soil. Prey: nymphs and imagoes of leafhoppers (Jassidae). Predators: emerald wasps *Hedychridium cupreum* (Dahlbom, 1845) (Chrysididae).

***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 2017b).

*** *Bembecinus hungaricus* (Frigalszky, 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 imagoes of leafhoppers and jumping plant lice (Cicadellidae, Psyllidae, Jassidae, and Fulgoridae). Predators: emerald wasps *Spinolia unicolor* (Dahlbom, 1831) (Chrysididae).

***Bembecinus tridens* (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.vi.2015, cord. Inorski (54°44'15"N & 43°08'53"E); 1 female, 24.vi.2014, Pushta (54°42'50"N & 43°13'32"E); 1 female, 1 male, 7.vii.2013, Temnikov Distr., Tarkhany; 2 male, 6.vii.2013, Lavrentevo (54°29'44"N & 43°02'41"E); 1 female, 24.vii.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

the centre till Crimea and northern Caucasus, Urals, and Altai), south of Europe, northern Africa, Israel, Jordan, Lebanon, Oman, Turkey, Abkhazia, Georgia, Azerbaijan, Armenia, and Syria (Nemkov 2012, 2017b).

Biology: Nests in loose sandy soil. Prey: larvae and imagoes of leafhoppers (Fulgoroidea, Cercopidae, and Jassidae) and jumping plant lice (Psyllidae). Predators: velvet ants *Nemka viduata* (Pallas, 1773) and *Smicromyrme nigriceps* Nonveiller, 1959 (Mutillidae).

**** *Stizus perrisii* Dufour, 1838**

Material: RM: 1 male, 4.vii.2017, MSNR, quar. 357 (54°46'07"N & 43°10'56"E).

General distribution: Russia (the European part from the northwest till Crimea and northern Caucasus, Urals, Altai, 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 imagoes of grasshoppers (Tettigoniidae) and locusts (Acrididae).

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

***Brachystegus scalaris* (Illiger, 1807)**

Literature: Mokrousov et al. 2013.

Material: RM: 2 female, 12.vii.2014, MSNR, quar. 86 (54°53'38"N & 43°35'59"E); 1 male, 13.vii.2014, cord. Novenkovski (54°55'53"N & 43°25'18"E).

General distribution: Russia (the European part from the centre till Crimea and northern Caucasus, and 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**

Literature: Mokrousov et al. 2013.

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**

Literature: Mokrousov et al. 2013.

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: Redikortsev 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)**

Literature: Ruchin et al. 2009; Mokrousov et al. 2009; Feoktistov 2011; Mokrousov et al. 2013.

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. Inorski (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)**

Literature: Mokrousov et al. 2013.

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 *Crepidodera*, *Cryptocephalus*, *Longitarsus*, and *Apthoma* (Chrysomelidae).

***Crabro cribrarius* (Linnaeus, 1758)**

Literature: Redikortsev 1938; Pavilshchikov 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.vii.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, northern Africa, Turkey, Kazakhstan, Iran, Mongolia, and Korea (Antropov 2017b).

Biology: Nests are usually in the soil, rarely in rotten stump wood. Prey: various flies. Predators: emerald wasps *Hedychridium coriaceum* (Dahlbom, 1854) (Chrysididae).

***Crabro peltarius* (Schreber, 1784)**

Literature: Pavilshchikov 1964; Mokrousov et al. 2013.

Material: RM: 1 female, 19.vi.2016, MSNR, quar. 401 (54°44'30"N & 43°05'15"E); 1 female, 13.vii.2016, quar. 319 (54°48'09"N & 43°28'25"E); 1 female, 3.vii.2016, quar. 338 (54°47'06"N & 43°19'40"E); NNR: 1 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 Caucasus, Urals, Siberia, Amur region, Khabarovsk Krai and Primorsky Krai, and Sakhalin), Europe, Turkey, Kazakhstan,

Mongolia, and Korea (Antropov 2017b).

Biology: Nests in the soil. Prey: various flies. Predators: emerald wasps *Pseudomalus auratus* (Linnaeus, 1758) and *Trichrysis cyanea* (Linnaeus, 1758) (Chrysididae) and velvet ants *Myrmosa atra* Panzer, 1801 and *Paramyrmosa brunnipes* (Lepeletier, 1845) (Mutillidae).

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

Literature: Pavilshchikov 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°08'53"E); NNR: 2 female, 16.vii.2016, Voznesenskoe Distr., Svobodnyi (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).

Biology: Nests in the soil, sometimes in burrows of rodents. Prey: various flies (mainly Dolichopodidae (*Diaphorus*), sometimes Muscidae and Syrphidae). Predators: emerald wasps *Chrysis fulgida* Linnaeus, 1761 (Chrysididae).

***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.vii.2016, MSNR, quar. 399 (54°46'40"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 Stratiomyidae).

***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), Europe, northern Africa, Turkey, Azerbaijan, Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, Iran, Mongolia, and Japan (Hokkaido). Acclimatized in Canada, USA, and Argentina (Antropov 2017b).

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

Literature: Mokrousov et al. 2013.

General distribution: Russia (the European part from the northwest to the centre and the east, Urals, Novosibirsk region, Altai, Irkutsk region, Yakutia, Transbaikalia, Amur region, and Khabarovsk Krai and Primorsky Krai), 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 leucostoma* (Linnaeus, 1758)**

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

Material: RM: 1 female, 11.vi.2016, MSNR, quar. 368 (54°46'37"N & 43°21'45"E); 1 female, 11.vii.2017, quar. 408 (54°44'57"N & 43°11'47"E); 2 female, 31.v.2014, Elniki Distr., Malye Mordovskie Poshaty (54°41'00"N & 43°43'50"E).

General distribution: Russia (the European part from the northwest to the centre and east, Urals, Altai, Irkutsk region, Magadan region, Kamchatka, Khabarovsk Krai and Primorsky Krai, and Sakhalin), Europe, Turkey, Kazakhstan, Mongolia, Korea, Japan (Hokkaido and Honshu), and North America (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).

