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Contribution to the bee fauna (Hymenoptera: Apiformes) of the Khanty-Mansi Autonomous Region, Western Siberia, Russia

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Abstract

The paper presents the first report concerning the bee species encountered in the Khanty-Mansi Autonomous Region, Siberia, Russia. Altogether, 31 species collected in the region over the period 29.VI. to 16.VIII.2010 are treated. Of them, 19 are new to the regional fauna. The record of *Sphecodes monilicornis* (KIRBY 1802) is the first in the Asian part of Russia. A preliminary biogeographically analysis shows the predominance of Holarctic (10) and trans-Palaeartic (16) species. There are further four species basically showing Western Palaeartic patterns, but no Eastern Palaeartic elements have been found. Based on all evidence, the region seems belong to the Western Palaeartic. A prognosis is given for the complete faunistic list.

Key words: Hymenoptera, Apoidea, Apiformes, bees, fauna, biogeography, Khanty-Mansi Autonomous Region, Western Siberia, Russia.

Резюме

Это первая публикация по всем пчёлам Ханты-Мансийского автономного округа, Сибирь, Россия. Всего в сборах с 29.VI по 16.VIII.2010 в регионе отмечен 31 вид. В

том числе 19 видов, новых для региональной фауны. Находка *Sphcodes monilicornis* (KIRBY 1802) – первое указание вида для азиатской части России. Согласно предварительному биогеографическому анализу в регионе преобладают голарктические (10) и транспалеарктические (16) виды. Кроме того, отмечено 4 вида с ареалами, лежащими преимущественно в Западной Палеарктике, но ни одного из Восточной Палеарктики. Предположительно регион следует отнести к Западной Палеарктике. Дан прогноз на счет полного фаунистического списка.

Key words: Hymenoptera, Apoidea, Apiformes, bees, fauna, biogeography, Khanty-Mansi Autonomous Region, Western Siberia, Russia.

Zusammenfassung

Vorliegende Arbeit behandelt erstmalig das Vorkommen von Bienen der autonomen sibirischen Region Khanty-Mansi in Russland. Insgesamt konnten im Zeitraum 29.VI. bis 16.VIII.2010 31 Arten nachgewiesen werden, von denen 19 neu für die Region sind. *Sphcodes monilicornis* (KIRBY 1802) wurde erstmalig für den asiatischen Teil Russlands nachgewiesen. Biogeografisch betrachtet dominieren bei den angeführten Arten die holarktischen (10) sowie die transpaläarktischen (16) Elemente. Vier weitere Arten zeigen ein westpaläarktisches Verbreitungsmuster, ostpaläarktische Spezies fehlen zur Gänze.

Introduction

The Khanty-Mansi Autonomous Region, or Yugra, referred to as KhMAR hereafter, is a federal unit of the Russian Federation, a part of the Tyumen Province. The KhMAR territory (about 534 800 km²) takes up the middle part of the West Siberian Plain and the eastern slopes of Ural Mountains (Fig. A). The subarctic climate of KhMAR is characterized by a long winter (soils frozen in October to May) and a cool summer (60-80 days with the average daily temperature of +10°C; 90-160 days of the vegetation season). Precipitations (from 450 to 700 mm in different parts) are higher than evapotranspiration. Most of the territory supports taiga forest (50.7 %), freshwater basins (the Ob' River basin, more than 300.000 lakes) and wetlands (waterlogging from 10 to 90 % in different parts) (DOBRINSKY & PLOTNIKOV 1997).

No special studies on wild bees have hitherto been conducted in the region (PESENKO & ASTAFUROVA 2003), the sole exception being the recent papers by DEMIDOVA (2011, 2012) on the ecology of bumblebees (Apiformes: *Bombus LATREILLAE* 1802) of the Middle Ob' Lowland. *Apis mellifera* LINNAEUS 1758 arrived to KhMAR only in the early XX century with the use of a special technology of bee keeping. Even now it is not widespread (ELFIMOV 2005).

