

ORIGINAL ARTICLE

Social wasps of the subfamily Vespinae (Hymenoptera, Vespidae) of the Kyrghyz Republic

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Abstract

Based on newly collected and museum material, the distribution of species of the Vespinae in the Kyrghyz Republic is discussed. *Vespula austriaca* is recorded for the first time from Kyrghyzstan. *Dolichovespula norwegica* is first reported in the Pamir-Alai Mountains, providing the southernmost record for the species.

Key words: distribution, *Dolichovespula*, Kyrghyzstan, *Vespa*, *Vespula*.

INTRODUCTION

Social wasps consist of the three vespid subfamilies: Vespinae, Polistinae and Stenogastrinae. Of these wasps, the stenogastrine wasps are Indo-Papuan; the Polistinae, consisting of more than 900 species, is a cosmopolitan subfamily but is mainly found in tropical regions; and the Vespinae, consisting of 67 species, is predominantly found in northern regions of the world (Carpenter & Kojima 1997). Despite the fact that the taxonomy and distribution of vespine wasps (hornets and yellowjackets) are relatively well studied compared with the other two social wasp subfamilies, the exact distribution of vespine wasps in many regions of the Palearctic is still incompletely documented. This is particularly true for the countries of Central and Inner Asia, including the Kyrghyz Republic (Kyrghyzstan). Birula (1930a; 1930b) published the first papers that included the vespine wasps of Kyrghyzstan. Milko (1999) published some important information on vespine wasps of Kyrghyzstan and adjacent territories, but the detailed distribution pattern of the vespine wasps in Central Asia is still poorly known.

In the present paper, we discuss the distribution of vespine wasps in Kyrghyzstan based on the specimens accumulated in museums over the past several decades, and those newly collected by the authors. These specimens provide comprehensive data that allow us to significantly update the faunistic list of the Vespinae of Kyrghyzstan, and in particular, to detail their distribution.

MATERIALS AND METHODS

During the past 30 years, vespine wasps in Kyrghyzstan have been mainly collected by Yu. S. Tarbinsky (YST), and also by D. A. Milko (DAM), S. L. Zonstein (SLZ), S. V. Ovchinnikov (SVO) and I. V. Makogonova (IVM). These specimens are deposited mainly in the Institute of Biology and Pedology (Bishkek, Kyrghyzstan). In 2000 and 2001, one of us, V. V. Dubatolov (VVD), carried out several research trips across the republic to collect vespine wasps: the specimens are deposited in the Siberian Zoological Museum, Institute of Animal Systematics and Ecology, Novosibirsk, Russia (SZMN). Additionally, thanks to the courtesy of Dr V. I. Tobias and Yu. A. Pesenko, we examined the wasp collection at the Zoological Institute, St Petersburg, Russia (ZIN). Material from the State Museum of Nature, Tashkent, Uzbekistan (SMNUz) was also examined by DAM in 1996–1998. The present study is based on these specimens.

Nomenclature follows Carpenter and Kojima (1997). All of the species treated in this study show significant caste dimorphism in females: in the lists of specimens

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examined, the queen is indicated by '♀' and worker by '♂'. Clarification of the collection localities from N. A. Zarudnyi's expedition to Ferghana in 1909 was based on Bobrinskii 1929).

DISTRIBUTION OF VESPINE SPECIES IN KYRGHZSTAN

Vespa orientalis Linnaeus, 1771 (Fig. 1a)

Specimens examined. **Jalalabad (=Dzhalal-Abad) Province:** 1♀, Kasan-Sai Ravine, 1 km N of Kyzyl-Tokoi, 1300 m, 17.vii.1999, DAM; 2♀, Dzhidebel Pass, ~28 km SE Karavan, 950 m, 22.vi.1999, DAM; 1♀1♂, ~15 km S of Tash-Kumyr, 9.viii.1973, L. V. Pek; 1♀, ~3 km NE of Tash-Kumyr, 14.vi.1992, SLZ; 1♀, ~6 km W of Tash-Kumyr, 15.vi.1992, DAM; 1♂, ~10 km W of Tash-Kumyr, 27.vii.1998, H. Rausch; 3♀, At-Ojnoksky Mountain Range, Kurpsaj Ravine, 950 m, 19.viii.1998, DAM; 1♂, Naryn Ravine, Kurpsai Power Station, 28.vii.2001, VVD; 1♀1♂, Naryn Ravine, Kurpsai Reservoir, near Beketchal, 8.vi.1995, DAM; 6♀ (ZIN), the former Fergana Province, Kaindysu Ravine (near Kara-Kul'), 16.vii.1895, Korzhin[skii]; 2♂, ~2 km N of Shamaldy-Sai, 27.vii.2001, VVD; 1♂, ~20 km W of Kochkor-Ata, 570 m, 24.vi.1999, G. Anufriev and M. Mokrousov; 2♀, Ak-Terek-Gava, 5.vi.1957, R. P. Karavaeva; 4♀, Gava forestry, 10.vi.1969, K. E. Romanenko; 2♂, Jarodar (=Dzharadar) Ravine near Arslanbob, 13.x.1992, DAM; 1♂7♀, Dzhalal-Abad, 19.x.1992, DAM, 10.vii.2000, VVD; 4♀7♂, ~10 km W of Dzhalal-Abad, 850 m, 21.viii.1998, DAM, 28.vi.1999, DAM and M. Mokrousov, 13.vii.2000, DAM; **Osh Province:** 1♀, Uzgen, 17.vii.2000, VVD; 4♀4♂, Keklik-Too Mountain Range, 8 km SE of Aravan, 1020 m, 27.vi.1999, DAM, G. Anufriev and M. Mokrousov.