***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 rotten wood and in branches with a soft core. Prey: small dipterans (Anthomyiidae, Chloropidae, Coelopidae, Dolichopodidae, Empididae, Lauxaniidae, Lonchaeidae, Muscidae, Rhagionidae, Sepsidae, Simuliidae, Stratiomyidae, Syrphidae, and Trypetidae). Predators: chalcid wasps *Habritys brevicornis* (Ratzeburg, 1844) (Pteromalidae), ichneumons *Endasys analis* (Thomson, 1883) (Ichneumonidae), and flies *Eustalomyia festiva* (Zetterstedt, 1845) (Anthomyiidae).

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 northern Caucasus, Urals, and Altai),

Europe, Kazakhstan, and Mongolia (Antropov 2017b).

Biology: Nests in sandy or clay soil. Prey: mostly small dipterans *Tachydromia arrogans* (Linnaeus, 1761) (Empididae), *Platypalpus verralli* (Collin, 1926) (Hybotidae), Chironomidae or Chloropidae, sometimes Heteroptera *Plagiognathus chrysanthemi* (Wolff, 1804) (Miridae), and rarely small lepidopterans.

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

***Crossocerus palmipes* (Linnaeus, 1767)**

Literature: Mokrousov et al. 2013.

General distribution: Russia (the European part from the northwest to the centre and the east, Urals, Novosibirsk region, Altai, Krasnoyarsk Krai, Irkutsk region, and Buryatia), Europe, northern Africa, Turkey, Kazakhstan, and Mongolia (Antropov 2017b).

Biology: Nests in sandy soil. Prey: small dipterans (Chloropidae, Dolichopodidae, Drosophilidae, Lauxaniidae, Muscidae, and, probably, Empididae). Predators: velvet ants *Myrmosa atra* Panzer, 1801 (Mutillidae).

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

Literature: Plavilshchikov 1964 (as *Crabro podagricus* Lind.).

General distribution: Russia (the European part from the north till Crimea and northern Caucasus, Urals, Altai, Primorsky Krai, Sakhalin, and Kuril Islands), Europe, northern Africa, Turkey, Kazakhstan, Iran, Mongolia, Korea, and Japan (Hokkaido and Honshu) (Antropov 2017b).

Biology: Forest species. Nests in tunnels of xylophagous insects in wood. Prey: various small dipterans (Ceratopogonidae, Chironomidae, Empididae, Lycoriidae, Mycetophilidae, Phoridae, Scatopsidae, and Sciaridae).

***Crossocerus quadrimaculatus* (Fabricius, 1793)**

Literature: Ruchin & Antropov 2014.

Material: RM: 1 female, 5.vii.2015, MSNR, quar. 413 (54°45'12"N & 43°16'54"E); 2 female, 6.ix.2014, 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, Tomsk region, Altai, eastern Siberia, Amur region, and Primorsky Krai), Europe, northern Africa, Turkey, Kazakhstan, Uzbekistan, Tajikistan, Iran, and Mongolia (Antropov 2017b).

Biology: Nests in sandy or clay soil, often in groups. Prey: various small dipterans (Anisopodidae

(*Sylvicola fenestralis* (Scopoli, 1763)), Anthomyiidae, Chironomidae, Culicidae, Dolichopodidae, Ephydriidae, 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, Muscidae, Rhagionidae, Tabanidae, and Tipulidae), as an exception leafroller moths (Tortricidae) and even worker ants *Myrmica rubra* (Linnaeus 1758) (Formicidae).

*** *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 in dry soil, sometimes in abandoned tunnels of other insects. Prey: various small dipterans (Agromyzidae, Ceratopogonidae, Chironomidae, Chloropidae, Dolichopodidae, Empididae, Ephydriidae, Lauxaniidae, Lonchaeidae, Muscidae, Simuliidae (*Simulium equinum* (Linnaeus, 1758), Tephritidae, and Tipulidae), less often Heteroptera (Anthocoridae), leafhoppers (Cicadellidae), and barkflies (Psocidae). Predators: velvet ants *Myrmosa atra* Panzer, 1801 (Mutillidae), and ichneumon *Phygadeuon rugulosus* Gravenhorst, 1829 (Ichneumonidae).

***Ectemnius borealis* (Zetterstedt, 1838)**

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

Material: RM: 2 female, 27.vii.2014, 27.v.2016, MSNR, quar. 360 (54°46'13"N & 43°13'31"E); 1 female,

13.viii.2015, quar. 249 (54°49'39"N & 43°32'08"E); 1 female, 7.vi.2015, quar. 399 (54°46'40"N & 43°27'27"E); 1 male, 13.vii.2015, quar. 434 (54°45'04"N & 43°19'02"E); 1 male, 5.vii.2015, quar. 405; 1 female, 28.vii.2015, quar. 82 (54°53'12"N & 43°32'46"E); 1 male, 17.viii.2014, quar. 397 (54°46'17"N & 43°25'44"E); 1 male, 5.vii.2015, quar. 403 (54°44'40"N & 43°06'57"E); 1 female, 23.viii.2016, quar. 85 (54°53'29"N & 43°35'00"E); 1 female, 18.vii.2016, quar. 383 (54°45'36"N & 43°11'48"E); 1 male, 15.vi.2016, quar. 409; 1 male, 4.vii.2017, quar. 357 (54°46'07"N & 43°10'56"E); 1 female, 8.vi.2014, cord. Inorski (54°44'15"N & 43°08'53"E); 1 female, 19.vii.2016, cord. Podrubnyi (54°47'51"N & 43°08'48"E); NNR: 1 ex., 29.v.2015, Sarov (54°55'08"N & 43°17'40"E), coll. P.V. Cherenkov (Image 3).

General distribution: Russia (the European part from the north till Crimea and northern Caucasus, Urals, Altai, eastern Siberia, Amur region, Kamchatka, Primorsky Krai, Sakhalin, and Kuril Islands), Europe, Turkey, Kazakhstan, Mongolia, Korea, Japan (Hokkaido), and North America (Antropov 2017b).

Biology: Nests in rotten wood. Prey: various small flies.

Ectemnius cavifrons (Thomson, 1870)

Literature: Plavilshchikov 1964 (as *Crabro plumifrons* Thms.); Mokrousov et al. 2009, 2013; Ruchin & Antropov 2014.

Material: RM: 1 male, 24.vii.2016, MSNR, quar. 398 (54°46'22"N & 43°25'48"E); 1 male, 19.vii.2016, 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, Kazakhstan, Tajikistan, Mongolia, Korea, Japan (Hokkaido, Honshu, Shikoku, Kyushu, and Ryukyu), and southeastern Asia (Antropov 2017b).