Yet there is also certain biogeographical interest in the bee faunas of the West Siberian Plain and Central Siberian Plateau since the discovery of some Western Palaearctic species in Yakutia (DAVYDOVA & PESENKO 2002; PESENKO & DAVYDOVA 2004). There are different points of view concerning the division between the Western and Eastern Palaearctic either by the Ural Mountains (PATINY et al. 2009) or by 90°E (the Yenisey

River) (PESENKO et al. 2007). So we feel tempted to publish the first information on the KhMAR bee fauna and to provide its preliminary biogeographical analysis.

Material and Methods

The bee material for this paper was collected by the second author (163 specimens, his private collection) from June 29th to August 16th, 2010 at nine localities (Fig. B): 1 – Ay-trom"egan (Ай-Тромъеган), 63.19°N, 72.22°E, Tyanskiy License Area, near bridge across Ay-trom"egan River; 2 – It'-Yakh (Ить-Ях), 61.85°N, 69.06°E, Severo-Seliyarovskiy License Area, near bridge across It'-Yakh River; 3 – Mukhrino (Мухрино), 60.89°N, 68.70°E, near Mukhrino Field Station of the Yugra State University, Baybalakovskaya River; 4 – Pripolyarnyi (Приполярный), 63.19°N, 59.80°E, airport of Pripolyarnyi; 5 – Seliyarovo (Селиярово), 61.47°N, 70.73°E, 50 km NE of Seliyarovo, Sakhalinsky License Area; 6 – Shapsha (Шапша), 61.09°N, 69.51°E, near Shapsha; 7 – Sovetskiy (Советский), 61.35°N, 63.54°E, near Sovetskiy; 8 – Vat'yavin (Ватьявин), 62.66°N, 71.95°E, near Vat'yavin River source, Nizhnesortymskiy License Area, 9 – Vol'ya (Волья), Ural Mountains, 1-5.VII. and 9-11.VII. at 63.77°N, 59.72°E in the Vol'ya River plain (256 m), 6-8 VII at 63.82°N, 59.56°E, hill peak (622 m) near Vol'ya River plain.

Most of the collecting localities were difficult of access, lying far from all four large cities of KhMAR in the Middle Ob' Lowland (Fig. B). Bees were taken together with other insects using an insect net. Only non-bumblebee bees in the Urals (Vol'ya) were collected with yellow pan traps.

The bees were identified by the first author. Reference collections of the Zoological Museum of the LOMONOSOV Moscow State University (ZMMU), Zoological Institute of the Russian Academy of Science, St. Petersburg (ZISP) and certain literature sources were used, in particular, AMIET et al. 1999; КУПИАНСКАЯ 1995; LØKEN 1973, 1984; MICHEZ & PATINY 2005; PESENKO et al. 2000, 2007; PROSHCHALYKIN 2007; SCHEUCHL 2006; SCHMID-EGGER & SCHEUCHL 1997. Morphometry, according to LØKEN & FRAMSTAD (1983), was utilized for the identification of the males of *Bombus flavidus* EVERSMAAN 1852 and *B. sylvestris* (LEPELETIER 1832). The identification of a single doubtful specimen of *Bombus cryptarum* (FABRICIUS 1775) was confirmed by DNA barcoding (HEBERT et al. 2003). That sample had been extracted, amplified and sequenced at the Biodiversity Institute of Ontario, University of Guelph, as part of the Bee Barcode of Life Initiative campaign (headed by L. PACKER, York University). The resulting sequence of COI (cytochrome c oxidase, subunit 1) gene was compared to the specific nucleotide combinations of *Bombus* s. str. species (WILLIAMS et al. 2012).

