

ORIGINAL ARTICLE

Species diversity of social wasps (Hymenoptera, Vespidae) in the urbanized territories of Chelyabinsk region

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Submitted: 28.12.2017. Accepted: 13.02.2018

The article gives an annotated list of Vespidae (Hymenoptera, Vespidae) from the urbanized territories of Chelyabinsk region, including 13 species belonging to 4 genera (*Vespula*, *Polistes*, *Dolichovespula* and *Vespa*) and 2 subfamilies (Vespinae and Polistinae).

Key words: checklist; Chelyabinsk region; Hymenoptera; Vespidae; wasps

Introduction

Vespidae are one of the largest families of order Hymenoptera. In the world fauna it is represented by 4800 species of 262 genera and 6 subfamilies. In the Palaearctic, 1046 species of 81 genus have been registered. 148 species of 31 genus are currently known from Russia (Kurzenko, 2012; Dubatolov et al., 2015). These well recognizable insects play an important role in ecosystems as pollinators of plants. In addition, they are active entomophages and consequently, natural regulators of the abundance of many small arthropods, including pests of agriculture and forestry. Some representatives of the subfamilies Polistinae and Vespinae have greater environmental plasticity and are met not only in natural ecosystems but also in the countryside and even in big cities where they can reach a large number. A significant part of Chelyabinsk region is occupied by urbanized territories unsuitable for most insects including Hymenoptera, but some species of wasps have adapted to living next to people. The peak activity of most wasp species is in the end of August — beginning of autumn. During this period, wasps penetrate into living quarters, accumulate in markets, at fruit stalls and garbage cans. The undesirable contact with a person is of particular importance, as it can lead not only to stinging, but also to possible fatal outcome. Thus, the study of wasps in the urbanized territories has also a great significance from the epidemiological point of view. The social wasps fauna of the Chelyabinsk region currently has 40 species belonging to 14 genera (Rudoiskatel, 2007), however not all the species have a large environmental plasticity. The aim of the presented study is to analyze the species diversity of Vespidae in the urbanized territories of Chelyabinsk region.

Material and Methods

The material was collected in the spring–summer–autumn period from 2000 to 2017 in different cities and their environs and in towns of Chelyabinsk region. The wasps were caught by the entomological net from flowers, in places of nesting, as well as in places of accumulations: near fruit stalls, in markets and garbage cans. In the parks and forest-parks wasps were caught at various baits, and also the Moerike traps were used. The collection was performed during all the day-light period. The methods of eco-faunistic studies of Hymenoptera are described in the works of Z.I. Tyumaseva and E.V. Guskova (2016; 2017). In total, 212 specimens of these insects have been examined. The specimens were identified using the identification keys (Tobias, 1978; Archer, 1989; Kurzenko, 1995; Dvorak, Roberts, 2006).

In the following check-list the general distribution of the species is given after a series of works (Kurzenko, 2012; Dubatolov et al, 2015). All the collected material is deposited in the entomological laboratory of South Ural State Humanitarian Pedagogical University (Chelyabinsk).

Results

Annotated list of Vespidae (Hymenoptera) from urbanized territories of Chelyabinsk region

As a result of the studies carried out in the urbanized territories of the Chelyabinsk region, we have registered 13 species of Vespidae belonging to 4 genera (*Vespula*, *Polistes*, *Dolichovespula* and *Vespa*) and 2 subfamilies (Vespinae and Polistinae).

