



The genus *Sphecodes* Latreille 1804 (Hymenoptera: Apoidea: Halictidae) in Central Asia

YULIA V. ASTAFUROVA¹ & MAXIM YU. PROSHCHALYKIN^{2,3}

¹Zoological Institute, Russian Academy of Sciences, Universitetskaya Nab., 1, Saint Petersburg, 199034, Russia.

E-mail: Yulia.Astafurova@zin.ru

²Federal Scientific Center of the East Asia Terrestrial Biodiversity, Far Eastern Branch of Russian Academy of Sciences, Vladivostok-22, 690022, Russia. E-mail: proshchalikin@biosoil.ru

³Corresponding author

Abstract

Available information on the bees of the genus *Sphecodes* Latreille 1804 in Central Asia is summarized. Twenty-eight species are currently known from this area. *Sphecodes turanicus* Astafurova & Proshchalykin, **sp. nov.** is described from Uzbekistan, Turkmenistan, Tajikistan, and Kazakhstan. Eight species: *Sphecodes anatolicus* Warncke 1992, *S. crassus* Thomson 1870, *S. croaticus* Meyer 1922, *S. ferruginatus* Hagens 1882, *S. miniatus* Hagens 1882, *S. pellucidus* Smith 1845, *S. rufiventris* (Panzer 1798), and *S. spinulosus* Hagens 1875 are newly recorded from Central Asia. The status of *S. nurekensis* Warncke 1992, **stat. nov.** is raised to species level; *S. tadschicus* Blüthgen 1935, **stat. resurr.** is reinstated as a valid taxon. A lectotype is designated for *S. gracilior* Morawitz 1893. Illustrated keys to both males and females of all species known from Central Asia are provided.

Key words: taxonomy, new species, cleptoparasitic, fauna, Palaearctic Region

Introduction

The present paper is part of a series of works dealing with the bees of the genus *Sphecodes* Latreille 1804 of the territory of the former Soviet Union (Proshchalykin 2012; Proshchalykin & Astafurova 2012; 2016; Astafurova & Proshchalykin 2014, 2015a, b, 2016a, b, 2017; Astafurova *et al.* 2014). Currently 45 species are known from this area, but the *Sphecodes* fauna of Central Asia is particularly understudied.

For the purpose of this publication only, Central Asia is limited to the territories of Uzbekistan, Kyrgyzstan, Turkmenistan and Tajikistan. It has an area of about 1,280 thousand km² (Fig. 1) and comprises the arid to semi-arid regions of the Turanian Basin in its centre and the mountain ranges of the Tien Shan and Pamir in the east. Although Kazakhstan is also part of this region, its *Sphecodes* fauna will be dealt with in a separate publication (Astafurova *et al.*, in preparation). Climatically and orographically the region is highly diverse, ranging from the lowland deserts of the Caspian Depression to the 7,495m high Ismoil Somoni Peak in the Pamir. After the Mediterranean Basin, Central Asia is the most important centre of bee diversity in the Palaearctic Region (Michener 1979).

Sphecodes gracilior Morawitz 1893 [= *S. alternatus* Smith 1853] was the first species of the genus described from Central Asia (Morawitz 1893), and a total of four species and two subspecies have been described since from this area (Warncke 1992—2 species and 1 subspecies, Morawitz 1893—1 species, Meyer 1920—1 subspecies, Blüthgen in Popov 1935—1 species), with five of them still valid (see section on taxonomy for details). Nineteen *Sphecodes* species have been recorded from Central Asia so far (Morawitz 1876, 1893; Radoszkowski 1886; Mayer 1920, 1925; Blüthgen 1924b; Popov 1935, 1951, 1967; Warncke 1992). Based on a comprehensive study of specimens in various collections we list here 28 species of *Sphecodes*, with one species described as new and eight species recorded from Central Asia for the first time. The status of *Sphecodes nurekensis* Warncke 1992 is raised to species level and that of *S. tadschicus* Blüthgen 1935 is reinstated as a valid taxon. Illustrated keys to the species of *Sphecodes* known from Central Asia are presented to facilitate further research on this bee genus.



FIGURE 1. Map of Central Asia (from Kuhlmann & Proshchalykin 2013).

Materials and methods

Synonymy and distribution of *Sphecodes* species generally follows Warncke (1992), Bogusch & Straka (2012), Mitai & Tadauchi (2013), Özbek et al. (2015), and Astafurova & Proshchalykin (2014, 2015a). Morphological terminology generally follows Michener (2007): e.g., we have used the abbreviations T1, T2, T3, etc., to denote the first, second, third, etc., metasomal terga; S1, S2, S3, etc. to denote the first, second, third, etc., metasomal sterna; and F1, F2, F3, etc., to denote the first, second, third, etc. flagellomere. Integumental sculpture is described by the following formula: puncture diameter (in μm) / ratio of distance between punctures to average puncture diameter, e.g., 15–20 μm / 0.5–1.5. The ventral surfaces of some flagellomeres bear a distinctive patch or zone of sensilla trichodea A (sensu Årgent and Svensson, 1982), and we refer to these as the tyloids, easily observable under light microscopy. Surface texture is described as follows: areolate—coarse, contiguous punctures; reticulate—superficially net-like or made up of a network of raised lines; rugose—irregular, nonparallel, wrinkled raised lines (rugae); rugulose—minutely rugose; strigae—narrow, transverse or longitudinal streaks, variety of parallel lineations; tessellate: regular network of shallow grooves with flat interspaces. Photographs were made using a combination of stereomicroscope Olympus SZX10 and digital camera Canon EOS70D. Illustrations were obtained by montaging an image series, covering different focal planes, into a single in-focus image with the Helicon Focus 6. The final illustrations were post-processed for contrast and brightness using Adobe® Photoshop® software.

Acronyms for collections from which specimens were borrowed or are deposited are as follows (the names of curators are given in parentheses):

FSCV—Federal Scientific Center of the East Asia Terrestrial Biodiversity, Far Eastern Branch of Russian Academy of Sciences, Vladivostok, Russia (A. Lelej);

MNHU—Museum für Naturkunde Berlin, Leibniz-Institut für Evolutions- und Biodiversitätsforschung, Berlin, Germany (F. Kohl, M. Ohl);

OÖLM—Oberösterreichisches Landesmuseum, Linz, Austria (F. Gusenleitner);

ZISP—Zoological Institute, Russian Academy of Sciences, St. Petersburg, Russia (Yu. Astafurova, S. Belokobylskij);

ZMMU—Zoological Museum of Moscow University, Russia (A. Antropov).

The results for Central Asia presented in this paper are based on 2,200 specimens collected mainly in the last

few decades by entomologists in Uzbekistan, Kyrgyzstan, Turkmenistan and Tajikistan and currently housed in the ZISP, ZMMU, OÖLM, and FSCV. Additional material from the Palaearctic Region and comparative reference material in ZISP, OÖLM and MNHU were also studied.

We have used the following abbreviations for collectors: AL—A.S. Lelej; AP—A.A. Ponomareva; AS—A.V. Shestakov; AZ—A.N. Zhekhovtsev; DK—D.R. Kasparyan; MP—M.Yu. Proshchalykin; MV—M.G. Volkovich; SB—S.A. Belokobylskij; VG—V.V. Gussakovskij; VP—V.V. Popov; VT—V.I. Tobias; YP—Yu.A. Pesenko. New distributional records are noted with an asterisk (*).

Taxonomy

Genus *Sphecodes* Latreille 1804

Sphecodes Latreille 1804: 182. Type species: *Nomada gibba* Fabricius 1804 = *Sphex gibba* Linnaeus 1758, by monotypy.

Sphecodes albilabris (Fabricius 1793)

(Figs 2, 3, 76)

Nomada albilabris Fabricius 1793: 349, ♀, ♂ (type locality: Germany).

Dichroa fuscipennis Germar 1819: 18, ♀ (type locality: Germany).

Sphecodes latreillei Wesmael 1835: 285, ♀, ♂ (type locality: Belgium).

Sphecodes rubripes Spinola 1839: 512, ♀ (type locality: Cyprus).

Sphecodes africanus Lepeletier de Saint Fargeau 1841: 541, ♀, ♂ (type locality: Algeria).

Sphecodes nigripes Lepeletier de Saint Fargeau 1841: 542, ♀, ♂ (type locality: France).

Sphecodes rugosus Smith 1848: 2209, ♂ (type locality: England).

Sphecodes nodicornis Gistel 1857: 554, ♀, ♂ (type locality: Germany).

Sphecodes fuscipennis var. *basalis* Dalla Torre 1877 (nom. praeocc., nec Sichel 1865): 185, ♀ (type locality: Italy). *Sabulicola cirsii* Verhoeff 1890: 329, ♂ (type locality: Germany).

Sphecodes grandis Meyer 1922: 173, ♂ (type locality: Northeast India).

Sphecodes rufipennis Cockerell 1931a: 348, ♂ (type locality: Morocco).

Sphecodes atrescens Cockerell 1931a: 350, ♂ (type locality: Morocco).

Sphecodes albilabris rubripes: Warncke 1992: 30.

Material examined (35 ♀, 196 ♂). **Uzbekistan**: Aman-Kutan; Dzhuma; Kuropatkino; Kurgan-Tyube; Varzaminor [=Zakhmad-Abad]; Samarkand; 20 km NW Chust; Chatkalskiy Nature Reserve, Bashkyzylsay; Yargak; Changir E Tashkent; 50 km E Guzar; Bukhara; Aman-Kutan. **Kyrgyzstan**: 3 km W Oytal, Alay Mts.; Osh; 5 km NE Kanysh-Kyya; 10 km S Sary-Bulak, Alay Mts.; 15 km N Toktogul. **Turkmenistan**: Bagir, Ashkhabad; Farab; Imam-Baba; Kara-Kala; Kushka; Iol-Dere, 15 km NE Kara-Kala. **Tajikistan**: 15 km WSW Karamyk, Alay Mts.; Stalinabad [=Dushanbe]; 15 km N Shakhrinav, Gissar Mts.; Kondara; Dzhili-Kul' on Vakhsh River; Dashti-Gurk, 40 km ES Komsomolabad, Peter I Range; 30 km SE Kulyab; Dzhirgital'; Kyzyltam, Gissar Mts.; Khorog; Khodzha-Obi-Garm, Gissar Mts.; Shuroabad; Gofil'abad; Dehi-Colon near Tavidara.

Published records. Morawitz (1876: 255, as *Sphecodes fuscipennis* (Germar)): Uzbekistan, Kyrgyzstan; Radoszkowski (1886: 20, as *S. fuscipennis* and *S. rubripes* Spinola): Turkmenistan; Meyer (1920: 104; 1925: 3, as *S. fuscipennis*): Syr-Darja River; Tajikistan; Popov (1935: 365; 1951: 167, as *S. fuscipennis*): Tajikistan; (1967: 45, as *S. fuscipennis*): Uzbekistan, Tajikistan.

General distribution. Central Asia (Uzbekistan, Kyrgyzstan, Turkmenistan, Tajikistan); Europe (north to Finland and Sweden), North Africa, Russia (east to Far East), Turkey, the Caucasus, Syria, Israel, India.

Sphecodes alternatus Smith 1853

(Fig. 82)

Sphecodes alternatus Smith 1853: 36, ♀ (type locality: Albania).

Sphecodes gibbus var. *similis* subvar. *scariosus* Sichel 1865: 444, ♂. Unavailable name (ICZN 1999, Article 45.5 of Code).

Sphecodes punctiventris Hagens 1882: 219, ♀, ♂ (type locality: France).

Sphecodes gracilior Morawitz 1893: 78, ♀, ♂ (lectotype: ♂, **designated here**, Warzaminor [Uzbekistan] // *gracilior* F. Mor., ♂ // F. Morawitz det., Typ. // lectotypus *Sphecodes gracilior* Morawitz 1893, design. Astafurova & Proshchalykin 2017; ZISP. Fig. 105.

Sphecodes antigae Tournier 1901: 258, ♀, ♂ (type locality: Spain).

Sphecodes reticulatus var. *algeriensis* Alfken 1914: 195, ♀, ♂ (type locality: Algeria).

Sphecodes alternatus lindbergi Pittioni 1950: 61, ♀, ♂ (type locality: Cyprus).

Material examined. Uzbekistan: 1 ♀, Khiva, 16.VI.1927, VG (ZISP); 2 ♂, Chardzhou, NW Bukhara, 1.VII.1928, VG (ZISP); 2 ♂, Yargak, 17.VI.1930, Zimin (ZMMU); 5 ♀, Dzhuma, 28.V-1.VII.1937, VP (ZISP); 1 ♀, Samarkand, 25.IV.1959, AZ (ZMMU); 1 ♀, 10 km W Saryassiy, 11.V.1987, N. Kurzenko (FSCV); 1 ♀, 50 km E Guzar, 18.V.2015, MP (FSCV); 1 ♀, Karshi, Khudoyzot, 20.V.2015, MP (FSCV). **Kyrgyzstan:** 1 ♀, 25 km ESE Osh, 1500 m, 21.VII.1979, YP (ZISP); 2 ♂, Uch-Debe, 15 km SSW Sufi-Kurgan, 2500 m, 23.VIII.1985, YP (ZISP); 2 ♂, Alarchin, 20 km S Frunze [=Bishkek], 1650 m, 11.IX.1986, YP (ZISP); 1 ♂, 5 km NE Kanysh-Kyya, 1800 m, 31.VIII.1988, YP (ZISP). **Turkmenistan:** 1 ♀, Kushka, 1.V.1917, L. Wollmann (ZISP); 2 ♂, Staraya Bukhara, 19.VIII.1926, V. Yakhontov (ZMMU); 2 ♀, Farab, Buchara, 4.VII.1928, VG (ZISP); 2 ♀, Bagir, Ashkhabad, 21–23.IV.1929, AS (ZISP); 1 ♀, Tashkent, Kabray, 26.IV.1929, E. Kuznetzova (ZISP); 7 ♀, 15 ♂, Imam-Baba, 1932, AS (ZISP); 1 ♂, Kopet-Dag, Yarty-Kala, Chandyrk River, 13.VIII.1934, VP (ZISP); 4 ♀, Sumbar River, 27.V.1952, Steinberg (ZISP); 2 ♀, 21 ♂, Kara-Kala, 28.VI–17.VII.1955, AP (ZISP); 2 ♀, Tedzhen, 10.V.1963, AP (ZISP); 1 ♀, Kopet-Dag, Chuli, 21.V.1964, AP (ZISP); 2 ♀, Kara-Kala, 15.V.1970, L. Zimina (ZMMU); 1 ♀, Kopet-Dag, 15 km SW Nokhur, 24.V.1985 (ZISP); 1 ♀, 20 km SE Mary, 28.V.1976, YP (ZISP). **Tajikistan:** 3 ♂, Kulyab, 20.VII.1933, VP (ZISP); 1 ♀, Stalinabad [=Dushanbe], 30.VII.1934, VG (ZISP); 1 ♀, Uzun, 30 km S Kurgan-Tyube, 9.VI.1936, VG (ZISP); 3 ♀, 8 ♂, 11–23.VII.1943; 14 ♂, 9.IX.1943, 1 ♀, 2 ♂, 6–23.V.1944, VP (ZISP); 1 ♂, Gissar Mts., Khodzha-Obi-Garm, 13.VIII.1944, M. Nikolskaya (ZISP); 1 ♀, 12 km N Pyandzh, 27.IV.1987, N. Kurzenko (FSCV); 3 ♀, 10 km N Garaviti, 3.V.1987, AL (FSCV).

Published records. Popov (1935: 367; 1951: 167): Tajikistan; (1952: 92): Turkmenistan; (1967: 46): Uzbekistan, Tajikistan.

General distribution. Central Asia (Uzbekistan, *Kyrgyzstan, Turkmenistan, Tajikistan); South and Central Europe, North Africa, Russia (east to Khakassia Republic), Caucasus, Turkey, Iran.

Remark. *Sphecodes gracilior* Morawitz 1893 was described from the specimens of both sexes collected in Warzaminor [now Zakhmat-abad, Upper Zaravshan Valley, Uzbekistan]. There is only one male in ZISP from this locality, which corresponds to the original description of F. Morawitz. This male with label “Typ.” is designated here as a lectotype of *S. gracilior* to avoid any confusion about the status of its type specimens and to properly diagnose this species.

***Sphecodes anatolicus* Warncke 1992**

(Figs 4, 5, 59)

Sphecodes anatolicus Warncke 1992: 27, fig. 21, ♂ (type locality: Turkey).

Material examined. Uzbekistan: 1 ♂, Karamazar, 2.VII.1931 (ZISP); **Kyrgyzstan:** 1 ♀, Sary-Chelek Lake, 1800 m, 27.VIII.1988, YP (ZISP); **Turkmenistan:** 1 ♂, Kara-Kala, 29.VI.1952, AP (ZISP); **Tajikistan:** 1 ♀, 21 ♂, 15 km WSW Karamyk, Alay Mts., 2700 m, 11.VIII.1985, YP (ZISP); 17 ♂, Peter I Range, Dashti-Gurk, 40 km ESE Komsomolabad, 1700 m, 31.VIII.1985, YP (ZISP).

Published records. –

General distribution. Central Asia (*Uzbekistan, *Kyrgyzstan, *Turkmenistan, *Tajikistan); Italy (Sicily), Georgia, Armenia, Turkey.

***Sphecodes armeniacus* Warncke 1992**

(Figs 16, 17, 77)

Sphecodes armeniacus Warncke 1992: 19, ♂, ♀ (type locality: Turkey).

Material examined. Tajikistan: 1 ♂, Nurek, 60 km E Dushanbe, 500 m, 6–7.VII.1990, J. Halada, paratype of *S. armeniacus* (OÖLM).

Published records. Warncke (1992: 19): Tajikistan.

General distribution. Central Asia: (Tajikistan); Turkey.

***Sphecodes crassus* Thomson 1870**

(Figs 6, 7)

Sphecodes crassus Thomson 1870: 100, ♀ (type locality: southern Sweden).

Sphecodes variegatus Hagens 1874: 40, ♂ (type locality: Germany).