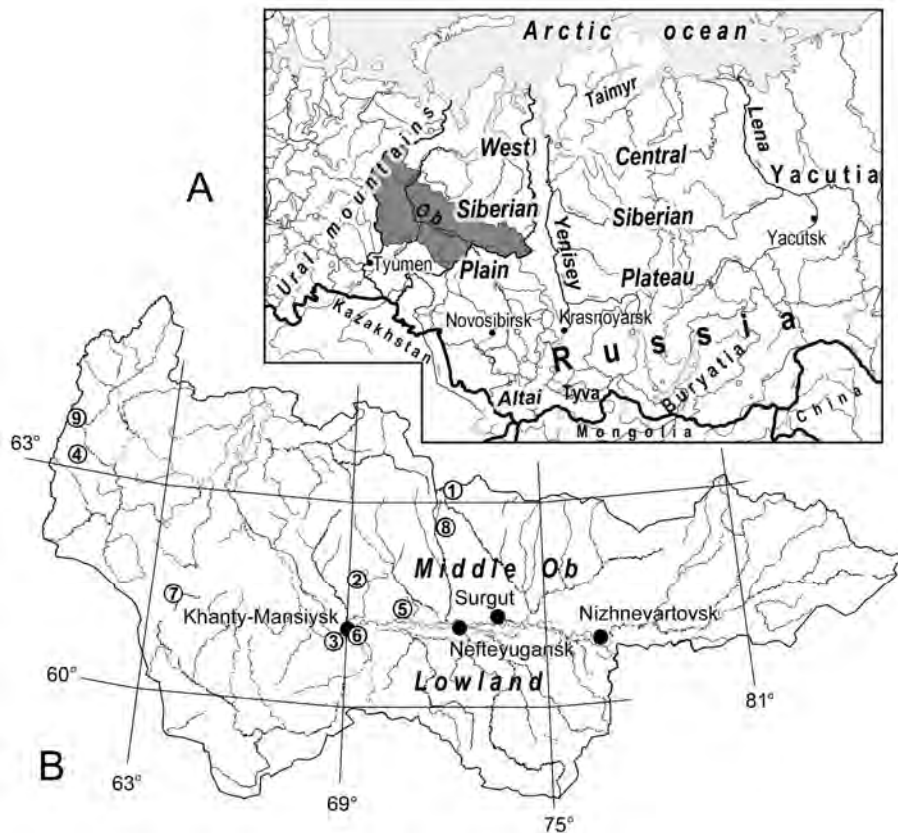


Fig. A, B: (A) Map of Siberia with Khanty-Mansi Autonomous Region (grey). (B) Map of Khanty-Mansi Autonomous Region with collecting localities: (1) Ай-Тром'еган (Ай-Тромъяган), (2) Ить-Ях (Ить-Ях), (3) Mukhrino (Мухрино), (4) Приполярный (Приполярный), (5) Seliyarovo (Селиярово), (6) Shapsha (Шапша), (7) Sovetskiy (Советский), (8) Vat'yavin (Ватьявин), (9) Vol'ya (Волья). Descriptions of collecting localities see in text.

Results

Altogether, 31 bee species from 12 genera have been found. In the checklist below, the classification is given according to MICHENER (2007). All 19 newly recorded species are marked by asterisks (*). The following abbreviations for the distribution patterns (GORODKOV 1984) are used: Hol. (Holarctic), Trans. (Trans-Palaearctic), West-Centr. (West-Central Palaearctic), West. (Western Palaearctic species).

Family C o l l e t i d a e

**Hylaeus annulatus* (LINNAEUS 1758)

M a t e r i a l e x a m i n e d : It'-Yakh (22.VII., 1♀), Seliyarovo (17-20.VII., 1♀), Shapsha (14-16.VII., 1♂, 1-4.VIII., 2♂♂), Vol'ya (1-4.VII., 2♀♀, 2♂♂, 6-8.VII., 1♂, 9-11.VII., 8♀♀, 3♂♂).

D i s t r i b u t i o n : Hol. Eurasia from Sweden (up to 68°N) and Pyrenees (EBMER 2011) to Chukotka, Kunashir Island and Mongolia (PROSHCHALYKIN 2007). North America from Alaska and California to Newfoundland and New Mexico (DATHE 1994).

Family A n d r e n i d a e

**Andrena barbilabris* (KIRBY 1802)

M a t e r i a l e x a m i n e d : Seliyarovo (17-20.VII., 1♀).

D i s t r i b u t i o n : Hol. Eurasia from Norway (up to 68°N), Ireland and Pyrenees (GUSENLEITNER & SCHWARZ 2002) to Kamchatka (PROSHCHALYKIN 2007), Honshu Island and Shanghai (XU & TADAUCHI 2009). North America from Alaska and New Mexico to Labrador and North Carolina (LABERGE 1989).

**Andrena lapponica* ZETTERSTEDT 1838

M a t e r i a l e x a m i n e d : Vol'ya (9-11.VII., 1♀).

