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CONTRIBUTION TO THE SIBERIAN CHRYSIDIDAE (HYMENOPTERA). PART 2

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Summary. In this second part, new Elampini records from Siberia are reported, as well as the description of 11 new species, namely: *Elampus agnolii* Rosa, **sp. n.**, *E. coloratus* Rosa, **sp. n.**, *Hedychridium belokobylskiji* Rosa, **sp. n.**, *H. gabriellae* Rosa, **sp. n.**, *H. longigena* Rosa, **sp. n.**, *H. leleji* Rosa, **sp. n.**, *H. loktionovi* Rosa, **sp. n.**, *H. propodeale* Rosa, **sp. n.**, *H. proshchalykini* Rosa, **sp. n.**, *H. arensi* Rosa, **sp. n.**, *H. sibiricum* Rosa, **sp. n.** are given. We upgraded to species level *Hedychridium asianum* Linsenmaier, 1997, **stat. n.** and *H. turcicum* Arens, 2010, **stat. n.** A new synonymy is proposed: *Holopyga generosa asiatica* Trautmann, 1926 = *Holopyga ovata proviridis* Linsenmaier, 1959, **syn. n.** An update check-list of the Siberian species is given and distribution by regions is discussed.

Key words: cuckoo wasps, taxonomy, new species, fauna, new records, Russia.

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Резюме. Во второй части сообщаются новые находки ос-блестянок трибы Elampini из Сибири, а также даются описания 11 новых видов: *Elampus agnolii* Rosa, **sp. n.**, *E. coloratus* Rosa, **sp. n.**, *Hedychridium belokobylskiji* Rosa, **sp. n.**, *H. gabriellae* Rosa, **sp. n.**, *H. longigena* Rosa, **sp. n.**, *H. leleji* Rosa, **sp. n.**, *H. loktionovi* Rosa, **sp. n.**, *H. propodeale* Rosa, **sp. n.**, *H. proshchalykini* Rosa, **sp. n.**, *H. arensi* Rosa, **sp. n.**, *H. sibiricum* Rosa, **sp. n.** Статус *Hedychridium asianum* Linsenmaier, 1997, **stat. n.** и *H. turcicum* Arens, 2010, **stat. n.** повышен с подвидового до видового. Предложена новая синонимия: *Holopyga generosa asiatica* Trautmann, 1926 = *Holopyga ovata proviridis* Linsenmaier, 1959, **syn. n.** Дается ревизованный список ос-блестянок Сибири и обсуждается их распространение по регионам.

INTRODUCTION

The second part of our contribution to the Siberian Chrysididae includes the genera: *Elampus* Spinola, *Holopyga* Dahlbom, and *Hedychridium* Abeille de Perrin of the Elampini tribe. Material, methods, abbreviations of collectors as well as depositary museums and collections are given in the first part of this contribution (Rosa *et al.*, 2017b).

Subfamily Chrysidinae

Tribe Elampini

Genus *Elampus* Spinola, 1806

Elampus Spinola, 1806: 10. Type species: *Chrysis panzeri* Fabricius, 1804, by subsequent designation of Latreille, 1810: 437.

Elampus ussuriensis (Semenov, 1967)

Notozus ussuriensis Semenov, 1967: 126. Holotype – ♀; Russia: Primorskii Terr., env. Vladivostok [ZIN] (examined).

SPECIMENS EXAMINED. **Russia:** Yakutsk Rep.: env. Yakutsk [ZIN], vill. Namskoe [ZIN].

DISTRIBUTION. Russia (Yakutsk Rep., Zabaikalskyi Terr., Primorskii Terr.).

Elampus coloratus Rosa, **sp. n.**

Figs 1A–F, 2A, 2C

SPECIMENS EXAMINED. Holotype – ♂, **Russia:** Tuva Rep., 20 km SSW Erzin, Tore-Khol' Lake, 3.VII 2013 (VL, MP) [ZIN]. Paratype: ♂, **Mongolia:** Lun-Ula 30 km WSW Dariganga, 1.VII 1971 (I. Kerzhner) [PRC].

DIAGNOSIS. The most distinctive features of *Elampus coloratus* sp. n. are body coloration, shallow punctuation, and genital capsule. Male has red face, head dorsally and mesosoma green with extensive golden-red color on pronotum anteriorly, mesonotum, metanotum, mesopleuron and legs. Metasoma metallic red and sterna golden-green. This coloration pattern was not observed in any other species so far. Occasionally, male specimens of *E. pyrosomus* (Förster, 1853) may show a greenish-golden coloration. However, *E. coloratus* sp. n. can be separated from these specimens through the subtriangular shape of head, in frontal view (*vs.* transversally

broadened in *E. pyrosomus*) and genital capsule with gonocoxae differently shaped (Fig. 2C vs. Fig. 2D). *Elampus sidus* (Semenov, 1967), from Iran, also shows a greenish-golden coloration, without a specific pattern, but can be recognized by large, robust habitus (Rosa et al. 2017x: Plate 290); face (in frontal view) mostly polished, impunctate; punctures on mesosoma dense, contiguous; metasomal lamella

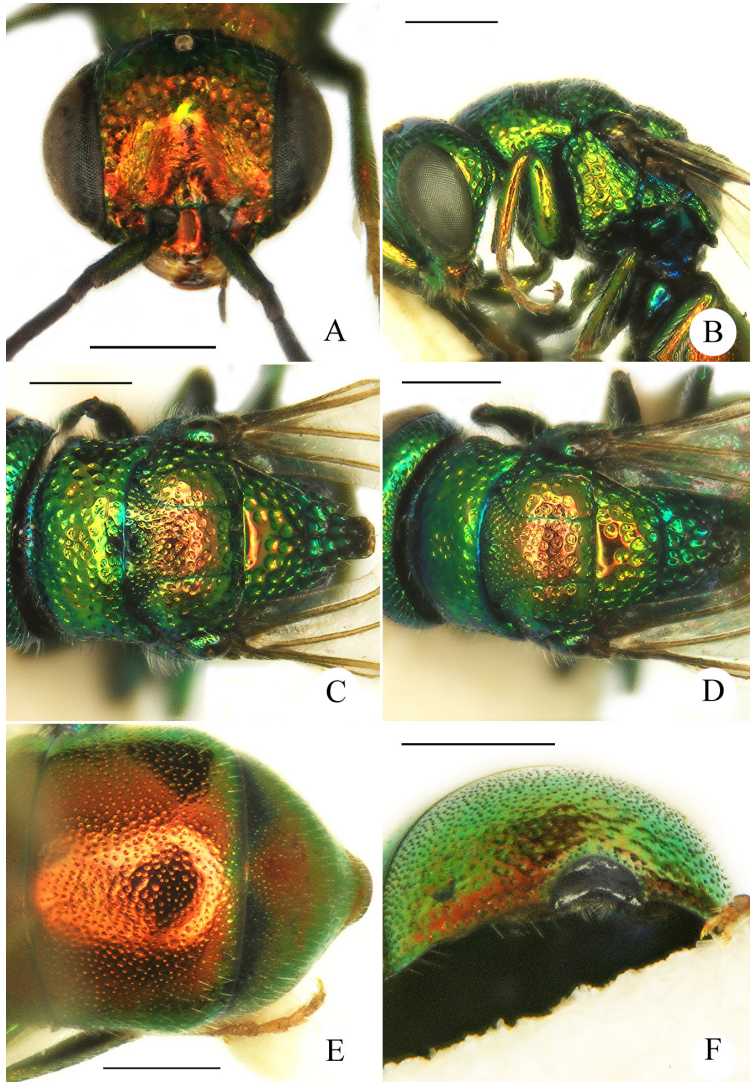


Fig. 1. *Elampus coloratus* Rosa, sp. n., holotype, ♂: A – head, frontal view; B – head and mesosoma, lateral view; C – mesosoma dorsal view; D – mesosoma, dorsal view; E – metasoma, dorsal view; F – T3, posterior view. Scale bar = 0.5 mm.

outstandingly broad. It is separated from other Asian species through shallow punctures on head, pronotum and mesoscutum, and subrectangular metanotal lamella with subparallel sides.

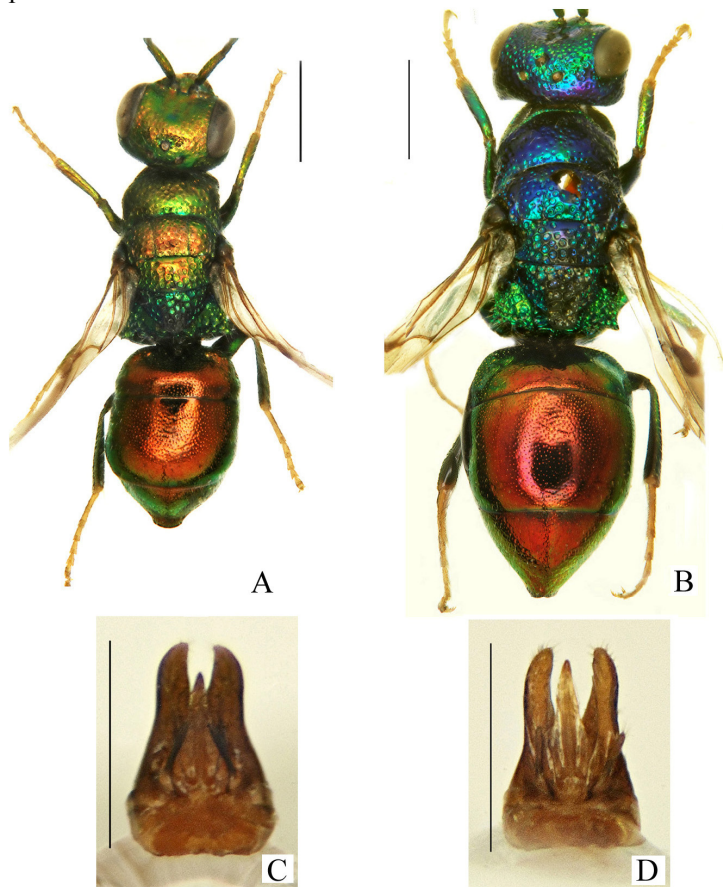


Fig. 2. *Elampus* Rosa, spp. A, C – *E. coloratus* Rosa, sp. n., holotype, ♂: A – habitus, dorsal view; C – genital capsule; B – *E. agnolii* Rosa, sp. n., holotype, ♀; habitus, dorsal view; D – *E. pyrosomus* (Förster), genital capsule. Scale bar = 1.0 mm for A, B and 0.5 mm for C, D.

DESCRIPTION. Male. Body length 4.5–5.5 mm. Fore wing length 3.0–3.5 mm. OOL = 3.0 MOD; POL = 2.6 MOD; MS = 0.2 MOD; relative length of P : F1 : F2 : F3 = 1 : 2.2 : 1.4 : 1.0.

Head. Frons, vertex and face between scapal basin and eye with shallow, medium-sized punctures, 0.5 PD apart (Fig. 1A), even shallower on post-ocellar vertex; face relatively flat; scapal basin broad, medially polished in the upper fourth; medially and laterally rugulose (Fig. 1A); clypeus impunctate. Ocellar triangle isosceles. Postocellar line deep and complete.

Mesosoma. Pronotum and mesoscutum with large (< 1 MOD), shallow punctures (Fig. 1C). Punctures on mesoscutum increasing in size towards posterior margin; notauli and parapsidal furrow complete. Mesoscutellum antero-medially impunctate, the rest with deep, large (> 1 MOD), foveate punctures (Fig. 1D). Metascutellum with foveate-reticulate punctures and subrectangular lamella (Fig. 1C); lamella with parallel sides and large punctures (1–2 MOD), apically truncate (Fig. 1C); lamella, in lateral view, slightly longer than mesoscutellum. Mesopleuron with foveate punctures and with scrobal carina reaching omaulus below its anterior protrusion (Fig. 1B). Fore femur basoventrally unmodified; tarsal claws with three teeth. Propodeal teeth acute, backwards directed (Fig. 2A). Forewing with Rs stub as long as pterostigma.

Metasoma. T1 with minute, evenly distributed punctures, 1–3 PD apart; T2 with larger punctures, with scattered minute punctures interspersed; punctuation on T3 coarser and rugulose towards apex; lateral margins shallowly sinuate before apical truncation; apical truncation forming half circle, its membrane indentation less than half truncation height (Fig. 1F).

Coloration. Head and mesosoma golden-green, red to golden-red on face, pronotum anteriorly, mesonotum, metanotum, mesopleuron and legs; apex of metanotal lamella blackish; tegulae fully metallic green; tarsi yellowish. Metasoma metallic red, becoming purplish towards T3 apical snout; sterna green. Scape and pedicel metallic green, flagellum black. Wings hyaline, pale amber around pterostigma and radial sector.

Vestiture. Short (up to 1 MOD), whitish setae on head, mesosoma and laterally on metasoma.

Female. Unkown.

DISTRIBUTION. Russia (Tuva Rep.); Mongolia.

ETYMOLOGY. The epithet *coloratus* (masculine, adjective) refers to the multi-colored body.

***Elampus foveatus* (Mocsáry, 1914)**

Elampus foveatus Mocsáry, 1914: 1. Lectotype ♂ (designated by Móczár 1964); Bosnia [HNHM] (examined).

Elampus sanzii: Anichtchenko 2002: 5 (Irkutsk Prov.).

Elampus foveatus: Paukkunen *et al.*, 2014: 14.

DISTRIBUTION. Russia (Irkutsk Prov.). Trans-Palaeartic, from Central Europe to Siberia (Paukkunen *et al.*, 2014). The exact distribution is still uncertain, because authors often misidentified *E. foveatus* with other, more or less closely related taxa, e.g. *E. sanzii* Gogorza and *E. spina* (Lepeletier).