Remarks. This is a common species, predominant in anthropogenic landscapes, including villages, settlements and towns with rural buildings. In the southern part of Central Asia, the species occurs in the mountains as high as approximately 2000 m altitude, such as Khorog, West Pamir, Tajikistan, 2170 m, 37°32'N 71°32'E (two females in the SMNUz labeled 'Khorog, July' and collected in 1928–1932; examined by DAM in 1997) and Kondara Gorge north of Dushanbe, 1800 m, south slope of Hissar Mountain Range, Tajikistan (14–17.vii.1982, DAM). In Kyrgyzstan, the highest locality records are as follows: Arkit Village (Chatkal Range, 1100 m), Kyzyl-Tokoi (Chatkal Range, 1300 m), River Naryn near Kurpsai Reservoir (800–

950 m), Yarodar (or Dzharodar) near Arslanbob and Kara-Kuldzha (Ferghana Range, 1400–1500 m) and Sulyukta (Turkestan Range, >1000 m). This species was also collected in the residual mountains, Chil'-Ustun and Keklik-Too near Aravan Village (Ferghana Valley, 1020 m).

Although this species was recorded a long time ago from the adjacent territories of the former Russian Turkestan, including neighboring localities in Uzbekistan (du Buysson 1904–1905; Birula 1925), it was relatively recently that the species was collected in Kyrgyzstan (Zonstein 1996), where the species seems to be restricted to the Ferghana Valley (Fig. 1a). This species may reach the western parts of the Talas and Chu valleys from the neighboring territories of Kazakhstan east of the Syr-Darja Kara-tau Mountains, where it was recently recorded by Milko (1999).

Summary of distribution. The Apennines, the Balkans, the Mediterranean islands east of Sicily, North Africa east of Algeria, southward to Ethiopia and Somalia (introduced in Madagascar), Turkey, south Georgia, south Armenia (Megri; based on specimens in ZIN and SZMN), south Azerbaijan, the Near East, Arabia, Iraq, Iran, Afghanistan, Pakistan, India, Nepal, China (Xinjiang) (Birula 1925; Archer 1989; Carpenter & Kojima 1997). In Central Asia, the species has been recorded from Turkmenistan, Uzbekistan, Tajikistan (Archer 1989; Carpenter & Kojima 1997), Kyrgyzstan and south Kazakhstan: Lake Biylikul in the Taraz Province (Milko 1999).

Vespa vulgaris (Linnaeus, 1758) (Fig. 1a)

Specimens examined. **Talas Province:** 1♂, Talas Range, Chichkan Ravine, ~2 km N of the mouth of Rivulet Ashuu-Bulak, 1650–1700 m, 9.viii.2000, VVD; **Issyk-Kul Province:** 2♂, Terskei Ala-Too Range, ~7 km SE Karakol, Karakol Gorge, 2300 m, 2.viii.2000, VVD; 1♂, ~25 km ENE of Karakol, 1760 m, 19.vii.2000, DAM; **Jalalabad (=Dzhalal-Abad) Province:** 1♀, Chatkal Range, Kara-Kysmak mouth, 2250 m, 19.vi.1999, DAM; 1♀, Chandalash Range, Chakmak-Su Ravine, Kuru-Tegerek, 2650 m, 9.vii.1998, DAM; 13♀, Chatkal Range, Sary-Chelek Nature Reserve, Arkit, 7.vii.1999, V. Gromenko, 8,20.vii.2000, VVD; **Osh Province:** 1♀, East Alai, ~3 km SSW Chon-Byuleolyu, 2250 m, 16.vii.2000, VVD.

Remarks. A rare species; nevertheless, it occurs almost throughout the Republic in humid mountain localities. To date, the species has been reliably recorded from the Chatkal Range and Chichkan Canyon on the southern slope of the Talas Range, in the eastern part of the