VESPINAE**VESPA** Linnaeus, 1758**Vespa crabro** Linnaeus, 1758**Material examined.** Chelyabinsk (roadside), 12.VI.2002, 3 ex.; Chebarkul, 5.VI.2005, 5 ex.; Zlatoust, 10.VII.2005, 9 ex.; Bakal, 7.VII.2006, 6 ex.; Yetkul vill., 20.VI.2008, 7 ex.; Krasnoselskoe vill., 25.VI.2012, 2 ex.; 10.VII.2017, 4 ex.**Distribution.** European part Russia, N Caucasus, Siberia, Middle Amur, Primorye, Sakhalin. Europe, north to 60-64° N, Asia minor, Transcaucasia, N Iran, W Turkmenistan, E Kazakhstan, W Mongolia, China, Korea, Japan. Introduced into Canada and USA.**Ecology.** Occurs in the vicinity of villages, very rare in cities. Builds nests in old tree hollows, under the roofs of buildings, in ventilation shafts and attics. A medium sized nest is approximately 20 cm. Under favorable climatic conditions, the nest can reach up to 60 cm in length and be populated with more than 7000 specimens. This creates a danger to humans (Antropov, Khrustaleva, 2009a).**VESPULA** Thomson, 1869**Vespula austriaca** (Panzer, 1799)**Material examined.** Chebarkul, 21.VI.2006, 6 ex.; Satka, 15.VII.2008, 7 ex.; Miass, 7.VII.2010, 11 ex.; Yuzhnouralsk, 5.VIII.2011, 4 ex.; Bakal, 20.VIII.2011, 9 ex.; Churilovo, 12.VII.2012, 2 ex.; Uvelsky, 15.VIII.2012, 13 ex.; Dolgoderevenskoye vill., 25.VIII.2016, 5 ex.**Distribution.** European part Russia, north to Arkhangelsk, south to Moscow; N Caucasus, Siberia, Kamchatka, Amur basin, Primorye, Sakhalin, Southern Kuriles. Western Europe, Turkey, Georgia, C and SE Kazakhstan, Kyrgyzstan, Pakistan, India (Kashmir), Mongolia, China (Xinjiang, Liaoning), Korea, Japan: Hokkaido, Honshu; N Pakistan, North America.**Ecology.** Occurs on the fringes and glades of forest-park zones of cities. Rarely flies into the city.**Vespula rufa** (Linnaeus, 1758)**Material examined.** Chelyabinsk, 30.V.2004, 17 ex.; Chebarkul, 25.V.2005, 7 ex., 10.VI.2008, 12 ex.; Satka, 15.VI.2009, 4 ex., Zlatoust, 17.VII.2009, 9 ex., Bakal, 15.VIII.2010, 11 ex.; Churilovo, 17.VII.2011, 12 ex.; Yetkul vill., 20.VIII.2012, 21 ex.; Kunashak vill., 15.VIII.2016, 4 ex.**Distribution.** European part Russia, N Caucasus, Siberia, Kamchatka, Amur basin, Primorye, Sakhalin, Kuriles: Urup, Iturup, Kunashir. Western Europe, Asia Minor, Transcaucasia, Uzbekistan, Kyrgyzstan, Kazakhstan, NE Mongolia, northern and mountain regions of China, Nepal, N Korea, Japan, North America.**Ecology.** Mostly registered in the forest-park zone of cities, rarely in the city center. Active predator, not a collector. Noted in the vicinity of villages and towns. The peak of activity is July, early August.**Vespula germanica** (Fabricius, 1793)**Material examined.** Chebarkul, 21.V.2002, 22 ex.; Satka, 25.V.2004, 12 ex.; Yuzhnouralsk, 12.VI.2006, 8 ex.; Churilovo, 7.VII.2008, 13 ex.; Krasnoselskoe vill., 12.VIII.2010, 10 ex.; Roza vill., 15.VIII.2011, 4 ex.; Uvelsky, 20.VIII.2012, 12 ex.; Kasargi vill., 7.IX.2017, 2 ex.**Distribution.** European part Russia, N Caucasus, S Siberia, Amur basin, Primorye, S Sakhalin. South and Central Europe, Asia Minor, Transcaucasia, Iran, Afghanistan, Pakistan, N India, Central Asia, Kazakhstan, Mongolia, China, Korea, N Africa. Introduced into Iceland, Canada, USA, Chile, Argentina, Australia, New Zealand, S Africa.**Ecology.** Registered on the fringes and glades of forest-park zones of cities. Often found in suburban territories. Occurs from the middle of May to the end of September.**Vespula vulgaris** (Linnaeus, 1758)**Material examined.** Chebarkul, 6.V.2008, 4 ex.; Satka, 22.IV.2010, 11 ex.; Zlatoust, 15.VII.2011, 3 ex.; Kyshtym, 25.VIII.2011, 2 ex.; Emanzhelinsk, 7.VII.2012, 1 ex.; Bakal, 12.VIII.2014, 4 ex.; Churilovo, 20.VII.2015, 7 ex.; Krasnoselskoe vill., 10.VIII.2015, 4 ex.; Uvelsky, 6.VII.2016, 2 ex.; Yetkul vill., 25.VIII.2017, 10 ex.; Kasargi vill., 5.IX.2017, 2 ex.**Distribution.** European part Russia, N Caucasus, Siberia, Amur basin, Primorye, Southern Sakhalin, Southern Kuriles: Iturup, Kunashir. Western Europe, Asia Minor, Transcaucasia, Iran, N India, Kyrgyzstan, Kazakhstan, Mongolia, China, Korea, Japan. Introduced into Iceland, Hawaii, Australia, New Zealand.**Ecology.** It is more common on the glades and fringes of forest-park zones, preferring open areas with an abundance of flowering plants. In cities can be met in the markets, where they are attracted by the smell of fruit, jam and meat. Number common. Occurs from late April to early September.**DOLICHOVESPULA** Rohwer, 1916**Dolichovespula media** (Retzius, 1783)**Material examined.** Chebarkul, 12.VII.2015, 8 ex.; Satka, 15.VII.2016, 16 ex.; Miass, 30.VIII.2016, 2 ex.; Zlatoust, 20.V.2017, 11 ex.; Kunashak vill., 20.IX.2017, 1 ex.**Distribution.** European part Russia, south to steppe belt, North-West Caucasus, Southern Siberia, Yakutia, east to the Sea of Okhotsk, Kamchatka, Amur basin, Primorye, S Sakhalin, S Kuriles: Iturup, Kunashir. Western Europe, E Kazakhstan, Mongolia, NE China, Korea, Japan.