REMARKS. Identifications of *Elampus sanzii* from North Europe (Paukkunen *et al.*, 2014), Siberia and Central Europe are likely to refer to *E. foveatus*. The latter is probably widespread in the central and northern part of Russia, whereas *E. sanzii* should be limited to the southern part; records from central and eastern regions of the Russian European part are in need of confirmation.

***Elampus pallasi* (Semenov, 1967)**

Notozus pallasi Semenov 1967: 123. Holotype – ♀; Kazakhstan: Zaysan [ZIN] (examined).

SPECIMENS EXAMINED. **Russia:** Irkutsk Prov.: 15 km E Ust'-Ordynskiy, 22.VI 2007, 1 ♂ (P. Nemkov) [IBSS].

DISTRIBUTION. *Russia (Irkutsk Prov.); Kazakhstan.

***Elampus petri* (Semenov, 1967)**

Notozus petri Semenov-Tian-Shanskij, 1967: 122. Holotype – ♀, Russia: Ryazan Prov., Khoper (paratypes from Kazacij, Gremyachka) [ZIN] (examined).

SPECIMENS EXAMINED. **Russia:** Tuva Rep.: 25 km NW Erzin, Dus-Khol' Lake, 13.VII 2014, 1 ♀ (AL, MP, VL) [IBSS]; Zabaikalskyi Terr. [ZIN].

DISTRIBUTION. Russia (Ryazan Prov., Tuva Rep., Zabaikalskyi Terr).

***Elampus agnolii* Rosa, sp. n.**

Figs 2B, 3A–F

SPECIMENS EXAMINED. Holotype – ♀, **Russia:** Tuva Rep., W of Ujukskyi Mountains, Kamennyi River Valley, 1000 m, 11–20.VII 2003 (collector unknown) [ZIN].

DIAGNOSIS. *Elampus agnolii* sp. n. is similar to *E. petri* (Semenov) for the T3 apical rim, alike a sickle or boomerang, with narrow rim along margins. It can be easily separated from *E. petri* (see Rosa *et al.*, 2017a: Plate 286) as follows: forefemur basoventrally with subrectangular carina (Fig. 3C) (*vs.* ecarinate in *E. petri*); mesopleuron ventrally simple (Fig. 3B) (*vs.* mesopleuron ventrally with a distinct small denticle projecting outward); antenna simple (*vs.* unusually long and thick); metanotal lamella subrectangular, with subtruncate apex (*vs.* metasomal lamella subtriangular and pointed). *E. agnolii* sp. n. is also similar to some specimens of *E. constrictus* (Förster) for apical truncation of T3, but it is separated through forefemur basoventrally carinate (Fig. 3C) (*vs.* unmodified), mesopleuron with scrobal carina reaching omaulus below its anterior protrusion (see Paukkunen *et al.*, 2015) (Fig. 3C) (*vs.* scrobal carina reaching omaulus at its anterior corner). It differs from *E. panzeri* (Fabricius) for the shape of T3, with lateral margins almost straight before apical truncation (Fig. 3F) (*vs.* lateral margin of T3 distinctly sinuose before apical truncation); apical truncation of T3 falcate (*vs.* horseshoe-shaped). It differs from *E. foveatus* (Mocsáry) through the falcate shape of apical rim (*vs.* apical truncation horseshoe-shaped with membrane differently shaped (see Paukkunen *et al.*, 2015)). Finally, it differs from *E. pallasi* (Semenov) through mesosoma punctuation and shape of the falcate apical truncation (*vs.* half-moon shaped).

DESCRIPTION. *Female.* Body length 6.1 mm. Fore wing length 4,5 mm. OOL = 3.3 MOD; POL = 3.1 MOD; MS = 1 MOD; relative length of P : F1 : F2 : F3 = 1 : 1.3 : 0.8 : 0.8.

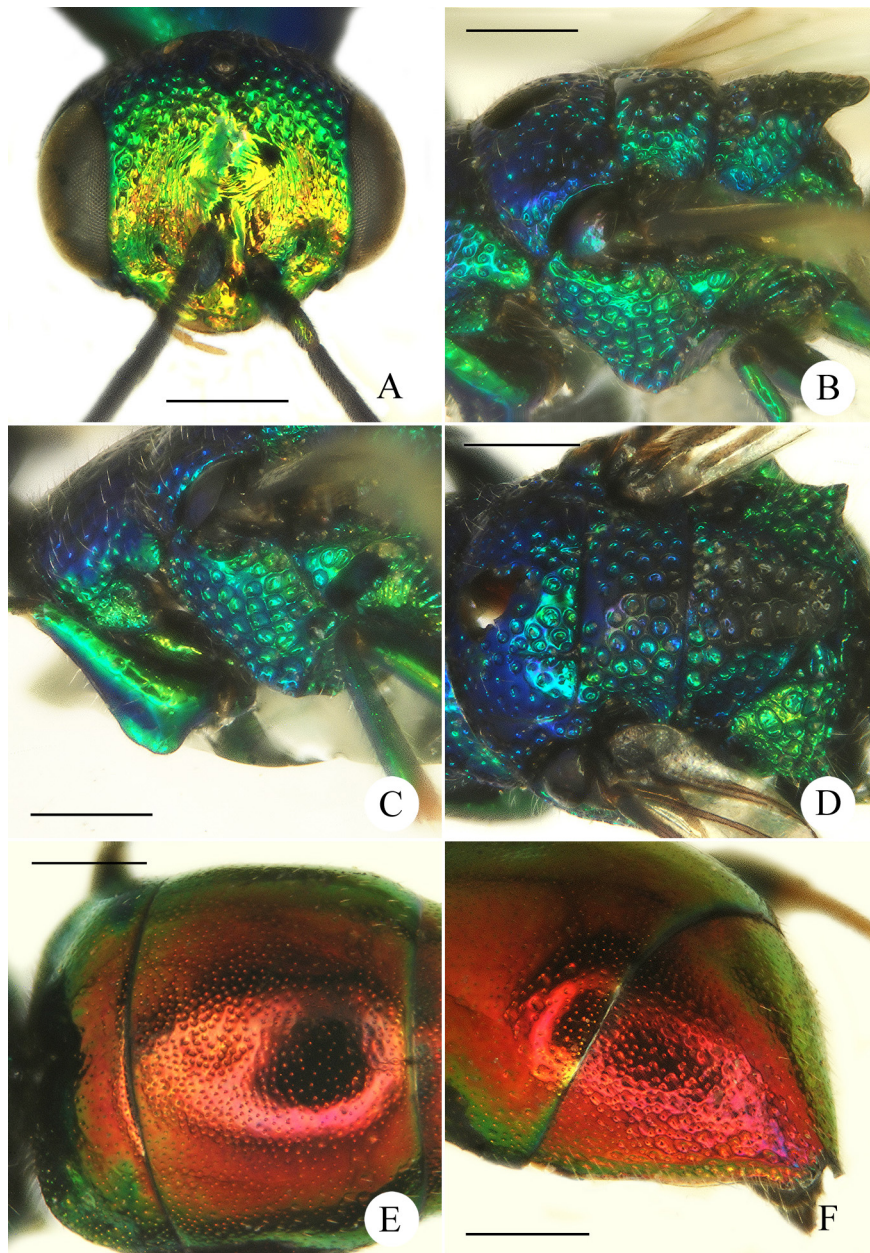


Fig. 3. *Elampus agnolii* Rosa, sp. n., holotype, ♀: A – head, frontal view; B – mesosoma, dorso-lateral view; C – foreleg and mesopleuron, lateral view; D – metasoma, dorsal view; E – metasoma, dorsal view; F – T3, postero-lateral view. Scale bar = 0.5 mm.

Head. Frons and vertex with shallow, small-medium punctures (0.2–0.5 MOD) contiguous to confluent, with narrow interspaces, 0.1–0.5 PD apart (Figs 2B, 3A); face medially polished, with faint, transversal, semi-elliptical wrinkles around the median pit. Punctures on post-ocellar vertex shallower, smaller (0.2 MOD), broadly separated (1–4 PD apart), with impunctate interspaces. Ocellar triangle isosceles. Postocellar line deep and complete.

Mesosoma. Pronotum largely polished, with small, sparse, mostly lacunose punctures (Fig. 2B). Mesoscutum with large punctures (up to 1 MOD) among notauli, towards posterior margin; laterally with shallow, scattered, smaller punctures (1–4 PD apart). Notauli and parapsidal furrow complete. Mesoscutellum antero-medially impunctate, the rest with deep, large, foveate punctures (Fig. 3D). Metascutellum with foveate-reticulate punctures and subrectangular lamella; lamella considerably broad, as large as mesoscutellum disc, elongate; in lateral view, lamella longer than mesoscutellum; lamella with large punctures (1–2 MOD) and apically subtruncate (Fig. 3D). Mesopleuron with scrobal carina reaching omaulus below its anterior protrusion and with foveate-reticulate punctures (Fig. 3C). Fore femur basoventrally carinate; tarsal claws with three teeth.

Metasoma. T1 with tiny, minute punctures, 1–5 PD apart (Fig. 2B). T2 dorsally with tiny punctures clumped along anterior margin, becoming smaller and scattered on posterior half (Fig. 3E); laterally and posteriorly with few large, deep, lacunose punctures (Fig. 3E). T3 sharpened; punctuation denser than T1 and T2, laterally with rugulose, confluent punctures; lateral margins weakly sinuose and slightly concave before apical truncation; apical truncation sickle- or boomerang-like shaped, with narrow rim (Fig. 3F).

Coloration. Head and mesosoma metallic green to blue, occipital area dark blue, mesoscutellum posteriorly and metanotal lamella blackish; tegulae dark brown, with metallic reflection at base; tarsi yellowish. Metasoma metallic red, purplish towards the apical truncation of T3. Wings brownish, particularly around pterostigma. Scape and pedicel metallic green, flagellum black.

Vestiture. Short (up to 1 MOD), whitish setae on head, mesosoma and laterally on metasoma.

Male. Unkown.

DISTRIBUTION. Russia (Tuva Rep.).

ETYMOLOGY. The specific epithet *agnolii* (masculine name in genitive case) is dedicated to Gian Luca Agnoli (Bologna, Italy), former owner of the holotype, who generously donated it to ZIN collection.

Genus *Holopyga* Dahlbom, 1845

Holopyga Dahlbom, 1845: 4. Type species: *Holopyga amoenula* Dahlbom, 1845, by subsequent designation of Ashmead, 1902: 227.

***Holopyga amoenula occidenta* Linsenmaier, 1959**

Holopyga amoenula occidenta Linsenmaier, 1959: 31. Holotype – ♂, France: Carpentras [NMLS] (examined); Linsenmaier, 1968: 16; 1969: 349.

SPECIMENS EXAMINED. **Russia:** Krasnoyarsk Terr.: Minusinsk [NMLS].

DISTRIBUTION. *Russia (Krasnoyarsk Terr.). West-Palaeartic, from South Europe (Spain to Greece) and Turkey (Yildirim & Strumia, 2006) to Siberia.

***Holopyga generosa asiatica* Trautmann, 1926**

Holopyga gloriosa var. *asiatica* Trautmann, 1926: 5. Holotype – ♀. Turkey: İzmir prov., Smyrna [MNHU] (examined).

Holopyga ovata proviridis Linsenmaier 1959: 31. Holotype – ♂, Syria (type series: Siberia) [NMLS] (examined); **syn. n.**

SPECIMENS EXAMINED. **Russia:** Altai Rep.: 12 km SE Aktash, Chuya River, 4.VII 2016, 2 ♂ (MP, VL) [IBSS]; Khakassia Rep.: 20 km SW Abakan, Izykhskie Kopi, 7.VII 2014, 2 ♂ (AL, MP, VL); 25 km Shira, Tus Lake, 6.VII 2014, 1 ♂ (AL, MP, VL) [IBSS]; Tuva Rep.: W Ujukskyi Mountains, Kamennyi River Valley, 800–1000m, 11–20.VII 2003, 2♂ [GLA]; Krasnoyarsk Terr.: 10 km NW Minusinsk, Bystraya River, 9.VII 2014, 1 ♂ (AL, MP, VL) [IBSS].

DISTRIBUTION. Russia (Altai Rep., Khakassia Rep., Krasnoyarsk Terr.). Trans-Palaeartic, from southern Europe and Caucasus to China (Rosa *et al.*, 2014).

REMARKS. *Holopyga generosa asiatica* was previously misidentified as *H. amoenula* (Mocsáry, 1889: 127; Dalla Torre, 1892: 20). *Holopyga ovata proviridis* Linsenmaier 1959 was synonymized previously with *H. amoenula* Dahlbom, 1845 by Kimsey & Bohart, 1991: 229.

***Holopyga generosa generosa* (Förster, 1853)**

Ellampus generosus Förster, 1853: 349. Holotype – ♂, Germany: env. Aachen [MNHU] (examined).

Holopyga ovata var. *b*: Eversmann 1858: 549 (Orenburg Prov., Saratov Prov.).

Holopyga amoenula: Mocsáry, 1890: 60.

Holopyga amoenula: Anichtchenko 2002: 6; Kizilov, 2007: 83; Kurzenko & Lelej, 2007: 1004.