Sphecodes divisus Hagens 1882 (nom. praeocc., nec Kirby 1802): 223, ♀, ♂ (type locality: Germany).

Sphecodes valesianus Frey-Gessner 1903: 100, ♀ (type locality: Switzerland).

Sphecodes dyozankeanus Tsuneki 1983: 33, ♂ (type locality: Japan).

Sphecodes ohdeyamamus Tsuneki 1984: 9, ♀ (type locality: Japan).

Material examined. Uzbekistan: 1 ♂, Nanay, Andizhan Distr., 19.VII.1961, E. Sugonyaev (ZISP); **Kyrgyzstan:** 2 ♀, Alay Mts., Karagay, 30 km S Naukat, 11.VI.1978, V. Tanasiychuk (ZISP); 1 ♀, Issyk-Kul Lake, 30 km ESE Rybachye, 1610 m, 15.VII.1979, YP (ZISP); 1 ♂, 30 km S Kazarman, 2500 m, 23.VIII.1988, YP (ZISP); **Tajikistan:** 1 ♀, Peter I Range, Zakh-Bursi Pass, 5.VII.1913, Golbek (ZISP).

Published records. –

General distribution. Central Asia (*Uzbekistan, *Kyrgyzstan, *Tajikistan); Europe (north to 64°), Russia (east to Far East), North Africa, Caucasus, Turkey, Iran, Mongolia, Japan.

Remark. In Central Asia this species is recorded in the mountains only.

***Sphecodes cristatus* Hagens 1882**

(Figs 8, 9, 60)

Sphecodes cristatus Hagens 1882: 218, ♀ (type locality: Germany).

Material examined. Uzbekistan: 1 ♀, Uchkyzyl, 6–8.V.2015, MP (FSCV). **Kyrgyzstan:** 8 ♀, Alarchin, 20 km S Frunze [=Bishkek], 1650 m, 11.IX.1986, YP (ZISP); 1 ♂, 5 km NE Kanysh-Kyya, 1800 m, 31.VIII.1988, YP (ZISP).

Published records. Bogusch & Straka (2012: 9): Tajikistan.

General distribution. Central Asia (*Uzbekistan, *Kyrgyzstan, Tajikistan); Europe (north to Sweden), Russia (east to Far East), Caucasus, Turkey, Mongolia, China (Beijing).

Remark. The record of *Sphecodes cristatus* from Tajikistan (Dushanbe) (Popov 1967: 46) belongs to *S. puncticeps* Thomson (refer to Astafurova & Proshchalykin 2015: 71).

***Sphecodes croaticus* Meyer 1922**

(Figs 20, 61, 98)

Sphecodes croaticus Meyer 1922: 171, ♂ (type locality: Croatia).

Material examined. Turkmenistan: 2 ♂, Kushka, 1.VI.1912 (ZISP); 1 ♀, 10 ♂, Imam-Baba, 1932, AS (ZISP); 1 ♂, Kyzyl-Dzhar, Badkhyz, 5.VI.1976, YP (ZISP).

Published records. –

General distribution. Central Asia (*Turkmenistan); South and Central Europe, Russia (Crimea, south of European part, North Caucasus), Caucasus, Turkey.

***Sphecodes ephippius* (Linné 1767)**

(Figs 18, 19, 62, 91)

Sphex ephippia Linné 1767: 944, ♂ (type locality: Sweden).
Apis minimus Harris 1776 (nom. praeocc., nec Poda 1761): 136, ♀ (type locality: England).
Apis rufescens Geoffroy 1785: 447, ♀ (type locality: France).
Apis obscura Geoffroy 1785 (nom. praeocc., nec Linné 1764): 447, ♀ (type locality: France).
Apis rufescens Gmelin 1790 (nom. praeocc., nec Geoffroy 1785): 2790, ♂ (type locality: Germany).
Apis labiata Fabricius 1793: 342, ♂ (type locality: Germany).
Melitta divisa Kirby 1802: 49, ♂ (type locality: England).
Andrena minuta Fabricius 1804: 327, ♀ (type locality: Germany).
Sphecodes similis Wesmael 1835: 283, ♀, ♂ (type locality: Belgium).
Sphecodes zablockii Blüthgen 1924a: 188, ♀ (type locality: Russia, Novosibirsk).

Material examined. **Uzbekistan:** 3 ♀, Pskem Mts., Nanay, 22.V.1963, Guryeva (ZISP); **Kyrgyzstan:** 1 ♀, Issyk-Kul Lake, Pokrovka, 16.VI.1954, D. Panfilov (ZMMU); 1 ♀, Alatau Mts, Arkit, 1500–2000 m, 29.VI.1952, AZ (ZMMU); 1 ♂, 10 km Sary-Bulak, 21.VIII.1985, A. Manukyan (ZISP); 4 ♂, 21.VIII.1985, YP (ZISP). **Turkmenistan:** 1 ♀, Ashkhabad, 16–20.IV.1929, AS (ZISP); 1 ♂, Kopet-Dag, Tutly, 3.V.1952, Kryzhanovskiy (ZISP); 1 ♀, Iol-Dere (gorge), Kara-Kala, 5.VI.1952, Steinberg (ZISP); 1 ♂, Kara-Kala, 29.VI.1952, AP (ZISP). **Tajikistan:** 1 ♂, Kondara (gorge), 1100 m, Varzob, 26.VII.1940, VG (ZISP); 12 ♂, Gissar Mts., Khodzha-Obi-Garm, 9–13.VIII.1944, M. Nikolskaya (ZISP); 1 ♂, Alay Mts., 15 km WSW Karamyk, 2700 m, 11.VIII.1985, YP (ZISP); 5 ♂, Peter I Range, Dashti-Gurk, 40 km ESE Komsomolabad, 1700 m, 31.VIII.1985, YP (ZISP).

Published records. Morawitz (1876: 258, as *Sphecodes similis*: Uzbekistan); Radoszkowski (1886: 20, as *S. similis*): Turkmenistan; Mayer (1920: 140, as *S. similis*): “Turkestan”; Popov (1951: 167, as *S. divisus* (Kirby)): Tajikistan.

General distribution. Central Asia (Uzbekistan, *Kyrgyzstan, Turkmenistan, Tajikistan); Europe (north to 62°), Russia (east to Irkutsk Prov.), Caucasus, Turkey, Kazakhstan, Mongolia.

Remark. In Central Asia this species is recorded in the foothills and mountains only.

***Sphecodes ferruginatus* Hagens 1882**

(Figs 12, 13, 80)

Sphecodes ferruginatus Hagens 1882: 221, ♀, ♂ (type locality: Germany).
Sphecodes rufescens var. *alpestris* Frey-Gessner 1903: 107, ♀, ♂ (type locality: Switzerland).
Sphecodes koikensis Tsuneki 1983: 27, ♀ (type locality: Japan).
Sphecodes hanedai Tsuneki 1983: 35, ♂ (type locality: Japan).
Sphecodes baratonis Tsuneki 1983: 34, ♂ (type locality: Japan).
Sphecodes sudai Tsuneki 1983: 38, ♂ (type locality: Japan).
Sphecodes chibaensis Tsuneki 1984: 8, ♀ (type locality: Japan).
Sphecodes izumindus Tsuneki 1986: 45, ♀ (type locality: Japan).

Material examined. **Kyrgyzstan:** 1 ♂, Sary-Chelek Lake, 1800 m, 27.VIII.1988, YP (ZISP).

Published records. –

General distribution. Central Asia (*Kyrgyzstan); Europe (north to 66°), Russia (east to Far East), Turkey, Japan.

***Sphecodes geoffrellus* (Kirby 1802)**

(Figs 10, 11)

Melitta geoffrella Kirby 1802: 45, ♀ (type locality: England).
Sphecodes affinis Hagens 1882: 224, ♀, ♂ (type locality: Germany).
Sphecodes fasciatus Hagens 1882: 224, ♂ (type locality: Germany).
Sphecodes rimalis Pérez 1903: 221, ♀ (type locality: France).
Sphecodes impunctatus Meyer 1922: 171, ♂ (type locality: Russia, Yakutsk).

Sphcodes silvicola Tsuneki 1983: 60, figs 246–248, ♀ (type locality: Japan).
Sphcodes shirozui Tsuneki 1983: 53, figs 98–104, ♂ (type locality: Japan).
Sphcodes kitamius Tsuneki 1983: 55, figs 105–108, ♂ (type locality: Japan).
Sphcodes geoffrellus atlassa Warncke 1992: 36, ♀ (type locality: Turkey).
Sphcodes geoffrellus hakkariensis Warncke 1992: 36, ♂ (type locality: Turkey).
Sphcodes campadellii Nobile & Turrisi 2004: 118, ♂ (type locality: Italy).

Material examined. Uzbekistan: 1 ♀, Pskem Mts., Nanay, 23.V.1963, VT (ZISP); 2 ♀, Chatkal Nature Reserve, Nevich, 9.VI.1963, VT (ZISP). **Kyrgyzstan:** 1 ♀, Issyk-Kul Lake, Pokrovka, 27.V.1951, D. Panfilov (ZMMU); 1 ♀, Karakoyun River, Tian-Shan Mts., 3.IX.1963, Viktorov (ZISP); 1 ♂, Teploklyuchinka, 2000–2600 m, 26.VI.1970, V. Tanasiychuk (ZISP); 1 ♂, Fergana Mts., 10 km NW Dzhambad, 31.VIII.1974, Kandybina (ZISP); 1 ♀, Sary Chelek Lake, 2000 m, 20.VI.1979, DK (ZISP); 1 ♂, 10 km SSW Teploklyuchinka, 2200 m, 6.VIII.1988, YP (ZISP); 2 ♀, 2 ♂, 1800 m, 27.VIII.1988, YP; 3 ♀, 30 km NW Naryn, 2300 m, 21.VI.1989, MV (ZISP). **Turkmenistan:** 1 ♀, Kugitang-Tau, 2500 m, 16.VI.1965, V. Tanasiychuk (ZISP). **Tajikistan:** 1 ♀, Pamir, Mayakovskiy Peak (Mts.), 3000 m, 13.VII.1965, 1 ♀, V. Tanasiychuk (ZISP); 1 ♀, Zeravshan Mts., 10 km SE Ayni, 9.VI.1982, SB (ZISP); 1 ♀, Peter I Range, Gursy-Tash, 31.VII.1911, A. Golbek (ZISP).

Published records. Morawitz (1876: 258): Uzbekistan, Kyrgyzstan.

General distribution. Central Asia (Uzbekistan, Kyrgyzstan, *Turkmenistan, *Tajikistan), Europe (north to 66°), Russia (east to Far East), North Africa, Turkey, Near East, Mongolia, Japan.

Remark. Rare in Central Asia, recorded in the mountains only.

Sphcodes gibbus (Linnaeus 1758)

(Figs 14, 15, 58, 74, 92)

Sphex gibba Linnaeus 1758: 571, ♀ (type locality: Sweden).
Apis glabra Füssly 1775: 51, ♀ (type locality: Switzerland).
Andrena ferruginea Olivier 1789: 139, nomen novum for *Nomada gibba* Fabricius 1775 (nom. praeocc., nec Linnaeus 1758).
Apis gibbosa Christ 1791: 177, nomen novum for *Nomada gibba* Fabricius 1775 (nom. praeocc., nec Linnaeus 1758).
Melitta sphecoides Kirby 1802: 46, ♀ (type locality: England).
Melitta picea Kirby 1802: 48, ♂ (type locality: England).
Andrena austriaca Fabricius 1804 (nom. praeocc., nec Panzer 1798): 325, ♀ (type locality: Denmark).
Dichroa analis Illiger 1806: 48, nomen novum for *Nomada gibba* Fabricius 1775 (nom. praeocc., nec Linnaeus 1758).
Sphcodes apicatus Smith 1853: 36, ♀ (type locality: India).
Sphcodes nigripennis Morawitz 1876: 257, ♀ (type locality: Kazakhstan).
Sphcodes sutor Nurse 1903: 538, ♀ (type locality: Pakistan).
Sphcodes gibbus var. *rufispinosus* Meyer 1920: 113, ♀ (type locality: Spain).
Sphcodes gibbus var. *turkestanicus* Meyer 1920: 113, ♀, ♂ (type locality: Uzbekistan, “Golodnaja Steppe”; China: Jarkand, Xinjiang).
Sphcodes castilianus Blüthgen 1924b: 473, ♀ (type locality: Portugal).
Sphcodes lustrans Cockerell 1931b: 411, ♂ (type locality: Morocco).
Sphcodes angarensis Cockerell 1937: 3–4, ♀ (type locality: Russia, Irkutsk Prov.).
Sphcodes pergibbus Blüthgen 1938: 50, ♀, ♂ (type locality: Cyprus).

Material examined (420 ♀, 370 ♂). **Uzbekistan:** Bukhara; Dorban; Dzhuma; Guliston; 50 km E Guzar; 5 km NW Kamzaabad; Karshi; Khiva; Kuropatkino; Samarkand; 10 km W Saryassiy. **Kyrgyzstan:** Belovodsk; 10 km E Sary-Bulak; Uch-Debe, 15 km SSW Sufi-Kurgan; 11 km WSW Daraut-Korgon; 20 km S Frinze [=Bishkek]; 20 km NW Kokand; 25 km ESE Osh; Toru-Aygyr, 25 km ENE Rybachye; Sary-Chelak Lake; 20 km E Talas; 10 km ESE Lay-Talaa; 3 km W Oytala. **Turkmenistan:** Ashkhabad; Akhcha-Kuyma; Akyr-Tyube; Anau; Bakharden; Farab; Firyuza; 30 km S Gasan-Kuli; Gusseyin-Ali; Imam-Baba; Iol-Dere (gorge), 15 km NE Kara-Kala; Kara-Kala; Krasnoye Znamya, 50 km S Iolotan'; Keshi; Kora-Bogaz, 40 km N Kyzyl-Arvat; Kyzyl-dzhar, Badkhyz Nature Reserve; Kushka; 20 km SE Mary; 12 km SE Tedzhen; 18 km E Tedzhen; Shakhi-Burun; Tashkepri; Takhta-Bazar. **Tajikistan:** Badakhshan, 25 km E Khorog; Gissar; Dashti-Gurk, 40 km ESE Komsomolabad, Peter I Range; 15 km SE Dusti; Gandzhino; Iskander-Kul'; Khodzha-Obi-Garm; Kulyab; Stalinabad [=Dushanbe]; Shuroabad; 15 km WSW Karamyk, Alay Mts.; Kammashi; Tigrovaya Balka Nature Reserve; 10 km N Pyandzh; Toshbulok.

Published records. Morawitz (1876: 256): Uzbekistan, Kyrgyzstan; Meyer (1920: 113, as *Sphcodes gibbus*

var. *turkestanicus*): Uzbekistan; (1925: 113, as *S. gibbus* var. *turkestanicus*): Turkmenistan, Kyrgyzstan; Popov (1935: 367; 1951: 167): Tajikistan; (1952: 92): Turkmenistan; (1967: 46): Uzbekistan, Tajikistan.

General distribution. Central Asia (Uzbekistan, Kyrgyzstan, Turkmenistan, Tajikistan); Europe (north to 63°), Russia (east to Yakutia), North Africa, Turkey, Pakistan, Israel, Mongolia, China (Xinjiang), India.

Sphecodes haladai Warncke 1992

(Figs 29, 84, 101)

Sphecodes haladai Warncke 1992: 36–37, ♀, ♂ (holotype: ♂, Nurek, 60 km E Duchanbe, 6–7.VI.1990, J. Halada, OÖLM).

Material examined. Turkmenistan: 9 ♀, Bagir, Ashkhabad, 16–23.IV.1929, AS (ZISP); 1 ♂, Kara-Kala, 26.VI.1952, Borisova (ZISP); 1 ♀, Firyuza, 23–26.IV.1989, S. Bekvar, paratype of *S. haladai*; (OÖLM).

Tajikistan: 1 ♀, Aruk-Tau Mts., 15 km W Gadzhino, 15.V.1970, VT (ZISP); 1 ♀, 15 km NE Kulyab, 25.IV.1987, AL (FSCV); 1 ♂, Nurek, 60 km E Duchanbe, 6–7.VI.1990, J. Halada, paratype of *S. haladai* (ZISP).

Published records. Warncke (1992: 36): Uzbekistan, Turkmenistan, Tajikistan.

General distribution. Central Asia (Uzbekistan, Turkmenistan, Tajikistan).

Sphecodes intermedius Blüthgen 1923

(Figs 32, 73, 78)

Sphecodes intermedius Blüthgen 1923: 500, ♀, ♂ (type locality: Caucasus).

Sphecodes lactipennis Meyer 1925: 7, ♂ (type locality: Libya).

Material examined. Uzbekistan: 1 ♂, Golodnaya Step (Gulistan), 15.IV.1903, Yakobson (ZISP); 1 ♀, Farab, 6.V.1917, L. Wollmann (ZISP); 1 ♂, Fergana Mts., Kug-art pass, 22.V.1925, Dobrzanskiy (ZISP); 1 ♀, Khiva, Nurlabay, 9.VI.1927, VG (ZISP); 1 ♀, 1 ♂, Dzhuma, 30.V.1937, VP (ZISP); Kurgan-Tube, 2.VIII.1938, 1 ♂, Flyagina (ZISP); 1 ♀, 30 km S Samarkand, 18.V.1979, YP (ZISP); 1 ♀, Dzharkuduk, 11.V.2015, MP (FSCV); 1 ♂, Kyzylkishlak, 18.V.2015, MP (FSCV). **Kyrgyzstan:** 1 ♀, 30 km ESE Rybachye, Issyk-Kul Lake, Myricaria sp., 15.VII.1979, YP (ZISP); 7 ♀, 1 ♂, 25 km ESE Osh, 1500 m, Ashillea sp., 21.VII. 1979, YP (ZISP); 1 ♀, Fergana Mts., 10 km ESE Lay-Talaa, 1700 m, 16.VIII.1985, YP (ZISP); 1 ♀, Alay Mts., 10 km S Sary-Bulak, 2300 m, 21.VIII.1985, YP (ZISP). **Turkmenistan:** 1 ♀, Serax, coll. F. Morawitz; 1 ♂, Chuli, Kopet-Dag, 6–8.V.1913, Golbek (ZISP); 9 ♀, 10 ♂, Bagir, Ashkhabad, 21–23.IV.1926, AS (ZISP); 1 ♀, Kara-Kala, 27.V.1953, Steinberg (ZISP); 1 ♂, Chayek, 12 km WSW Firyuza, 28–30.IV.1989, MV (ZISP); 1 ♀, Badkhyz Nature Reserve, 3.V.1990, SB (ZISP); 4 ♀, 50 km ENE Takhta-Bazar, 15.V.1990, A. Sitdikov (ZISP). **Tajikistan:** 1 ♀, Kammashi, 19.VI.1932, VG (ZISP); 1 ♀, 5 ♂, Stalinabad [=Dushanbe], 6.V.1944, VP (ZISP); 2 ♀, Alay Mts., 15 km WSW Karamyk, 2700 m, 11.VIII.1985, YP (ZISP); 1 ♀, Sangvor River, 7.VII.1975, YP (ZISP); 1 ♀, Gissar Mts., Ramit, no date, MV (ZISP).