D i s t r i b u t i o n : Trans. Eurasia from Norway (up to 70°N), Ireland and Portugal (GUSENLEITNER & SCHWARZ 2002) to Magadan Province, Kunashir Island and northern Japan (Honshu) (PROSHCHALYKIN 2007).

Family H a l i c t i d a e

**Lasioglossum rufitarse* (ZETTERSTEDT 1838)

M a t e r i a l e x a m i n e d : Shapsha (15-16.VIII., in forest, 1♂), Vol'ya (9-11.VII., 1♀).

D i s t r i b u t i o n : Hol. Eurasia from Sweden (up to 67°N), Ireland and highlands of Spain (EBMER 2011) to Kamchatka, Primirskiy Territory and eastern China (Fujian) (PESENKO et al. 2007). North America from Alaska and California to Labrador and Michigan (EBMER 2011).

**Sphecodes monilicornis* (KIRBY 1802)

M a t e r i a l e x a m i n e d : Vol'ya (9-11.VII., 1♀).

D i s t r i b u t i o n : West. North Africa (Morocco, Algeria) and Eurasia (up to 64°N in Finland) from Norway, Ireland and Portugal (WARNCKE 1992a) to Udmurtia (SITDIKOV 1986), Orenburg Region and southern Turkmenistan (Kopet-Dag); Pakistan and Kashmir (WARNCKE 1992a).

N o t e : This species is new to the Asian part of Russia.

Family Melittidae

**Macropis europaea* WARNCKE 1973

Material examined: Shapsha (14-16.VII., in forest, 1♂).

Distribution: West. Eurasia (up to 64°N in Finland) from Norway, Wales and Portugal to Altai (Barnaul) (MICHEZ & PATINY 2005).

Family Megachilidae

**Hoplitis tuberculata* (NYLANDER 1848)

Material examined: Vol'ya (9-11.VII., 1♂).

Distribution: Trans. Eurasia (up to 68°N in Finland) (ELFVING 1968) from Sweden (NILSSON 2003) and France (RASMONT et al. 1995) to Magadan Province and Khabarovsk Territory (PROSHCHALYKIN 2007).

**Osmia nigriventris* ZETTERSTEDT 1838

Material examined: Vol'ya (1-4.VII., 3♀, 9-11.VII., 10♀).

Distribution: Hol. Eurasia (up to 70°N in Finland) (ELFVING 1968) from Sweden (NILSSON 2003) and France (RASMONT et al. 1995) to Chukotka and Primorskiy Territory (PROSHCHALYKIN 2012). North America from Alaska and Oregon to Ontario and Minnesota (EBMER 2011).

**Osmia parietina* CURTIS 1828

Material examined: Vol'ya (1-4.VII., 1♀, 6-8.VII., 1♂, 9-11.VII., 4♀, 1♂).

Distribution: Trans. Eurasia from Sweden (up to 69°N) (TKALCŮ 1983), England (BALDOCK 2008) and northern Spain (Pyrenees) (ORNOSA et al. 2006) to Magadan Province (PROSHCHALYKIN 2007) and eastern Kazakhstan (Almaty) (SCHEUHL 2006).

**Osmia uncinata* GERSTAECKER 1869

Material examined: Vol'ya (1-4.VII., 1♀, 9-11.VII., 2♀).

Distribution: Trans. Eurasia (up to 70°N in Finland) (ELFVING 1968) from Sweden (NILSSON 2003), Scotland (BALDOCK 2008) and northern France and Italy (ORONSA et al. 2006) to Chukotka and Primorskiy Territory (PROSHCHALYKIN 2012).

**Megachile lapponica* THOMSON 1872

Material examined: Seliyarovo (17-20.VII., 1♂), Shapsha (14-16.VII., 1♂), Vol'ya (1-4.VII., 1♀, 9-11.VII., 1♀, 1♂).

Distribution: Hol. Eurasia (up to 66°N in Finland) (ELFVING 1968) from Norway (BERG 2000) and France (RASMONT et al. 1995) to Kamchatka (PROSHCHALYKIN 2007), Japan (Hokkaido) (HIRASHIMA & MAETA 1974) and Korea (PROSHCHALYKIN 2012). North America from Alaska and British Columbia to Newfoundland and Ontario (SHEFFIELD et al. 2011).