Ecology. Builds hanging nests at a height more than 1 m above the ground (Antropov, Khrustaleva, 2009b). Occurs in the forest-park zone in the cities. Number common. Flight until the early October.

Dolichovespula saxonica (Fabricius, 1793)

Material examined. Churilovo, 21.V.2000, 14 ex.; Yetkul vill., 25.VI.2008, 9 ex.; Chebarkul, 12.VII.2009, 16 ex.; Satka, 12.V.2011, 21 ex.; Miass, 20.VII.2012, 3 ex.; Zlatoust, 25.VII.2013, 12 ex.; Kopeysk, 10.VIII.2013, 3 ex.; Kyshtym, 5.VIII.2015, 1 ex.; Emanzhelinsk, 10.VIII.2016, 1 ex.; Bakal, 2.IX.2016, 7 ex.; Kremenkul vill., 17.IX.2016, 1 ex.; Uvelsky, 5.V.2017, 3 ex.; Dolgoderevskoye vill., 15.V.2017, 4 ex.; Kunashak vill., 10.VII.2017, 8 ex.; Kasargi vill., 15.VIII.2017, 1 ex.; Chelyabinsk, 10.IX.2017, 3 ex.

Distribution. European part Russia, Siberia, east to Upper Kolyma and Kamchatka, Komandorskie Is., Sakhalin, Kurile. Western Europe, Asia Minor, Caucasus, E Kazakhstan, Mongolia, China, Korea, Japan.

Ecology. Occurs locally, on flowering plants in the river floodplains, though it is not a collector. Nests in shelters and buildings under the roof, in stacks of firewood, attics. Not aggressive.

Dolichovespula norvegica (Fabricius, 1781)

Material examined. Satka, 1 ex.

Distribution. European part Russia, Caucasus, Siberia, east to Chukotka and Kamchatka, Sakhalin. W Europe, Asia Minor, Georgia, E Kazakhstan, E Kyrgyzstan, Mongolia, NW and NE China, North America.

Ecology. Rare.

Dolichovespula sylvestris (Scopoli, 1763)

Material examined. Satka, 5.VI.2000, 36 ex.; Miass, 17.VI.2002, 17 ex.; Zlatoust, 10.VI.2005, 31 ex.; Kopeysk, 12.VI.2007, 3 ex.; Emanzhelinsk, 15.VI.2008, 6 ex.; Bakal, 10.VIII.2008, 8 ex.; Churilovo, 8.VII.2011, 29 ex.; Krasnoselskoe vill., 5.IX.2011, 18 ex.; Kremenkul vill., 12.VIII.2012, 2 ex.; Roza vill., 5.V.2013, 5 ex.; Uvelsky, 20.VI.2015, 10 ex.; Dolgoderevskoye vill., 10.VIII.2016, 8 ex.; Chelyabinsk, 17.VII.2017, 12 ex.; Chebarkul, 7.VIII.2017, 29 ex.; Yetkul vill., 15.VIII.2017, 39 ex.; Kunashak vill., 22.VIII.2017, 6 ex.; Kasargi vill., 5.IX.2017, 5 ex.

Distribution. S European part Russia, N Caucasus, S Siberia to Transbaikalia. N-Wt Africa, W Europe, Asia Minor, Armenia, Iran, Afghanistan, Pakistan, India: Kashmir, Kyrgyzstan, Kazakhstan, Mongolia, China.

Ecology. Builds nests in the attics of country houses.

Dolichovespula omissa (Bischoff, 1931)

Material examined. Chebarkul, 5.VII.2016, 1 ex.; Uvelsky, 15.VIII.2017, 1 ex.

Distribution. European part Russia, SW Siberia. S Scandinavia, Central Europe, Turkey, Georgia, SW Iran.

Ecology. Parasitizes on *Dolichovespula sylvestris*.