Published records. Popov (1967: 47): Uzbekistan, Turkmenistan, Tajikistan; Bogusch & Straka (2012: 12): Turkmenistan, Tajikistan.

General distribution. Central Asia (Uzbekistan, *Kyrgyzstan, Turkmenistan, Tajikistan); Kazakhstan, Europe (east to Ukraine), Russia (European part, Ural), North Africa, Caucasus, Turkey.

Sphecodes longulus Hagens 1882

(Figs 33, 34)

Sphecodes longulus Hagens 1882: 226, ♀, ♂ (type locality: Germany).

Sphecodes longulus var. *eupidus* Hagens 1882: 226, ♀, ♂ (type locality: Germany).

Sphecodes nitidulus Hagens 1882: 226, ♂ (type locality: Germany).

Sphecodes amakusensis Yasumatsu et Hirashima 1951: 121, ♀ (type locality: Japan).

Sphecodes sabulosus Tsuneki 1983: 39, ♂ (type locality: Japan).

Sphecodes crassicornis Tsuneki 1983: 63, ♀ (type locality: Japan).

Sphecodes tsunekii Haneda 1994: 640, replacement name for *S. crassicornis* Tsuneki 1983 (nom. praeocc., nec Smith 1879).

Material examined. Uzbekistan: 1 ♀, Podan, 9.V.2015, MP (FSCV); **Turkmenistan:** 2 ♀, Bagir, Ashkhabad, 21.IV.1929, AS (ZISP); 3 ♂, Kara-Kala, 11.VI.1952, VT (ZISP). **Tajikistan:** 1 ♂, Gissar Mts., 2800 m, Maydanak, 2.IX.1933, Veltishchev (ZISP); 1 ♀, Gissar, 26.VI.1935, VG (ZISP); 1 ♀, Shuroabad, 30 km NE Kulyab, 20.IX.1936, VG (ZISP); 1 ♀, Kondara, 1100 m, Varzob, 5.VI.1937, VG (ZISP); 2 ♀, Gissar Mts., Khodzha-Obi-Garm, 8.VIII.1944 (ZISP); 1 ♀, Zerafshan Range, 10 km SE Ayn, 9.VI.1982, SB (ZISP); 1 ♂, Staraya Pristan, V.1970, VT (ZISP); 1 ♀, 15 km NE Kulyab, 25.IV.1987, AL (FSCV).

Published records. Warncke (1992: 17): Tajikistan; Bogusch & Straka (2012: 12): Tajikistan.

General distribution. Central Asia (*Uzbekistan, *Turkmenistan, Tajikistan); Europe (north to Finland, Sweden, Denmark, England), Russia (east to Far East), Turkey, Syria, Japan.

***Sphecodes miniatus* Hagens 1882**

(Figs 35, 36, 85, 90)

Sphecodes miniatus Hagens 1882: 223, ♀, ♂ (type locality: Germany).

Sphecodes dimidiatus Hagens 1882: 224, ♀, ♂ (type locality: Germany).

Sphecodes murithianus Frey-Gessner 1903: 100, ♀ (type locality: Switzerland).

Sphecodes pilicornis Meyer 1922: 170, ♂ (type locality: Russia, Orenburg Prov.).

Material examined. Kyrgyzstan: 1 ♀, 15 km SW Laylyak, 18.VII.1982, SB (ZISP); 1 ♀, 6 ♂, Fergana Mts., Alay-Kuu, 2850 m, 18.VIII.1985, YP (ZISP).

Published records. –

General distribution. Central Asia (*Kyrgyzstan); Kazakhstan, Europe (north to 62°), Russia (east to Far East), Caucasus, Mongolia.

***Sphecodes monilicornis* (Kirby, 1802)**

(Figs 37, 38, 64)

Melitta monilicornis Kirby 1802: 47, ♂ (type locality: England).

Sphecodes maculatus Lepeletier de Saint Fargeau 1841: 545, ♂ (type locality: France).

Sphecodes subquadratus Smith 1845: 1014, ♀, ♂ (type locality: England).

Sphecodes gibbus var. *ephippium* subvar. *rufipes* Sichel 1865: 428, ♀, ♂. Unavailable name (ICZN 1999, Article 45.5 of Code).

Sphecodes gibbus var. *ephippium* subvar. *dubius* Sichel 1865: 419, ♂. Unavailable name (ICZN 1999, Article 45.5 of Code).

Sphecodes gibbus var. *ephippium* subvar. *incertus* Sichel 1865: 420, ♂. Unavailable name (ICZN 1999, Article 45.5 of Code).

Sphecodes gibbus var. *ephippium* subvar. *nigrescens* Sichel 1865: 427, ♂. Unavailable name (ICZN 1999, Article 45.5 of Code).

Sphecodes gibbus var. *ephippium* subvar. *testaceipes* Sichel 1865: 428, ♂. Unavailable name (ICZN 1999, Article 45.5 of Code).

Sphecodes ruficrus Dalla Torre 1896 (nom. praeocc., nec Erichson 1835): 9, replacement name for *Sphecodes rufipes* Sichel 1865.

Sphecodes hamuman Nurse 1903: 538, ♀ (type locality: Pakistan).

Sphecodes monilicornis var. *nigerrima* Blüthgen 1927: 41, ♂ (type locality: Pakistan).

Sphecodes caucasicus Meyer 1920: 124, ♂ (type locality: Georgia).

Sphecodes cephalotes Meyer 1920: 129, ♀ (type locality: Turkey).

Sphecodes smyrnensis Meyer 1920: 116, ♂ (type locality: Turkey).

Sphecodes monilicornis quadratus Meyer 1920: 129, ♂, ♀ (type locality: Spain).

Sphecodes monilicornis berberus Warncke 1992: 22, ♂, ♀ (type locality: Morocco).

Sphecodes quadratus cephalotiformis Pittoni 1950: 62, ♂, ♀ (type locality: Cyprus).

Material examined. Uzbekistan: 1 ♂, Kuropatkino, 50 km NE Samarkand, 12.VII.1930 (no collector) (ZISP); 1 ♀, Bostandyk, 30.V.1959, Lao Din Si (ZISP); Naryn River, 1 ♀, 20 km NE Tash-Kumyr, 3.VI.1989, MV (ZISP); 2 ♀, Dorban, 10.V.2015, V. Gromenko (FSCV). **Kyrgyzstan:** 1 ♀, 20 km ESE Bystrovka, 1350 m, 13.VII.1979, YP (ZISP); 2 ♂, 10 km ESE Lay-Talaa, 1700 m, 16.VII.1985, YP (ZISP); 1 ♂, 20 km S Frunse [=Bishkek], 1650

m, 11.IX.1986, YP (ZISP); 6 ♂, 5 km NE Kanysh-Kyya, 1800 m, 31.VIII.1988, YP (ZISP); 1 ♀, Kizil-kiya, 15.V.1994, M. Halada (OÖLM); 2 ♀, 10 km S Sari-Tzelek, 5.VI.1995, J. Halada (OÖLM); 1 ♀, Terek-Sai, 7.VI.1995, J. Halada (OÖLM). **Turkmenistan:** 1 ♂, Chuli, Kopet-Dag, 14.VI.1914, Golbek (ZISP); 1 ♀, Aman-Kutan, 21.VII.1931, VG (ZISP); 1 ♀, Kara-Kala, Iol-Dere (gorge), 5.VI.1952, Steinberg (ZISP); 1 ♀, 2 ♂, Kara-Kala, 17.V.1953, AP (ZISP). **Tajikistan:** 1 ♂, Voznaut, Roshanm 28.VII.1915, Lazdin (ZISP); 1 ♂, Dushanbe, 12.VII.1934, VG (ZISP); 4 ♂, Parkhar, Pyandzh River, 3.VII.1936, VG (ZISP); 1 ♂, Dzhirgital', 6.VIII.1939, A. Romanov (ZISP); 3 ♂, Khodzha Obi-Garm, Gissar Mts., 13.VIII.1944, M. Nikolskaya (ZISP); 1 ♀, 20 km N Vanch, Vakhsh River, 5–6.VI.1965, VT (ZISP); 1 ♀, Gissar Mts., 1 ♀, 6 km SW Ramit, 11.VII.1975, YP (ZISP); 2 ♂, Peter I Range, Dashti-Gurk, 40 km ESE Komsomolabad, 1700 m, 31.VIII.1985, YP (ZISP).

Published records. Morawitz (1876: 257, as *Sphecodes subquadratus* Smith): Uzbekistan; Radoszkowski (1886: 20, as *S. subquadratus*): Turkmenistan; Popov (1967: 47): Tajikistan.

General distribution. Central Asia (Uzbekistan, *Kyrgyzstan, Turkmenistan, Tajikistan); Europe (north to 64°), Russia (east to Far East), North Africa, Caucasus, Turkey, Pakistan, Mongolia.

***Sphecodes nurekensis* Warncke 1992, stat. nov.**

(Figs 44, 45, 97)

Sphecodes dusmeti nurekensis Warncke 1992: 17, ♂ (holotype: ♂, Nurek, 60 km E Dushanbe, Tajikistan, 500 m, 6–7.VI.1990, J. Halada, OÖLM), examined.

Material examined. **Tajikistan:** 2 ♂ (holotype and paratype): Nurek, 60 km E Dushanbe, 500 m, 6–7.VI.1990, J. Halada (OÖLM).

Published records. Warncke (1992: 17): Tajikistan.

General distribution. Central Asia (Tajikistan).

Remark. Warncke (1992: 17) described the male of this species as a subspecies of *Sphecodes dusmeti* Blüthgen, 1924. Both species possess a similar elongate gonostylar shape (Figs 44, 45), however *S. nurekensis* is easily differentiated from *S. dusmeti* by densely punctate metasomal terga (Fig. 97), including T1 with regular punctures (versus a few punctures along marginal zone in *S. dusmeti*).

***Sphecodes olivieri* Lapeletier de Saint Fargeau 1825**

(Figs 39, 40, 65, 75, 89)

Sphecodes olivieri Lapeletier de Saint Fargeau in Lapeletier de Saint Fargeau & Audinet-Serville 1825: 448, ♂ (type locality: Arabia).

Sphecodes collaris Spinola 1843: 137, ♀ (type locality: Spain).

Sphecodes hispanicus var. *abyssinicus* Sichel 1865: 447, ♀ (type locality: Ethiopia).

Sphecodes ruficornis Sichel 1865: 440, ♀ (type locality: Algeria).

Sphecodes punctulatus Sichel 1865: 443, ♂ (type locality: Algeria).

Sphecodes subpunctulatus Sichel 1865: 445, ♂ (type locality: Morocco).

Sphecodes rufithorax Morawitz 1876: 225, ♀ (type locality: Kazakhstan).

Sphecodes verticalis Hagens 1882: 219, ♀ (type locality: France).

Sphecodes desertus Nurse 1903: 540 ♀, ♂ (type locality: India).

Sphecodes chionospilus Cockerell 1911: 217, ♂ (type locality: Pakistan).

Sphecodes chionospilus var. *sanguinatus* Cockerell 1911: 217, ♂ (type locality: Pakistan).

Sphecodes tenuis Meyer 1920: 121, ♂ (type locality: Transcaspia).

Sphecodes olivieri var. *niveatus* Meyer 1925: 4, ♂ (type locality: Algeria).

Material examined (108 ♀, 125 ♂). **Uzbekistan:** Dzhuma; Guliston; Chimbay; Karshi; 35 km SW Karshi; Kuropatkino; Khiva; Yargak; Kurgan-Tyube; Staraya Bukhara; Tashkent; 10 km NW Sharabad;

Turkmenistan: Ashkhabad; Karakym desert, 60 km NE Ashkhabad; Akhcha-Kuyma; Chardzhou; Bakharden; Farab; Firyuza; Imam-Baba; 20 km SE Mary; Repetek; Kara-Bogaz; Kara-Kala; Khodzha-Kala; Komarovsk; Serax; Tedzhen; **Tajikistan:** Dushanbe, Kirovobod; Kulyab; Khodzha; Staraya Pristan'; Kurgan-Tyube; 15 km S Shaartuz; 10 km N Garavuti.

Published records. Radoszkowski (1886: 20, as *Sphecodes rufithorax*): Turkmenistan; Blüthgen (1924b: 463): Turkmenistan; Mayer (1925: 3, as *S. tenuis*): Tajikistan; Popov (1935: 365): Tajikistan; (1952: 92): Turkmenistan; (1967: 45): Uzbekistan, Tajikistan.

General distribution. Central Asia (Uzbekistan, Turkmenistan, Tajikistan); South Europe, Russia (South of European part), North Africa, Caucasus, Turkey, Iran, Pakistan, Israel, Arabian Peninsula.

Remark. This species is common in deserts of Central Asia.

Sphecodes pectoralis Morawitz 1876

(Fig. 41)

Sphecodes pectoralis Morawitz 1876: 259, ♀ (type locality: Kazakhstan).

Material examined. **Uzbekistan:** 3 ♂, 4 ♀, Golodnaya Step (Gulistan), 30.V.1903, Yakobson (ZISP); 2 ♂, 4 ♀, Farab, 12–28.V.1929, AS (ZISP); 1 ♀, Changir, E Tashkent, 8.V.1930 (ZISP); 1 ♀, Samarkand, 11.V.1959, AZ (ZMMU); 2 ♀, 35 km SE Gazli, Peganum harmala, 13.V.1978, YP (ZISP); 1 ♂, 35 km SW Karshi, Tamarix sp., 16.V.1978, YP (ZISP); 35 ♂, 20 km NW Kokand, 23.V.1978, YP (ZISP). **Turkmenistan:** 50 ♀, Bagir, Ashkhabad, 16–23.IV.1926, AS (ZISP); 2 ♂, Uch-Adzhi, 1–3.V.1929, AS (ZISP); 5 ♀, 31 ♂, Imam-Baba, 1932, AS (ZISP); 24 ♀, 4 ♂, Tash-kepri, Murgab River, 1.VI.1954, VT (ZISP); 1 ♂, 25 km W Firyuza, 15.V.1985, MV (ZISP); 1 ♂, Firyuza, 20.V.1985, AL (FSCV); 2 ♀, Repetek, 25.IV.1987, VT (ZISP); **Tajikistan:** 1 ♀, Aral, Vakhsh River, 11.IX.1935, VG (ZISP); 1 ♀, Kondara, Varzob River, 3.V.1944, Shatkelberg (ZISP); 1 ♀, Stalinabad [=Dushanbe], 13.V.1943, Shatkelberg (ZISP); 1 ♀, Kurgan-Tube, 29.III.1944, A. Shtakelberg (ZISP); 1 ♂, Staraya Pristan, V.1970, VT (ZISP); 1 ♀, 2 ♂, 15 km SW Dusti, Salsola leptoclada, 14.VI.1975, YP (ZISP); 5 ♀, Gandzhino, 1000 m, Ferula sp., 20.IV.1989, VT (ZISP); 1 ♀, 20 km SSW Shaartuz, Limonium sp., 16.VIII.1979, YP (ZISP); 1 ♂, 20 km NW Bekabad, 15.VI.1982, SB (ZISP).

Published records. Blüthgen (1924b: 463): Turkmenistan; Mayer (1925: 5): Turkmenistan; Popov (1935: 365): Tajikistan; (1952: 92): Turkmenistan; (1967: 45): Uzbekistan, Tajikistan.

General distribution. Central Asia (Uzbekistan, Turkmenistan, Tajikistan); Kazakhstan.

Sphecodes pellucidus Smith 1845

(Figs 42, 43, 63, 81)

Sphecodes pellucidus Smith 1845: 1014, ♀, ♂ (type locality: England).

Sphecodes pilifrons Thomson 1870: 99, ♀ (type locality: Sweden).

Sphecodes brevicornis Hagens 1874: 39, ♂ (type locality: Germany).

Sphecodes volatilis Smith 1879: 26, ♂ (type locality: Russia, Siberia).

Sphecodes pellucidus var. *algirus* Alfken 1914: 195, ♀ (type locality: Algeria).

Sphecodes pellucidus var. *hybridus* Blüthgen 1924b: 516, ♀ (type locality: China: Sichuan).

Sphecodes pellucidus var. *niveipennis* Meyer 1925: 7, ♂ (type locality: China: Xinjiang).