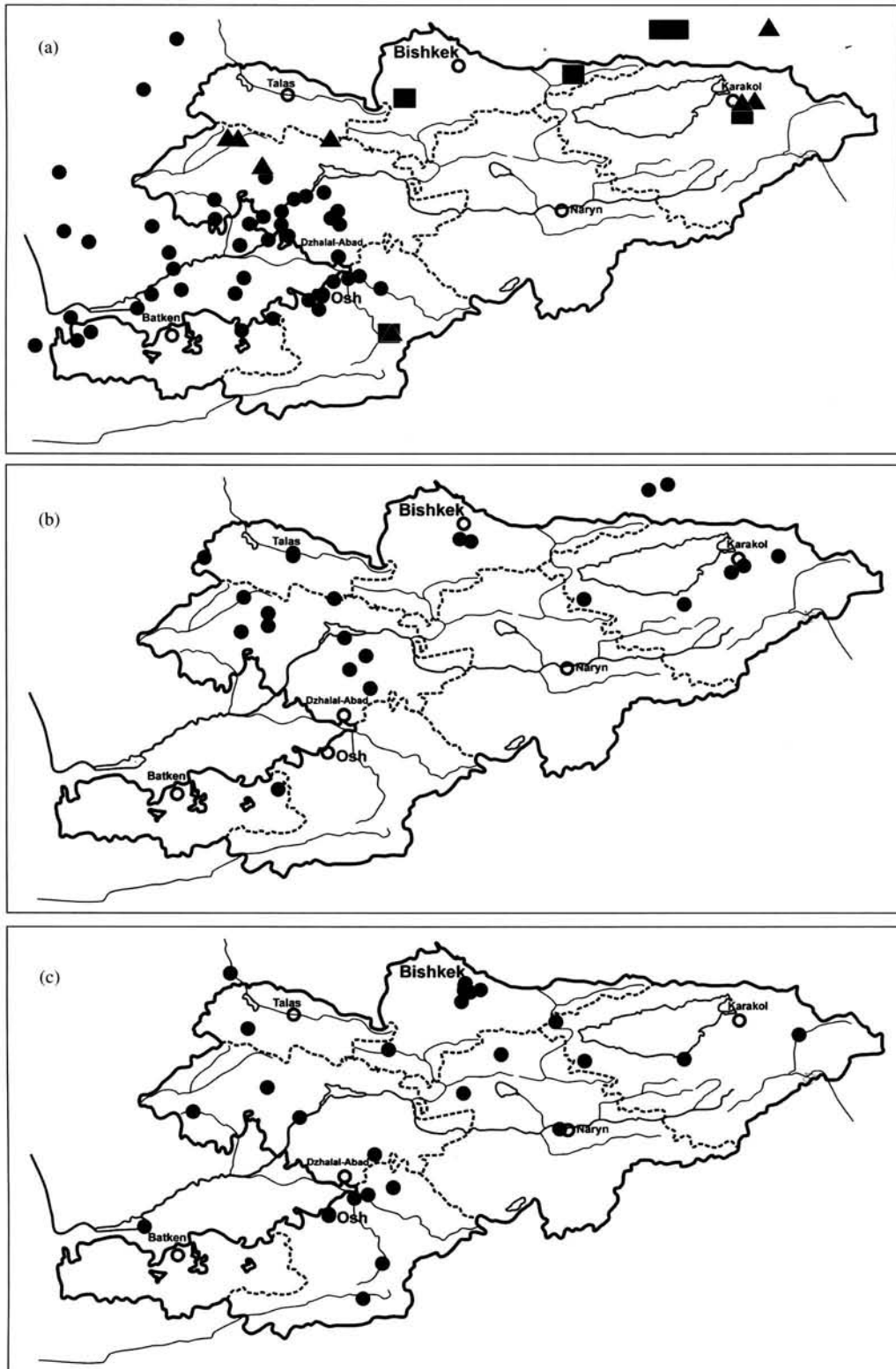


Figure 1 Maps of Kyrgyzstan and adjacent areas showing collection localities of *Vespa* and *Vespula*. (a) *Vespa orientalis* (●, ○), *Vespula vulgaris* (▲) and *Vespula austriaca* (■). (b) *Vespula rufa*. (c) *Vespula germanica*.

Terskei Ala-Too Range, and in the most humid eastern part of the Alai Range from 1300 to 2650 m altitude.

The first record in Kyrgyzstan (the northern part of the Republic) was published by Zonstein (1996), and then Milko (1999) recorded it from West Tien Shan (Chandalash Range).

Summary of distribution. Eurasia, southward to the Mediterranean Sea, Turkey, Iran, India (Kashmir), Kyrgyzstan, north Kazakhstan, Mongolia, China, Korea, Japan and North America; introduced in Iceland, New Zealand, Australia and the Hawaiian Islands (Carpenter & Kojima 1997).

***Vespula austriaca* (Panzer, 1799)** (Fig. 1a)

Specimens examined. **Chu Province:** 2♀, Kyrghyz Mountain Range, Kara-Balta Ravine, ~4 km S of the Abla Rivulet 1900–50 m, 6.vii.2000, VVD; 2♀, Transili Mountain Range, ~8 km WSW of Ak-Tyuz, 27.vii.1997, DAM and SVO; **Issyk-Kul Province:** 1♀, ~6 km SE of Karakol, River Kashka-Suu, 2200–2300 m, 18.vii.2001, VVD; **Osh Province:** 1♀, East Alai, Chon-Byuleolyu Ravine, 2050 m, 7.vii.2000, G. Anufriev and D. Potanin; 1♀, East Alai, 3 km SSW Chon-Byuleolyu, 2250 m, 16.vii.2000, VVD.

Remarks. A rare species, occurring in humid mountain regions, namely in the Kyrghyz Range, westernmost parts of the Transili Range, eastern Cis-Issykkulia, and easternmost parts of the Alai Range from 1750 to 2300 m altitude, where it was collected only in the canyons with moist, tall, herbaceous vegetation. This wasp is a social parasite of *Vespula rufa* (Linnaeus), and in North America it also parasitizes *Vespula acadica* (Sladen) (see Reed *et al.* 1979).