Biology: Gnaws nests in rotten wood. Prey: various dipterans (mainly *Episyrphus balteatus* (De Geer, 1776) (Syrphidae), Calliphoridae, Sarcophagidae, Stratiomyiidae, and Tabanidae) and leafhoppers *Iassus lanio* Linnaeus, 1761 (Cicadellidae) (Giovanni et al. 2017). Predators: chalcid wasps *Pteromalus* (Pteromalidae), ichneumons *Perithous albicinctus* (Gravenhorst, 1829) (Ichneumonidae), emerald wasps *Chrysis fulgida* Linnaeus, 1761 (Chrysididae), and parasitic flies *Eustalomyia festiva* (Zetterstedt, 1845) and *E. hilaris* (Fallen, 1823) (Anthomyiidae).

Ectemnius cephalotes (Olivier, 1792)

Literature: Mokrousov et al. 2009, 2013; Feoktistov 2011; Ruchin & Antropov 2014.

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.viii.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: Gnaw nests in rotten wood, but sometimes in dense 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.viii.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.viii.2014, cord. Polyanski (54°46'36"N & 43°28'47"E); 1 male, 12.ix.2017, cord. Plotomoika (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.vii.2016, Polyanski (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, Pervomaik 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, Syrphidae, 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 [Chrysididae] and ichneumons *Perithous mediator* (Fabricius, 1804) (Ichneumonidae).

Remark: The species is confirmed in MSNR.

***Ectemnius fossorius* (Linnaeus, 1758)**

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, 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.viii.2017, cord. Pavlovski (54°45'15"N & 43°24'03"E), coll. G.B. Semishin; 1 male, 23.viii.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, Khabarovsk Krai and Primorsky Krai, Sakhalin, and Kuril Islands), Europe, northern Africa, Turkey, Kazakhstan, Uzbekistan, Kyrgyzstan, Mongolia,

northeastern China, Korea, and Japan (Hokkaido and Honshu) (Antropov 2017b).

Biology: Gnaws nests mostly in rotten wood, but often in dense wood, as well as in clay walls. Prey: large flies Syrphidae and Asilidae.

***Ectemnius guttatus* (Vander Linden, 1829)**

Literature: Redikortsev 1938 (as *Crabro spinicollis* H. Sch.); Plavilshchikov 1964 (as *Crabro spinicollis* H.-Sch.).

Material: RM: 1 female, 17.vi.2016, MSNR, quar. 330 (54°46'44"N & 43°11'09"E); 1 female, 18.vii.2016, quar. 303 (54°47'17"N & 43°12'32"E); 2 male, 4.vi.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, Altai, Irkutsk region, and Transbaikalia), Europe, and Kazakhstan (Antropov 2017b).

Biology: Gnaw nests in rotten wood or in shoots with a soft core. Prey – various dipterans (Chloropidae, Muscidae, and Syrphidae).

Remark: The species is confirmed in MSNR.

***Ectemnius lapidarius* (Panzer, 1804)**

Literature: Redikortsev 1938 (*Crabro chrysostomus* Lep.); Plavilshchikov 1964 (*Crabro chrysostomus* Lep.); Ruchin et al. 2009; 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 male, 11.vii.2015, quar. 142 (54°51'12"N & 43°09'21"E); 1 male, 27.vii.2014, quar. 360 (54°46'13"N & 43°13'31"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.vi.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, 1 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,

Stratiomyidae, *Sphaerophoria scripta* (Linnaeus, 1758) (Syrphidae), and Therevidae). Predators: chalcid wasps *Pteromalus* and *Habritys brevicornis* (Ratzeburg, 1844) [Pteromalidae], ichneumons *Perithous 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.vii.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. Podrubnyi (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 *Trichrysis cyanea* (Linnaeus, 1758) (Chrysididae), velvet ants *Cystomutilla ruficeps* (Smith, 1855) and *Myrmosa brunripes* (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. 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, 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 (*Episyrphus balteatus* (De Geer, 1776) and *Syrphus torvus* Osten Sacken, 1875)). Predators: emerald wasps *Pseudomalus auratus* (Linnaeus, 1758) (Chrysididae) and ichneumons *Perithous scurra 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).

Biology: Gnaws nests in rotten wood. Prey: various small lepidopterans (Drepanidae, Geometridae, Noctuidae, Pyralidae, Tortricidae, Uraniidae, and, sometimes, Lycaenidae). Predators: ichneumons *Exeristes* (Ichneumonidae).

**** *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) (Antropov 2017b).

Biology: Nests in the soil. Prey: various small lepidopterans (*Agriphila geniculea* (Haworth, 1811), *Agriphila tristellus* (Denis et Schiffermüller, 1775), *Chrysoteuchia 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.viii.2016, cord. Inorski (54°44'15"N & 43°08'53"E); 1 female, 22.vii.2017, Elniki Distr., Malye Mordovskie Poshty (54°41'00"N & 43°43'50"E); NNR: 1 male, 1.viii.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, Amur region, Khabarovsk Krai and Primorsky Krai, and Sakhalin), Turkey, Kazakhstan, Mongolia, southwestern and northeastern China, Korea, and Japan (Hokkaido and Honshu) (Antropov 2017b).

Biology: 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.viii.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.viii.2017, quar. 111; 3 male, 9.vi.2013, 11.vii.2015, 4.vii.2017, cord. Podrubnyi (54°47'51"N & 43°08'48"E); 2 male, 28.vi.2015, 17.viii.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).

Biology: Nests in the abandoned tunnels of xylophagous insects. Prey: various lepidopterans (Crambidae, Noctuidae, Sesiidae, and Sterrhidae) and sometimes dipterans (Empididae, Muscidae, and Syrphidae). Predators: emerald wasps *Chrysis fasciata* Olivier, 1790 (Chrysididae) and digger wasps *Palarus*

variegatus (Fabricius, 1781) (Crabronidae).

**** *Lestica subterranea* (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).

Biology: Nests in the soil. Prey: various small lepidopterans (Crambidae, *Lythria purpuraria* Linnaeus, 1758 (Geometridae), Glyphipterigidae, and *Tortrix viridana* Linnaeus, 1758 (Tortricidae), rarely Zygaenidae).