Material examined. **Uzbekistan:** 1 ♀, Tashkent, 7.V.1930, VG (ZISP); 1 ♂, Kattakurgan, 11.VII.1931, VG (ZISP); 1 ♂, Turtkul, 18.VI.1932, P. Vorontzovskiy (ZISP); 1 ♀, Topolevka E Samarkand, Dghungar Alatau, 25.V.1957, I. Kerzhner (ZISP); 1 ♀, Pskem Mts., Nanay, 23.V.1963, VT (ZISP); 1 ♀, Chatkalskiy Nature Reserve, 1200 m, 16.V.1980, DK (ZISP); 1 ♀, Pangaz River, 10 km N Pangaz, 27.V.1989, MV (ZISP); 1 ♂, Kyzylkishlak, 18.V.2015, MP (FNCV); 3 ♂, 50 km E Guzar, 19.V.2015, V. Gromenko (FNCV). **Kyrgyzstan:** 1 ♀, Issyk-Kul Lake, Dolinka, 21.VI.1965, V. Tanasiychuk (ZISP); 1 ♀, Fergana Mts., 10 km ESE Lay-Talaa, 1700 m, 16.VIII.1985, YP (ZISP); 5 ♂, Ulakhol River, 25 km SE Rybachye, 2000 m, 9.VIII.1988, YP (ZISP); 4 ♂, Terskey-Alat, 30 km SE Rybachye, 2200 m, 10.VIII.1988, YP (ZISP); 1 ♂, 30 km S Kazarman, 2500 m, 23.VIII.1988, YP (ZISP). **Turkmenistan:** 3 ♀, Ashkhabad, 27.IV.1932, AS (ZISP); 1 ♀, Repetek, 23.V.1976, AL (FNCV); 1 ♀, 15 km W Firyuza, 20.V.1988, A. Barkalov (ZISP). **Tajikistan:** 1 ♀, Aruk-Tau Mts., 15 km E Gandzhino, 15.V.1970, VT (ZISP); 1 ♀, 1 ♂, Khodzha-Obi-Garm, Gissar Mts., 28.VII.1944, M. Nikolskaya (ZISP); 1 ♀, 1 ♂, Peter I Range, Gursy-Tash River, 31.VII.1911, A. Golbek (ZISP); 1 ♀, Kondara, Gissar Mts., 1.V.1964, VT (ZISP); 1 ♂,

Alay Mts., 15 km WSW Karamyk, 2700 m, 11.VIII.1985, YP (ZISP); 1 ♂, 10 km W Vorukh, 16.VII.1982, SB (ZISP); 1 ♂, Romit, 6.VI.1982, SB (ZISP); 1 ♂, Rushan, 8.VII.1965, VT (ZISP); 1 ♀, 15 km NE Kulyab, 25.IV.1987, N. Kurzenko (FSCV); 1 ♀, Leningradskiy, 24.IV.1987, AL (FSCV); 2 ♀, Tavidara distr., Dehi-Colon near Tavidara, 24–27.V.2016, Yu. Danilov (ZISP).

Published records. –

General distribution. Central Asia (*Uzbekistan, *Kyrgyzstan, *Turkmenistan, *Tajikistan); Kazakhstan, Europe (north to 66°), Russia (east to Far East), North Africa, Turkey, Mongolia, North China.

Remark. This species is widespread and common in moderate zone of Palaearctic, but rare in Central Asia.

Sphecodes pinguiculus Pérez 1903

(Figs 27, 28, 79)

Sphecodes pinguiculus Pérez 1903: CCXX, ♀ (type locality: Spain).

Sphecodes sareptensis Meyer 1922: 170, ♂ (type locality: Russia, Sarepta [Volgograd]).

Sphecodes excellens Meyer 1922: 170, ♀ (type locality: Spain).

Sphecodes punctatissimus Meyer 1922: 172, ♂ (type locality: S Kazakhstan).

Sphecodes hungaricus Blüthgen 1923: 498, ♀ (type locality: Hungary).

Sphecodes coelebs Blüthgen 1923: 505, ♂ (type locality: Spain).

Sphecodes consobrinus Blüthgen 1923: 507, ♂ (type locality: Libya).

Sphecodes persicus Blüthgen 1924b: 509, ♂ (type locality: Iran).

Sphecodes capverdensis Pauly et La Roche in Pauly et al. 2002: 203, ♂ (type locality: Cape Verde).

Material examined. Uzbekistan: 1 ♂, Golodnaya Step [=Gulistan], 2.V.1903, G. Yakobson (ZISP); 1 ♀, Khiva, Nurlabay, 1.VI.1927, VG (ZISP); 1 ♂, 120 km NW Shakhrikhan, Kyzylkum desert, 17.IV.1965, V. Zaytzev (ZISP); 1 ♂, Ak-Tau, near Tamdy, 9.V.1965, V. Zaytzev (ZISP). **Kyrgyzstan:** 1 ♀, 30 km ESE Rybachye, Issyk-Kul Lake, Myricaria sp., 15.VII.1979, YP (ZISP). **Turkmenistan:** 7 ♀, 7 ♂, Bagir, Ashkhabad, 16.IV–17.V.1926, AS (ZISP); 1 ♀, Dzhebel, 21.VII.1934, VP (ZISP). **Tajikistan:** 1 ♂, Dushanbe, 4.V.1962, Guryeva (ZISP).

Published records. Popov (1952: 92, as *Sphecodes sareptensis*): Turkmenistan; Warncke (1992: 32, as *S. pinguiculus sareptensis*): Tajikistan, Turkmenistan; Proshchalykin & Astafurova (2016: 16): Central Asia.

General distribution. Central Asia (*Uzbekistan, *Kyrgyzstan, Turkmenistan, Tajikistan); South Europe, Russia (east to Buryatia), North Africa, Turkey, Israel, Iran, Mongolia, Cape Verde Islands.

Sphecodes puncticeps Thomson 1870

(Figs 21, 22, 95)

Sphecodes puncticeps Thomson 1870: 99, ♀, ♂ (type locality: Sweden).

Sphecodes bituberculatus Pérez 1903: 220, ♀ (type locality: France).

Sphecodes opacifrons Pérez 1903: 219 ♀, ♂ (type locality: Spain).

Sphecodes puncticeps var. *cretanus* Strand 1921: 305, ♀, ♂ (type locality: Crete).

Material examined. Uzbekistan: 1 ♀, Farab, 31.III.1912, Kuleshov (ZISP); 2 ♀, 5 ♂, Karshi, Khudoyzot, 20.V.2015, MP (FSCV). **Kyrgyzstan:** 1 ♂, Fergana Mts., 10 km ESE Lay-Talaa, 1700 m, 16.VIII.1985, YP (ZISP); 1 ♀, 5 km NE Kanysh-Kyya, 1800 m, 31.VIII.1988, YP (ZISP). **Turkmenistan:** 2 ♂, Kizil-Arvat, 1896, Ander (ZISP); 1 ♀, Bagir, Ashkhabad, 21–23.IV.1929, AS (ZISP); 1 ♀, Kara-Kala, 12.VI.1952, Kryzhanovskiy (ZISP); 2 ♂, 5 km S Tedzhen, 15.V.1963, AP (ZISP). **Tajikistan:** 2 ♀, Ashkhabad, Feryuza, 13.V.1928, VG (ZISP); 1 ♂, Gissar Mts., Khan-Takhta, 27.VIII.1933, Veltishchev (ZISP); 1 ♀, Gissar, 5.VII.1935, VG (ZISP); 2 ♀, Kondara, Varzob, 1100 m, 5.VI.1937, VG (ZISP); 2 ♀, 2 ♂, Stalinabad [=Dushanbe] (ZISP), 5.V.1944, 6.X. 1943, VP (ZISP); 1 ♀, Dusti, 2–7.III.1944, Arnoldi (ZISP); 1 ♂, Gissar Mts., Khodzha-obi-garm, 12.VIII.1944, M. Nikolskaya (ZISP); 1 ♂, Peter I Range, Dashti-Gurk, 40 km ESE Komsomolabad, 1700 m, 31.VIII.1985, YP (ZISP); 1 ♀, 10 km N Garavuti, Vakhsh River, 2.V.1987, AL (FSCV).

Published records. Morawitz (1876: 258): Uzbekistan, Tajikistan; Mayer (1920: 150): “Turkestan”; Popov (1967: 46, as *Sphecodes cristatus*): Tajikistan.

General distribution. Central Asia (Uzbekistan, *Kyrgyzstan, *Turkmenistan, Tajikistan); Europe (north to Finland and Sweden), Russia (east to Far East), North Africa, Turkey, Israel, Mongolia.

Sphecodes reticulatus Thomson 1870

(Figs 46, 47, 72, 83)

Sphecodes reticulatus Thomson 1870: 98, ♀, ♂ (type locality: Sweden).

Sphecodes distinguendus Hagens 1874: 38, ♂ (type locality: Germany).

Material examined. Kyrgyzstan: 1 ♀, Alay Mts., 10 km S Sary-Bulak, 2300 m, 21.VIII.1985, YP (ZISP); 31 ♂, 25 km ESE Osh, 1500 m, Ashillea sp., 21.VII. 1979, YP (ZISP); 10 ♂, Fergana Mts., 10 km ESE Lay-Talaa, 1700 m, 16.VIII.1985, YP (ZISP); 11 ♂, Alay Mts., 3 km W Oytal, 2000 m, 19.VIII.1985, YP (ZISP); 2 ♂, 10 km S Sary-Bulak, 20.VIII.1985, A. Manukyan (ZISP); 5 ♂, Uch-Debe, 15 km SSW Sufi-Kurgan, 2500 m, 30.VIII.1985, YP (ZISP); 1 ♂, 20 km ESE At-Bashi, 2200 m., 17.VIII.1988, YP (ZISP); 1 ♂, Sary-Chelek Lake, 1800 m, 27.VIII.1988, YP (ZISP); 2 ♂, 15 km ENE Dzhany-Bazar, Chatkal River, 1500 m, 30.VIII.1988, YP (ZISP); 21 ♂, 5 km NE Kanysh-Kyya, 1800 m, 31.VIII.1988, YP (ZISP). **Tajikistan:** 2 ♂, Khan-Takhta, Gissar Mts., 22.VIII.1933, Veltishchev (ZISP); 2 ♂, Shuroabad, 30 km SE Kulyab, 19.IX.1936, VG (ZISP); 1 ♀, 9 ♂, Muminabad, Kulyab Distr., 1300 m, 20.V.1953, AZ (ZMMU); 1 ♂, Pasrud, 2200 m, 5.IX.1964, V. Tanasiychuk (ZISP); 1 ♀, Aruk-Tau Mts., 15 km W Gandzhino, 15.V.1970, VT (ZISP); 3 ♀, 15 ♂, Alay Mts., 15 km WSW Karamyk, 2700 m, 11.VIII.1985, YP (ZISP); 3 ♂, Peter I Range, Dashti-Gurk, 40 km ESE Komsomolabad, 1700 m, 31.VIII.1985, YP (ZISP).

Published records. Warncke (1992: 25): “Turkestan”.

General distribution. Central Asia (*Kyrgyzstan, Tajikistan); Europe (north to 62°), Russia (east to Irkutsk Prov.), Turkey.

Remark. In Central Asia this species is recorded in the mountains only.

Sphecodes rufiventris (Panzer 1798)

(Figs 48, 49, 66, 93)

Tiphia rufiventris Panzer 1798: 4, ♀ (type locality: Germany).

Sphecodes subovalis Schenck 1853: 223, ♀ (type locality: Germany).

Sphecodes brevis Hagens 1875: 317, ♀, ♂ (type locality: Germany).

Sphecodes singularis Meyer 1920: 130, ♂ (type locality: Serbia).

Sphecodes combinatus Blüthgen 1927: 37, ♂ (type locality: France).

Sphecodes subovalis austrius Erlandsson 1979: 123, ♂ (type locality: Italy).

Sphecodes subovalis austrius var. *balcanicus* Erlandsson 1979: 123, ♂ (type locality: Croatia). Unavailable name (ICZN 1999, Article 45.5 of Code).

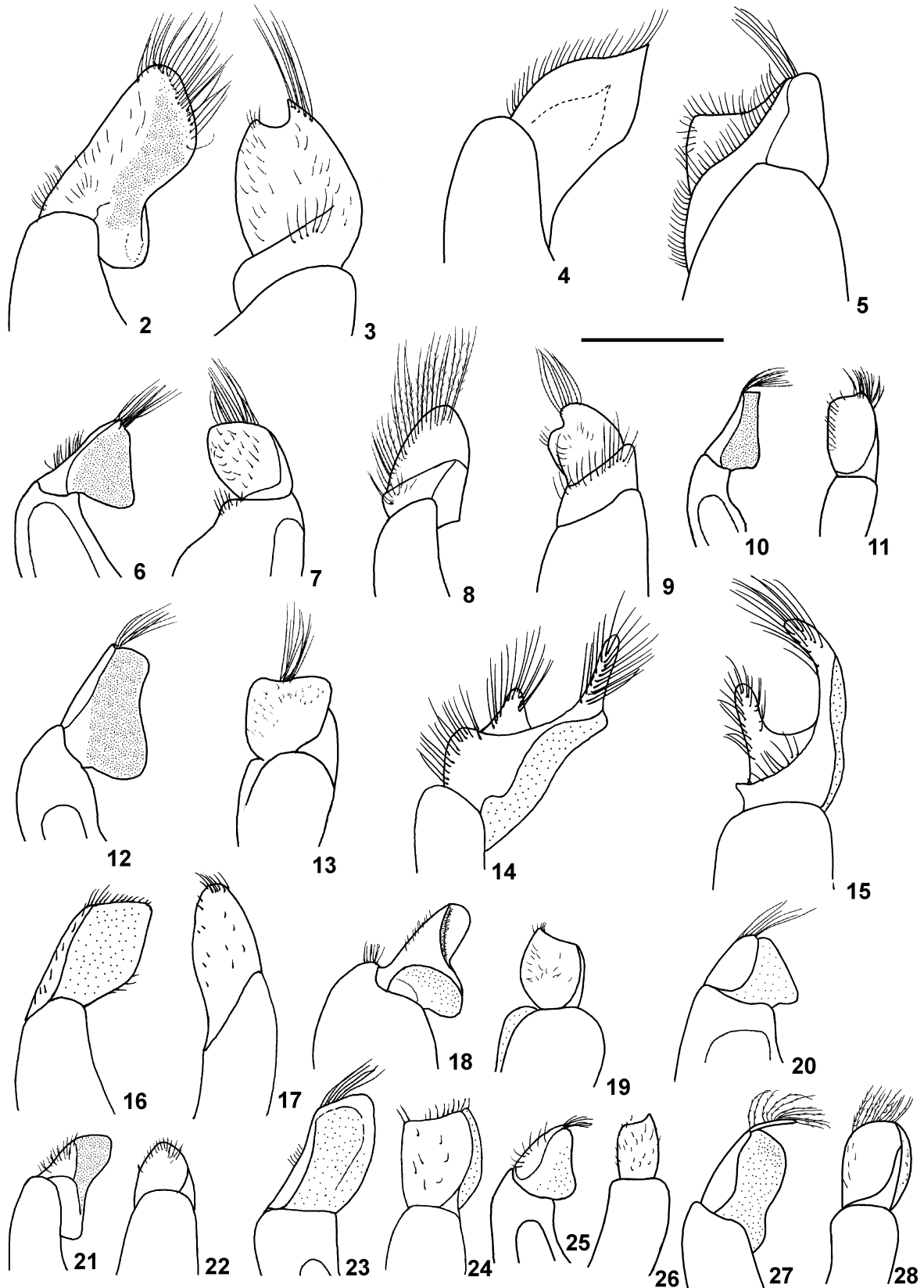
Sphecodes rufiventris hethiticus Warncke 1992: 28, ♀, ♂ (type locality: Turkey).

Material examined. Uzbekistan: 3 ♂, Ravat-Say, 29.VII.1930, E. Kuznetsova (ZISP); 1 ♀, Chatkal nature Reserve, 1200 m, 16.V.1980, DK (ZISP). **Kyrgyzstan:** 1 ♀, 1 ♂, Alay Mts., 10 km S Sary-Bulak, 2300 m, 21.VIII.1985, YP (ZISP); 9 ♂, 20 km S Frunze [=Bishkek], 1650 m, 11.IX.1986, YP (ZISP); 9 ♂, 5 km NE Kanysh-Kyya, 1800 m, 31.VIII.1988, YP (ZISP); 3 ♂, 25 km S Kara-Balty, 1600 m, 13.VIII.1988, YP (ZISP); 1 ♂, N Bishkek, VI.1999, Gurko (ZISP). **Tajikistan:** 1 ♀, Sangvor River, 7.VII.1975, YP (ZISP); 1 ♂, Kvak, 2000 m, 21.VII.1939, VG (ZISP); 1 ♀, 15 km NW Ramit, 11.VI.1975, YP; 30 ♂, Alay Mts., 15 km WSW Karamyk, 2700 m, 11.VIII.1985, YP (ZISP).