This is the first record from Kyrgyzstan where the species was found in the high mountains of North Tien Shan and East Alai.

Summary of distribution. Eurasia, southward to the Mediterranean Sea, Turkey, south-eastern Kazakhstan, Kyrgyzstan, Indian Kashmir, Mongolia, north-west and north-east China, Japan and North America (Carpenter & Kojima 1997).

***Vespula rufa* (Linnaeus, 1758)** (Fig. 1b)

Specimens examined. **Talas Province:** 2♀, Talas Range, Ara-Bijik Ravine, ~17 km NNE of Maidantal Pass, 2100 m, 3.vii.1998, DAM; 4♀, Talas, vi.1975, L. V. Pek; 1♀, Talas Range, Chichkan Ravine, ~2 km N of mouth of Rivulet Ashuu-Bulak, 1650–1700 m, 8.viii.2000, VVD; 2♀, Chichkan Ravine, 1600–1750 m, 1.vi.1995, 21.vii.1999, DAM; **Chu Province:** 8♀, Kyrghyz Range, Ala-Archa Gorge, Kashka-Suu,

1600 m, 16.vi.1997, IVM, 10.viii.1997, SVO, 15.vi.1980, 17.vii.2001, DAM; **Issyk-Kul Province:** 2♀, Terskei Ala-Too Range, Ulakol, 24.vii.1975, YST; 1♂2♀, ~16 km S of Barskaun, 2350 m, 5.vii.1999, DAM; 1♂, Dzhety-Oguz health resort, 9.vii.1994, DAM; 1♂2♀, Turgen-Aksu Ravine, 12.vii.1975, YST; **Jalalabad (=Dzhalal-Abad) Province:** 1♀, Chatkal Range, mouth of Kara-Kysmak, 2250 m, 19.vi.1999, DAM; 15♀, Chatkal Range, Sary-Chelek Nature Reserve, Arkit, 8,19–20.vii.2000, VVD; 1♀, Ferghana Range, Kyzyl-Unkur, 12.vii.1993 SLZ; 1♀1♂, Ferghana Range, Kokbel Pass, 27.vi.1992, SLZ.

Remarks. This species is rare, occurring mainly in humid forest areas: Cis-Issykkulia, Kyrghyz, Talas, Chatkal and Ferghana ranges from 1200 to 2400 m altitude. Ten years ago, one of us (DAM) found a single specimen of this species in the collection of the Forest Department, Institute of Biology and Pedology (National Academy of Sciences of the Kyrgyz Republic (NASKR)); this specimen was mixed up with materials collected from the outskirts of Kyzyl-Kiya, but most probably was actually collected from higher mountains neighboring the road in the canyon of the River Isfairamsai.

In Kyrgyzstan, it was first recorded by Birula (1930b) from North Ferghana (Arsantscha), later by Zonstein (1996) from the northern part of the Republic, and then additionally by Milko (1999) from West Tien Shan and the Ferghana Valley.

Summary of distribution. Eurasia, southward to the Mediterranean Sea, Turkey, north Kazakhstan, Uzbekistan, Kyrgyzstan, Mongolia, China, Japan and North America (Carpenter & Kojima 1997).

***Vespula germanica* (Fabricius, 1793)** (Fig. 1c)

Specimens examined. **Talas Province:** 1♀, Kara-Buura Ravine, at the Rivulet Taity mouth, 7.viii.2001, VVD; **Chu Province:** 1♀, Suusamyр Valley, 2300 m, 29.vii.1998, SVO; 5♂3♀, Bishkek, 27.vi.1980, 4.ix.1981, 19.x.1993, 30.ix, 20,22.x.1994, 9.x.1998, DAM; 2♀, ~3 km S of Bishkek, 1100 m, 7.ix.1995, SLZ; 2♀2♂, Chon-Aryk, *prope* Bishkek, 1060 m, 7.ix.1999, DAM; 1♀, Kyok-Dzhar, near Bishkek, 13.vi.1994, DAM; 3♀1♂, ~20 km SE of Bishkek, Gornaya Maevka, 3.viii.1996, IVM; 1♀1♂, ~25 km SSW of Bishkek, Ala-Archa Ravine, Kashka-Suu, 17.vii.1996, 18.x.1997, IVM; **Issyk-Kul Province:** 4♀, Boom Ravine, ~25 km W of Balykchi, 1550 m, 6.ix.1998, DAM; 1♀, Terskei Ala-Too, Ulakol Ravine, 24.vii.1975, YST; 1♀, Terskei Ala-Too, ~5 km S of Barskaun 1890 m, 5.vii.1999, DAM; **Naryn Province:** 1♀,