SPECIMENS EXAMINED. **Russia:** Novosibirsk Prov.: Iskitimsky distr., Soldatskoe Lake, 2.VIII 2010, 1 ♂ (MP) [IBSS]; Altai Rep.: 12 km SE Aktash, Chuya River, 4.VII 2016, 2 ♂ (MP, VL); 15 km SE Kurai, Chuya River, 6-8.VII 2016, 1 ♀, 1 ♂ (MP, VL) [IBSS]; Altai Terr.: 30 km N of Bijsk, 11.VII 2003, 1♂, 2♀ (R. Yakovlev) [GLA]; Khakassia Rep.: 27 km E Shira, Borets, 29.VI 2014, 1 ♂ (AL, MP, VL); Zhemchuzhnyi, Shira Lake, 1.VII 2014, 1 ♂ (AL, MP, VL); 20 km SW Abakan, Izykhskie Kopi, 7.VII 2014, 4 ♀, 4 ♂ (AL, MP, VL) [IBSS]; Tuva Rep.: 13 km SW Samagaltai, Dyttyg-Khem River, 8–10.VII 2013, 2 ♀, 2 ♂ (VL, MP) [IBSS]; Krasnoyarsk Terr.: 10 km NE Minusinsk, Malaya Minusa River, 8.VII 2014, 1 ♀ (AL, MP, VL) [IBSS]; Khabarovsk Terr.: Solnechnyi distr., Evoron Lake, 13.VII 2006, 1 ♀, 1 ♂ (MP) [IBSS].

DISTRIBUTION. Russia (Karelian Rep., Leningrad Prov., Lipetsk Prov., Moscow Prov., Penza Prov., Ryazan Prov., Kirov Prov., Samara Prov., Tatar Rep.,

Ulyanovsk Prov., North Ossetian Rep., Stavropol Terr., Crimea, Orenburg Prov., Perm Prov., Sverdlovsk Prov., Altai Rep., Novosibirsk Prov., Tomsk Prov., Krasnoyarsk Prov., Khakassia Rep., Tuva Rep., Irkutsk Prov., Buryat Rep., Khabarovsk Prov.). Trans-Palaeartic: from Western Europe to China and Korea (Bang *et al.*, 2011; Rosa *et al.*, 2014).

REMARKS. Previous citations for *Holopyga amoenula* are unreliable, since they may refer to several different, related species. We here assume that they are most likely misidentification of *H. generosa*, the commonest and widespread species.

***Holopyga lucida* (Lepeletier, 1806)**

Hedychrum lucidum Lepeletier, 1806: 122. Syntypes – France [MRSN or MNHN].

SPECIMENS EXAMINED. **Russia:** Khakassia Rep.: Zhemchuzhnyi, Shira Lake, 1.VII 2014, 1 ♀ (AL, MP, VL) [IBSS]; Irkutsk Prov.: Zalari District, Tungui Village, 18.VI 1997, 1 ♂, 1 ♀ (A. Anichthenko) [GLA].

DISTRIBUTION. *Russia (Nizhny Novgorod Prov., Rostov Prov., Chelyabinsk Prov., Khakassia Rep., Irkutsk Prov.); Central and South Europe, Turkey (Linsenmaier, 1968).

REMARKS. Some citations of *Holopyga gloriosa* (Fabricius) in old collections and Russian literature may be linked to this species.

***Holopyga ignicollis* Dahlbom, 1854**

Holopyga ovata var. *ignicollis* Dahlbom, 1854: 53 (given as var. h). Syntypes – ♂♂, ♀♀ [no holotype]; Greece: Rhodes Isl., Austria [NHMW, MNHU] (examined).

SPECIMENS EXAMINED. **Russia:** Altai Rep.: 12 km SE Aktash, Chuya River, 4.VII 2016, 1 ♀, 1 ♂ (MP, VL) [IBSS]; Irkutsk Prov.: Zalari District, Tungui Village, 18.VI 1997, 1 ♂, 1 ♀ (A. Anichtchenko) [GLA]; Khakassia Rep.: 27 km E Shira, Borets, 4.VII 2014, 1 ♂ (AL, MP, VL) [IBSS]; Krasnoyarsk Terr.: 40 km NE Minusinsk, Tuba River, 7.VII 2012, 1 ♂ (MP, VL) [IBSS].

DISTRIBUTION. Russia (Karachayevo-Cherkess Rep., Krasnodar Terr., Stavropol Terr., Crimea, Orenburg Prov., Altai Rep., Krasnoyarsk Terr., Khakassia Rep., Irkutsk Prov.). West-Palaeartic: from South Europe to Middle East, Caucasus, Kyrgyzstan (Arens, 2004) and Kazakhstan.

***Holopyga minuma* Linsenmaier, 1959**

Holopyga minuma Linsenmaier, 1959: 31. Holotype – ♀, Turkey: Niğde Prov., Niğde [NMLS] (examined).

SPECIMENS EXAMINED. **Russia:** Khakassia Rep.: Zhemchuzhnyi, Shira Lake, 14–1.VII 2014, 1 ♀ (AL, MP, VL); 10 km E Shira, Itkul' Lake, 28.VI 2014, 1 ♂ (AL, MP, VL); 20 km SW Abakan, Izykhskie Kopi, 7.VII 2014 (AL, MP, VL) [IBSS]; Tuva Rep.: 25 km SE Erzin, Tes-Khem River, 14.VII 2013, 1 ♀ (VL, MP) [IBSS];

Krasnoyarsk Terr.: 10 km NW Minusinsk, Bystraya River, 9.VII 2014, 1 ♀ (AL, MP, VL) [IBSS]).

DISTRIBUTION. Russia (Samara Prov., Krasnoyarsk Terr., Khakassia Rep., Tuva Rep.); Central and East Europe.

REMARKS. In Russian collections and literature, specimens of *Holopyga minima* were identified as *H. amoenula* Dahlbom, 1845. *H. minima* is similar to *H. amoenula* but consistently smaller (4–4.5 mm) (vs. 7–8 mm in *H. amoenula*), with smaller, scattered punctures on metasoma (vs. dense punctures clearly double, with minute punctures in the interspaces among the largest punctures); it can be separated by the similar *H. generosa* (Förster, 1853) for the small body dimensions (vs. usually 7–9 mm in *H. generosa*), punctuation scarce, barely visible on S2 (vs. dense in *H. generosa*).

Genus *Hedychridium* Abeille de Perrin, 1878

Hedychridium Abeille de Perrin, 1878: 3. Type species: *Hedychrum minutum* Lepelletier, 1806 [= *Hedychridium ardens* (Coquebert, 1801)], by subsequent designation of Ashmead, 1902: 227.

Hedychridium belokobylskiji Rosa, sp. n.

Figs 4A–F, 13C, D

SPECIMENS EXAMINED. Holotype – ♀, **Russia**: Tuva Rep., 12 km SW Samagaltai, Dytytg-Khem River, 19.VII 2014 (AL, MP, VL) [ZIN]. Allotype – ♂, Russia: Tuva Rep., 13 km SW Samagaltai, Dytytg-Khem River, 9–10.VII 2013 (VL, MP) [ZIN]. Paratypes: Russia: Khakassia Rep.: 21 km SW Abakan, Izykhskie Kopi, 13.VII 2012, 5 ♀ (MP, VL); Zhemchuzhnyi, Shira Lake, 14–15.VII 2012, 1 ♀ (MP, VL); 20 km SW Abakan, Izykhskie Kopi, 7.VII 2014, 1 ♀ (MP, VL); Tuva Rep.: 27 km SSW Erzin, Tore-Khol Lake, 12.VII 2014, 1 ♀ (AL, MP, VL); 25 km SE Erzin, Tes-Khem River, 14.VII 2013, 1 ♀ (VL, MP); idem, 14.VII 2014, 1 ♀; 12 km SW Samagaltai, Dytytg-Khem River, 17.VII 2014, 6 ♀ (AL, MP, VL); 20 km SSW Erzin, Tore-Khol' Lake, 3.VII 2013, 6 ♀, 7 ♂ (VL, MP); Ubsu-Nur Lake, 7.VII 2013, 2 ♀ (MP, VL); 13 km SW Samagaltai, Dytytg-Khem River, 9–10.VII 2013, 38 ♀ (VL, MP); 30 km W Erzin, Yamaalyg, 4.VI 2013, 3 ♀, 1 ♂ (MP, VL); 6 km SE Bai-Khaak, Sosnovka, 21.VII 2014, 1 ♀ (AL, MP, VL); Krasnoyarsk Terr.: 10 km NE Minusinsk, Malaya Minusa River, 7.VII 2012, 2 ♀ (MP, VL); idem, 8.VII 2014, 1 ♀, 1 ♂ (AL, MP, VL) [IBSS].

DIAGNOSIS. *Hedychridium belokobylskiji* sp. n. belongs to the *ardens* species-group. The structure of male genitalia is similar to the genital capsule of *H. ardens* (Coquebert, 1801) and *H. aereolum* sensu Linsenmaier, 1959, for straight and elongate gonostyle and elongate volsella (Figs 13C–D, vs. 13A); it is distinct for the narrower gonostyle, digitus as long as cuspis, and apex of cuspis larger and bent outwards. As for coloration pattern, it is similar to *H. jucundum* (Mocsáry, 1889) because of the medially, large, delimited dull spot on T2. Nevertheless, the male can be separated through the genital capsule with elongate cuspis (vs. short in *H. jucundum* (Fig. 13B)); short and stout F1 ($l/w = 1.7$) (vs. $l/w = 2.5$); posterior margin

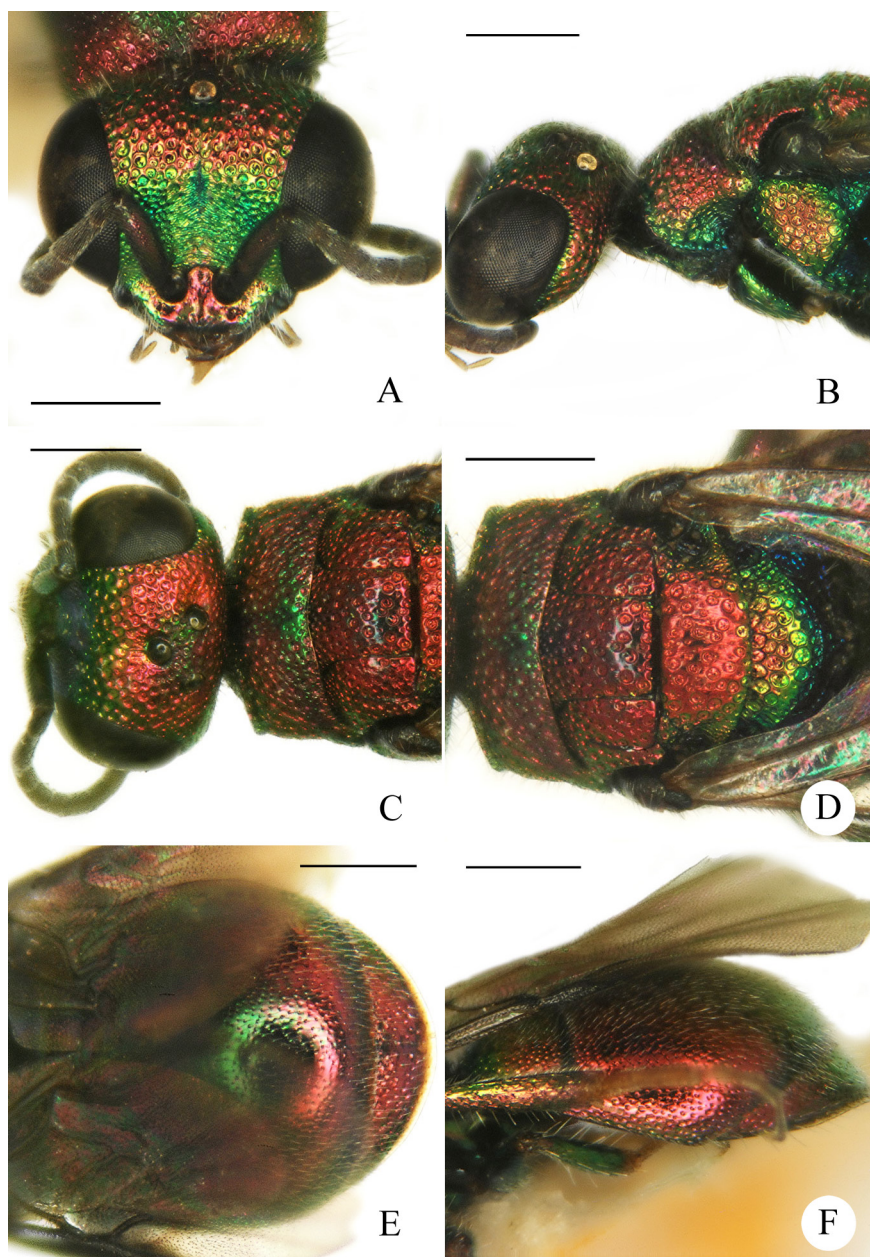


Fig. 4. *Hedychridium belokobylskiji* Rosa, sp. n., holotype, ♂: A – head, frontal view; B – head and mesosoma, lateral view; C – head and mesonotum, dorsal view; D – mesosoma, dorsal view; E – metasoma, dorsal view; F – metasoma, lateral view. Scale bar = 0.5 mm.

of propodeum without spine before the propodeal tooth (*vs.* elongate spine halfway between base and propodeal tooth); metallic red base of metanotum, concolorous with mesonotum (*vs.* wholly blue or green metanotum, strongly contrasting with red mesonotum). The female can be separated through the metallic red base of metanotum, concolorous with mesonotum (*vs.* wholly blue or green metanotum, strongly contrasting with red mesonotum), elongate setae on margin of T3 (up to 2 MOD) (*vs.* ≤ 1 MOD). It also shows some similarities with *H. gussakovskii* Semenov et Nikol'skaya, 1954 (from Tajikistan), from which is separated through different coloration: in *H. gussakovskii* T2 is concolorous (*vs.* with a large, darker, well-delimited spot; mesopleuron and legs green (*vs.* mesopleuron and legs red), metanotum wholly green, contrasting with mesoscutellum (*vs.* at least anteromedially red, not contrasting); punctuation on T2 dense, almost contiguous medially (*vs.* punctuation with minute and sparse punctures, 1–3 PD apart).