****Megachile nigriventris* SCHENCK 1870**

M a t e r i a l e x a m i n e d : Shapsha (14-16 VII, 1♂), Vol'ya (1-4 VII, 1♂, 9-11 VII, 1♀, 4♂♂).

D i s t r i b u t i o n : Trans. Eurasia (up to 64°N in Finland) (ELFVING 1968) from Sweden (NILSSON 2003) and highlands of Spain (ORNOSA et al. 2007) to Komi (SEDYKH 1974) and Bashkiria (NIKIFORUK 1957); Amurskaya Province (PROSHCHALYKIN 2007).

****Megachile versicolor* SMITH 1844**

M a t e r i a l e x a m i n e d : Shapsha (14-16 VII, 1♂).

D i s t r i b u t i o n : Trans. Eurasia (up to 65°N in Finland) (ELFVING 1968) from Sweden (NILSSON 2003), Ireland and Spain (SCHEUCHL 2006) to Kamchatka and Primorskiy Territory (PROSHCHALYKIN 2007).

****Megachile willughbiella* (KIRBY 1802)**

M a t e r i a l e x a m i n e d : Seliyarovo (17-20 VII, 1♂), Vol'ya (1-4 VII, 1♂, 9-11 VII, 2♀♀, 1♂).

D i s t r i b u t i o n : North Africa (Algeria) (ORNOSA et al. 2006) and Eurasia (up to 66°N in Finland) (ELFVING 1968) from Sweden (NILSSON 2003), Ireland (O'CONNOR et al. 2009) and Spain (ORNOSA et al. 2007) to Magadan Province, Kunashir Island and Japan (Hokkaido, Honshu) (PROSHCHALYKIN 2007).

****Coelioxys inermis* (KIRBY 1802)**

M a t e r i a l e x a m i n e d : Shapsha (14-16 VII, 2♂♂).

D i s t r i b u t i o n : Trans. North Africa from Morocco to Tunisia (WARNCKE 1992b). Eurasia from Sweden (up to 66°N), Ireland (O'CONNOR et al. 2009) and Portugal (WARNCKE 1992b) to Sakhalin (PROSHCHALYKIN 2007), Japan (SCHEUCHL 2006) and eastern China (WU 2006).

Family A p i d a e

****Nomada flavoguttata* (KIRBY 1802)**

M a t e r i a l e x a m i n e d : Vol'ya (6-8 VII, 1♀, 9-11 VII, 1♀, near Vol'ya River source, 1♀).

D i s t r i b u t i o n : Trans. North Africa (Algeria, Tunisia) (CELARY 1995) and Eurasia (up to 66°N in Finland) (ELFVING 1968) from Sweden (NILSSON 2003), Ireland (O'CONNOR et al. 2009) and Spain (CELARY 1995) to Yakutia (DAVYDOVA & PESENKO 2002), Japan and Taiwan (MITAI & TADAUCHI 2007).

****Nomada panzeri* LEPELETIER 1841**

M a t e r i a l e x a m i n e d : Seliyarovo (17-20 VII, 1♀), Vol'ya (1-4 VII, 3♀♀, 9-11 VII, 1♀).

D i s t r i b u t i o n : Trans. North Africa (Algeria) (CELARY 1995) and Eurasia (up to 69°N in Finland) (ELFVING 1968) from Sweden (NILSSON 2003), Ireland (O'CONNOR et al. 2009) and Portugal (CELARY 1995) to Kamchatka (PROSHCHALYKIN 2012), Japan and South Korea (MITAI & TADAUCHI 2007).

***Bombus balteatus* DAHLBOM 1832**

Material examined: Seliyarovo (17-20 VII, 1♂), Vat'yavin (24-26 VII, 1♂).

Distribution: Hol. Eurasia from Norway (from 71°N to 59°N) (LØKEN 1973) to Chukotka and Shumshu Island in northern Kurils (PROSHCHALYKIN 2007). North America from Alaska and highland California to Greenland and Newfoundland (THORP et al. 1983).