Kabak-Too (=Kavak-Too), 31.viii.1974, YST; 1♀, Dzhungaltoo Mountains, Seok-East Ravine, 2620 m, 25.vii.2000, DAM; 1♀, ~10 km W of Naryn, 27.ix.1997, G. Lazkov; **Jalalabad (=Dzhalal-Abad) Province:** 1♀2♂, Chatkal Range, Kasan-Sai Ravine, 41°29'N 70°53'E, 2200 m, 1.vii.1996, SLZ, 7.viii.2001, VVD; 2♀, Chatkal Range, Sary-Chelek Nature Reserve, Arkit, 8.vii.2000, VVD; 1♀, ~2 km S of Arkit, 1200 m, 28.viii.1998, SLZ; 1♀3♂, Naryn Ravine, At-Ojnoksky Mountain Range, Kurpsaj Ravine, ~950 m, 19.viii.1998, 23.vi.1999, DAM; 1♀, Ferghana Range, Urumbash Ravine, ~10 km NE of Arkhangel'skoe, 1650 m, 26.viii.1998, DAM; **Osh Province:** 1♀, Uzgen suburbs, 22.viii.1998, DAM; 1♀, Ferghana Range, River Yassy Valley, 28.v.1975, YST; 2♀2♂, Alai Range, Gultcha Ravine, ~50 km S of Gultcha, 2500 m, 15.vii.1998, DAM, H. Rausch and A. Karabaev; 1♀, Alai Range, Gultcha Ravine, vicinity of Sufi-Kurgan, 6.vi.1999, SLZ; 2♀, Transalai Range, E part, Kalta-Bulak Ravine, 2950 m, 15.vii.1998, SLZ.

Remarks. This species is common in anthropogenic habitats, but rare in the natural environment; it is particularly rare in mountainous areas. Nevertheless, the species is recorded from almost everywhere in the Republic, excluding the highest regions. In mountains, it occurs at up to 3100 m altitude.

In Kyrgyzstan, *V. germanica* was first recorded by Kurzenko (1982) on the distribution map of the species. Zonstein (1996) and Milko (1999) recorded it from almost the whole territory of the Republic, including the most upper part of Inner Tien Shan (1♀, by visual observation, river Sary-Dzhaz, Ken-Suu, 42°18'N 79°11'E, 20.vii.2000, DAM).

Summary of distribution. North-west Africa, Eurasia, southward to the Mediterranean Sea, the Azores and Canary Islands, Israel, Iran, Pakistan, India (Kashmir), Central China and Taiwan; introduced in Iceland, New Zealand, Australia, South Africa, Canada, USA, Chile and Argentina (Carpenter & Kojima 1997).

Dolichovespula sylvestris (Scopoli, 1763)

(Fig. 2a)

Specimens examined. **Talas Province:** 1♀, Talas Range, Kara-Buura Ravine, ~5–6 km downstream of the Taldy-Sai Rivulet, 1700–1800 m, 30.vi.2001, VVD; **Chu Province:** 1♀, River Kokomenen Ravine, near Kyzyl-Oi 1700–1900 m, 10.vii.2001, VVD; 3♀2♂, Kyrgyz Mountain Range, Kara-Balta Ravine, ~4 km S of the Abla Rivulet, 1900–1950 m, 6.vii, 12.viii.2000, VVD; 1♀, ~26 km S of Bishkek, 9.v.1995, DAM; 1♂, Kyrgyz Range, Kegety Ravine, 17.viii.1955,

R. P. Karavaeva; 1♀, Transili Ala-Too, Kemin Ravine, 9.vii.1951, R. P. Karavaeva; **Issyk-Kul Province:** 1♂ (ZIN), 'Issyk-Kul', 27.vii.1911, Nedzvetskii; 1♂, Kungei Ala-Too, Chon-Uryukty, 1.viii.1992, DAM; 2♀1♂, Terskei Ala-Too, ~16 km S of Barskaun, 2350 m, 5.vii.1999, DAM and M. Mokrousov; 1♂2♀, Terskei Ala-Too, ~3 km SE Kyzyl-Suu 2000 m, 2.viii.2000, VVD and A. Malysheva; 1♀, Terskei Ala-Too, ~12 km SSE of Karakol, 2500 m, 1.viii.2000, VVD; **Jalalabad (=Dzhalal-Abad) Province:** 1♀, Talas Range, Kara-Kysmak Ravine, 2550 m, 42°08'N 71°33'E, 18.vi.1999, DAM; 2♀, Chandalash Range, Suuluu-Tegerek Ravine, near Chakmak-Suu, 2200–2300 m, 1.vii.2001, VVD; 2♀ (SMNUz), Chatkal Range, Lake Sary-Chelek, 10, 18.vii.1925, I. Yankovsky; 2♀, Chatkal Range, Sary-Chelek Nature Reserve, Arkit, 8, 20.vii.2000, VVD; 1♀, Chatkal Range, Chaptchyma Pass, 2800–3100 m, 2.vii.2001, VVD; 1♀ (ZIN), Chatkal Range, Mount Kek-Sarai, 5.vi.1909, N. Zarudnyi; 1♀ (ZIN), Chatkal Range, Sai Bukte-Bulak, 11.vi.1909, N. Zarudnyi; 1♀1♂ (ZIN), Chatkal Range, Arsantschá (near Chymyndy-sai), 28–29.vi.1909, N. Zarudnyi; 5♂1♀, Ferghana Range, Urumbash Pass, 3050 m, 41°17'N 73°38'E, 27.viii.1998, DAM; **Osh Province:** 1♀, Ferghana Range, Salamalik, 28.v.1975, YST; 1♀, East Alai, Chon-Byuleolyu Ravine, 2050 m, 7.vii.2000, DAM; 3♀20♂, East Alai, ~3 km SSW Chon-Byuleolyu, 2250 m, 16.vii.2000, VVD, IVM; 1♀, Alai Range, Gulcha Ravine, ~50 km S of Gulcha, 2500 m, 15.vii.1998, DAM; 2♀, Gulcha River, ~3 km of mouth of Rivulet Katta-Karakol, 22.vii.1998, IVM; 1♀, right side of the Gulcha River, ~3 km of the mouth of the Rivulet Katta-Karakol, 2900 m, 12.vii.2000, VVD.