DESCRIPTION. Body length 4.0–5.0 mm. Fore wing length 3.0–3.5 mm. *Female*. OOL = 2.2 MOD; POL = 1.7 MOD; MS = 0.5 MOD; relative length of P : F1 : F2 : F3 = 1 : 1.7 : 0.8 : 0.8.

Head. Frons and vertex with small to medium punctures (0.1–0.5 MOD), nearly contiguous; in frontal view, between scapal basin and eye gradually decreasing from frons to clypeus (Fig. 4A); scapal basin medially transversely microridged; punctuation on post-ocellar vertex denser, with smaller punctures. Ocellar triangle isosceles; midocellus anteriorly sunken, posterior ocelli laterally sunken.

Mesosoma. Pronotum with punctuation irregularly sized, anteriorly and laterally mostly contiguous. Mesoscutum with similar punctuation, medially with large, scattered punctures (1–2 PD apart). Mesoscutellum with similar punctures, partly longitudinal rugulose on interspaces. Metascutellum with foveate-reticulate punctures (Fig. 4D). Propodeal teeth triangular, acute, slightly pointing backward. Forewing medial vein more than twice as long as RS stub, medially arched.

Metasoma. T1 and T2 with minute, sparse punctures, 1–3 PD apart, larger, laterally denser. T3 with denser, deeper punctures; posterior margin with brownish rim (0.2–0.3 MOD).

Coloration. Body metallic red; darker to purplish inside ocellar triangle, basomedially on pronotum, and more or less extensively on mesoscutum; face green; metanotum anteriorly red, medially greenish and posteriorly blue; propodeum blue. T2 with a large, delimited, bluish to blackish area; ventrally black, in a few specimens with a slight reddish hue medially on S2. Scape metallic red, pedicel with or without a distinct hue, flagellum black; legs red on outer side, greenish on inner side. Wings smoky.

Vestiture. Body dorsally covered by dense, whitish, long setae (1–1.5 MOD); on legs, metasoma laterally and ventrally with very long setae (≥ 2 MOD).

Male: similar to female, with face laterally covered with appressed, silvery setae; antennae elongate, with slender flagellum and cylindrical articles (l/w 1.2–1.5 instead of l/w ≈ 1); mesopleuron greenish. Genital capsule as in Figs 13C, D.

DISTRIBUTION. Russia (Krasnoyarsk Terr., Khakassia Rep., Tuva Rep.).

ETYMOLOGY. The specific epithet *belokobylskiji* (masculine name in genitive case) is dedicated to Sergey A. Belokobylskij (St. Petersburg, Russia), curator of the Hymenoptera collection at ZIN, who supported the study of the Siberian and Russian Chrysididae.

***Hedychridium arensi* Rosa, sp. n.**

Figs 5A–F

SPECIMENS EXAMINED. Holotype – ♀, **Russia**: Tuva Rep., 31 km NEE Erzin, Erzin River, 18.VII 2014 (AL, MP, VL) [ZIN]. Paratype: 1♀, same data as holotype [PRC].

DIAGNOSIS. *Hedychridium arensi* sp. n. belongs to the *ardens* species-group. It is similar to *H. ardens* (Coquebert, 1801) for general habitus; it differs through face unusually flat with peculiar sculpture: frons, in frontal view, with scattered, small punctures, 0.5–2.0 PD apart, and polished interspaces; punctures on face with rugulose interspaces; scapal basin medially with fine cross ridging (*vs.* face fully punctate in *H. ardens*); it can be also separated through body coloration and pubescence: body dorsally metallic red to green-rosy, including metanotum and propodeum, without contrasting blue or green areas (*vs.* metanotum and propodeum generally contrasting in *H. ardens*); metasoma ventrally black, without metallic spot (*vs.* medially on S2 with defined, metallic red spot); laterally on metasoma with long setae (2 MOD) (*vs.* 0.5-1 MOD). A similar microsculpture on face, with rugulose interspaces, and body coloration is observed in *H. karatavicum* Semenov, 1967, *H. miramae* Semenov, 1967, and *H. ciliatum* Semenov, 1967. *H. ciliatum* is distinct through coarse punctures on frons, without polished interspaces; it has light brown F1 and F2 (*vs.* black in *H. arensi*); scapal basin partially covered with silvery, short, appressed setae (*vs.* without visible setae); larger and dense punctures on metasoma (*vs.* tiny and scatterd). *H. karatavicum* has longer antennae, with cylindrical flagellomeres (*vs.* short and stout); long, silvery setae covering outer sides of scapal basin and malar spaces (*vs.* without visible setae); denser punctuation on mesosoma. Finally, *H. miramae* has denser punctuation on mesosoma, laterally contiguous (*vs.* sparse, with large polished interspaces on the whole surface). Pictures of all Semenov's types are available in Rosa *et al.* 2017a.

DESCRIPTION. Body length 4.5–5.2 mm. Fore wing length 3.2–3.5 mm. *Female*. OOL = 2.2 MOD; POL = 2.3 MOD; MS = 0.7 MOD; relative length of P : F1 : F2 : F3 = 1 : 1.1 : 0.7 : 0.6.

Head. Vertex with small, nearly contiguous punctures (0.1–0.3 MOD); frons, in frontal view, with scattered punctures, 0.5–2 PD apart, with polished interspaces (Fig. 5A); face laterally with dense, minute punctures, gradually decreasing towards clypeal margin, with rugulose interspaces; scapal basin medially with fine cross ridging. Ocellar triangle isosceles; midocellus anteriorly sunken, posterior ocelli laterally sunken.

Mesosoma. Pronotum with irregularly sized punctures, with minute punctures on interspaces. Mesoscutum and mesoscutellum with similar, yet more scattered punctures, with polished interspaces; here and there with few minute punctures (Fig. 5C). Mesopleuron with large, contiguous punctures (Fig. 5B). Metascutellum with areolate-reticulate punctures (Fig. 5D). Propodeal teeth spine-like, with sharp angle pointing backward. Forewing medial vein twice as long as RS stub, clearly arched at basal third.

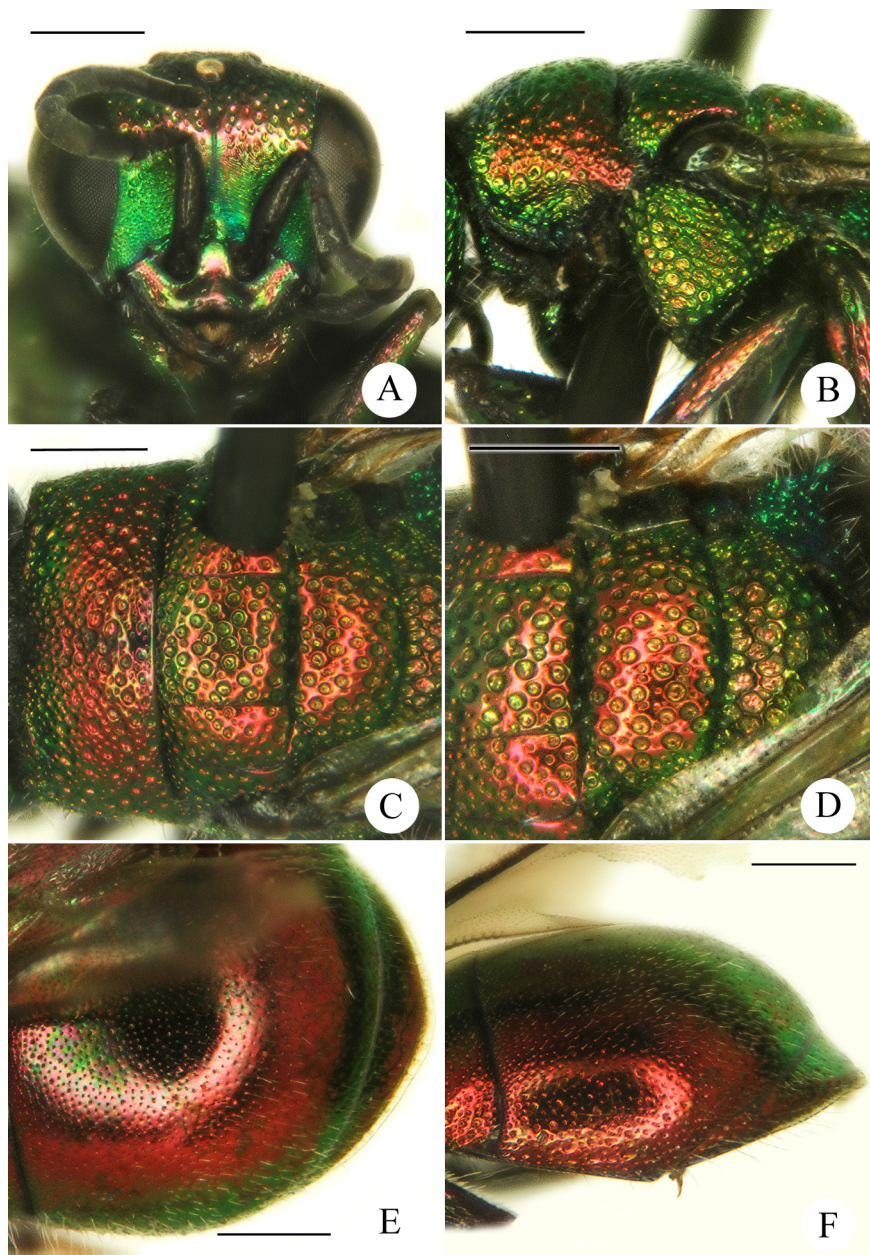


Fig. 5. *Hedychridium arensi* Rosa, sp. n., holotype, ♀: A – head, frontal view; B – mesosoma, lateral view; C – mesosoma, dorsal view; D – mesosoma, detail, dorsal view; E – metasoma, dorsal view; F – metasoma, lateral view. Scale bar = 0.5 mm.

Metasoma. T1, T2 and T3 with minute, sparse punctures, 1–4 PD apart; laterally with lacunose punctures, interspersed with minute ones. T3 posterior margin with hyaline rim (0.2 MOD).

Coloration. Body dorsally metallic red to rosy-red; green on scapal basin; on propleuron, mesopleuron, metanotum and propodeum green to rosy-greenish; anteromedially on T2 darker to purplish. Metasoma ventrally black, without metallic area on S2. Scape and pedicel shiny black, without metallic reflections, flagellum blackish. Tegulae brown, non-metallic. Wings medially smoky.

Vestiture. Head, mesosoma and metasoma dorsally with sparse, whitish, short setae (>1 MOD), mesosoma and metasoma laterally with very long setae (≥ 2 MOD). Legs with long (2 MOD), erect setae on coxa, trochanter and femur, and with short erect setae on tibiae (≤ 1 MOD).

Male. Unknown.

DISTRIBUTION. Russia (Tuva Rep.).

ETYMOLOGY. The specific epithet *arensi* (masculine name in genitive case) is dedicated to Werner Arens (Bad Hersfeld, Germany), expert chrysidologist, who considerably contributed to the study of the genus *Hedychridium* among others.

***Hedychridium femoratum* (Dahlbom, 1854)**

Hedychrum femoratum Dahlbom, 1854: 90. Holotype – ♀, Austria [NHMW] (examined) (*ardens* group).

SPECIMENS EXAMINED. **Russia**: Khakassia Rep.: 20 km SW Abakan, Izykhskie Kopi, 7.VII 2014, 1 ♀ (AL, MP, VL); Tuva Rep.: 20 km SSW Erzin, Tore-Khol' Lake, 30.VI–3.VII 2013, 6 ♀, 1 ♂ (VL, MP); 12 km SW Samagaltai, Dytytg-Khem River, 9–10.VII 2013, 3 ♀, 2 ♂ (MP, VL); 17.VII 2014, 3 ♀ (AL, MP, VL); Krasnoyarsk Terr.: 10 km NW Minusinsk, Bystraya River, 9.VII 2014, 1 ♀, 1 ♂ (AL, MP, VL).

DISTRIBUTION. Russia (Stavropol Terr., Krasnoyarsk Terr., Khakassia Rep., Tuva Rep.).

***Hedychridium propodeale* Rosa, sp. n.**

Figs 6A–F, 13E, F

SPECIMENS EXAMINED. Holotype – ♀, **Russia**: Tuva Rep., 20 km SSW Erzin, Tore-Khol' Lake, 3.VII 2013 (VL, MP) [ZIN]. Allotype – ♂, same data as holotype [ZIN]. Paratypes [ZIN, IBSS, PRC]: Russia: Khakassia Rep.: 10 km E Shira, Itkul' Lake, 28.VI 2014, 1 ♀ (AL, MP, VL); Tuva Rep.: 20 km SSW Erzin, Tore-Khol' Lake, 30.VI–3.VII 2013, 52 ♀, 7 ♂ (VL, MP); 27 km SSW Erzin, Tore-Khol Lake, 12.VII 2014, 1 ♀ (AL, MP, VL); 13 km SW Samagaltai, Dytytg-Khem River, 10.VII 2013, 6 ♀, 1 ♂ (VL, MP); 6 km SE Bai-Khaak, Sosnovka, 21.VII 2014, 1 ♀ (AL, MP, VL); 30 km W Erzin, Yamaalyg, 4.VI 2013, 1 ♀ (MP, VL); Krasnoyarsk Terr.: 10 km NE Minusinsk, Malaya Minusa River, 7.VII 2012, 2 ♀, 11 ♂ (MP, VL); Selo Padun, Tunguska, 14.VII 1968 (Tchekanovskij).