***Lindenius albilabris* (Fabricius, 1793)**

Literature: Redikortsev 1938 (*Crabro albilabris* F.); Pavilshchikov 1964 (*Crabro albilabris* F.); Ruchin et al. 2009; Ruchin & Antropov 2016.

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, Israel, Turkey, Syria, Kazakhstan, Uzbekistan, Kyrgyzstan, Turkmenistan, Mongolia, and Korea (Antropov 2017b).

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 atra* Panzer, 1801 (Mutillidae).

***Lindenius panzeri* (Vander Linden, 1829)**

Literature: Redikortsev 1938 (*Crabro panzeri* Rind.); Pavilshchikov 1964 (*Crabro panzeri* Lind.); Ruchin et al. 2009; Mokrousov et al. 2013.

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).

Biology: Nests in sandy or clay soil. Prey: small dipterans (Chloropidae, Ephydriidae, and Trypetidae). Predators: velvet ants *Myrmosa atra* Panzer, 1801 (Mutillidae).

***Lindenius pygmaeus* (Rossi, 1794)**

Literature: Mokrousov et al. 2013.

Material: RM: 1 female, 25.vii.2013, MSNR, quar.

420 (54°45'29"N & 43°24'19"E).

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**

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 centre to northern Caucasus), eastern Europe, Turkey, and Kazakhstan (Antropov 2017b).

***Tachysphex fulvitaris* (Costa, 1867)**

Literature: Mokrousov et al. 2013.

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).

Biology: Nests in soil. Prey: hoppers *Metrioptera bicolor* (Philippi, 1830), *Platycleis*, and *Roeseliana roeselii* (Hagenbach, 1822) (Tettigoniidae).

Remark: The species is confirmed in MSNR.

***Tachysphex helveticus* Kohl, 1885**

Literature: Mokrousov et al. 2013.

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, Tajikistan, and Mongolia (Antropov 2017b).

Biology: Nests in soil. Prey: grasshoppers *Calliptamus italicus* (Linnaeus, 1758) (Acrididae). Predators: velvet ants *Smicromyrme rufipes* (Fabricius, 1787) (Mutillidae).

***Tachysphex obscuripennis* (Schenck, 1857)**

Literature: Mokrousov et al. 2013.

Material: RM: 1 male, 2.vii.2017, MSNR, cord. Inorski (54°44'15"N & 43°08'53"E).

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 pompiliformis* (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).

Biology: Nests in soil. Prey: nymphs of grasshoppers *Acrotylus*, *Aulocara*, *Calliptamus coelesyriensis* Giglio-Tos, 1893, *Camnula*, *Chorthippus*, *Dericorys tibialis* (Pallas, 1773), *Dociostaurus kraussi* (Ingenizkij, 1897), *Gomphocerippus rufus* (Linnaeus, 1758), *Gomphocerus*, *Melanoplus*, *Oedaleonotus*, *Omocestus*, and *Stenobothrus* (Acrididae), sometimes nymphs of hoppers (Tettigoniidae). Predators: parasitic flies *Apodacra*, *Taxigramma*, and *Xeromyia* (Sarcophagidae), emerald wasps *Hedychridium adventicium* Zimmermann, 1962, *H. ardens* (Coquebert, 1801), *H. roseum* (Rossi, 1790), *Chrysis bicolor* Lepeletier de Saint Fargeau, 1806, *C. illigeri* Wesmael, 1839, and *C. succincta* Linnaeus, 1767 (Chrysididae), and velvet ants *Smicromyrme sicanus* (De Stefani, 1887) (Mutillidae).

*** *Tachysphex psammobius* (Kohl, 1880)**

Material: RM: 1 male, 30.v.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, Urals, Tomsk region, Altai, Irkutsk region, Buryatia, and Primorsky territory), south of Europe, northern Africa, Israel, Turkey, Kazakhstan, China, and North America (Antropov 2017b).

Biology: Nests in sandy soil. Prey: nymphs of grasshoppers *Circotettix maculatus* S.H. Scudder, 1880

and *Melanoplus* (Acrididae).

***Tachytes panzeri* (Dufour, 1841)**

Literature: Ruchin et al. 2009; Mokrousov et al. 2013.

Material: RM: 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 centre till Crimea and northern Caucasus, Urals, Novosibirsk region, Altai, and Irkutsk region), south of Europe, northern Africa, Israel, Turkey, Kazakhstan, Uzbekistan, Turkmenistan, Tajikistan, 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.

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 soil. Prey: juvenile spiders Salticidae and Theridiidae.

***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 [Theridiidae]. Predators: emerald wasps *Chrysis cortii* Linsenmaier, 1951, *C. lanceolata* Linsenmaier, 1959, *C. leachii* Shuckard, 1836, and *Hedychridium elegantulum* du Buysson, 1887 (Chrysididae) and velvet ants *Smicromyrme sicanus* (De Stefani, 1887) (Mutillidae).

***Miscophus concolor* Dahlbom, 1844**

Literature: Mokrousov et al. 2013.

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

Biology: Nests in sandy soil. Prey: juvenile spiders *Salticus* (Salticidae) and *Stemonyphantes*

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: Pavilshchikov 1964 (as *Nitela spinolae* 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 *Smicromyrme sicanus* (De Stefani, 1887) (Mutillidae).

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, Urals, 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 *Smicromyrme rufipes* (Fabricius, 1787) (Mutillidae), and female digger wasps *Palarus variegatus* (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, Pushta (54°42'50"N & 43°13'32"E).

General distribution: Russia (the European part from the north to the southeast, Urals, 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 mediatubunda* (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 *Smicromyrme lewisi* Mickel, 1935 and *Smicromyrme rufipes* (Fabricius, 1787) (Mutillidae), chalcid wasps *Perilampus ruficornis* (Fabricius, 1793) (Perilampidae), and parasitic flies *Phrosinella fulvicornis* (Coquillett, 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 staegei* (Rondani, 1859) (Sarcophagidae). Predators: parasitic flies *Metopia staegei* (Rondani, 1859) (Sarcophagidae) and digger wasps *Palarus variegatus* (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.vii.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,

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) (Chrysididae).