Remarks. A common species, occurring from 1300 to 3100 m altitude, and inhabiting different habitats up to the alpine meadows.

In Kyrgyzstan, it was first recorded by Birula (1930a) from the Issyk Kul Basin (without exact locality), Chatkal (Mount Keok-Sarai, Arsantschá and Saj Bukté-bulák) and Ferghana (Syureon-Tebe Range near Kok-Yangak) ranges. Besides several localities in the Ferghana Range, Eck (1992) reported an additional locality near Naryn. Milko (1999) refined the species distribution in Tien Shan. Later, this species was collected also in the Alai Range.

Summary of distribution. North-West Africa, Europe, Russia, Turkey, Armenia, Iran, Afghanistan, Pakistan, India (Kashmir), Tajikistan, Uzbekistan, Kyrgyzstan, Kazakhstan, Mongolia and China (Birula 1930a; Carpenter & Kojima 1997).

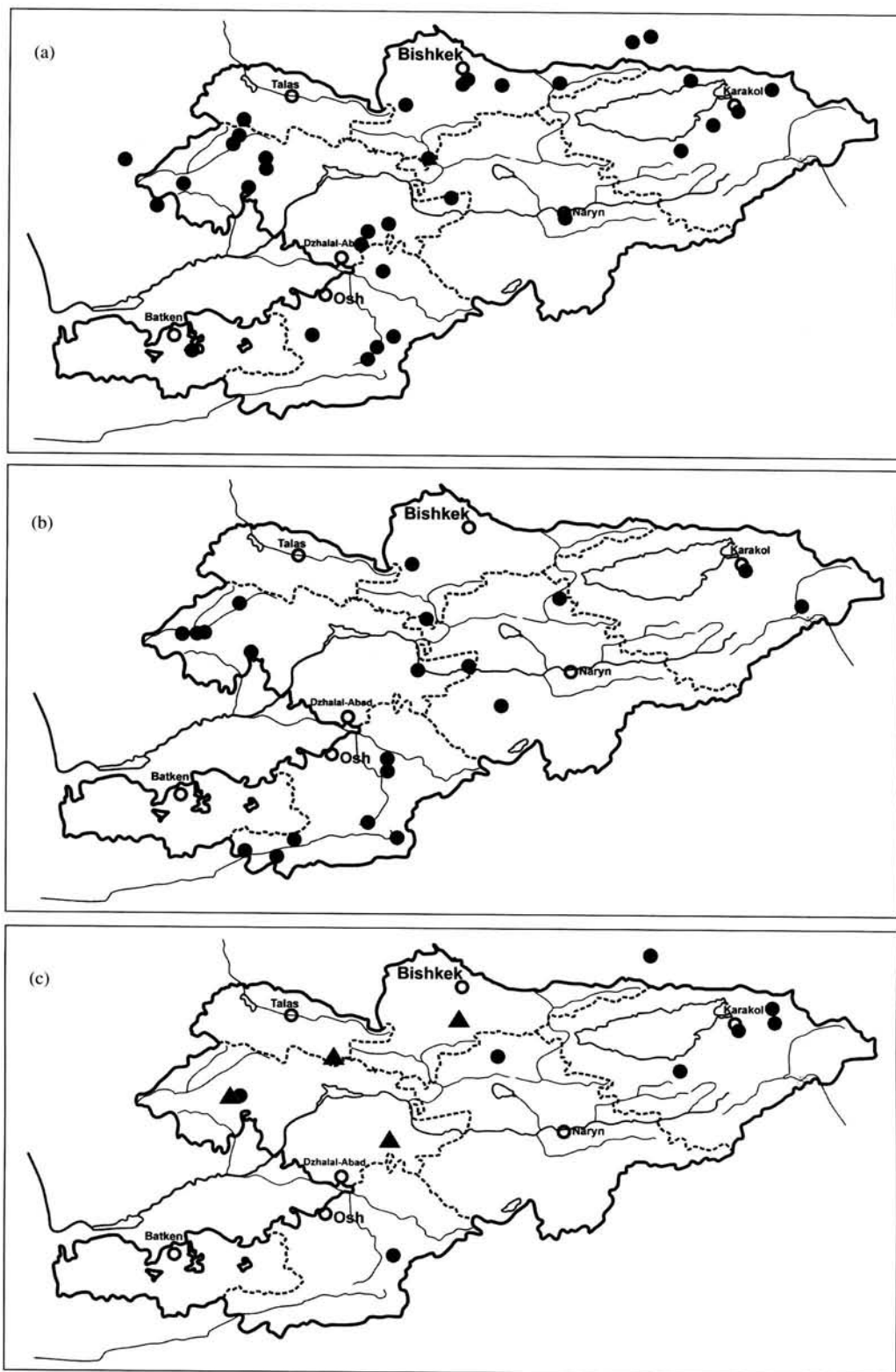


Figure 2 Maps of Kyrgyzstan and adjacent areas showing collection localities of *Dolichovespula*. (a) *Dolichovespula sylvestris*. (b) *Dolichovespula intermedia*. (c) *Dolichovespula norvegica* (●, ○) and *Dolichovespula adulterina* (▲).