****Bombus cryptarum* (FABRICIUS 1775)**

Material examined: Mukhrino (7 VIII, 1♂).

Distribution: Hol. Eurasia from Norway (RASMONT 1984), Ireland (MURRAY et al. 2008) and the Massif Central in France (RASMONT 1984) to Chukotka (up to 68°N), Japan (Hokkaido) and Nepal. North America: Alaska, Alberta (BERTSCH et al. 2010).

***Bombus distinguendus* MORAWITZ 1869**

Material examined: Shapsha (14-16 VII, 2♀♀).

Distribution: Hol. Eurasia (up to 67°N in Sweden) from Norway (LØKEN 1973), Ireland (O'CONNOR et al. 2009) and Switzerland (AMIET 1996) to Kamchatka and Sakhalin (PROSHCHALYKIN 2007). North America: Aleutian Islands and Alaska (WILLIAMS et al. 2011).

***Bombus flavidus* EVERSMAAN 1852**

Material examined: Ay-trom"egan (28 VII, 1♀), Seliyarovo (17-20 VII, 1♀, 11♂♂), Shapsha (14-16 VII, 2♂♂), Vol'ya (5 VII, 1♀).

Distribution: Hol. Eurasia from Norway (from 71°N to 60°N), Alps and Pyrenees (LØKEN 1984) to Kamchatka and Sakhalin (PROSHCHALYKIN 2007). According to new data (CAMERON et al. 2007), *B. flavidus* has been recorded in North America as *B. fernaldae* (FRANKLIN 1911), widespread from Alaska and California to Newfoundland and North Carolina (THORP et al. 1983).

***Bombus hypnorum* (LINNAEUS 1758)**

Material examined: Ay-trom"egan (28 VII, 1♀, 1♂), Pripolyarnyi (12 VII, 1♂), Seliyarovo (17-20 VII, 1♀, 2♂♂), Vol'ya (9-11 VII, 1♀).

Distribution: Trans. Eurasia from Norway (up to 71°N) (LØKEN 1973), England (BALDOCK 2008) and Spain (PAGLIANO 1994) to Kamchatka, Japan (PROSHCHALYKIN 2007) and Taiwan (WILLIAMS et al. 2009).

***Bombus jonellus* (KIRBY 1802)**

Material examined: Ay-trom"egan (28 VII, 1♀), It'-Yakh (22 VII, 3♂♂), Pripolyarnyi (12 VII, 1♂), Seliyarovo (17-20 VII, 1♀, 10♂♂), Shapsha (14-16 VII, river plain, 2♂♂), Vol'ya (6-8 VII, 2♀♀).

Distribution: Hol. Eurasia (up to 72°N in Taimyr) (PANFILOV 1982) from Iceland (LØKEN 1973), Ireland (O'CONNOR et al. 2009) and northwestern Spain (LØKEN 1973) to Commander Islands, Kamchatka and northern Sakhalin (PROSHCHALYKIN 2007). North America: Alaska and western Canada (WILLIAMS 1991).

***Bombus lapponicus* FABRICIUS 1793**

Material examined: Ay-trom"egan (28 VII, 1♂), It'-Yakh (22 VII, 1♂), Vol'ya (6-8 VII, 2♀♀).

Distribution: *Trans.* Northern Eurasia from Norway (from 71°N to 58°N) (SVENSSON 1979) to Chukotka and Khabarovsk Territory (PROSHCHALYKIN 2007). According to recent studies (CAMERON et al. 2007), *B. lapponicus* is distinct from *B. sylvicola* KIRBY 1837, the latter species being widespread in North America from Alaska and California to Labrador (THORP et al. 1983).

***Bombus lucorum* (LINNAEUS 1761)**

Material examined: Mukhrino (7-13 VIII, 3♀♀, 3♂♂), Sovetskiy (29 VI, 1♀).

Distribution: *West-Centr.* Eurasia (up to 69°N in Finland) (PAMILO et al. 1999) from Iceland (WILLIAMS et al. 2012), Ireland (MURRAY et al. 2008) and northern Spain (BERTSCH 2009) to Yakutia (Yakutsk) (BERTSCH et al. 2010), Inner Mongolia and Sichuan (WILLIAMS et al. 2009).