***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 *Thereva arcuata* Loew, 1847 (Therevidae), as well as *Th. plebeja* (Linnaeus, 1758) (Therevidae), *Bellardia corsicana* (Villeneuve, 1911) (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 to northern Caucasus, Urals, Altai, Irkutsk region, Buryatia, and Khabarovsk Krai and Primorsky Krai), Europe, northern Africa, Turkey, and Kazakhstan (Antropov 2017b).

Biology: Nests in sandy soil. Prey: dipterans *Bellardia pandia* (Walker, 1849), *B. viarum* (Robineau-Desvoidy, 1830), *Blondelia nigripes* (Fallen, 1810), *Pollenia atramentaria* (Meigen, 1826), *P. griseotomentosa* (Jacentkovsky, 1944), *P. hungarica* Rognes, 1987, *Nyctia halterata* (Panzer, 1798), *Calliphora vicina* Robineau-Desvoidy, 1830 (Calliphoridae), and *Blaesoxipha plumicornis* (Zetterstedt, 1859) (Sarcophagidae).

***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).

Biology: Nests in soil of different density, from clayey-stony to sandy. Prey: various dipterans (Anthomyiidae, Bombyliidae, Calliphoridae, Chloropidae, Dolichopodidae, Fanniidae, Muscidae, Platystomatidae, Rhagionidae, Sarcophagidae, Simuliidae, Stratiomyidae, and Syrphidae) and Orthoptera (Steiner, 1979). Predators: emerald wasps *Hedychridium coriaceum* (Dahlbom, 1854) (Chrysididae), velvet ants *Myrmosa atra* Panzer, 1801 and *Smicromyrme rufipes* (Fabricius, 1787) (Mutillidae), parasitic flies *Anthomyia pluvialis* (Linnaeus, 1758), *Delia florilega* (Zetterstedt, 1845), *D. radicum* (Linnaeus, 1758), *Leucophora cinerea* Robineau-Desvoidy, 1830 (Anthomyiidae), *Fannia incisurata* (Zetterstedt, 1838), *F. scalaris* (Fabricius, 1794) (Fanniidae), *Megaselia pygmaea* (Zetterstedt, 1848) (Phoridae), *Macronychia griseola* (Fallen, 1820), *M. polyodon* (Meigen, 1824), *Metopia argyrocephala* (Meigen, 1824), *Miltogramma germari* Meigen, 1824, and *Sphecapata conica* Fallen, 1810 (Sarcophagidae).

*** *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*, *Camptopoeum*, *Chelostoma*, *Colletes*, *Dasypoda*, *Halictus*, *Hylaeus*, *Lasioglossum*, *Megachile*, *Melitta*, *Nomada*,

Nomia, *Osmia*, *Panurgus*, *Sphecodes*, *Tetralonia*, and *Thyreus*), wasps *Mutilla* and *Myrmosa* (Mutillidae), *Myzinum* and *Tiphia* (Tiphidae), *Scolia*, *Trielis* and male *Campsoscolia* (Scoliidae), *Eumenes*, *Odynerus*, *Polistes*, *Pterocheilus* and *Vespula* (Vespidae), *Ammophila*, *Podalonia* and *Prionyx* (Sphecidae), *Alysson*, *Astata*, *Bembecinus*, *Cerceris*, *Crabro*, *Diodontus*, *Dryudella*, *Ectemnius*, *Lestica*, *Liris*, *Oxybelus*, *Pemphredon*, *Philanthus*, *Pison*, *Tachysphex*, *Tachytes* and male *Larra* (Crabronidae), ant flies *Formica* and *Camponotus* (Formicidae), as well as parasitic hymenopterans *Leucospis* (Leucospidae), *Amblyteles*, *Barylypa*, and *Ichneumon* (Ichneumonidae). Predators: velvet ants *Smicromyrme rufipes* (Fabricius, 1787) (Mutillidae) and parasitic flies *Protomiltogramma fasciata* (Meigen, 1824) (Sarcophagidae).

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 *Aritranis coxator* (Tschek, 1871), *Ephialtes*, and *Perithous* (Ichneumonidae) (Olberg 1959).

Trypoxylon figulus (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, Japan (Hokkaido and Honshu), and North America (Antropov 2017b).

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), *Singa hamata* (Clerck, 1757), *S. nitidula* C.L. Koch, 1844 and *Zilla* (Araneidae), *Dictyna arundinacea* (Linnaeus, 1758) (Dictynidae), *Agyneta rurestris* (C.L. Koch, 1836), *Bathypantes*, *Entelecara erythropus* (Westring, 1851), *Kaestneria dorsalis* (Wider, 1834), *Linyphia triangularis* (Clerck, 1757), *Neriene 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. tepidariorum* (C.L. Koch, 1841), *Platnickina tinctoria* (Walckenaer, 1802), *Simitidion 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 *Chrysis fasciata* Olivier, 1790, *C. fulgida* Linnaeus, 1761, *h. ignita* (Linnaeus, 1758), *C. obtusidens* Dufour et Perris, 1840, *C. splendidula* Rossi, 1790, *C. viridula* Linnaeus, 1761, *Elampus panzeri* (Fabricius, 1804), *Pseudomalus auratus* (Linnaeus, 1758), *P. pusillus* (Fabricius, 1804) and *Trichrysis cyanea* (Linnaeus, 1758) (Chrysididae), 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 assectator* (Linnaeus, 1758), *G. jaculator* (Linnaeus, 1758) and *G. opacum* (Tournier, 1877) (Gasterutpionidae), *Aritranis heliophilus* (Tschek, 1870), *Isadelphus armatus* (Gravenhorst, 1829), *Nematopodius formosus* Gravenhorst, 1829, *Perithous divinator* (Rossi, 1790), *P. scurra* (Panzer, 1804), *Poemenia notata* Holmgren, 1859, *Polysphincta*, *Stenodontus marginellus* (Gravenhorst, 1829), and *Townesia tenuiventris* (Holmgren, 1860) (Ichneumonidae), as well as parasitic flies *Eustalomyia hilaris* (Fallen, 1823) (Anthomyiidae), *Amobia signata* (Meigen 1824), *Metopia argyrocephala* (Meigen, 1824), and *Miltogramma punctatum* (Meigen, 1824) (Sarcophagidae) and skin beetles *Megatoma undata* (Linnaeus, 1758) (Dermestidae) (Olberg 1959).