***Dolichovespula intermedia* (Birula, 1930)**

(Fig. 2b)

Specimens examined. **Chu Province:** 2♀1♂, Kyrgyz Mountain Range, Kara-Balta Ravine, ~4 km S of the Abla Rivulet 1900–1950 m, 6.vii, 12.viii.2000, VVD; 1♂, Sary-Kamysh Range, ~11 km WSW of Kyzyl-Oi, River Kovyuk-Suu headwater, 2600–2800 m, 7.viii.2000, VVD; **Issyk-Kul Province:** 1♀, Terskei Ala-Too, ~6 km SE of Karakol, Rivulet Kashka-Suu, 2200–2300 m, 1.vii.2001, VVD; 1♀, Terskei Ala-Too, ~12 km SSE of Karakol, 2500 m, 1.viii.2000, VVD; 2♀, Sary-Dzhaz, Kaindy Ravine, 2200 m, 16.vii.1993, DAM; **Naryn Province:** 1♀, Moldo-Too Range, Teke-Uyuk Ravine, 2300 m, 41°34'N 74°40'E, 30.vi.1999, DAM; 1♀, Baibiche-Too, 2700 m, 42°06'N 75°50'E, 4.viii.1995, DAM; 1♀, ~15 km SSE of Kotchkorka, 20.viii.1995, DAM; **Jalalabad (=Dzhalal-Abad) Province:** 1♀, Chandalash Range, Suuluu-Tegerek Ravine near Chakmak-Suu, 2200–2300 m, 1.vii.2001, VVD; 2♀, Chatkal Range, ~10 km E of Dzhany-Bazar, 2150–2700 m, 11.vii.1998, DAM; 4♀, Chatkal Range, ~4 km SW of Aigyr-Dzhal 1800 m, 12.vii.1998, DAM and H. Rausch; 3♂1♀ (SMNUz), Chatkal Range, Padsha-Ata River, 15.viii.1933, I. Yankovsky; 2♀, junction of Kokerim and Kugart rivers, near Kazarman, 1250 m, 28.viii.1998, G. Anufriev and M. Mokrousov; **Osh Province:** 7♀, Karakuldzha District, Laisu Ravine 1850–1900 m, 40°31'N 73°37'E, 25.viii.1998, DAM, Ch. Dietrich, G. Anufriev and M. Mokrousov; 5♀, Alai Range, S slope, Ok-Suu Ravine, ~6 km NWW of Kara-Teit, 2600 m, 39°31'N 71°41'E, 17.vii.1998, DAM; 2♀, Alai Range, S slope, Kyzyl-Eshme Ravine, 2900 m, 39°37'N 72°17'E, 20.vii.1998, DAM and SVO; 3♀, Transalai Range, W part, Berk-Suu Ravine, 2600 m, 39°29'N 72°02'E, 19.vii.1998, DAM and IVM; 3♀, Transalai Range, E part, Kalta-Bulak Ravine, 2950 m, 15.vii.1998, SLZ and IVM.

Notes on systematics. This species was originally described as a variety of the previously listed species *Vespula sylvestris* var. *intermedia* Birula, 1930, from the River Zerafshan Valley (Uzbekistan) and Eastern Buchara (territory now belonging to Tajikistan). Archer (1981) raised it to full species status and proposed an unnecessary replacement name, *Dolichovespula asiatica* Archer (see Carpenter & Kojima 2002). These two species (*D. sylvestris* and *D. intermedia*) can be easily distinguished by the structure of the male genitalia (Archer 1989: fig. 54); namely, the inner margin of gonostipes of *D. intermedia* is noticeably concave (straight in *D. sylvestris*). In addition, the following two external

morphological characters (although varying to some extent) can also be used: (i) *D. sylvestris* usually has denser large punctures on the clypeus than in *D. intermedia* (but some workers of the latter species have deep irregular micropunctures in addition to large punctures on the clypeus and thus have a state very similar to that in *D. sylvestris*); and (ii) the wide continuous yellow band on the gena and temporae is present in *D. intermedia* (narrow and interrupted in *D. sylvestris*).

Remarks. As with *D. sylvestris*, this species is relatively common, inhabiting open habitat in mountainous areas from 1200 to 3000 m altitude.