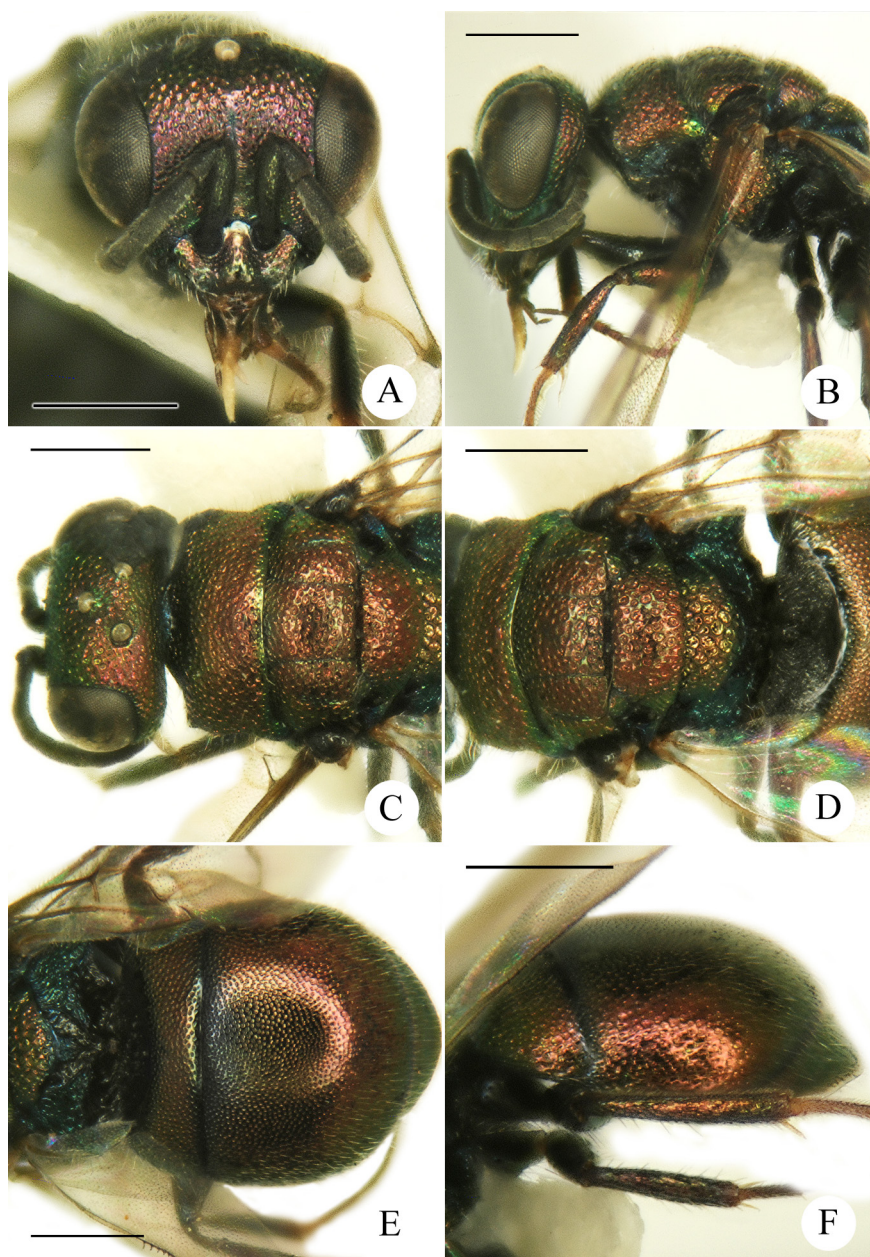


Fig. 6. *Hedychridium propodeale* Rosa, sp. n., holotype, ♀: A – head, frontal view; B – mesosoma, lateral view; C – mesosoma, dorsal view; D – mesosoma, dorsal view; E – metasoma, dorsal view; F – metasoma, lateral view. Scale bar = 0.5 mm.

DIAGNOSIS. *Hedychridium propodeale* sp. n., *H. longigena* sp. n. and *H. gabriellae* sp. n. belong to the same (sub)group of *H. rhodinum* Semenov et Nikol'skaya, 1954, sharing similar features. This (sub)group can be easily recognized through the combination of the following characteristics: face nearly flat, densely punctate throughout; mouth parts elongate, in lateral view a little shorter than head length (Figs 6A, B); genitalia with slender gonocoxae and short cuspis (Figs 13E–J). Within this (sub)group, *H. propodeale* sp. n. can be recognized through body color: metallic red-bronze, with contrasting blue propodeum and black anterior declivity of T1 (Figs 6D, E).

It is distinct from *H. rhodinum* for thin genae, seen in lateral view (*vs.* thick in *H. rhodinum*); punctuation on T2 decreasing, becoming shallower, with larger interspaces, on posterior third (Fig. 5E) (*vs.* punctuation on metasoma even and coarse, with medium-sized punctures). It is also similar to *H. longigena* sp. n. but differs through general habitus and coloration (in which coloration pattern is uniformly metallic red or with propodeum slightly greenish-rosy); larger POL (2.1 MOD) (*vs.* 1.6 MOD in *H. longigena*); head, in frontal view, triangularly shaped with convergent malar spaces (*vs.* longitudinally elongate with subparallel malar spaces). It differs from *H. gabriellae* sp. n. through body coloration (entirely shining red, including T1 anterior declivity, in *H. gabriellae*); shape of propodeal angles (narrow, digitate in *H. gabriellae*); shape of genital capsule (Figs 13G–H).

DESCRIPTION. *Female*. Body length 3.2–3.5 mm. Fore wing length 2.0–2.4 mm. OOL = 2.1 MOD; POL = 2.1 MOD; MS = 1.2 MOD; relative length of P : F1 : F2 : F3 = 1 : 1.2 : 0.8 : 0.7.

Head. Face nearly flat, coarsely punctate throughout (Fig. 6A); frons with contiguous, longitudinally rugulose punctures; punctuation on lower face with dense, minute punctures; scapal basin medially with fine cross-ridging. Clypeus elongate, subantennal space > 1.5 MOD. Facial longitudinal midline only visible on upper scapal basin, not reaching midocellus or clypeal margin. Punctuation on post-ocellar vertex with small, dense, irregular punctures. Ocellar triangle isosceles; posterior ocelli with pit along external margin (Fig. 6C).

Mesosoma. Pronotum with coarse, irregularly sized and contiguous punctures. Mesoscutum and mesoscutellum with similar, scattered punctures; with polished, narrow interspaces, 0.3–1.0 PD apart (Fig. 6C). Mesopleuron with large, contiguous, areolate punctures; on metascutellum areolate-reticulate. Propodeal teeth subrectangular, with subparallel sides and blunt teeth. Forewing basal vein as long as RS stub, almost straight.

Metasoma. T1, T2 antero-medially with even, small punctures, almost contiguous (Fig. 6E); posteriorly and laterally shallower, sparser, 2 PD apart; T3 with denser punctures. T3 posterior margin with narrow brownish rim.

Coloration. Head and body dorsally metallic red-bronze, with the exception of blue contrasting propodeum. In some paratypes other parts could be more or less extensively bluish: axillary trough, posterior margin of T1, anterior margin of T2; in few paratypes the propodeum is dark green, anyway contrasting with the rest of body color; T2 antero-medially sometimes darker to brassy. Scape and pedicel shiny black, with metallic sheen on scape; flagellum dull, black. Tegulae brown, non-metallic. Wings clear.

Vestiture. Body dorsally with sparse, whitish and short setae (1 MOD), metasoma laterally with appressed and erect and long setae (1.5 MOD). Legs with erect setae (1 MOD).

Male. Similar to female. Genital capsule as in Fig. 13E–F.

DISTRIBUTION. Russia (Krasnojarsk Terr., Khakassia Rep., Tuva Rep.).

ETYMOLOGY. The specific epithet *propodeale* refers to the bluish coloration of the propodeum, contrasting with the rest of the body coloration.

***Hedychridium gabriellae* Rosa, sp. n.**

Figs 7A–F, 13G, H

SPECIMENS EXAMINED. Holotype – ♀, **Russia:** Tuva Rep., 20 km SSW Erzin, Tore-Khol' Lake, 30.VI–3.VII 2013 (VL, MP) [ZIN]. Allotype – ♂, same date as holotype [ZIN]. Paratypes [IBSS, PRC]: 20 km SSW Erzin, Tore-Khol' Lake, 30.VI–3.VII 2013, 9 ♀, 3 ♂ (VL, MP); 27 km SSW Erzin, Tore-Khol Lake, 12.VII 2014, 1 ♀ (AL, MP, VL).

DIAGNOSIS. *Hedychridium gabriellae* sp. n. is similar to *H. rhodinum* Semenov, *H. propodeale* sp. n. and *H. longigena* sp. n. for general habitus and coloration. However, it differs through these distinctive features: mid- and hindfemur, inner side of forefemur, and tarsi yellowish; femura may be darkened on outer side, with or without slightly metallic reflection; antennae ventrally yellowish to light brown; clypeus narrow, subantennal space < 1.0 MOD; body entirely shining red, including propodeum and anterior declivity of T1; punctures on mesosoma shallow and separated by impunctate and polished interspaces, 0.2–1.0 PD apart; POL (2.0 MOD) larger than other species.

DESCRIPTION. Body length 3.0–3.5 mm. Fore wing length 2.2–2.3 mm. *Female.* OOL = 1.7 MOD; POL = 2.0 MOD; MS = 0.8 MOD; relative length of P : F1 : F2 : F3 = 1 : 0.9 : 0.7 : 0.6.

Head. Face nearly flat, evenly convex from midocellus to upper face; face densely punctate throughout, with contiguous, aligned punctures forming wrinkles converging to medial line; punctuation dense with minute punctures on lower face; scapal basin medially with cross-ridging from middle to the basal half. Clypeus short, subantennal space < 1.0 MOD (Fig. 7A). Facial longitudinal midline only visible on upper scapal basin. Punctuation on post-ocellar vertex with small, even and dense punctures. Ocellar triangle isosceles; posterior ocelli with large pit along external margin (Fig. 7C).

Mesosoma. Pronotum, mesonotum and mesoscutellum with shallow and medium-sized punctures, with impunctate and polished interspaces (Fig. 7C, D). Metascutellum with large areolate punctures. Propodeal teeth narrow and digitate, (Fig. 7D) obliquely subtruncate at apex. Forewing basal vein 1.2 times as long as RS stub, almost straight.

Metasoma. T1 and T2 with dense, contiguous, medium-sized punctures (Fig. 7E); T3 with denser punctures and narrow apical hyaline rim.

Coloration. Body entirely metallic red, with some brassy reflections; ventrally metallic red to bronze, metasoma ventrally black. Femura and tarsi yellowish, tarsi on the outer surface can be darkened, with or without slightly metallic reflection; scape metallic bronze, rest of antennae brownish, ventrally yellowish to light brown. Tegulae non-metallic, brown to yellowish.

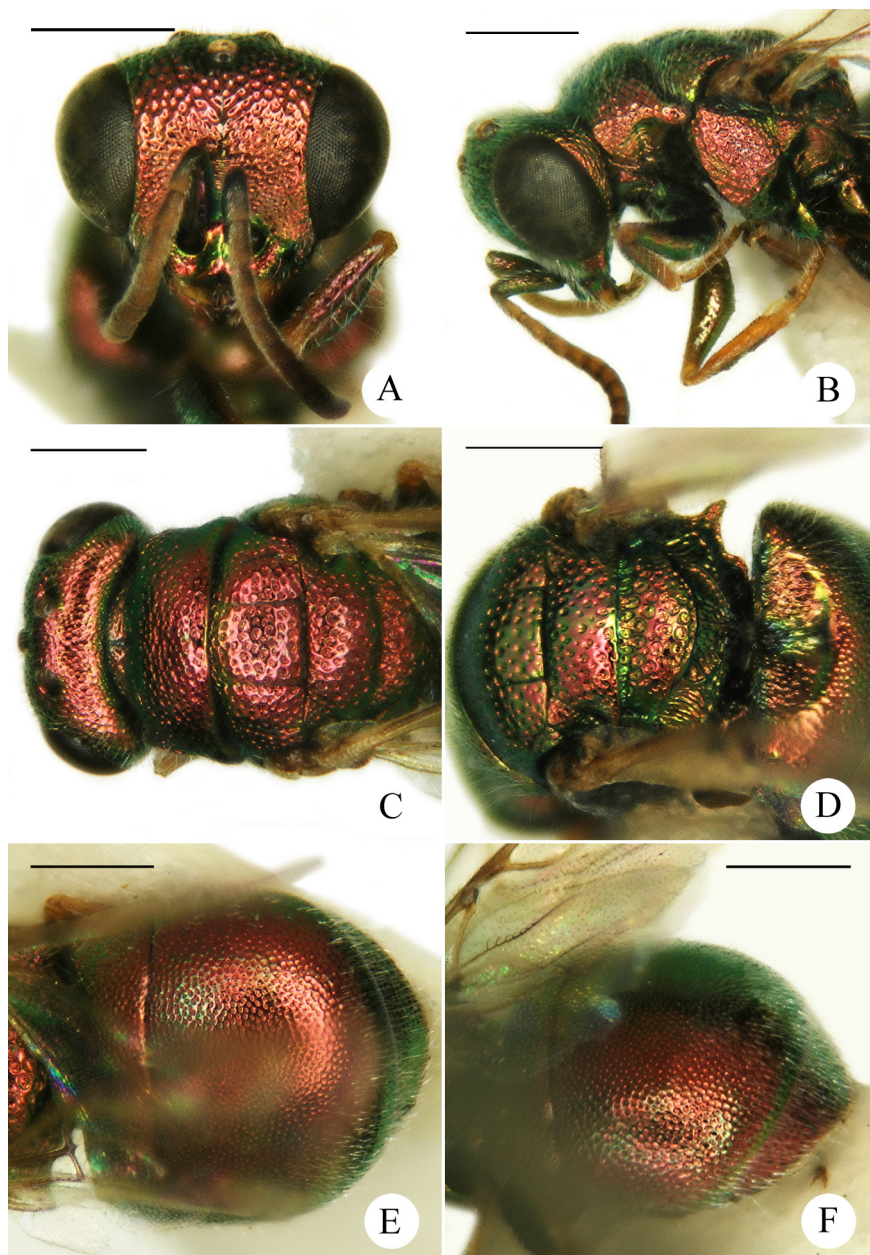


Fig. 7. *Hedychridium gabriellae* Rosa, sp. n., holotype, ♀: A – head, frontal view; B – head and mesosoma, lateral view; C – head and mesosoma, dorsal view; D – mesosoma, detail; E – metasoma, dorsal view; F – metasoma, lateral view. Scale bar = 0.5 mm.