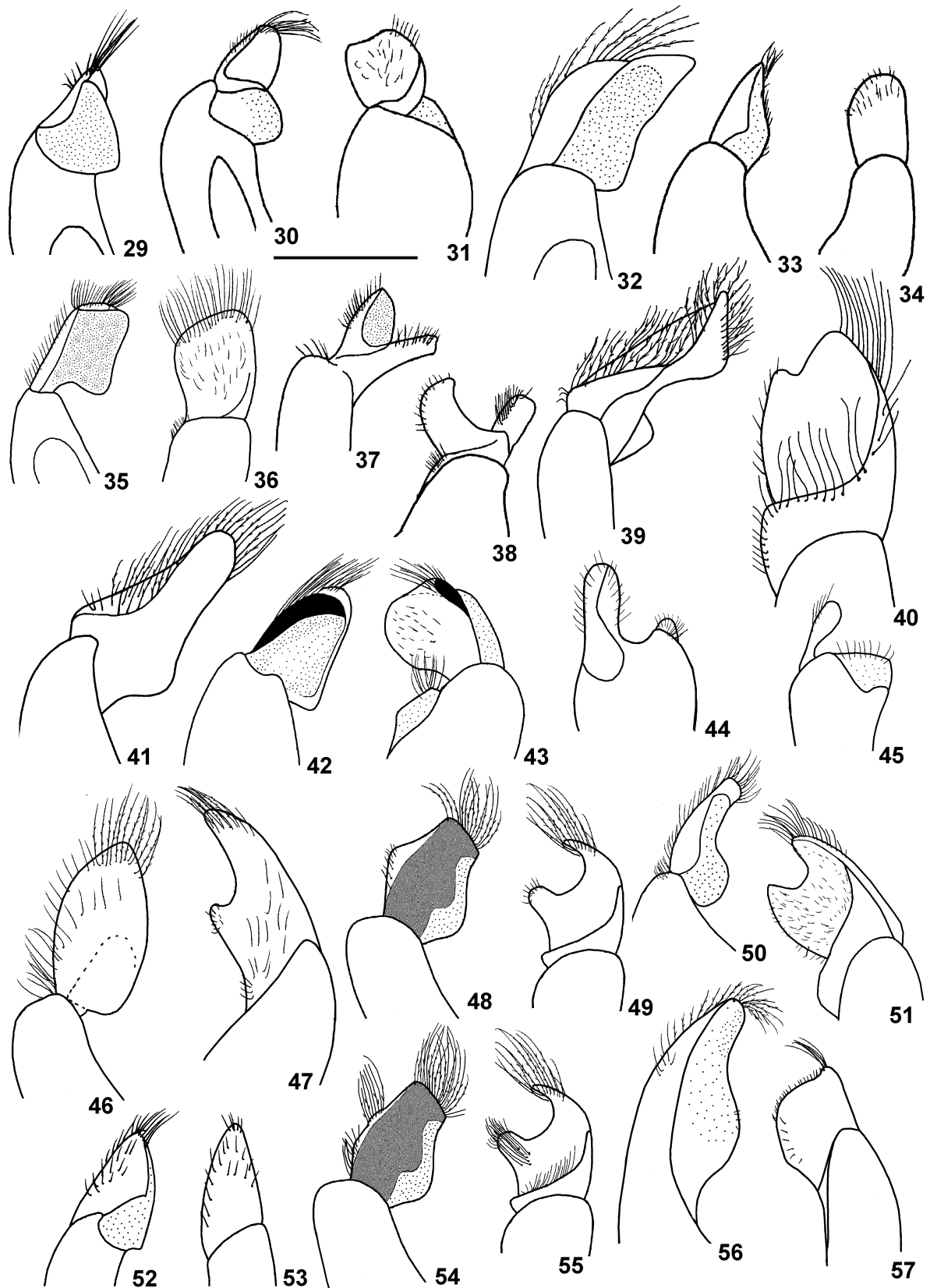
Published records. –

General distribution. Central Asia (*Uzbekistan, *Kyrgyzstan, *Tajikistan); Kazakhstan, Europe (north to 57°), Russia (east to Khakassia Republic), North Africa, Turkey.

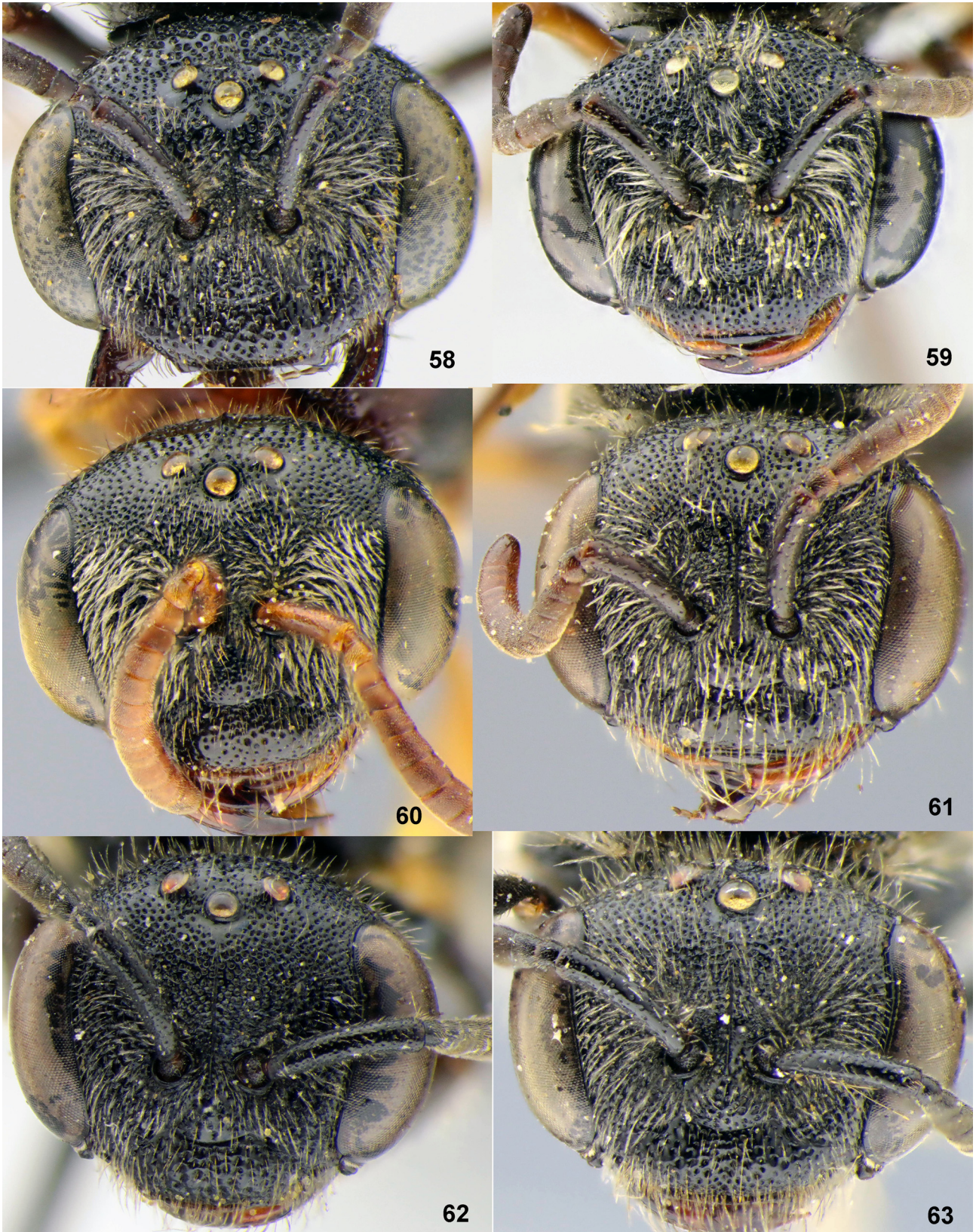
Remark. In Central Asia this species occurs in the mountains only.



FIGURES 2–28. Males, gonostylus, dorsal and lateral views; 2, 3—*Sphecodes albilabris* (Fabricius); 4, 5—*S. anatolicus* Warncke; 6, 7—*S. crassus* Thomson; 8, 9—*S. cristatus* Hagens; 10, 11—*S. geoffrellus* (Kirby); 12, 13—*S. ferruginatus* Hagens; 14, 15—*S. gibbus* (Linnaeus); 16, 17—*S. armeniacus* Warncke; 18, 19—*S. ephippius* (Linné); 20—*S. croaticus* Meyer; 21, 22—*S. puncticeps* Thomson; 23, 24—*S. saxicolus* Warncke; 25, 26—*S. schwarzi* Astafurova & Proshchalykin; 27, 28—*S. pinguiculus* Pérez. Scale bar: 0.5 mm.



FIGURES 29–57. Males, gonostylus, dorsal and lateral views; 29—*Sphecodes haladai* Warncke; 30, 31—*S. hyalinatus* Hagens; 32—*S. intermedius* Blüthgen; 33, 34—*S. longulus* Hagens; 35, 36—*S. miniatus* Hagens; 37, 38—*S. monilicornis* (Kirby); 39, 40—*S. olivieri* Lapeletier de Saint Fargeau; 41—*S. pectoralis* Morawitz; 42, 43—*S. pellucidus* Smith; 44, 45—*S. nurekensis* Warncke; 46, 47—*S. reticulatus* Thomson; 48, 49—*S. rufiventris* (Panzer); 50, 51—*S. scabricollis* Wesmael; 52, 53—*S. turanicus* Astafurova & Proshchalykin, **sp. nov.**; 54, 55—*S. tadschicus* Blüthgen; 56, 57—*S. spinulosus* Hagens. Scale bar: 0.5 mm.



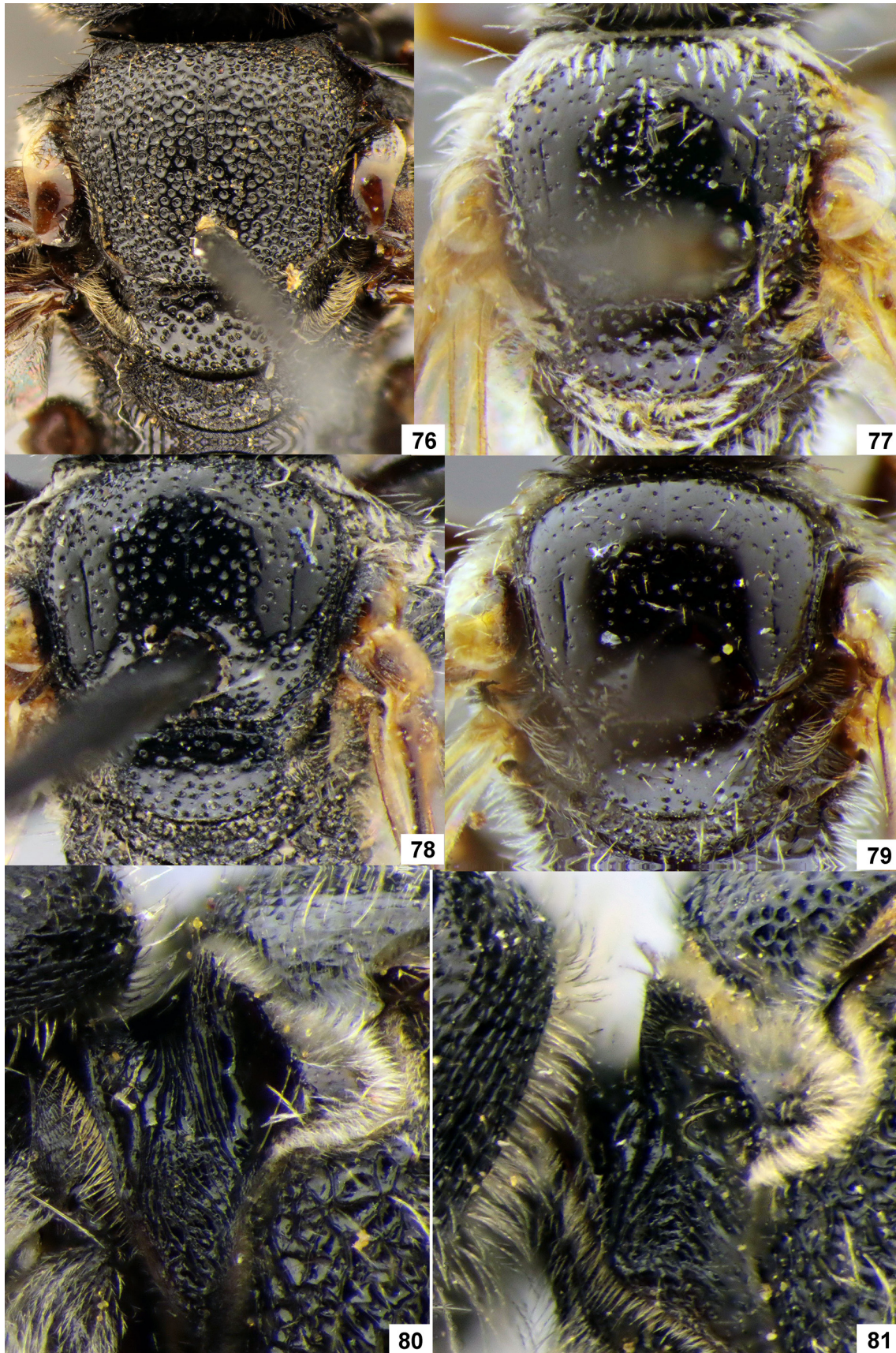
FIGURES 58–63. Females, head; frontal view; 58—*S. gibbus* (Linnaeus); 59—*S. anaticus* Warncke; 60—*S. cristatus* Hagens; 61—*S. croaticus* Meyer; 62—*S. ephippius* (Linné); 63—*S. pellucidus* Smith.



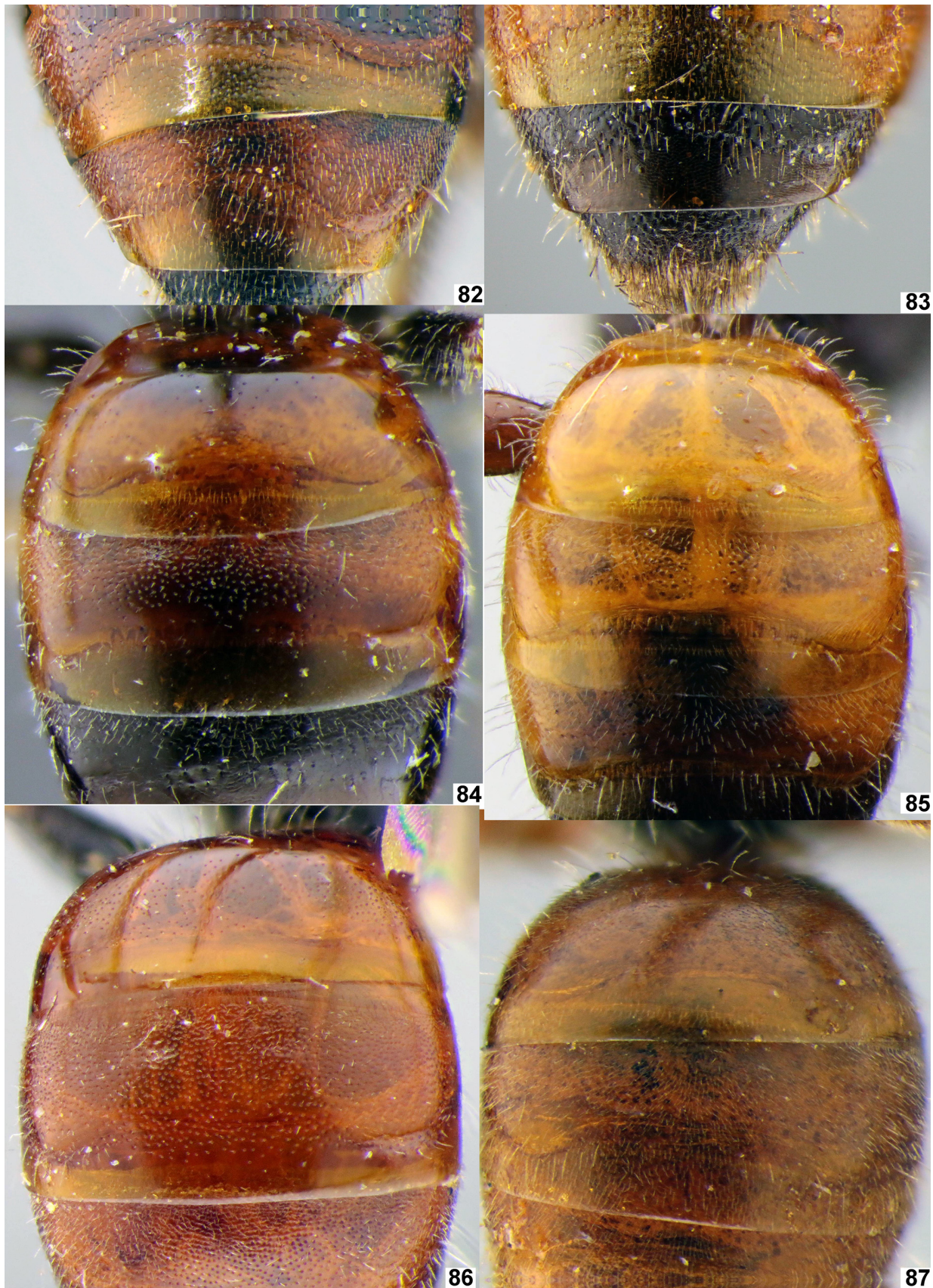
FIGURES 64–69. Females, head; frontal view; 64—*Sphecodes monilicornis* (Kirby); 65—*S. olivieri* Lepeletier de Saint Fargeau; 66—*S. rufiventris* (Panzer); 67—*S. saxicolus* Warncke; 68—*S. tadschicus* Blüthgen; 69—*S. schwarzi* Astafurova & Proshchalykin.