***Bombus pratorum* (LINNAEUS 1761)**

Material examined: Pripolyarnyi (12 VII, 1♀), Shapsha (14-16 VII, river plain, 1♀, 1♂), Vol'ya (6-8 VII, 1♀, 9-11 VII, 1♀).

Distribution: *West-Centr.* Eurasia from Norway (up to 71°N) (LØKEN 1973), Ireland (O'CONNOR et al. 2009) and Spain (LØKEN 1973) to Yakutia (DAVYDOVA & PESENKO 2002), Kemerovo Province (PANFILOV 1981) and northern Iran (LØKEN 1973).

****Bombus saltuarius* (SKORIKOV 1922)**

Material examined: Vol'ya (6-8 VII, subalpine *Ahnus* shrub with flowering *Aconitum*, 2♀♀).

Distribution: *Trans.* Komi (Pechora River plain) (WILLIAMS et al. 2009), Novosibirsk (BYVALTSEV 2008), Magadan Province (Aman' and Budun rivers and Madaun) (PROSHCHALYKIN & KUPIANSKAYA 2005).

Note: Both large females from Vol'ya are identical to the large female in ZISP, labelled as '*Hortobombus saltuarius*' in A.S. SKORIKOV's handwriting from the Pechora River. There is also a *B. saltuarius* male from northern Western Siberia (Yamalo-Nenetskiy Autonomous Region, vicinity of Salekhard, 2.VIII.1953, 1♂, I. TELISHEV) labelled '*Hortobombus saltuarius* SKOR., coll. V. SELIVANOVSKIY' in ZMUM. The male genitalia are identical to Skorikov's illustration (SKORIKOV 1931: fig. 39).

***Bombus schrenckii* MORAWITZ 1881**

Material examined: Vol'ya (1-4 VII, 3♀♀).

Distribution: *Trans.* Eurasia (up to 63°N in Komi) (SEDYKH 1974) from Leningrad Province (SKORIKOV 1925) and Volyn' Province (KONOVALOVA 2007) to Kamchatka (PROSHCHALYKIN 2007), Japan and Hebei, China (AN et al. 2010).

***Bombus sporadicus* NYLANDER 1848**

Material examined: Mukhrino (5 VIII, 1♂, 7-13 VIII, 1♂), Vol'ya (1-4 VII, 1♀).

Distribution: *Trans.* Eurasia from Norway (from 70°N to 59°N) (LØKEN 1973), Nizhniy Novgorod Province (PANFILOV 1957) and Perm Territory (TKALCŮ 1967) to Kamchatka, Primorskiy Territory (PROSHCHALYKIN 2007) and Hebei, China (AN et al. 2010).

***Bombus sylvestris* (LEPELETIER 1832)**

Material examined: Seliyarovo (17-20 VII, 9♂♂).

Distribution: *Trans.* Eurasia from Norway (up to 70°N) (LØKEN 1984), Ireland (O'CONNOR et al. 2009) and Spain (PAGLIANO 1994) to Magadan Province, Sakhalin and Korea (PROSHCHALYKIN 2007).

***Apis mellifera* LINNAEUS 1758**

Material examined: Shapsha (14-16 VII, 1♀, 1-4 VIII, 1♀, 15-16 VIII, 1♀).

Distribution: *Cosmopolitan.* Introduced from Eurasia and Africa to America and Australia (AMIET 1996). In KhMAR, it appeared since 1912 year as a domestic animal. Now it is rarely kept in the open in the region's south, often in greenhouses (ELFIMOV 2005).

Discussion

Most of the examined bee material (136 specimens, 25 species and seven genera) are long-tongued bees (Megachilidae and Apidae). About half of the material is bumblebees and cuckoo bumblebees (81 specimens, 49.7 %). These data agree with the prognosis of the bee population and fauna of the Western Siberian taiga given by PANFILOV (1968). He even suggested a greater proportion of bumblebees (55-70 %) which are known to be well-adapted to cool climates. According to PANFILOV (1968), a quarter of the bee fauna might belong to the ground-nesting Halictini and *Andrena*. However, we have only got a few specimens from KhMAR, which may well be due to the absence of spring material. Another reason might be low evapotranspiration and vast wetland areas. All of the species of nest-building Megachilidae and *Hylaeus annulatus* do not make nests in the soil and often use dry wood (WESTRICH 1990).