Vestiture. Body with whitish and short setae (1 MOD), postero-laterally on metasoma with both appressed and erect longer setae (> 1.0 MOD). Legs short with erect setae.

Male. Similar to female, but with punctuation on mesonotum and mesoscutellum shallower and more scattered, 1–2 PD apart. Genital capsule as in Fig. 13G–H.

DISTRIBUTION. Russia (Tuva Rep.).

ETYMOLOGY. The specific epithet *gabriellae* (feminine noun in genitive case) is dedicated to Gabriella Fossati (Bernareggio, Italy), mother of the first author, for her continuous support and help in the study of Chrysididae and her translation of German articles and books.

***Hedychridium longigena* Rosa, sp. n.**

Figs 8A–F, 13I, J

SPECIMENS EXAMINED: Holotype – ♀, **Russia:** Irkutsk Prov., 8 km N Irkutsk, Angara River, sandy slopes, 10.VII 2001 [ZIN]. Allotype – ♂, same data as holotype [ZIN]. Paratypes: 5♀, 2♂, same data as holotype [GLA, PRC].

DIAGNOSIS. *Hedychridium longigena* sp. n. is similar to *H. propodeale* for general habitus and coloration. It differs through: shape of head, in frontal view, longitudinally elongate with subparallel malar spaces (Fig. 8A) (vs. triangularly shaped with convergent malar spaces in *H. propodeale* (Fig. 6A)); shorter POL (1.6 MOD) (vs. 2.1 MOD in *H. propodeale*); triangular, acute propodeal angles, (Fig. 8) (vs. short and blunt (Fig. 6D)); genitalia (Figs 13I–J); tegulae metallic green in female (vs. non-metallic). It is separated from *H. rhodinum* Semenov for the elongate malar spaces (1.3 MOD) (vs. 1 MOD); F1 (1.3 MOD) (vs. 1 MOD). It differs from *H. gabriellae* sp. n. for shape of head; body coloration (entirely shining red, including T1 anterior declivity in *H. gabriellae*, flagellum ventrally light brown); shape of propodeal angles (narrow and digitate in *H. gabriellae*) and shape of genital capsule. Lastly all examined specimens of *H. longigena* sp. n. have T3 extremely short, reduced, almost fused to T2 (Fig. 8D–F).

DESCRIPTION. Body length 3.5–4.0 mm. Fore wing length 2.2–2.4 mm. *Female.* OOL = 1.8 MOD; POL = 1.6 MOD; MS = 1.3 MOD; relative length of P : F1 : F2 : F3 = 1 : 1.3 : 0.8 : 0.7.

Head. Face nearly flat, evenly convex from midocellus to upper face; face densely punctuate throughout; frons with contiguous small punctures; punctuation on lower face with minute dots; scapal basin medially cross-ridged. Clypeus elongate, subantennal space 1.7 MOD (Fig. 8A). Facial longitudinal midline barely visible only on upper scapal basin. Punctuation on post-ocellar vertex with small, dense and irregular punctures. Ocellar triangle isosceles and posterior ocelli with pit along external margin (Fig. 8C).

Mesosoma. Pronotum, mesonotum and mesoscutellum with coarse, irregularly sized and contiguous punctures (Fig. 8C). Metascutellum with large and contiguous areolate punctures. Propodeal teeth triangle shaped, with acute teeth. Forewing basal vein 1.3 times as long as RS stub, almost straight.

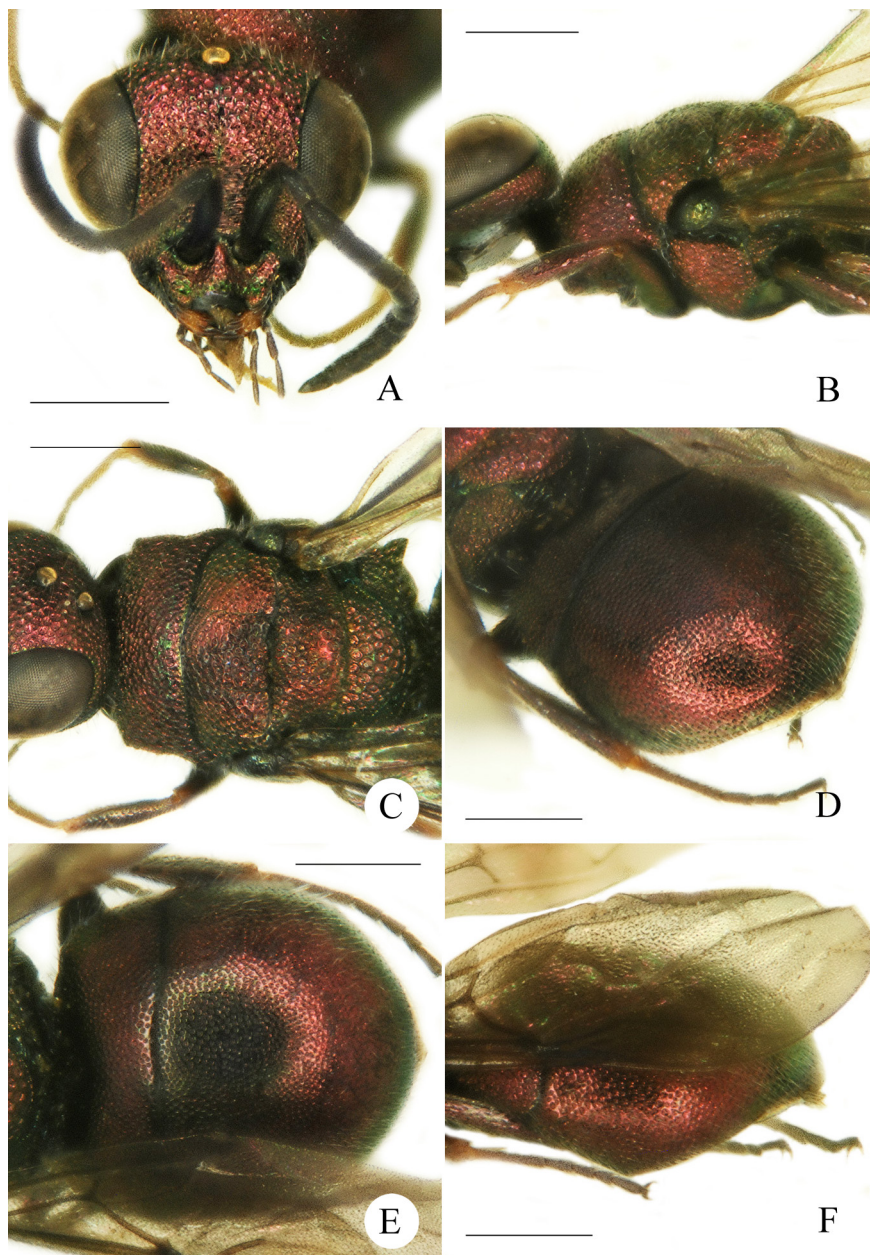


Fig. 8. *Hedychridium longigena* Rosa, sp. n., holotype, ♀: A – head, frontal view; B – mesosoma, lateral view; C – mesosoma, dorsal view; D – metasoma, dorso-lateral view; E – metasoma, dorsal view; F – metasoma, lateral view. Scale bar = 0.5 mm.

Metasoma. T1 and T2 with dense and medium-sized punctures, almost contiguous (Fig. 8E); T3 very narrow, almost fused with T2: only the tip of the apical margin and the narrow semitransparent rim are visible (Figs 8D, F).

Coloration. Head and body dorsally metallic red, with some brassy reflections, with the only exception of greenish to blackish median part of propodeum, in some paratypes the greenish area on propodeum is more extended. Holotype with small darker to blackish area dorsally on T2. Body ventrally dark bronze, metasoma ventrally black. Scape and pedicel shiny black, with metallic sheen on scape, flagellum blackish. Tegulae metallic greenish. Wings hyaline or darker to ambrate in some specimens.

Vestiture. Body with sparse, whitish and short setae (1.0 MOD), on metasoma laterally with appressed and erect setae, and a little longer (> 1.0 MOD). Setae short, erect on legs.

Male. Similar to female, without metallic tegulae. Genital capsule as in Figs 13I, J.

DISTRIBUTION. Russia (Irkutsk Prov.).

ETYMOLOGY. The specific epithet *longigena* (a noun in apposition) derives from the Latin *longus* (long) and *gena* (cheek) and refers to the elongate and sub-parallel malar spaces.

REMARKS. The shortened T3 seems diagnostic for this species. However, other Siberian specimens show the reduction of the last visible tergum. In some specimens of *H. ardens* (Coquebert) is even observed the complete fusion between T2 and T3, as in the case of *Oligogaster kimseyae* Soliman, 2013.

***Hedychridium leleji* Rosa, sp. n.**

Figs 9A–F, 14C, D

SPECIMENS EXAMINED. Holotype – ♀, **Russia**: Tuva Rep., 30 km W Erzin, Yamaalyg, 4.VII 2013 (MP, VL) [ZIN]. Allotype – ♂, Tuva Rep., 31 km NEE Erzin, Erzin River, 18.VII 2014 (AL, MP, VL) [ZIN]. Paratypes: Tuva Rep.: 20 km SSW Erzin, Tore-Khol' Lake, 3.VII 2013, 1♀, 1♂ (VL, MP) [PRC]; 31 km NEE Erzin, Erzin River, 18.VII 2014, 1♂ (AL, MP, VL) [IBSS].

DIAGNOSIS. *Hedychridium leleji* sp. n. and the following two species, *H. loktionovi* sp. n. and *H. proshchalykini* sp. n. belong to a distinct species group or subgroup characterized by short and stout genital capsule (Fig. 14A–G), scapal basin microridged to broadly cross-ridged and unusual body coloration. Very likely, *H. uvarovi* Semenov, 1967 is another member of this group, whose genitalia are not yet studied. *Hedychridium leleji* sp. n. is immediately recognizable for the peculiar body color: head blue to violet, in dorsal view; frons metallic red, face red to greenish; ocellar area and occipital area dark blue to violet; propodeum red with two posterolaterally violet stripes, more or less medially separated, mesoscutum and mesoscutellum red, mesopleuron and metanotum red to greenish-red, propodeum and ventral surface bluish to blackish; metasoma dorsally red and ventrally black with an undefined bluish sheen on S2. Moreover, it can be recognized through face with broad cross-ridging from medial line of scapal basin to eye margin. It can be separated from *H. proshchalykini* sp. n. through simple sculpture of metanotum, without