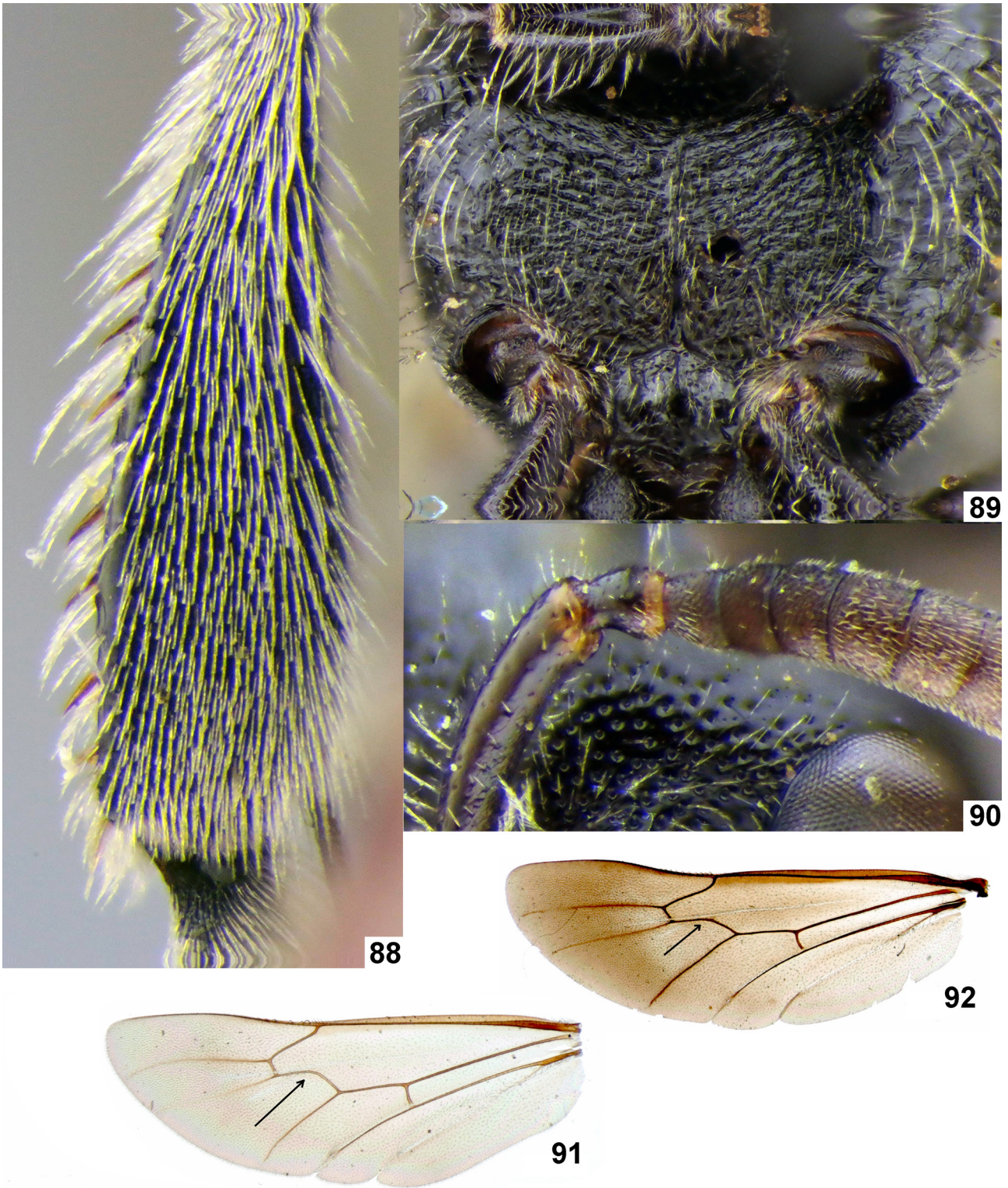
FIGURES 70–75. Females, head: 70, 72–74 – dorsal view; 71, 75—lateral view; 70—*Sphecodes spinulosus* Hagens; 71—*S. scabricollis* Wesmael; 72—*S. reticulatus* Thomson; 73—*S. intermedius* Blüthgen; 74—*S. gibbus* (Linnaeus); 75—*S. olivieri* Lepeletier de Saint Fargeau.



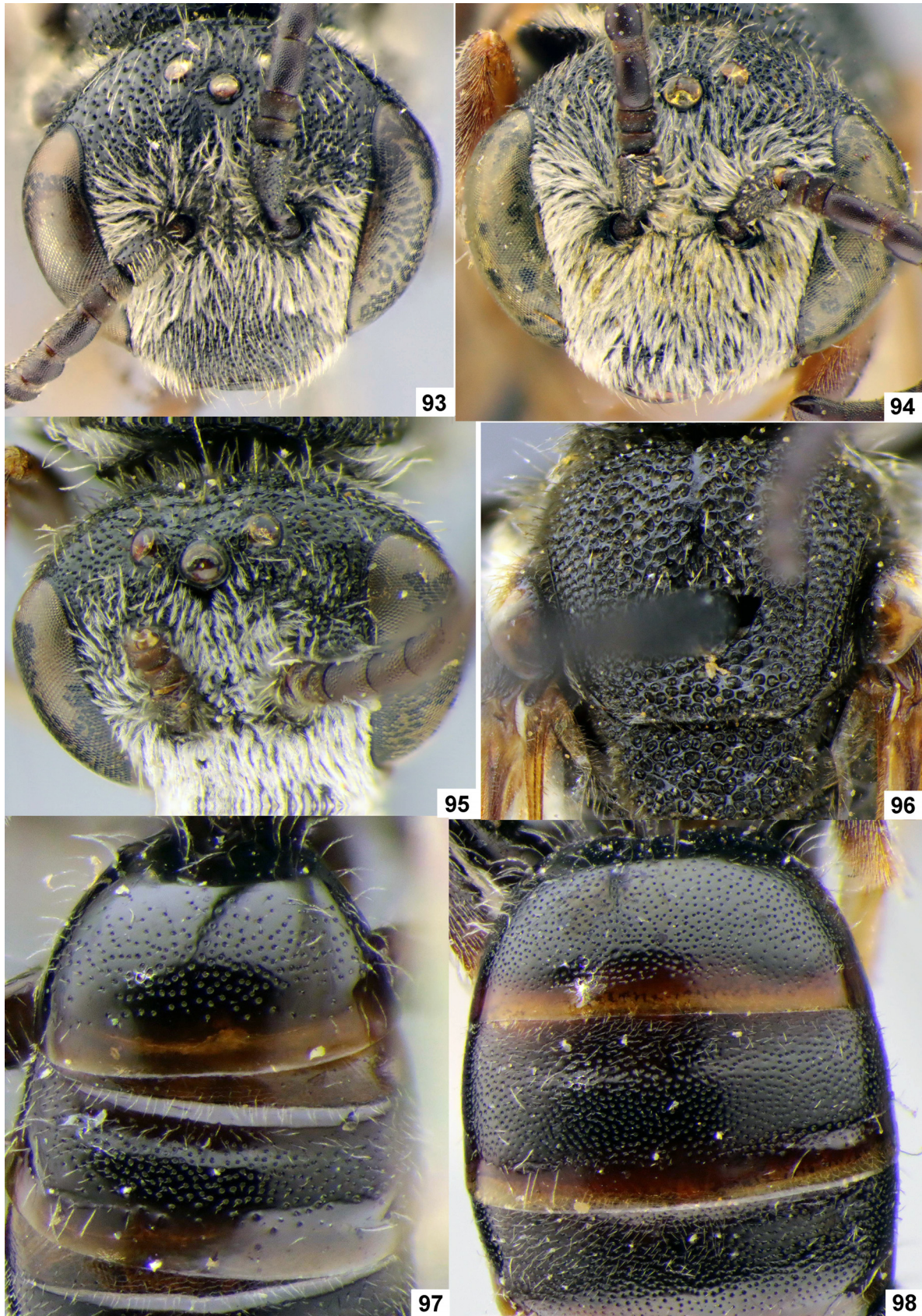
FIGURES 76–81. Females; 76–79—mesoscutum; 80, 81—pronotum; 76—*Sphecodes albilabris* (Fabricius); 77—*S. armeniacus* Warncke; 78—*S. intermedius* Blüthgen; 79—*S. pingiculus* Pérez; 80—*S. ferruginatus* Hagens; 81—*S. pellucidus* Smith.



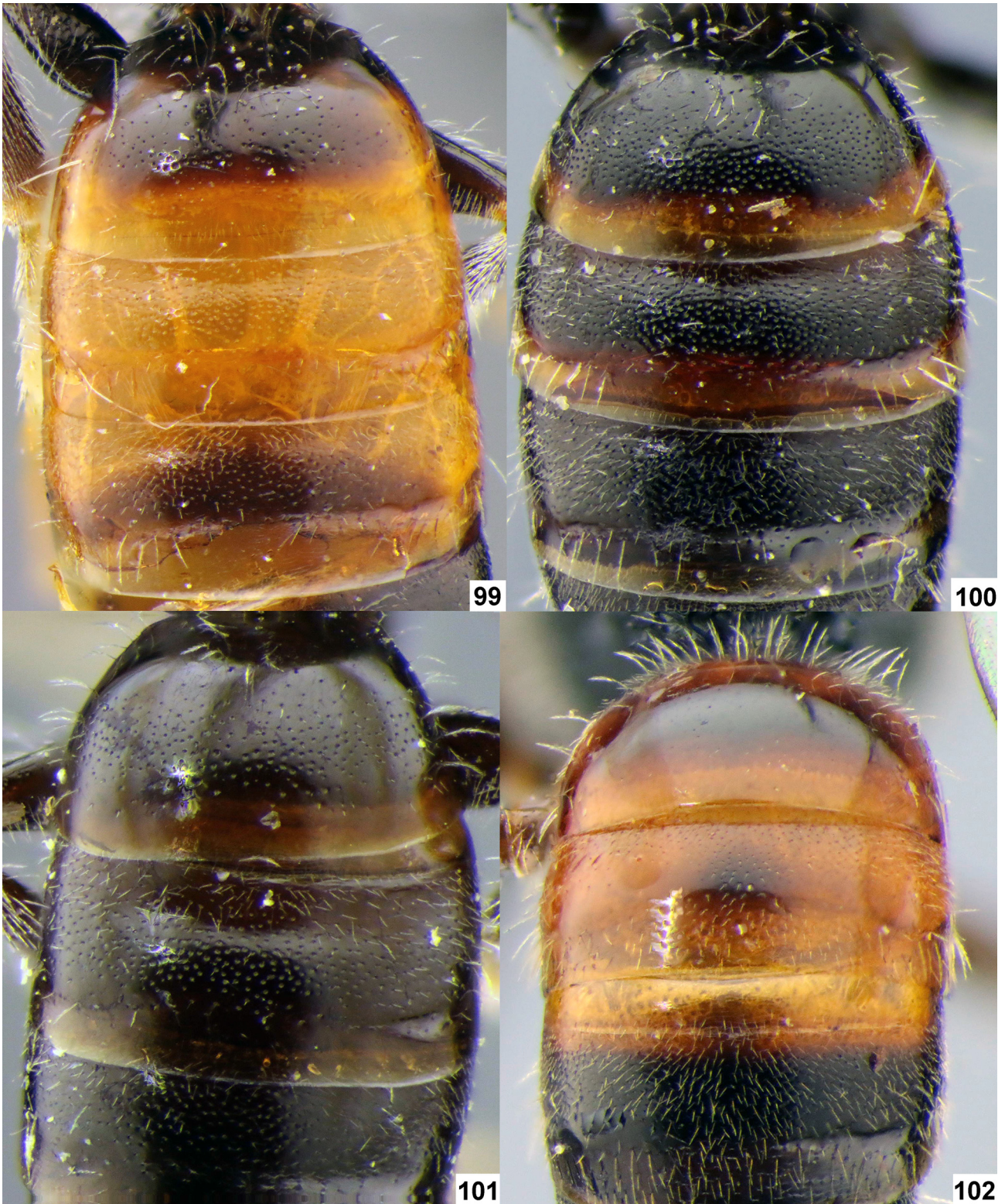
FIGURES 82–87. Females, metasoma; 82, 83—T4–T5; 84–87—T1–T2; 82—*Sphecodes alternatus* Smith; 83—*S. reticulatus* Thomson; 84—*S. haladai* Warncke; 85—*S. miniatus* Hagens; 86—*S. saxicolus* Warncke; 87—*S. turanicus* Astafurova & Proshchalykin, *sp. nov.*



FIGURES 88–92. 88—male; 89–92—females; 88—metatibia; 89—thorax, ventral view; 90—antenna; 91, 92—hind wing; 88—*Sphecodes spinulosus* Hagens; 89—*S. hyalinatus* Hagens; 90—*S. miniatus* Hagens; 91—*S. ephippius* (Linné); 92—*S. gibbus* (Linnaeus).



FIGURES 93–98. Males; 93, 94—head, frontal view; 95—head, dorsal view 96—mesoscutum; 97, 98—metasoma, T1–T2; 93—*Sphecodes rufiventris* (Panzer); 94—*S. tadschicus* Blüthgen; 95—*S. puncticeps* Thomson; 96—*S. scabricollis* Wesmael; 97—*S. nurekensis* Warncke; 98—*S. croaticus* Meyer.



FIGURES 99–102. Males, metasoma, T1–T3; 99—*Sphecodes saxicolus* Warncke; 100—*S. schwarzi* Astafurova & Proshchalykin; 101—*S. haladai* Warncke; 102—*S. turanicus* Astafurova & Proshchalykin, **sp. nov.**

***Sphecodes saxicolus* Warncke 1992**

(Figs 23, 24, 67, 86, 99)

Sphecodes saxicolus Warncke 1992: 37, ♀, ♂ (holotype: ♂, Nurek, 60 km E Duchanbe, Tajikistan, 6–7.VI.1990, J. Halada, OÖLM).

Material examined. **Uzbekistan:** 1 ♂, Kyzylkishlak, 18.V.2015, MP (FSCV). **Kyrgyzstan:** 3 ♂, Issyk-Kul, 30 km ESE Rybachye, 1610 m, 15.VII.1979, YP (ZISP). **Turkmenistan:** 1 ♀, Ashkhabad, 23.IV.1903, K. Ander (ZISP); 1 ♂, Chuli, Kopet-Dag, 6–8.V.1913, Golbek (ZISP); 3 ♀, 1 ♂, Akhcha-kuyma, 6.VII.1934, VP (ZISP); 4 ♂, Kara-Kala, 1–3.VI.1952, VT (ZISP); 1 ♂, Kopet-Dag, Syunt Mts., 24.VI.1953, Odintzova (ZISP); 3 ♀, 1 ♂, Repetek, 25.IV.1987, VT (ZISP); Kyzyl-Dzhar, Badkhyz Nature Reserve, 6.V.1989, MV (ZISP); 1 ♀, Puli-Khatum, Tedzhen River, 29.IV.1990, SB (ZISP). **Tajikistan:** 1 ♂, Nurek, 60 km E Duchanbe, 6–7.VII.1990, J. Halada, paratype of *Sphecodes saxicolus* (ZISP).

Published records. Warncke (1992: 37): Tajikistan.

General distribution. Central Asia (*Uzbekistan, *Kyrgyzstan, *Turkmenistan, Tajikistan).

***Sphecodes spinulosus* Hagens 1875**

(Figs 56, 57, 70, 88)

Sphecodes spinulosus Hagens 1875: 317, ♂ (type locality: Germany).

Material examined. **Uzbekistan:** 4 ♂, Aman-Kutan, near Samarkand, 31.V.1931, VG (ZISP); 2 ♂, Pskem Mts., Nanay, 23.V.1963, VT (ZISP); 1 ♂, Chatkal River, Aurahmat, 2.VI.1963, Zaslavskiy (ZISP); 1 ♂, near Pskem, 11.V.1988, A. Kireychuk (ZISP); 1 ♀, Chatkalsry Ridge, Kizilchasai, 2000 m, 15.VII.2002, V. Gurko (OÖLM); 1 ♂, Dorban, 10.V.2015. V. Gromenko (FSCV); 1 ♂, 50 km E Gusara, 19.V.2015, V. Gromenko (FSCV). **Kyrgyzstan:** 2 ♂, Chatkal Mts., Arkit, 1500–2000 m, 15–24.VI.1952, AZ (ZMMU); 1 ♀, Arslanbob, 21.VI.1963, E. Sugonyaev (ZISP); 1 ♀, 20 km E Talas, 4.VII.1982, SB (ZISP); 1 ♀, Ala-Archa riv. vall., Kaskha-Suu, 1650 m, VII.2002, V. Gurko (OÖLM). **Turkmenistan:** 1 ♂, 6 km NW Kara-Kala, 19.V.1984, MV (ZISP). **Tajikistan:** 1 ♂, Kharangon River, near Stalinabad [=Dushanbe], 3.VI.1934, Luppova (ZISP); 1 ♀, Kondara, Varzob, 1100 m, 19.VI.1937, VG (ZISP); 1 ♀, 2 ♂, Muminabad, Kulyab distr., 20–24.V.1953, AZ (ZMMU); 1 ♂, Dushanbe, 14.V.1966, V. Krivokhatskij (ZISP); 1 ♀, Kondara, 30 km N Dushanbe, 2.VI.1975, YP (ZISP); 2 ♂, Tavidara distr., Dehi-Colon near Tavidara, 24–27.V.2016, Yu. Danilov (ZISP).

Published records. –

General distribution. Central Asia (*Uzbekistan, *Kyrgyzstan, *Turkmenistan, *Tajikistan); Europe (north to 56°), Russia (east to Altai), North Africa, Turkey.

***Sphecodes tadschicus* Blüthgen 1935, stat. resurr.**

(Figs 54, 55, 68, 94)

Sphecodes tadschicus Blüthgen in Popov 1935: 366, ♂, ♀ (holotype: ♂, near Kulab [Tajikistan], 25.VII.1935, V. Popov // *Sph. tadschicus* n. sp., ♂, Blüthgen det., 1934 // Type; ZISP), examined.

Sphecodes rufiventris tadschicus Blüthgen: Warncke 1992: 29.

Material examined. **Uzbekistan:** 1 ♂, Seravshan, 1892, Glasunov, coll. F. Morawitz (ZISP). **Kyrgyzstan:** 1 ♀, 20 km ESE Pokrovka, 2000 m, 21.V.1998, A. Kireychuk (ZISP). **Turkmenistan:** 2 ♀, Bagir, Ashkhabad, 21–23.IV.1926, AS (ZISP); 1 ♂, Western Kopetdag, Khasardag, 23.VI.1953, AP (ZISP); 1 ♀, 3 ♂, Iol-Dere (gorge), 15 km NE Kara-Kala, 7.VII.1953, E. Arens (ZISP); 4 ♂, Western Kopetdag, Syunt Mts., 9.VII.1953, E. Arens (ZISP); 1 ♀, Kopetdag Mts., Firyuza, 24.IV.1987, DK (ZISP); 1 ♀, 5 km SE Firyuza, 2–3.VI.1985, AL (FSCV). **Tajikistan:** 3 ♂, Gissar Mts., Dzhurek, 22.IV.1921, A. Fursov (ZISP); 1 ♀, Khodzhen, 8.VII.1930 (ZISP); 2 ♀, Stalinabad [=Dushanbe], 11.V.1943, VP (ZISP); 1 ♀, Gissar Mts., Takob, 13.VI.1952, N. Filippov (ZISP).

Published records. Popov (1967: 47): Uzbekistan, Tajikistan; Warncke (1992: 29): Tajikistan.