? *Trypoxylon fronticorne* Gussakovskij, 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 *Etelecar* 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), *Tetrastichus* (Eulophidae) and *Eurytoma* (Eurytomidae), ichneumons *Ephialtes*, *Peritous* (Ichneumonidae), and parasitic flies *Cacoxenus indagator* Loew, 1858 (Drosophilidae) (Olberg 1959).

Remark: The species is confirmed in MSNR.

Subfamily Dinetinae

Dinetus pictus (Fabricius, 1793)

Literature: Mokrousov et al. 2013.

Material: RM: 1 male, 11.vii.2015, MSNR, quar. 142 (54°51'12"N & 43°09'21"E).

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

Biology: Nests in the sandy soil. Prey: nymphs of heteropterans Nabidae (mainly, *Nabis*) and Lygaeidae. Pre-dators: emerald wasps *Chrysis bicolor* Lepeletier,

1806.

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, 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 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 *Smicromyrme rufipes* (Fabricius, 1787) (Mutillidae) and parasitic flies *Macronychia griseola* (Fallen, 1820), *Metopia argyrocephala* (Meigen, 1824), *Sphecapata conica* Fallen, 1810, and *Paramacronychia* (Sarcophagidae).

? *Mellinus crabroneus* (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 centre till Crimea and northern Caucasus, Urals, Altai, and eastern Siberia), Europe, northern Africa, Turkey, Kazakhstan, and Mongolia (Mokrousov 2017).

Biology: Nests in dense soil on precipices and steep slopes. Prey: nymphs and imagoes of aphids. This species kills victims by clenching its mandibles (Edwards & Telfer

2002).

*** *Diodontus medius* Dahlbom, 1844**

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 imagoes of aphids. This species kills victims by clenching its mandibles.

***Diodontus minutus* (Fabricius, 1793)**

Literature: Mokrousov et al. 2013.

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 imagoes of aphids (Edwards & Telfer 2002). This species kills victims by clenching its mandibles. Predators: emerald wasps *Chrysis lanceolata* and *C. leachii* and velvet ants *Myrmica atra* Panzer, 1801 and *Smicromyrme sicanus* (De Stefani, 1887).

***Passaloecus borealis* Dahlbom, 1844**

Literature: Mokrousov et al. 2013.

General distribution: Russia (the European part from the northwest to the centre, Altai, Irkutsk and Magadan regions, Khabarovsk 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 imagoes of aphids. This species kills victims by clenching its mandibles.

***Passaloecus corniger* Shuckard, 1837**

Literature: Ruchin & Antropov 2016.

General distribution: Russia (the European part

from the north till Crimea and northern Caucasus), Europe, northern Africa, Turkey, Kazakhstan, and 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 imagoes 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) (Chrysididae).

**** *Passaloecus gracilis* (Curtis, 1834)**

Material: RM: 1 female, 14.vi.2013, MSNR, Pushta (54°42'50"N & 43°13'32"E).

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 galls of gallflies). Prey: nymphs and imagoes of Rhynchota (Sternorrhyncha) (Edwards & Telfer 2002; Giovanni et al. 2017). Predators: emerald wasps *Omalus aeneus* (Fabricius, 1787), *O. biaccinctus* (du Buysson, 1892), and *Pseudomalus auratus* (Linnaeus, 1758) (Chrysididae).

***Pemphredon fabricii* (M. Müller, 1911)**

Literature: Mokrousov et al. 2013.

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**

Literature: Mokrousov et al. 2013.

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 and Magadan regions, Kamchatka, Khabarovsk Krai and Primorsky Krai, Sakhalin, and Kuril Islands), Europe, northern Africa, Turkey, Abkhazia, Kazakhstan, central Asia, Mongolia, northern China,

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 to the east, Urals, Altai, Krasnoyarsk Krai, and Irkutsk and Magadan regions), Europe, Turkey, and Kazakhstan (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.

***Pemphredon lugubris* (Fabricius, 1793)**

Literature: Mokrousov et al. 2009; Feoktistov 2011; Ruchin & Antropov 2014.

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, 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*.

***Spilomena 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.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, 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 (Wesmael, 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.vii.2016, Elniki Distr., Malye Mordovskie Poshaty (54°41'00"N & 43°43'50"E).

General distribution: Russia (the European part from the north to 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 leafhoppers (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.); Plavilshchikov 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.

Pseneo 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 China, Korea, and Japan (Hokkaido, Honshu, Shikoku, and Ryukyu) (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. Podrubnyi (54°47'51"N & 43°08'48"E); 2 female, 16.vii.2016, 17.vii.2017, Pushta (54°42'50"N & 43°13'32"E).

General distribution: Russia (the European part from the north till Crimea and northern Caucasus, Urals, and Primorsky Krai), Europe, Georgia, Turkey, India, Korea, and Japan (Hokkaido and Honshu) (Mokrousov 2017).

Biology: Nests in tubular cavities in wood, in hollow or soft-core stems of plants, and in old galls of flies *Lipara* (Chloropidae). Prey: nymphs and imagoes of aphids. Predators: *Omalus sculpticollis*, *Melittobia acastra*, *Perithous septemcinctarius*, and *Trichodes apiarius* (Martynova & Fateryga 2014).

Remark: The species is confirmed in MSNR and

adjacent territories.

Psenulus pallipes (Panzer, 1798)

Literature: Redikortsev 1938; Plavilshchikov 1964.

Material: RM: 4 female, 17.vii.2016, MSNR, quar. 330 (54°46'44"N & 43°11'09"E); 1 female, 21.vi.2015, quar. 381 (54°45'17"N & 43°09'52"E); 1 male, 12.vi.2016, quar. 430 (54°44'34"N & 43°16'00"E); 1 female, 13.vii.2017, quar. 347 (54°47'34"N & 43°28'31"E); 1 female, 19.vii.2016, cord. Podrubnyi (54°47'51"N & 43°08'48"E).

General distribution: Russia (the European part from the north 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 imagoes 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 Cecerini

Cerceris arenaria (Linnaeus, 1758)

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

Material: RM: 1 male, 19.vii.2015, Elniki Distr., Malye Mordovskie Poshty (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).