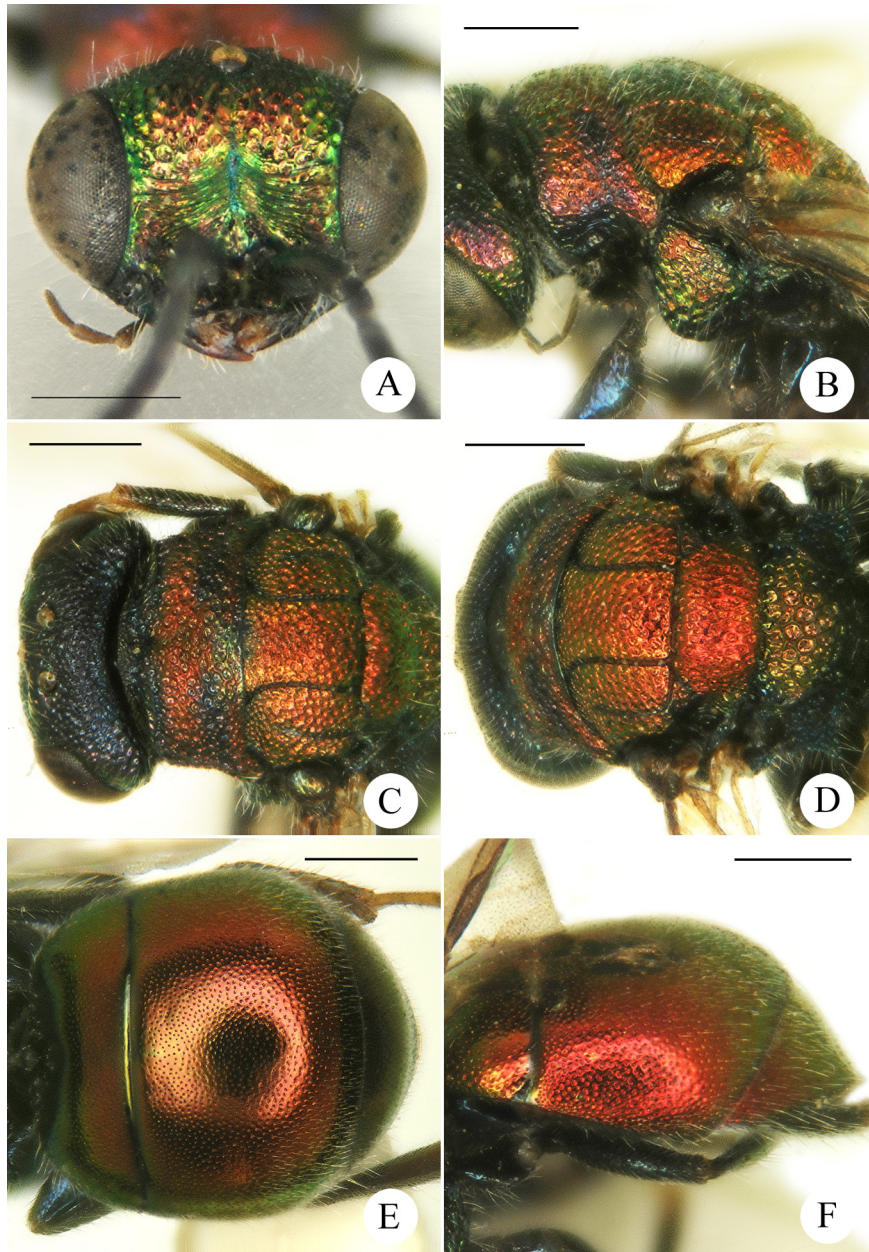


Fig. 9. *Hedychridium leleji* Rosa, sp. n. A – paratype, ♂, head, frontal view. B–F – holotype, ♀: B – mesosoma, lateral view; C – mesosoma, dorsal view; D – mesosoma, dorsal view; E – metasoma, dorsal view; F – metasoma, lateral view. Scale bar = 0.5 mm.

longitudinal wrinkles (*vs.* rugulose in *proshchalykini*), and from *H. loktionovi* sp. n. through body coloration with violet stripes on pronotum (uniformly green in *H. loktionovi*) and T2 uniformly red dorsally (*vs.* black, lustreless on T1 and T2).

DESCRIPTION. Body length 4.0–5.0 mm. Fore wing length 2.8–3.2 mm. *Female*. OOL = 2.2 MOD; POL = 1.8 MOD; MS = 0.3 MOD; relative length of P : F1 : F2 : F3 = 1 : 1.3 : 0.8 : 0.7.

Head. Vertex and frons with contiguous, medium sized punctures (0.3–0.5 MOD); face with punctures of the same size, along eye margin, interspersed with cross-ridging; scapal basin with broad cross-ridging, originating from middle line and reaching eye margin. Facial longitudinal midline deep and connecting midocellus to clypeal margin or nearly so. Punctuation on post-ocellar vertex coarse (Fig. 9C). Ocellar triangle isosceles.

Mesosoma. Pronotum punctures irregularly sized, coarse, mostly shallow and contiguous. Mesoscutum and mesoscutellum with similar punctures; on mesoscutellum slightly rugulose (Fig. 9D). Mesopleuron with large, coarse, contiguous punctures (Fig. 9B). Metascutellum with areolate-reticulate punctures. Propodeal teeth triangular, with angle pointing outside (Fig. 9D). Forewing basal vein 1.2 times as long as RS stub, gently arched.

Metasoma. T1 and T2 with minute, sparse punctures, 1–3 PD apart, uniformly distributed (Fig. 9E); T2 laterally with double punctuation (Fig. 9F). T3 with denser punctures; T3 posterior margin with narrow brownish apical rim.

Coloration. Frons metallic red; face red to greenish; ocellar area and post-ocellar vertex dark blue to violet; genae from violet to greenish. Propodeum red with two postero-laterally violet stripes, more or less medially separate; mesoscutum and mesoscutellum red; mesopleuron and metascutellum red to greenish; propodeum and legs bluish to blackish; metasoma dorsally red and ventrally black, with an undefined bluish sheen on S2. Scape and pedicel shiny black, with metallic sheen; flagellum blackish. Tegulae brown, non-metallic. Wings medially lightly amber.

Vestiture. Body dorsally with sparse, whitish, short setae (1 MOD), mesosoma and metasoma laterally with long setae (1.5 MOD) (Fig. 9F). Legs with erect setae (1 MOD).

Male. Similar to female. Genital capsule as in Figs 14C, D.

DISTRIBUTION. Russia (Tuva Rep.).

ETYMOLOGY. The specific epithet *leleji* (masculine name in genitive case) is dedicated to Arkady S. Lelej (Vladivostok, Russia), curator at the Federal Scientific Centre of the East Asia Terrestrial Biodiversity, expert hymenopterist and collector of part of the studied material in these articles, who entrusted the first author in the study of the Russian Chrysididae.

***Hedychridium proshchalykini* Rosa, sp. n.**

Figs 10A–F, 14A, B

SPECIMENS EXAMINED. Holotype – ♀, **Russia**: Tuva Rep., 20 km SSW Erzin, Tore-Khol' Lake, 3.VII 2013 (VL, MP) [ZIN]. Allotype – ♂, same locality, 30.VI 2013 [ZIN]. Paratypes: 2 ♀, 2 ♂, same locality, 30.VI–3.VII 2013 [ZIN, IBSS, PRC].

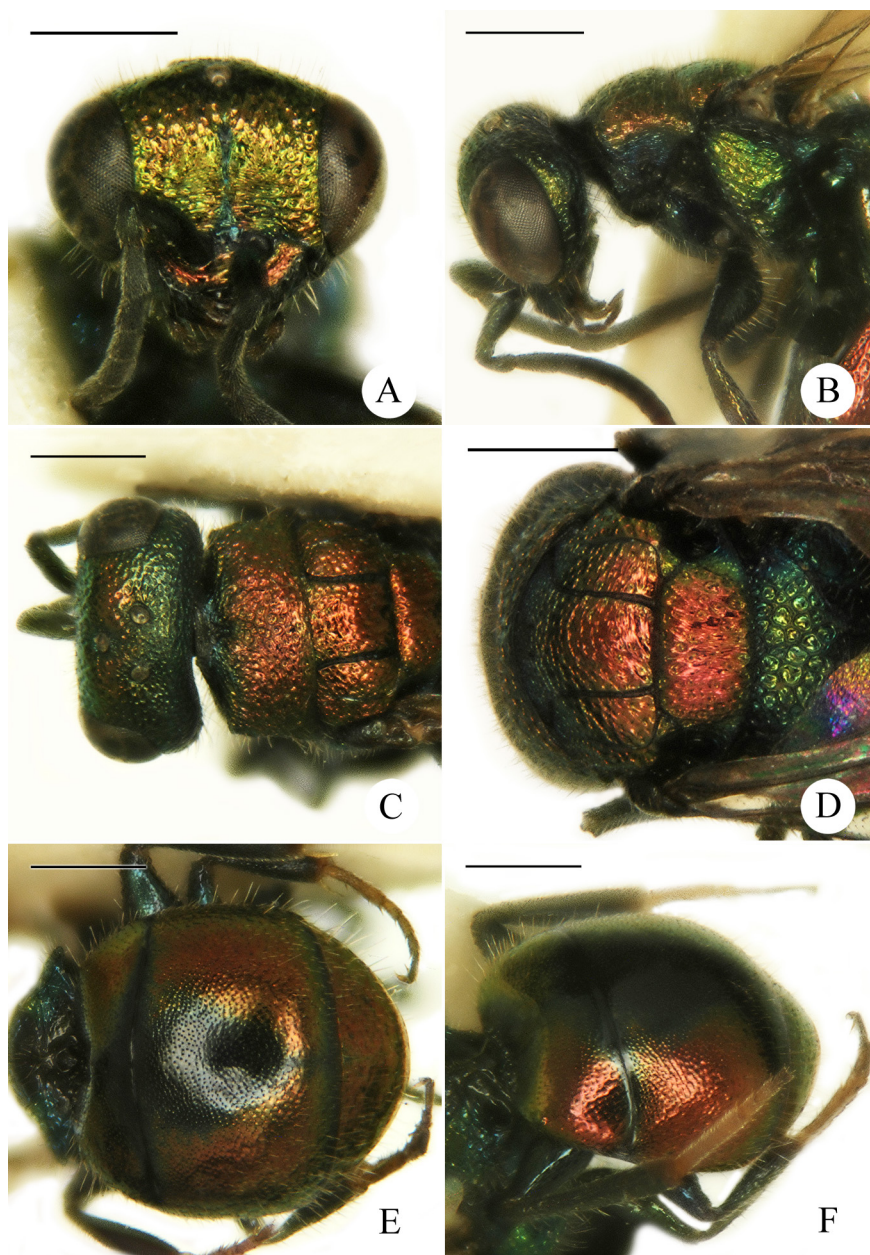


Fig. 10. *Hedychridium proshchalykini* Rosa, sp. n., holotype, ♀: A – head, frontal view; B – mesosoma, lateral view; C – mesosoma, dorsal view; D – mesosoma, dorsal view; E – metasoma, dorsal view; F – metasoma, dorso-lateral view. Scale bar = 0.5 mm.

DIAGNOSIS. *Hedychridium proshchalykini* sp. n. is closely related to *H. leleji* sp. n. for face with broad cross-ridging and structure of genital capsule. It differs from *H. leleji* sp. n. through: coloration without violet stripes on pronotum and a large dorso-medial black area on T1 and T2; punctuation on pronotum, mesonotum, mesoscutellum and metascutellum shallower and scattered, with irregular sized punctures; pronotum and mesonotum, seen in posterior view, with punctuation rugulose, somehow forming transverse striae or wrinkles among punctures (Fig. 10D); rugulose punctures on mesoscutellum outline longitudinal wrinkles, more obvious than in *H. leleji* sp. n. (Fig. 10D); genitalia (Fig. 14A, B);

DESCRIPTION. Body length 3.7–4.8 mm. Fore wing length 2.5–2.8 mm. *Female*. OOL = 2.8 MOD; POL = 2.0 MOD; MS = 0.4 MOD; relative length of P : F1 : F2 : F3 = 1 : 1.1 : 0.7 : 0.6.

Head. Vertex and frons with shallow, contiguous and medium-sized punctures (0.3–0.5 MOD); face with punctures of the same size also along eye margin; on lower half of face, punctures interspersed with broad cross-ridging originating from middle line of scapal basin; face with deep and broad median sulcus, connecting midocellus to clypeus (Fig. 10A). Punctuation on post-ocellar vertex smaller, shallower, with impunctate interspaces. Ocellar triangle isosceles.

Mesosoma. Pronotum, mesoscutum and mesoscutellum with rugulose, shallow punctures; on pronotum irregularly sized, contiguous (Fig. 10C); on posterior half of mesoscutum shallow to almost vanishing, with transverse wrinkles between punctures (Fig. 10D). Mesoscutellum with rugulose punctures forming longitudinal wrinkles (Fig. 10D). Metascutellum with areolate-reticulate punctures and mesopleuron with large foveate punctures. Propodeal teeth triangular, with angle slightly pointing backward. Forewing basal vein as long as RS stub, gently arched.

Metasoma. T1 and T2 with minute, scattered punctures, 1–3 PD apart, T3 with denser punctures, partially transversely rugulose; T2 laterally with double punctuation. T3 posterior margin with very narrow brownish rim.

Coloration. Frons mostly metallic red and face bronze to coppery; broad median sulcus blue to blackish, contrasting with the rest of face; mid ocellar area and occipital area greenish. Pronotum metallic red; pronotal collar and propleuron dark blue to violet; mesoscutum and mesoscutellum red; mesopleuron and metanotum greenish, propodeum and ventral surface bluish. Metasoma metallic red, postero-medially on T1 and antero-medially on T2 black; sterna black with an ill-defined greenish sheen on S2. Scape and pedicel shiny black, with metallic sheen, flagellum blackish. Tegulae brown, non-metallic. Wings medially light amber.

Vestiture. Body dorsally with sparse, whitish, long setae (1.5 MOD); mesosoma and metasoma laterally with very long setae (2.0 MOD). Legs with erect setae (1 MOD).

Male. Similar to female. Genital capsule as in Fig. 18A, B.

DISTRIBUTION. Russia (Tuva Rep.)

ETYMOLOGY. The specific epithet *proshchalykini* (masculine name in genitive case) is dedicated to M. Yu. Proshchalykin (Vladivostok, Russia), expert hymenopterologist and collector of great part of the studied material of these articles.

***Hedychridium loktionovi* Rosa, sp. n.**

Figs 11A–F, 14E, F

SPECIMENS EXAMINED. Holotype – ♀, **Russia**: Altai Rep., 5 km SE Chagan-Uzun, Tudituyaryk River, 11.VII 2016 (MP, VL) [ZIN]. Allotype – ♂, Altai Rep., 15 km SE Kurai, Chuya River, 6.VII 2016, 1 ♂ (MP, VL) [ZIN]. Paratypes: Altai Rep.: 5 km SE Chagan-Uzun, Tudituyaryk River, 11.VII 2016, 2 ♀ (MP, VL) [IBSS, PRC].