TABLE 1. Records of Central Asian *Sphecodes* species by countries; + published records; ⊕ current data.

| <i>Sphecodes</i> species | Uzbekistan | Kyrgyzstan | Turkmenistan | Tajikistan |
|--------------------------|------------|------------|--------------|------------|
| <i>S. albilabris</i> | + | + | + | + |
| <i>S. alternatus</i> | + | ⊕ | + | + |
| <i>S. anatolicus</i> | ⊕ | ⊕ | ⊕ | ⊕ |
| <i>S. armeniacus</i> | | | | + |
| <i>S. crassus</i> | ⊕ | ⊕ | | ⊕ |
| <i>S. cristatus</i> | ⊕ | ⊕ | | + |
| <i>S. croaticus</i> | | | ⊕ | |
| <i>S. nurekensis</i> | | | | + |
| <i>S. ephippius</i> | + | ⊕ | + | + |
| <i>S. ferruginatus</i> | | ⊕ | | |
| <i>S. geoffrellus</i> | + | + | ⊕ | ⊕ |
| <i>S. gibbus</i> | + | + | + | + |
| <i>S. haladai</i> | + | | + | + |
| <i>S. intermedius</i> | + | ⊕ | + | + |
| <i>S. turanicus</i> | ⊕ | | ⊕ | ⊕ |
| <i>S. longulus</i> | ⊕ | | ⊕ | + |
| <i>S. miniatus</i> | | ⊕ | | |
| <i>S. monilicornis</i> | + | ⊕ | + | + |
| <i>S. olivieri</i> | + | | + | + |
| <i>S. pectoralis</i> | + | | + | + |
| <i>S. pellucidus</i> | ⊕ | ⊕ | ⊕ | ⊕ |
| <i>S. pinguiculus</i> | ⊕ | ⊕ | + | + |
| <i>S. puncticeps</i> | + | ⊕ | ⊕ | + |
| <i>S. reticulatus</i> | | ⊕ | | + |
| <i>S. rufiventris</i> | ⊕ | ⊕ | | ⊕ |
| <i>S. saxicolus</i> | ⊕ | ⊕ | ⊕ | + |
| <i>S. spinulosus</i> | ⊕ | ⊕ | ⊕ | ⊕ |
| <i>S. tadschicus</i> | + | ⊕ | ⊕ | + |
| <i>Total:</i> | 22 | 20 | 20 | 25 |

General distribution. This species occurs in the mountains of Central Asia (Uzbekistan, *Kyrgyzstan, *Turkmenistan, Tajikistan); Kazakhstan.

Remark. Warncke (1992) regarded Blüthgen's species to be conspecific with *S. rufiventris*, and demoted it to subspecific rank. Indeed, *S. tadschicus* is similar to *S. rufiventris*, as well as to *S. schenckii*, but each is consistently different from the others, with *S. tadschicus* in some respects intermediate between *S. rufiventris* and *S. schenckii*. Differences between these species are outlined in table 2.

TABLE 2. Differences between *Sphecodes rufiventris* (Panzer 1798), *S. tadschicus* Blüthgen 1935, and *S. schenckii* Hagens 1882.

| Characters | <i>S. rufiventris</i> | <i>S. tadschicus</i> | <i>S. schenckii</i> |
|--------------------------|--|--|---|
| Males | | | |
| Head width: | 1.1–1.15 times as wide as long | 1.2–1.25 times as wide as long | 1.2 times as wide as long |
| Tyloids: | usually well developed, variable: from covering larger part of flagellomere to semicircular across basal 1/3 (at least from F4 onward) and widely linear across remainder of flagellomere as seen in profile | variable: from covering larger part of flagellomere to semicircular across basal 1/4–1/3 (at least from F4 onward) | weakly developed, at most semicircular across basal 1/5 |
| Clypeal pubescence: | sparse; setae weakly plumose and not obscuring integument | dense; setae strongly plumose and obscuring integument | dense; setae strongly plumose and obscuring integument |
| Length of flagellomeres: | F2 1.4–1.5 as long as wide, F3 1.1–1.2 as long as wide | F2 1.5 as long as wide, F3 1.3 as long as wide | F2 1.7–1.8 as long as wide, F3 1.5 as long as wide |
| Females | | | |
| Head width: | 1.2–1.25 times as wide as long | 1.3 times as wide as long | 1.25–1.3 times as wide as long |
| Length of scapal setae: | about width of scape | twice width of scape | twice or more width of scape |
| Mesepisternum: | strigae or strigate-rugose | strigae-rugose, sometimes medially close to reticulate | reticulate-rugose to sometimes strigae-rugose ventrally |

***Sphecodes turanicus* Astafurova & Proshchalykin, sp. nov.**

(Figs 52, 53, 102–104)

Diagnosis. This species is similar to small Palaearctic species with simple mandibles which lack an inner tooth (i.e., *Sphecodes longuloides* Blüthgen 1923, *S. hirtellus* Blüthgen 1923, Thomson 1870, *S. longulus* Hagens 1882, *S. puncticeps* Thomson 1870, and *S. armeniacus* Warncke 1992). The female differs from these species in the finely (3–5 µm) punctate T2 and T3 (5–15 µm in other species). The female is similar to *S. armeniacus* by dense, appressed, snow-white pubescence obscuring integument on face (below the antennal toruli), gena and mesepisternum (this pubescence is sparse and not obscuring integument in other species), but differs from this species by densely punctate mesoscutum with punctures separated by at most a puncture diameter (versus sparsely and irregularly punctate mesoscutum with punctures separated 1–5 puncture diameters in *S. armeniacus*). The male is closest to *S. longulus* and *S. longuloides* in sharing similar genitalic form with short, oval gonostylus (Figs 52, 53), but differs from the first species by a longer antenna with F2 1.8 as long as wide (1.4–1.5 times as long as wide in *S. longulus*) and differs from the second species by stronger developed tyloids on the flagellomeres extending across 1/2–3/4 of ventral flagellar surfaces (versus those at most 1/2 in *S. longuloides*).

Description. Female. Total body length 4.5–6.0 mm, holotype 5.8 mm (Fig. 103a). Head strongly transverse (Fig. 103b), 1.2–1.3 times as wide as long; vertex not elevated, distance from top of head to upper margin of lateral ocellus about 1.5 lateral ocellar diameters as seen in dorsal views; F1–F3 transverse, 0.6–0.7 times as long as wide; labrum semicircular (0.5 times as long as width), antenna and mandible yellow or reddish; clypeus, supraclypear, paraocular areas, face and gena with dense punctures separated by less than a puncture diameter; ocellocular area with punctures separated by 0.5–2 puncture diameters; supraclypear, paraocular areas and gena with dense, appressed, snow-white pubescence obscuring integument.

Mesoscutum and mesoscutellum densely punctate (15–30 µm), with punctures separated by at most a puncture diameter (Fig. 103c); mesepisterna coarsely reticulate-rugose with dense, appressed, snow-white pubescence

obscuring integument; propodeal triangle shiny with coarsely longitudinal-winding wrinkles; rest of propodeum coarsely reticulate-rugose; stigma and veins brown; hind wing with basal vein strongly curved; costal margin with 5–6 hamuli; legs yellow or reddish. Metasoma. Metasomal terga (including T1) with dense microscopical setae pore (3–5 μm). T1–T3 yellow or reddish (Fig. 103d); pygidial plate 1.2 as wide as metabasitarsus.



FIGURE 103. *Sphecodes turanicus* Astafurova & Proshchalykin, **sp. nov.**, female, holotype; a—lateral habitus; b—head, frontal view; c—mesoscutum; d—metasoma, T1–T2.

Male. Total body length 4.0–5.0 mm (Fig. 104a). Head sculptured as female (see above), transverse, 1.1–1.2 times as wide as long (Fig. 104c); tyloids on flagellomeres semioval-shaped, variable in length and extending across 1/2–3/4 of ventral flagellar surfaces, clypeus with dense, appressed, snow-white pubescence obscuring integument. Mesoscutum with punctures (15–30 μm) separated by about a puncture diameter, becoming denser peripherally (Fig. 104e), mesoscutellum with coarse punctures (25–50 μm / 0.1–1); mesepisterna, propodeal triangle shiny and rest of propodeum coarsely reticulate-rugose; femur and tibia variable in color from brown to reddish, tarsi yellow. Metasoma. T1 impunctate, T2–T3 finely (5 μm) but distinctly punctate (Fig. 102). T1–T2 red, T3 red basally; gonocoxite dorsally without impression; gonostylus as in Figs 52, 53.

Type material (16 specimens). Holotype: ♀, Turkmenistan, Chardzhou, 16.IV.1988, Dialentov (ZISP).

Paratype: Uzbekistan: 1 ♀, Khiva, Ravat, 9.V.1927, VG; 1 ♀, 1 ♂, Karshi, Khudozot, 13, 20.V.2015, M.Yu. Proshchalykin; Tajikistan: 9 ♂, 15 km SW Shaartuz, 2.VI.1982, S.A. Belokobylskij; Kazakhstan, 2 ♀, Almaty Prov., near Ili, Ili River, 23.V.1970, T.P. Marikovskaya (ZISP); 1 ♀, Iliysk, 29.V.1953, L.V. Zimina (ZMMU).

Etymology. The specific epithet is named after the Turanian Basin.

General distribution. Central Asia (Turkmenistan, Uzbekistan, Tajikistan); Kazakhstan.

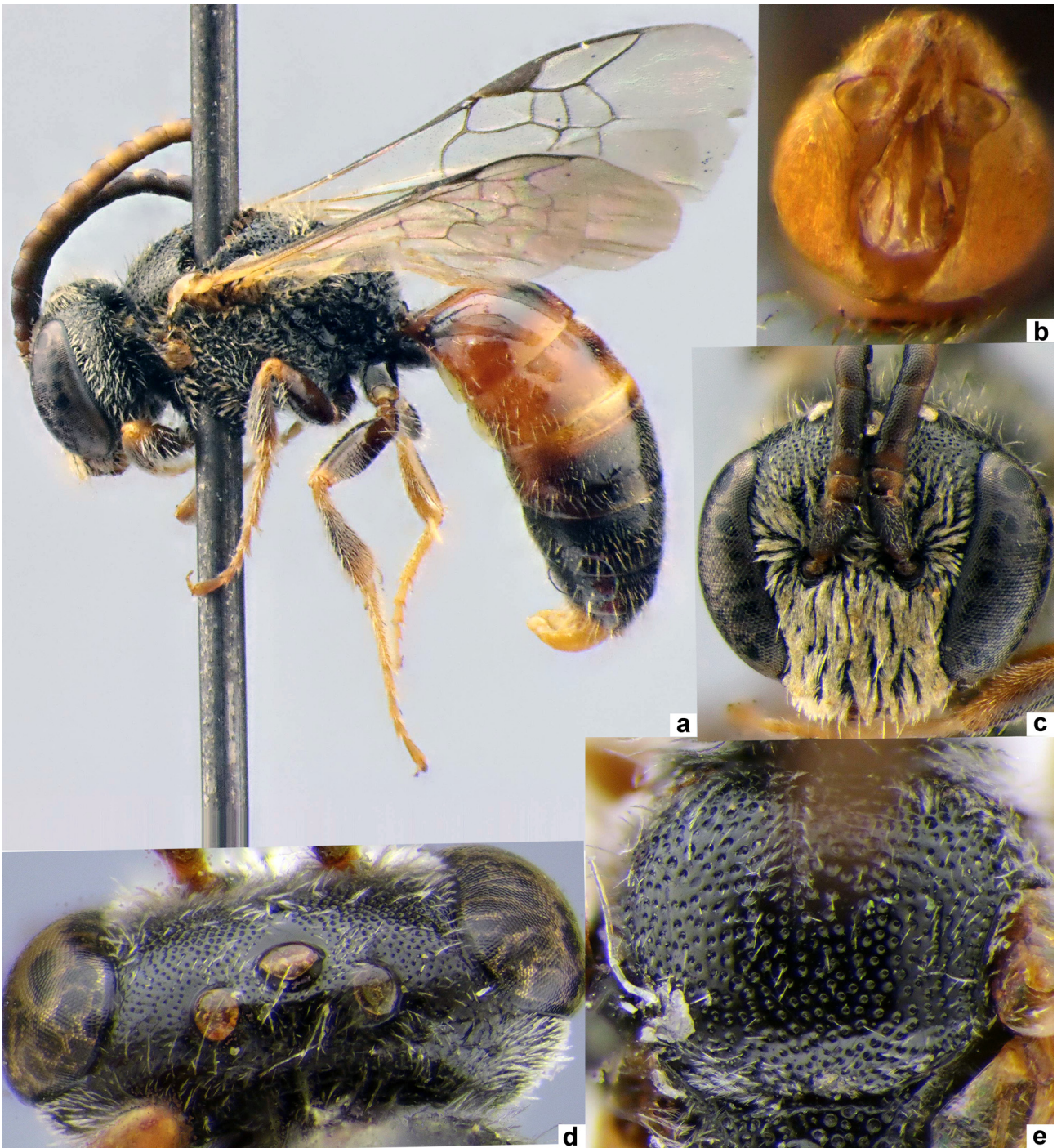


FIGURE 104. *Sphecodes turanicus* Astafurova & Proshchalykin, **sp. nov.**, male, paratype; a—lateral habitus; b—genital capsule; c—head, frontal view; d—head, dorsal view; e—mesoscutum.



FIGURE 105. *Sphecodes gracilior* Morawitz 1893, male, lectotype; lateral habitus and labels.

Key to the *Sphecodes* species of the Central Asia

Additional included *Sphecodes schwarzi* Astafurova & Proshchalykin 2015 (known from Mongolia and Siberia), *S. scabricollis* Wesmael 1835 and *S. hyalinatus* Hagens 1882 (both are widespread in Palaearctic) because the records of these species in Central Asia in the future are doubtless.

Females

1. Preoccipital carina present along vertex only (Fig. 70). F2 square, as long as wide, remaining flagellomeres distinctly longer than wide ***S. spinulosus* Hagens**
- Preoccipital carina not developed or present laterally behind eye only. F2 transverse, 0.5–0.7 times as long as wide, remaining flagellomeres square or slightly longer than wide 2
2. Hind wing with basal (*M*) vein weakly curved (Fig. 92); costal margin with 7–14 hamuli. Usually large species: total body length 6.0–15.0 mm 3
- Hind wing with basal (*M*) vein strongly curved (Fig. 91); costal margin with 5–6 hamuli. Large or small species: total body length 4.5–11.0 mm 14
3. Vertex less elevated (distance from top of head to upper margin of lateral ocellus less two lateral ocellar diameters as seen in frontal view), with longitudinal sharp carina (Fig. 75) 4

- Vertex more elevated (distance from top of head to upper margin of lateral ocellus more two lateral ocellar diameters as seen in frontal view), acarinate, but sometimes with weak (indistinct) longitudinal ridge 6
- 4. Face and gena with sparse, semi-erect, gray pubescence not obscuring integument (Fig. 60). Metasomal T1 with fine punctures (3–10 μm) ***S. cristatus* Hagens**
- Face and gena with dense, appressed, snow-white pubescence obscuring integument (Fig. 65). Metasomal T1 with coarse punctures (10–30 μm) 5
- 5. Mesoscutum coarsely punctate (25–75 μm). Metasomal T2 with marginal zone impunctate. Larger: total body length 8.0–11.0 mm ***S. olivieri* Lapeletier de Saint Fargeau**
- Mesoscutum relatively finely punctate (25–40 μm). Metasomal T2 with marginal zone distinctly punctate. Smaller: total body length 6.5–8.5 mm ***S. pectoralis* Morawitz**
- 6. Gena flat. Preoccipital lateral carina developed (Fig. 71) ***S. scabricollis* Wesmael**
- Gena swollen. Preoccipital carina not developed 7
- 7. Mesoscutum densely punctate, with punctures separated by less a puncture diameter (Fig. 76) ***S. albilabris* (Fabricius)**
- Mesoscutum sparsely punctate, medially with punctures separated by at least 2 puncture diameters 8
- 8. Vertex shorter, distance from top of head to upper margin of lateral ocellus about 2 lateral ocellar diameters as seen in dorsal view (Fig. 72). Metasomal T4 with marginal zone punctate and smooth between punctures or finely tessellate without punctures. Sides of propodeum reticulate-rugose 9
- Vertex longer, distance from top of head to upper margin of lateral ocellus equal to 2.5–3.0 lateral ocellar diameters as seen in dorsal view (Fig. 74). Metasomal T4 with marginal zone impunctate, smooth (rarely indistinctly tessellate). Sides of propodeum strigae or reticulate-rugose 10
- 9. Metasomal T4 with marginal zone impunctate, finely tessellate (Fig. 83); T1 finely punctate (10–15 μm). Mesoscutum usually densely punctate, medially with punctures separated by not more than 1–3 puncture diameters, sometimes sparser ***S. reticulatus* Thomson**
- Metasomal T4 with marginal zone distinctly punctate, smooth between punctures (rarely indistinctly tessellate) (Fig. 82); T1 coarsely punctate (15–25 μm). Mesoscutum usually sparsely punctate, medially with punctures separated by mostly 2–4 puncture diameters ***S. alternatus* Smith**
- 10. Head rounded-rectangular on upper margin, square-shaped as seen in frontal view (Fig. 64); vertex sparsely punctate, punctures mostly separated by more than a puncture diameter. Pygidial plate equal or slightly narrower than metabasitarsus. Metasomal T1 indistinctly punctate, with a few very fine punctures ***S. monilicornis* (Kirby)**
- Head uniformly rounded on upper margin, oval as seen in frontal view; vertex densely punctate, punctures mostly separated by less than a puncture diameter. Pygidial plate 0.5–0.6 times as wide as metabasitarsus. Metasomal T1 distinctly punctate, with fine and coarser punctures 11
- 11. Mesepisternum strigae or strigae-rugose at least ventrally, sides of propodeum strigae. Metasomal T3 with marginal zone coarsely punctate 12
- Mesepisternum reticulate-rugose, sides of propodeum strigae or reticulate-rugose. Metasomal T3 with marginal zone impunctate 13
- 12. Head less transverse, 1.2–1.25 times as wide as long (Fig. 66). Length of scapal setae is about width of scape ***S. rufiventris* (Panzer)**
- Head more transverse, 1.3 times as wide as long (Fig. 68). Length of scapal setae is twice width of scape ***S. tadschicus* Blüthgen**
- 13. Vertex less elevated, distance from top of head to upper margin of lateral ocellus about two lateral ocellar diameters as seen in frontal view (Fig. 59) ***S. anatolicus* Warncke**
- Vertex more elevated, distance from top of head to upper margin of lateral ocellus about three lateral ocellar diameters as seen in frontal view (Fig. 58) ***S. gibbus* (Linnaeus)**
- 14. Mandible simple (without an inner tooth) 15
- Mandible bidentate 18
- 15. Head less transverse, at most 1.15 times as wide as long ***S. longulus* Hagens**
- Head more transverse, 1.2–1.3 times as wide as long 16
- 16. Face, gena and mesepisternum with gray, sparse, semi-erect pubescence, not obscuring integument. Metasoma coarser punctate (10–15 μm). Pygidial plate as wide as metabasitarsus ***S. puncticeps* Thomson**
- Face, gena and mesepisternum with dense, snow-white, appressed, pubescence obscuring integument (Fig. 103b). Metasoma finely punctate (3–10 μm). Pygidial plate 1.4–1.5 times as wide as metabasitarsus 17
- 17. Mesoscutum finely and irregularly punctate (10–20 μm), with punctures separated up to 5 puncture diameters (Fig. 77) ***S. armeniacus* Warncke**
- Mesoscutum coarsely and densely punctate (15–30 μm), with punctures separated by at most a puncture diameter (Fig. 103c). ***S. turanicus* sp. nov.**
- 18. Pygidial plate at least 1.2 times wider than metabasitarsus, usually dull. Mesoscutum densely punctate, punctures usually separated by less than two puncture diameters. Total body length 7.0–11.0 mm 19
- Pygidial plate equal or narrower than metabasitarsus, shiny. Mesoscutum usually sparsely punctate, disc medially with punctures separated by more than two puncture diameters. Total body length 4.0–9.0 mm 20
- 19. Head more transverse, 1.30–1.35 times as wide as long; vertex, behind ocelli, not elevated in frontal view (Fig. 63). Setae on scape distinctly longer than width of scape. Pygidial plate 1.3–1.5 times as wide as metabasitarsus ***S. pellucidus* Smith**
- Head less transverse, 1.20–1.25 times wider than long (Fig. 62); vertex, behind ocelli, weakly elevated. Setae on scape shorter than width of scape. Pygidial plate 1.2–1.4 times as wide as metabasitarsus ***S. ephippius* (Linné)**