Dolichovespula adulterina (du Buysson, 1905)

Material examined. Chebarkul, 10.VII.2004, 12 ex.; Zlatoust, 8.VI.2006, 30 ex.; Kopeysk, 17.VI.2008, 12 ex.; Korkino, 15.VII.2010, 6 ex.; Kyshtym, 12.VII.2011, 11 ex.; Emanzhelinsk, 16.VII.2012, 24 ex.; Kremenkul vill., 15.VII.2014, 2 ex.; Satka, 22.VI.2015, 26 ex.; Kasargi vill., 11.VIII.2015, 9 ex.; Miass, 12.VII.2016, 16 ex.

Distribution. European part Russia, N Caucasus, Siberia to Chukotka Peninsula and Kamchatka, N Primorye, Southern Kuriles: Kunashir. Western Europe, Asia Minor, Georgia, SE Kazakhstan, N Kyrgyzstan, Mongolia, China (Taiwan), Japan, North America.

Ecology. Recorded in the vicinity of settlements. Parasitizes on *Dolichovespula saxonica*

POLISTINAE

POLISTES Latreille, 1802

Polistes biglumis (Linnaeus, 1758)

Material examined. Chelyabinsk, 12.VI.2000, 43 ex.; Chebarkul, 10.VI.2001, 17 ex.; Satka, 12.VII.2003, 24 ex.; Miass, 21.VII.2004, 18 ex.; Zlatoust, 15.VI.2006, 21 ex.; Kopeysk, 20.VI.2007, 38 ex.; Korkino, 10.VI.2008, 7 ex.; Kyshtym, 15.VIII.2010, 2 ex.; Yuzhnouralsk, 7.VI.2011, 12 ex.; Emanzhelinsk, 5.VIII.2011, 27 ex.; Bakal, 12.VI.2012, 9 ex.; Churilovo, 10.VII.2014, 137 ex.; Krasnoselskoe vill., 17.VI.2015, 12 ex.; Kremenkul vill., 7.VIII.2015, 21 ex.; Roza vill., 12.VII.2016, 6 ex.; Uvelsky, 7.VIII.2016, 37 ex.; Dolgoderevskoye vill., 15.V.2017, 6 ex.; Yetkul vill., 12.VI.2017, 164 ex.; Kunashak vill., 20.VI.2017, 2 ex.; Kasargi vill., 25.VII.2017, 25 ex.; Chelyabinsk, 10.VIII.2017, 13 ex.

Distribution. European part Russia, N Caucasus, S Ural, S Siberia, Middle Amur. N Africa, W Europe, north to the Arctic Circle, Asia Minor, Near East, Caucasus, Iran, C and E Kazakhstan.

Ecology. Mostly associated with the countryside, also occurs in the forest-park zone of cities. Not aggressive. Mass species.

Polistes nimpha (Christ, 1791)

Material examined. Chebarkul, 10.V.2000, 5 ex.; Satka, 12.VI.2001, 11 ex.; Miass, 15.VII.2003, 21 ex.; Zlatoust, 20.VII.2004, 10 ex.; Kopeysk, 17.VI.2005, 24 ex.; Korkino, 12.VII.2006, 3 ex.; Yuzhnouralsk, 21.VI.2008, 15 ex.; Emanzhelinsk, 17.VII.2009, 18 ex.; Kunashak vill., 10.VI.2010, 1 ex.; Bakal, 20.VII.2010, 27 ex.; Churilovo, 12.VI.2011, 79 ex.; Krasnoselskoe vill., 25.VII.2012, 31 ex.;

Kremenkul vill., 10.VI.2013, 16 ex.; Uvelsky, 25.VII.2013, 14 ex.; Dolgoderevenskoye vill., 20.VI.2014, 8 ex.; Yetkul vill., 22.V.2015, 91 ex.; Chelyabinsk, 17.VI.2017, 24 ex.; Kasargi vill., 20.VII.2017, 12 ex.

Distribution. European part Russia (excluding the Far North), N Caucasus, S Siberia. N Africa, Europe, Asia minor, Near East, Caucasus, Iran, Kyrgyzstan, Kazakhstan, Mongolia.

Ecology. Nests found under roofs of country houses. Not aggressive. Mass species.

Acknowledgements

The authors are grateful to S.O. Velizhantseva (Chelyabinsk) for providing the material for examination.

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Citation:

Tyumaseva, Z.I., Guskova, E.V. (2018). Species diversity of social wasps (Hymenoptera, Vespidae) in the urbanized territories of Chelyabinsk region. *Ukrainian Journal of Ecology*, 8(1), 745–748.



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