Biology: Nests in dense clay or sandy soil. Prey: snout beetles, more often *Brachyderes*, *Curculio*, *Hylobius*, *Otiorhynchus*, *Pissodes*, *Sitona*, *Strophosomus*, and *Tanymecus* and sometimes *Bromius* (Curculionidae) (Polidori et al. 2005). Predators: emerald wasps *Chrysis ignita* (Linnaeus, 1758), *C. sexdentata* Christ, 1791, *Hedychrum niemelai* Linsenmaier, 1959, *H. nobile* (Scopoli, 1763), *H. rutilans* Dahlbom, 1854, and *H. simile* Mocsáry, 1889 (Chrysididae), velvet ants *Smicromyrme sicanus* (De Stefani, 1887) (Mutillidae), parasitic flies

Metopia leucocephala (Rossi, 1790), *Miltogramma punctatum* Meigen, 1824 (Sarcophagidae), and *Leucophora cinerea* Robineau-Desvoidy, 1830 (Anthomyiidae), as well as ants *Tetramorium caespitum* (Linnaeus, 1758) (Formicidae), ticks of the genera *Vidia* (Winterschmidtidae), and nematodes (Polidori et al. 2010).

***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: snout beetles (Curculionidae) and rarely seed beetles (Bruchidae). Predators: emerald wasps *Hedychrum chalybaeum* Dahlbom, 1854 (Chrysididae).

***Cerceris quadrfasciata* (Panzer, 1799)**

Literature: Mokrousov et al. 2013.

Material: RM: 1 female, 19.vii.2016, MSNR, quar. 330 (54°46'44"N & 43°11'09"E); NNR: 1 ex., 19.vii.2014, Voznesenskoe Distr., Alamasovo (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, Siberia, Amur region, Khabarovsk Krai and Primorsky Krai, and Sakhalin), Europe, Turkey, Armenia, Georgia, Abkhazia, Kazakhstan, northeastern China, and Korea (Danilov & Mokrousov 2017).

Biology: Nests in dense soil, often in large groups. Prey: snout beetles *Anthonomus*, *Dorytomus*, *Otiorrhynchus*, *Phyllobius*, *Polydrosus*, and *Strophosomus* (Curculionidae). Predators: emerald wasps *Hedychrum niemelai* Linsenmaier, 1959 *H. nobile* (Scopoli, 1763) and *Holopyga chrysonota* (Förster, 1853) (Chrysididae).

Remark: The species is confirmed in MSNR.

***Cerceris quinquefasciata* (Rossi, 1792)**

Literature: Redikortsev 1938; Plavilshchikov 1964; Ruchin & Antropov 2014, 2016.

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., 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, and Siberia), Europe, northern Africa, Turkey, Azerbaijan, and Kazakhstan (Danilov & Mokrousov 2017).

Biology: Nests in dense soil. Prey: small snout beetles *Apion*, *Meligethes*, *Sitona*, *Strophosomus*, and *Tychius* (Curculionidae). Predators: emerald wasps *Hedychrum niemelai* Linsenmaier, 1959 (Chrysididae).

***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, Khabarovsk Krai, and Sakhalin), Europe, northern Africa, Turkey, Kazakhstan, Uzbekistan, Kyrgyzstan, Tadjikistan, Iran, northern China, and Korea (Danilov & Mokrousov 2017).

Biology: Nests in dense soil. Prey: snout beetles *Apion*, *Otiorrhynchus*, *Sitona*, and *Strophosomus* (Curculionidae) as well as leaf beetles *Longitarsus* and *Bromius* (Chrysomelidae), and, probably, heteropterans. Predators: emerald wasps *Hedychrum gerstaeckeri* Chevrier, 1869, *H. niemelai* Linsenmaier, 1959, and *H. nobile* (Scopoli, 1763) (Chrysididae).

Remark: The species is confirmed in MSNR.

***Cerceris rybyensis* (Linnaeus, 1771)**

Literature: Mokrousov et al. 2009, 2013; Feoktistov 2011; Ruchin & Antropov 2014.

Material: RM: 1 male, 3.vii.2016, MSNR, quar. 429 (54°44'31"N & 43°14'59"E); 1 male, 24.vi.2014, 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 Sloboda (54°44'24"N & 43°42'59"E); 1 male, 22.vii.2017, 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, Primorye, and Sakhalin), Europe, northern Africa, Turkey, Georgia, Azerbaijan, Syria, Kazakhstan, Uzbekistan, Turkmenistan, Tajikistan, Iran, India, Korea,