Based on the general distributions of bees in the above checklist, five distribution patterns can be distinguished. Only *Apis mellifera* is cosmopolitan, present in all continents except Antarctica, mostly as a result of introduction. The ranges of the other bees seem to be natural. Holarctic bees (10 species, 32,3 %) are widespread both in Eurasia and North America. Only three Holarctic species, *Bombus cryptarum*, *B. distinguendus* and *B. jonellus*, are not circumpolar, occupying Eurasia and western North America (trans-Pacific). Most of the species are trans-Palaeartic (16 species, 51,6 %) ranging in Eurasia from the Atlantic to the Pacific. *Nomada flavoguttata* and *Bombus hypnorum* even reach Taiwan in the south (northern part of the Oriental Region). A large proportion of Holarctic and trans-Palaeartic bees (widespread in the Northern Hemisphere) indicate a poor differentiation of the fauna in high latitudes with taiga conditions in KhMAR. This can also be interpreted by Western Siberia occupying a position intermediate between the western and eastern Palaeartic. However four species in our material, i.e. *Sphecodes monilicornis*, *Macropis europaea*, *Bombus lucorum* and

B. pratorum, fail to reach the Pacific and mostly demonstrate western (former two) or west-central Palaearctic distribution patterns. Thus, Western Siberia seems to represent part of the Western Palaearctic. This is confirmed by studies on the bumblebee faunas of the forested steppe and steppe of the West Siberian Plain (BYVALTSEV 2008). *Bombus pseudobaicalensis* VOGT 1911 is the only species showing an Eastern Palearctic distribution pattern, up to Novosibirsk in the west. All other species in BYVALTSEV's material are also present in Europe.

PANFILOV's (1968) forecast is about 100 bee species in the local taiga fauna. So our 31 species listed in this paper is only the first step. We estimate that some other widespread Holarctic, trans-Palaearctic and some Western Palaearctic species might join in. For example, it is highly probable that *Andrena clarkella* (KIRBY 1802), Holarctic species (EBMER 2011), actually occurs in KhMAR. This species, as well as *A. barbilabris*, have been recorded on the eastern slopes of Ural Mountains, i.e. at Pay-Er and Ray-Is, both in the Yamalo-Nenetskiy Autonomous Region (FRIDOLIN 1936). Another example is the trans-Palaearctic *Panurginus romani* AURIVILLIUS 1914, widespread in the taiga from Norway (BERG 2000) to Kamchatka and Primorskiy Province (PROSHCHALYKIN 2007). It is known from the Central Siberian Plateau (Turukhansk, Krasnoyarsk Territory) (ROMANKOVA & ASTAFUROVA 2011). There are also records in KhMAR of bumblebees and cuckoo bumblebees (DEMIDOVA 2011) that we have not found: *B. barbutellus* (KIRBY 1802); *B. bohemicus* (SEIDL 1838); *B. campestris* (PANZER 1801); *B. cingulatus* WAHLBERG 1854; *B. consobrinus* DAHLBOM 1832; *B. cullumanus* (KIRBY 1802); *B. hortorum* (LINNAEUS 1761); *B. modestus* EVERSMANN 1852; *B. muscorum* (LINNAEUS 1758); *B. norvegicus* (SPARRE-SCHNEIDER 1918); *B. pascuorum* (SCOPOLI 1763); *B. quadricolor* (LEPELETIER 1832); *B. rupestris* (FABRICIUS 1793); *B. semenoviellus* SKORIKOV 1910; *B. sichelii* RADOSZKOWSKI 1859. Since we have failed to examine that material, at least some of the above identifications remain dubious. In addition, DEMIDOVA (2012) admitted that she had failed to identify all of her species. Yet the unusual report of *B. cullumanus* (= *B. serrisquama* MORAWITZ 1888) from the Ob' River plain was revised and confirmed by A.M. BYVALTSEV (personal communication), thus representing the northernmost record of this species (61°N). To summarize, there can be no doubt that KhMAR will prove to support a far richer bee fauna, including some unexpected southern species.

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