20. Clypeus densely punctate, punctures separated by less than a puncture diameter. Pronotum, between dorsal and lateral surfaces, rounded, not angulate (Fig. 80) 21
 - Clypeus sparsely punctate, punctures separated by at least a puncture diameter. Pronotum between dorsal and lateral surfaces with sharp angle (Fig. 81) 22
21. Ventral part of thorax dull, finely reticulate-rugulose (Fig. 89) **S. hyalinatus Hagens**
 - Ventral part of thorax shiny, coarsely reticulate-rugose **S. ferruginatus Hagens**
22. Vertex long, distance from top of head to upper margin of lateral ocellus about 3–3.5 times lateral ocellar diameters as seen in dorsal view (Fig. 73). Upper half of gena with appressed, dense pubescence obscuring integument 23
 - Vertex shorter, distance from top of head to upper margin of lateral ocellus about two lateral ocellar diameters as seen in dorsal view. Gena with erect, sparse pubescence 24
23. Mesoscutum and mesoscutellum very sparsely punctate with punctures separated by 1–7 diameters (Fig. 79)
 - Mesoscutum and mesoscutellum denser punctate with punctures separated by 1–3 puncture diameters (Fig. 78)
 **S. pinguiculus Pérez**
 **S. intermedius Blüthgen**
24. F3 transverse, 0.6–0.7 times as long as wide, as long as F1 (Fig. 90). Pygidial plate as wide as metabasitarsus 25
 - F3 square, as long as wide, longer than F1. Pygidial plate narrower than metabasitarsus 27
25. Paraocular area with dense, strongly plumose setae below the antennal toruli (Fig. 69)
 **S. schwarzi Astafurova & Proshchalykin**
 - Face with sparser, simple and weakly plumose setae 26
26. Head more transverse 1.15–1.23 times as wide as long. Metasomal T2 on disc densely punctate on anterior half and usually sparsely and irregularly punctate on posterior half, punctures shallow, not reaching marginal zone (Fig. 85)
 **S. miniatus Hagens**
 - Head less transverse, about 1.10–1.15 times as wide as long. Metasomal T2 on disc densely punctate, with deep punctures reaching the marginal zone at least medially (Fig. 84) **S. haladai Warncke**
27. Metasomal T1 with distinct punctures separated by 1–4 puncture diameters; T2 with coarser and denser punctures reaching the marginal zone (15–20 µm / 1–2) (Fig. 86) 28
 - Metasomal T1 impunctate or with a few fine punctures; T2 with finer and sparser punctures on anterior third or half only (10–15 µm / 1–4) 29
28. Vertex elevated and visible in as seen in frontal view (Fig. 61). Clypeus with furrow in the middle wider, about 3 times as wide as long **S. croaticus Mayer**
 - Vertex not elevated (Fig. 67). Clypeus without furrow in the middle, narrower, less than 3 times as wide as long
 **S. saxicolus Warncke**
29. Head more transverse, 1.25 times as wide as long. Labrum trapezoidal, 0.7 times as long as wide. Metafemur strongly enlarged on proximal half, maximum width 0.4 times its length **S. crassus Thomson**
 - Head less transverse, 1.1 times as wide as long. Labrum semicircular, 0.5 times as long as width. Metafemur weakly enlarged on proximal half, maximum width 0.35 times its length **S. geoffrellus (Kirby)**

Males

1. Costal margin of hind wing with 7–14 hamuli. Base of gonocoxite dorsally without impression. Usually large species: total body length 7.0–12.0 mm 2
 - Costal margin of hind wing with 5–6 hamuli. Base of gonocoxite dorsally with impression or without it. Large or small species: total body length 3.5–11.0 mm 14
2. Preoccipital carina developed, complete. Upper side of metatibiae with red spines (Fig. 88) **S. spinulosus Hagens**
 - Preoccipital carina not developed or present laterally behind eye only. Upper side of metatibiae without spines 3
3. Head rounded, about as long as wide. Hind wing with basal (*M*) vein strongly curved. Metasomal T1 finely and sparsely (sometimes indistinctly) punctate **S. monilicornis (Kirby)**
 - Head transverse, wider than long. Hind wing with basal (*M*) vein weakly curved. Metasomal T1 distinctly coarsely and densely punctate 4
4. Mesoscutum densely punctate, with confluent punctures (areolate) 5
 - Mesoscutum sparsely punctate, medially with punctures separated by at least a puncture diameter 6
5. Head more transverse, 1.2 times as wide as long. Vertex long, distance from top of head to upper margin of lateral ocellus about 2.5–3.0 lateral ocellar diameters as seen in dorsal view. Tyloids on flagellomeres (at least from F4 onward) semicircular across basal 1/5–1/3 and linear across remaining flagellomeres as seen in lateral view. Mesoscutellum sparsely punctate, medially with punctures separated by more than a puncture diameter and often with impunctate areas. Metasomal T1 completely red. Gonostylus as in Figs 2, 3 **S. albilabris (Fabricius)**
 - Head less transverse, 1.1 times as wide as long. Vertex shorter, distance from top of head to upper margin of lateral ocellus about two lateral ocellar diameters as seen in dorsal view. Tyloids on flagellomeres semicircular across basal 1/6–1/4, linear portion along remaining flagellomeres not developed. Mesoscutellum densely punctate, with confluent punctures (Fig. 96). Metasomal T1 black or brownish at least on basal 1/3. Gonostylus as in Figs 50, 51 **S. scabricollis Wesmael**
6. Vertex with a longitudinal carina 7
 - Vertex without a longitudinal carina 9
7. Tyloids on flagellomeres (at least from F4 onward) are semicircular across basal 1/3–1/2. Metasomal T1 with marginal zone very finely and indistinctly punctate. Gonostylus as in Figs 8, 9 **S. cristatus Hagens**
 - Tyloids on flagellomeres weakly developed, very narrow, semicircular across basal 1/7–1/5 of flagellomere. Metasomal T1

| | | |
|---------|---|---|
| | with marginal zone coarsely and distinctly punctate | 8 |
| 8. | Head more transverse, 1.2 times as wide as long. Mesoscutum coarser punctate (30–75 µm). Metasomal T2 with marginal zone impunctate. Larger: total body length 7.0–11.0 mm. Gonostylus as in Figs 39, 40 . . . <i>S. olivieri</i> Lepeletier de Saint-Fargeau | |
| - | Head less transverse, 1.10–1.15 times as wide as long. Mesoscutum finer punctate (25–40 µm). Metasomal T2 with marginal zone distinctly punctate. Smaller: total body length 5.0–7.0 mm. Gonostylus as in Fig. 41 <i>S. pectoralis</i> Morawitz | |
| 9. | Vertex long, distance from top of head to upper margin of lateral ocellus about three lateral ocellar diameters as seen in dorsal view. Tyloids on flagellomeres cover at least 1/3 part of flagellomere 10 | |
| - | Vertex shorter, distance from top of head to upper margin of lateral ocellus about two lateral ocellar diameters as seen in dorsal view. Tyloids on flagellomeres not cover more than 1/4 part of flagellomere. Gonostylus as in Figs 46, 47 13 | |
| 10. | F3 short, 1.1–1.3 as long as wide. Gonostylus apically more emarginate as seen in lateral view (Figs 49, 55) 11 | |
| - | F3 long, about 2 times longer than wide. Gonostylus apically less emarginate as seen in lateral view (Fig. 5, 15) 12 | |
| 11. | Clypeus with sparse, weakly plumose hairs not obscuring integument (Fig. 93). Head less transverse, 1.1–1.15 times as wide as long. Gonostylus as in Figs 48, 49 <i>S. rufiventris</i> (Panzer) | |
| - | Clypeus with dense, strongly plumose hairs obscuring integument (Fig. 94). Head more transverse, 1.2–1.25 times as wide as long. Gonostylus as in Figs 54, 55 <i>S. tadschicus</i> Blüthgen | |
| 12. | Tyloids on flagellomeres well developed, covering large part of flagellomere (as seen in lateral view). Gonostylus elongate, with apical process (Figs 14, 15) <i>S. gibbus</i> (Linnaeus) | |
| - | Tyloids on flagellomeres weakly developed, semicircular across basal 1/7–1/5. Gonostylus short, without apical process (Figs 4, 5) <i>S. anatolicus</i> Warncke | |
| 13. | Metasomal T4 with marginal zone finely tessellate, without punctures <i>S. reticulatus</i> Thomson | |
| - | Metasomal T4 with marginal zone distinctly punctate, smooth between punctures (rarely indistinctly tessellate) <i>S. alternatus</i> Smith | |
| 14. | Base of gonocoxite dorsally without impression 15 | |
| - | Base of gonocoxite dorsally with impression 21 | |
| 15. | Metasomal T1 densely punctate (Fig. 97). Gonostylus elongate, as in Figs 44, 45 <i>S. nurekensis</i> Warncke | |
| - | Metasomal T1 impunctate or with a few fine punctures. Gonostylus another shape 16 | |
| 16. | Vertex coarsely and densely punctate, ocellocular area with confluent punctures, separated by at most a half puncture diameter 17 | |
| - | Vertex finely and sparser punctate, ocellocular area with punctures, separated by at least a puncture diameter 18 | |
| 17. | Tyloids on last flagellomeres (at least from F4 onward) usually cover more 1/2 ventral flagellar surfaces, often up 4/5. Membranous portion of gonostylus large, as in Figs 42, 43 <i>S. pellucidus</i> Smith | |
| - | Tyloids on last flagellomeres (at least from F4 onward) usually cover about 1/2 ventral flagellar surfaces, rare up 3/4. Membranous portion of gonostylus small, as in Figs 18, 19 <i>S. ephippius</i> (Linné) | |
| 18. | Tyloids on flagellomeres cover entire ventral flagellar surfaces. Gonostylus as in Figs 16, 17 <i>S. armeniacus</i> Warncke | |
| - | Tyloids on flagellomeres extend across at most 3/4 of ventral flagellar surfaces 19 | |
| 19. | Ocellocular area dense punctate, with punctures, separated by about a puncture diameter (Fig. 95). Gonostylus large, as in Figs 21, 22 <i>S. puncticeps</i> Thomson | |
| - | Ocellocular area sparse punctate, with punctures, separated by 1–3 puncture diameters (Fig. 104d). Gonostylus small, as in Figs 33, 34, 52, 53 20 | |
| 20. | F2 shorter, 1.4–1.6 times as long as wide. Tyloids on the flagellomeres extend across 1/4–1/2 of ventral flagellar surfaces <i>S. longulus</i> Hagens | |
| - | F2 longer, 1.7–1.8 times as long as wide. Tyloids on the flagellomeres extend across 1/2–3/4 of ventral flagellar surfaces <i>S. turanicus</i> sp. nov. | |
| 21(14). | Metasomal T1 densely punctate (Fig. 98) 22 | |
| - | Metasomal T1 impunctate or with sparse punctures (in <i>S. miniatius</i> sometimes relatively densely punctate) 27 | |
| 22. | Tyloids on flagellomeres (from F2 onward) cover entire ventral flagellar surfaces (rarely shorter, covering about 3/4–4/5 flagellar length). Membranous portion of gonostylus large, rectangular or weakly S-curved (Figs 27, 32) 23 | |
| - | Tyloids on flagellomeres (from F3 onward) cover about 1/3–3/4 of ventral flagellar surfaces (rarely longer, but at most 4/5 flagellar length). Gonostylus small, triangular or oval (Figs 20, 23, 24) 24 | |
| 23. | Antenna longer, last flagellomeres 1.4 times as long as wide. Gonostylus as in Figs 27, 28 <i>S. pinguiculus</i> Pérez | |
| - | Antenna shorter, last flagellomeres slightly longer than wide. Gonostylus as in Fig. 32 <i>S. intermedius</i> Blüthgen | |
| 24. | Head more transverse 1.2 times as wide as long. Larger species: total body length 5.5–8 mm. Membranous portion of gonostylus larger, triangular or oval (Figs 20, 23) 25 | |
| - | Head less transverse, 1.1 times as wide as long. Membranous portion of gonostylus small, triangular (Figs 25, 29). Small species: total body length 4.5–5.5 mm 26 | |
| 25. | Metasomal terga coarsely punctate (15–25 µm) (Fig. 98). Gonostylus triangular (Fig. 20) <i>S. croaticus</i> Mayer | |
| - | Metasomal T2 finely punctate (7–10 µm) (Fig. 99). Gonostylus oval (Figs 23, 24) <i>S. saxicolus</i> Warncke | |
| 26. | Tyloids on flagellomeres covering 1/2–4/5 of ventral flagellar surfaces. Metasomal T2 on average coarser and denser punctate (7–15 µm / at most 1) (Fig. 100) <i>S. schwarzi</i> Astafurova & Proshchalykin | |
| - | Tyloids on flagellomeres covering at most 1/2 underside of flagellomere. Metasomal T2 on average finer and sparser punctate (7–10 µm / 1–3) (Fig. 101) <i>S. haladai</i> Warncke | |
| 27. | F2 short, 0.9–1.0 times as long as F3. Tyloids on flagellomeres (at least from F4 onward) usually cover entire ventral flagellar surfaces. Gonostylus as in Figs 10, 11 <i>S. geoffrellus</i> (Kirby) | |
| - | F2 longer, 1.1–1.2 as long as F3. Tyloids on flagellomeres shorter, covering at most 4/5 the ventral flagellar surfaces (in <i>S. min-</i> | |

| | | |
|-----|--|--------------------------------------|
| | <i>iatu</i> s tyloids on last flagellomeres sometimes cover entire ventral flagellar surfaces) | 28 |
| 28. | Pronotum between dorsal and lateral surfaces rounded, not angulated. Mesoscutum densely punctate, with punctures separated by at most a puncture diameter | 29 |
| - | Pronotum between dorsal and lateral surfaces with sharp angle. Mesoscutum sparsely punctate, punctures (at least medially) mostly separated by more than a puncture diameter | 30 |
| 29. | Tyloids on flagellomeres covering less than 1/3 of ventral flagellar surfaces. Gonostylus long, trapezoidal (Figs 12, 13) | <i>S. ferruginatus</i> Hagens |
| - | Tyloids on flagellomeres (at least from F4 onward) covering about 1/3–1/2 of ventral flagellar surfaces, rarely 3/4 on last flagellomeres. Gonostylus shorter, not trapezoidal (Figs 30, 31) | <i>S. hyalinatus</i> Hagens |
| 30. | Tyloids on flagellomeres usually covering less than 1/3 of ventral flagellar surfaces (rarely 1/2). Gonostylus oval (Figs 6, 7) | <i>S. crassus</i> Thomson |
| - | Tyloids on flagellomeres cover more than 3/4 of ventral flagellar surfaces, sometimes entire surfaces. Gonostylus trapezoidal (Figs 35, 36) | <i>S. miniatus</i> Hagens |

Acknowledgements

We thank all curators listed under materials and methods and also Yu.N. Danilov (Institute of Systematics and Ecology of Animals, Novosibirsk, Russia) and M. Schwarz (Ansfelden, Austria) for providing *Sphecodes* specimens. S.V. Triapitsyn and D. Yanega (Entomology Research Museum, University of California, Riverside, USA) made suggestions for the improving of text. The comments of Allan H. Smith Pardo and two anonymous reviewers helped to improve the quality of this paper.

This investigation was supported by the Russian Funds for Basic Research (grant numbers 15–29–02466 офи_м; 16–04–00197; 17–04–00259) and the state research project (AAAA–A17–117030310205–9).

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