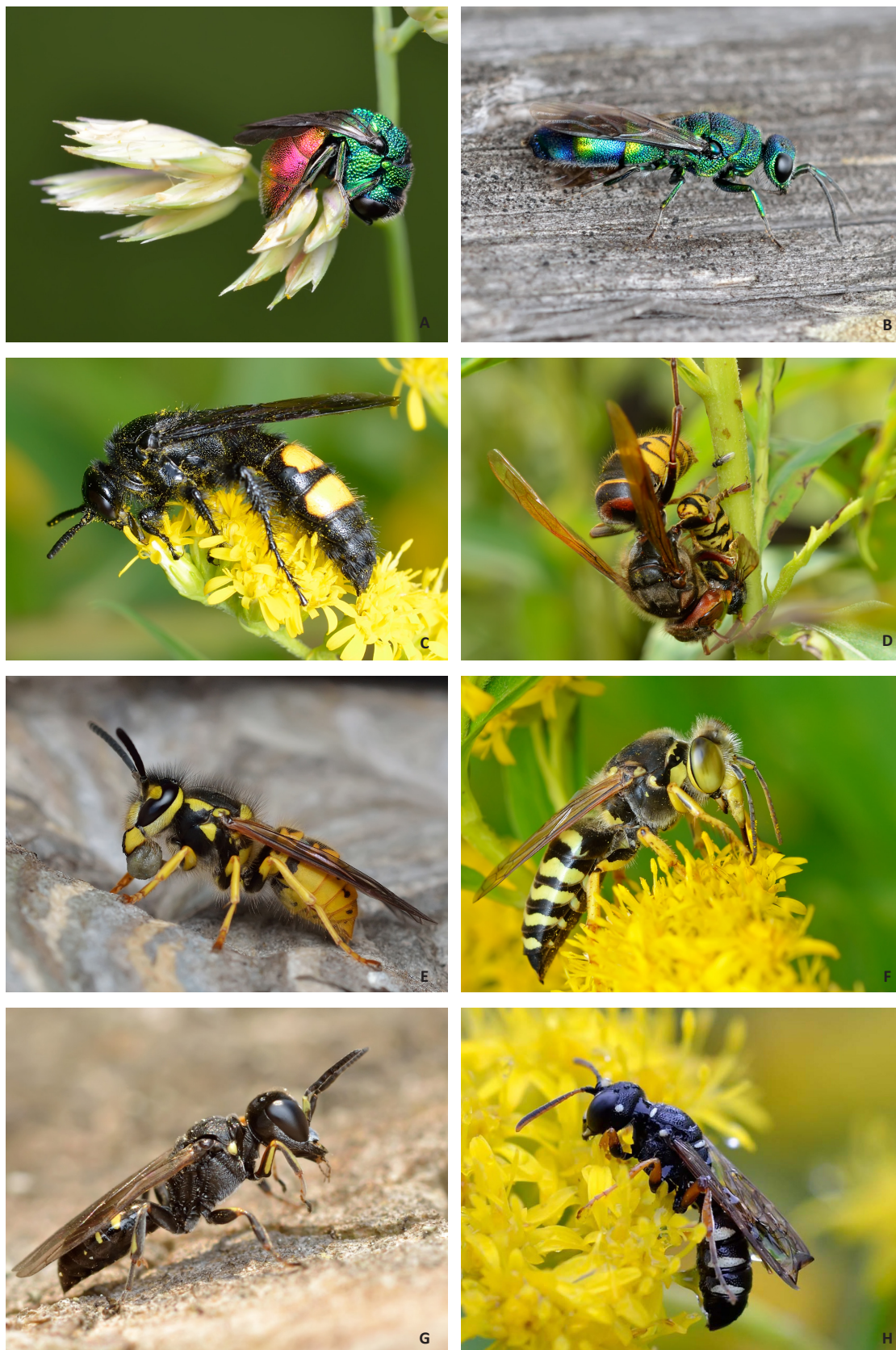


Image 2. Images of wasps (© P.V. Cherenkov). A - *Hedychrum longicollis* (Sarov, 18.vi.2015), B - *Trichrysis cyanea* (Voznesenskoe Distr., Alamasovo, 14.vi.2015), C - *Scolia hirta* (Sarov, 8.viii.2014), D - *Vespa crabro* with prey *Vespula vulgaris* (Sarov, 6.viii.2014), E - *Vespula germanica* (Sarov, 31.viii.2014), F - *Bembix rostrata* (Sarov, 8.viii.2014), G - *Ectemnius borealis* (Sarov, 29.v.2015), H - *Cerceris interrupta* (Sarov, 16.viii.2014).



Image 3. Images of wasps. A - *Ancistrocerus trifasciatus* (Voznesenskoe Distr., Alamasovo, 22.vii.2017, © P.V. Cherenkov), B - *Polistes nimpha* (cord. Inorski, 6.ix.2014, © G.B. Semishin), C - *Podalonia hirsuta* (Voznesenskoe Distr., Alamasovo, 16.vii.2017, © P.V. Cherenkov), D - *Spheg funerarius* (Sarov, 5.viii.2014, © P.V. Cherenkov), E - *Gorytes laticinctus* (cord. Inorski, 2.vi.2017, © G.B. Semishin), F - *Bembix rostrata* (cord. Inorski, 27.vii.2017, © G.B. Semishin).

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)

(Sarcophagidae).

***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. 80 (54°53'11"N & 43°30'22"E); 1 female, 24.viii.2017, quar. 85 (54°53'29"N & 43°35'00"E); 1 female, 24.viii.2017, 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. Cherenkov.

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 mellifera* Linnaeus, 1758 or, as an exception, solitary bees, for example, *Andrena* and *Halictus* (Rathmayer, 1962). Predators: emerald wasps *Chrysis ignita* (Linnaeus, 1758), *Hedychrum gerstaeckeri* Chtvrier, 1869, *H. rutilans* Dahlbom, 1854, *Pseudomalus auratus* (Linnaeus, 1758) (Chrysididae), velvet ants *Dasylabris maura* (Linnaeus, 1758) (Mutillidae), parasitic flies *Senotainia albifrons* (Rondani, 1859), *Phylloteles pictipennis* Loew, 1824, *Metopia leucocephala* (Rossi, 1790), *Sphecapata conica* Fallen, 1810 (Sarcophagidae), *Physocephala 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 Trigonoidea

Family Trigonalidae

***Pseudogonalos hahnii* (Spinola, 1840)**

Literature: Ruchin et al. 2009; Feoktistov 2011 (as

Pseudogonalis hahni Spin.).

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 Bethyridae, 31 in Chrysididae, two in Tiphidae, two in Mutillidae, one in Scoliidae, 28 in Pompilidae, 37 in Vespidae, nine in Sphecidae, 108 in Crabronidae, and one in Trigonalidae.

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. pumila*, *Ch. comparata*, *P. tydei*, *N. spinolae*, *M. crabroneus* (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 fauna list.

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. gussakovskij*, *P. minuta*, *P. parvulus*, *P. schoedtei*, *A. concinnus*, *A. anceps*, *H. sanguinolentus*, *A. auctus*, *M. parvulus*, *D. lineata*, *N. dimidiatus*, *N. fulvipes*, *C. annulipes*, *C. elongatulus*, *C. exiguus*, *O. haemorrhoidalis*, *P. fabricii*, *S. troglodytes* (Mokrousov et al. 2013), *O. simillimus* (Ruchin & Antropov 2014), *A. ichneumonideus*, *E. quadrifasciatus*, *G. laevipes*, *S. gracilis*, *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*, *Chrysis 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. murarius*, *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. quinquecinctus*, *Bembecinus tridens*, *Nysson spinosus*, *Crabro cribrarius*, *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 MSNRlist 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 (Rasplus 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 (Savranskaya & 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 (Orlovskiy 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 rubicole (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

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

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

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; Chikhlyayev & Ruchin 2014; Legalov et al. 2014; Egorov & Shapovalov 2017; Chursina & Ruchin 2018a, 2018b; Ruchin & Egorov 2018a, 2018b, 2018c, 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 Mordovia Mordovia Republic (Table 1). Of the 283 species of wasps in Mordovia, 220 species (77.7%) are found within MSNR.

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Monograph

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

– Alexander Ruchin & Alexander Antropov, Pp. 13195–13250



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