In Kyrgyzstan, the species was first recorded by Birula (1930a) as *Vespula sylvestris* var. *intermedia* from Ak-Bosogo and Toguz-Bulak (Alai Range). Mapping the species distribution, Eck (1992) reported on two additional localities: western Issyk Kul Basin and Osh. Later, its distribution was refined by Milko (1999), who recorded the species from the Alai Valley, Chatkal, Fergana, Alai and Baibiche-Too ranges under '*D. asiatica*'. During the past few years, *D. intermedia* has been collected in different localities of the Republic, such as Inner Tien Shan, the Sary-Dzhaz Valley and the Kyrgyz Range.

Summary of distribution. Turkmenistan, Kazakhstan, Kyrgyzstan, Uzbekistan, Tajikistan, Afghanistan, Pakistan, India (Kashmir), Mongolia and China (Sichuan) (Birula 1930a; Carpenter & Kojima 1997).

***Dolichovespula adulterina* (du Buysson, 1905)**

(Fig. 2c)

Specimens examined. **Chu Province:** 1♀, ~30 km S Bishkek, on *Viburnum*, ~1550 m, 42°39'N 74°30'E, 28.vi.2002, DAM; **Talas Province:** 1♀, S slope of the Talas Range, Chichkan Ravine, 1600 m, 42°07'N 72°53'E, 1.vi.1995, DAM; **Jalalabad (=Dzhalal-Abad) Province:** 1♀ (ZIN), Chatkal Range, Arsantchá (near Chymyndy-sai), 28–29.vi.1909, N. Zarudnyi; 2♂, Fergana Range, Urumbash Pass, 3050 m, 41°17'N 73°38'E, 27.viii.1998, DAM.

Remarks. This species is rare. It is a social parasite of other *Dolichovespula* species. The positive host records in Europe are limited to *D. saxonica* (Fabricius), with indirect evidence suggesting *D. norwegica* (Fabricius) (see Guiglia 1972: 136). In Kyrgyzstan, *D. saxonica* has never been found, including during our present research, while *D. norwegica* certainly occurs sympatrically with *D. adulterina*. Although we do not have any direct evidence for the association of *D. adulterina* and *D. norwegica*, such sympatric occurrences of these spe-

cies strongly suggest this combination of social parasitism. Similar to the host species, it occurs in the most humid forests of mountainous areas from 1600 to 3050 m altitude.

In Kyrgyzstan, it was first recorded by Milko (1999) from the central part of the Ferghana Range and in the south-western part of the Suusamy Range; later it was found in the Kyrgyz Range.

Summary of distribution. North, Central and East Europe, Russia, Turkey, Georgia, Kyrgyzstan, South-Eastern Kazakhstan, Mongolia, China (Taiwan), Japan and North America (Kurzenko 1995; Carpenter & Kojima 1997).

Dolichovespula norwegica (Fabricius, 1781)

(Fig. 2c)

Specimens examined. Issyk-Kul Province: 1♀, Terskei Ala-Too, ~16 km S of Barskaun, 5.vii.1999, G. Anufriev, M. Mokrousov; 1♀, Terskei Ala-Too, Turgen-Aksu Ravine, approximately 42°35'N 78°53'E, 12.vii.1975, YST; 1♀, Karkara, approximately 42°46'N 78°58'E, 18.vii.1975, YST; 2♀, ~7 km SE Karakol, Karakol Ravine 2000 m, 2.viii.2000, VVD; Naryn Province: 2♀, Dzhungaltoo Range, Seok-East Ravine, 2620 m, 42°13'N 75°01'E, 25.vii.2000, DAM; Osh Province: 2♀, East Alai, ~3 km SSW Chon-Byuleolyu, 2250 m, 16.vii.2000, VVD, IVM.

Remarks. A rare species, inhabiting the most humid forest parts of mountains at the same altitudes (1600–3050 m) as its social parasite, *D. adulterina* (du Buysson).

In Central Asia, it was first recorded by Birula (1930a) from the single female collected by Zarudnyi in North Ferghana (Arsantchá in the Chatkal range near Chymyndy-sai). Additionally, two females were found from the Chinese part of East Tien Shan (Tsangma, River Kungess Basin and Kuldzha District, River Kasch, now Kax He) (Birula 1930a), and later from south-eastern Kazakhstan (Kurzenko 1995; Milko 1999). In Kyrgyzstan, it was reported by Milko (1999) from the eastern Issyk Kul Basin. During the past years, this species has also been collected from Inner Tien Shan and East Alai, representing the southernmost localities thereof. The record from the River Syr-Darja (Eck 1981) seemed to be based on a mistakenly labeled specimen.

Summary of distribution. North Europe, the mountains of Central Europe, Russia, Turkey, Kyrgyzstan, Eastern Kazakhstan, Mongolia, north-western and north-eastern China, North America (Kurzenko 1995; Carpenter & Kojima 1997).

CONCLUDING REMARKS

Nine species of the subfamily Vespinae are known to date from the territory of the Kyrgyz Republic. Two of them (*V. orientalis* and *D. intermedia*) are southern species, which are not recorded to the north of south Kazakhstan. The others are quite widespread in the Palearctic, of which *Vespula germanica* occurs both in plains and mountainous landscapes, whereas the others are restricted to mountain territories. Of these latter species, the majority (*V. austriaca*, *V. rufa*, *V. vulgaris*, *D. adulterina* and *D. norwegica*) predominate in the most humid areas with arboreal vegetation.

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