DIAGNOSIS. *Hedychridium loktionovi* sp. n. is related to *H. proshchalykini* sp. n., but can be separated through body coloration, almost uniformly greenish to bronze, including propodeum (*vs.* metallic red, with bluish contrasting matanotum and propodeum in *H. proshchalykini* sp. n.); S2 black with large, defined red to greenish median spot (*vs.* S2 black with ill-limited greenish area); face punctuation with large punctures and weak cross-ridging, limited to the median part (*vs.* lower half of face with punctures interspersed with broad cross-ridging); punctuation on mesoscutellum contiguous, without transverse wrinkles; punctuation on metascutellum rugulose without longitudinal wrinkles; genitalia differently shaped (Figs. 14E, F).

DESCRIPTION. *Female*. Body length 4.0–4.5 mm. Fore wing length 3.0–3.2 mm. OOL = 2.5 MOD; POL = 2.0 MOD; MS = 0.6 MOD; relative length of P : F1 : F2 : F3 = 1 : 1.3 : 0.9 : 0.8.

Head. Vertex and front with deep, defined, contiguous and medium-sized punctures (0.3–0.5 MOD); face with punctures of the same size on upper scapal basin and along eye margin; scapal basin medially cross-ridged, only partially interspersed in punctures (Fig. 11A); face with deep and broad median sulcus connecting mid-ocellus to clypeus. Punctuation on post-ocellar vertex smaller, irregular, denser, without polished interspaces. Ocellar triangle isosceles.

Mesosoma. Pronotum with irregularly sized, contiguous, coarse and rugulose punctures. Mesoscutum and mesoscutellum with smaller punctures, interspaces slightly rugulose or polished (Fig. 11C). Mesopleuron with large, coarse and contiguous punctures (Fig. 11B). Metascutellum with areolate punctures (Fig. 11D). Propodeal teeth triangular, with angle pointing outside. Forewing basal vein two-thirds as long as RS stub, gently arched.

Metasoma. T1 and T2 with minute, scattered punctures, 1–4 PD apart (Fig. 11E), T3 with denser punctures; T1 and T2 laterally with double punctuation. T3 posterior margin with very narrow brownish rim (Fig. 11F).

Coloration. Frons and face green to bronze; broad median sulcus blue to blackish; ocellar area, post-ocellar vertex and occipital area bluish; mesosoma green with coppery reflections; propodeum mostly unicolor, darker to bluish on the lower and posterior part; metasoma greenish, laterally coppery, dorsally with extensively black spot on T1 and T2; sterna black with large and defined greenish-coppery median spot. Scape and pedicel metallic green, flagellum black, Tegulae brown. Wings slightly infusate.

Vestiture. Head and mesosoma dorsally with dense, whitish, erect and long setae (1.5 MOD); metasoma dorsally with sparser, appressed, shorter setae (1.0 MOD); metasoma postero-laterally with long, erect whitish setae (2.0 MOD). Femura and tibiae with long, erect setae (\geq 1.5 MOD).

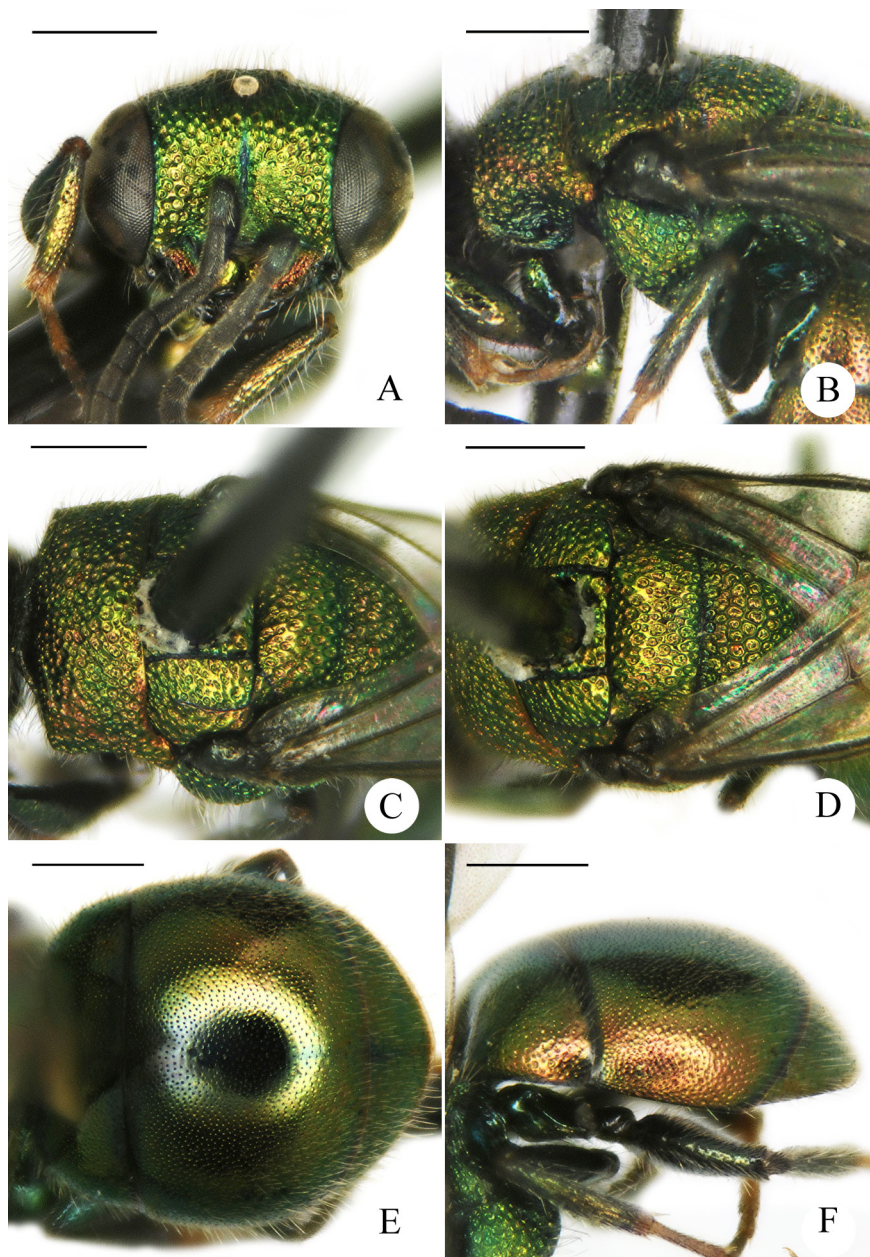


Fig 11. *Hedychridium loktionovi* Rosa, sp. n., holotype, ♀: A – head, frontal view; B – mesosoma, lateral view; C – mesosoma, dorsal view; D – mesosoma, detail, dorsal view; E – metasoma, dorsal view; F – metasoma, lateral view. Scale bar = 0.5 mm.

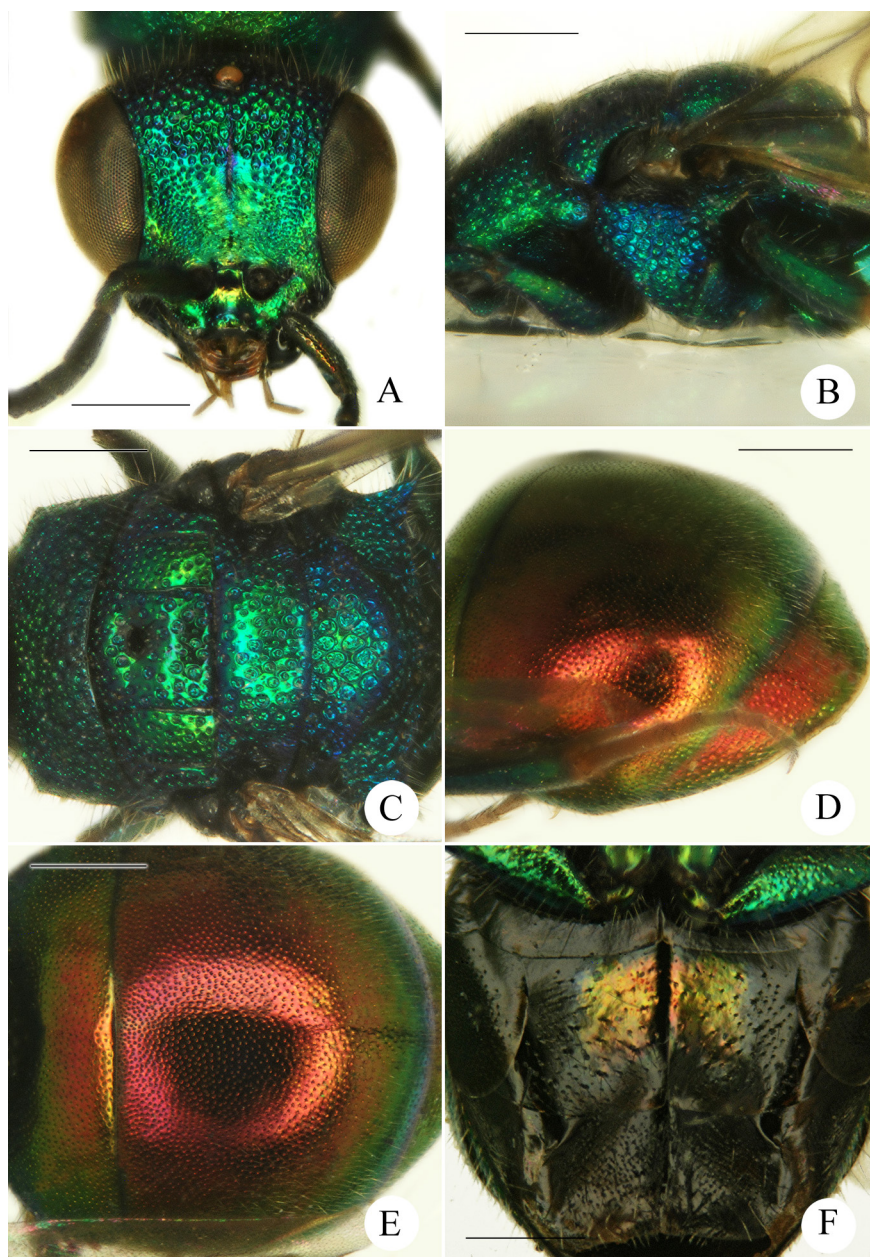


Fig. 12. *Hedychridium sibiricum* Rosa, sp. n., holotype, ♂: A – head, frontal view; B – mesosoma, lateral view; C – mesosoma, dorsal view; D – metasoma, dorso-lateral view; E – metasoma, dorsal view; F – metasoma, ventral view. Scale bar = 0.5 mm.

Male. Similar to female. Genital capsule as in Fig. 14E, F.

DISTRIBUTION. Russia (Tuva Rep.).

ETYMOLOGY. The specific epithet *loktionovi* (masculine name in genitive case) is dedicated to Valery M. Loktionov (Vladivostok, Russia), researcher of Siberian Hymenoptera and collector of great part of the studied material of these articles.

***Hedychridium asianum* Linsenmaier, 1997 stat. n.**

Fig. 14H, J

Hedychridium (Hedychridium) integrum asianum Linsenmaier, 1997a: 254. Holotype – ♂, Mongolia: Central Aimag, Ulan Bator, 1900 m [Koschwitz private coll.] (paratypes examined) (*ardens* group).

SPECIMENS EXAMINED. **Russia**: Altai Terr.: 24 km NWW Aktash, Chuya River, 30.VI 2016, 1 ♀ (MP, VL); 2 km SE Chagan-Uzun, Balkhash River, 9.VII 2016, 1 ♀ (MP, VL); Tuva Rep.: 20 km SSW Erzin, Tore-Khol' Lake, 1–3.VII 2013, 6 ♀ (VL, MP); 30 km W Erzin, Yamaalyg, 4.VI 2013, 1 ♀, 2 ♂ (MP, VL); Irkutsk Prov.: 8 km N Irkutsk, Angara River, sandy slopes, 10.VII 2001, 4 ♀ [GLA]; Krasnoyarsk Terr.: 10 km NE Minusinsk, Malaya Minusa River, 7.VII 2012, 1 ♀ (MP, VL); idem, 8.VII 2014, 1 ♂ (AL, MP, VL); Buryatia Rep.: 5 km N Naushki, Kharankhoi, 1.VIII 1977, 1 ♀; Gusinoe Lake, Baraty, 26.VII 2007, 2 ♀ (AL, MP, VL).

DISTRIBUTION. *Russia (Altai Terr., Krasnoyarsk Terr., Tuva Rep., Buryatia Rep.); Mongolia, China (Gansu).

REMARKS. Linsenmaier (1997) described *asianum* as a subspecies of *H. integrum* (Dahlbom, 1854); the latter has been synonymized by Paukkunen *et al.* (2014) with *H. ardens* (Coquebert, 1801). Linsenmaier (1959, 1997) confused *H. cupreum* (Dahlbom) with *H. integrum* and described *H. asianum* as an oriental subspecies of the latter.

H. asianum is similar to *H. cupreum* (Dahlbom), but can be easily recognized by denser punctuation on pronotum and mesoscutum (Fig. 14J vs. Fig. 14I); shorter body pubescence; contrasting color of metanotum; different shape of genitalia (Figs 14H vs. 14G). For these different morphological features we here upgrade *H. asianum* to species level.

***Hedychridium cupreum* (Dahlbom, 1845)**

Figs 14G, I

Hedychrum cupreum Dahlbom, 1845: 3. Lectotype ♀ (designated by Paukkunen *et al.*, 2014: 23); Sweden: Lund [NHMW] (examined) (*ardens* group).

SPECIMENS EXAMINED. **Russia**: Irkutsk Prov.: Irkutsk [sub *H. integrum*, ZIN]; Khakassia Rep.: Chernoe Lake, 16–18.VII 2012, 1 ♀ (MP, VL); 22 km NW Shira, Belyi Iyus River, 2.VII 2014, 1 ♀ (AL, MP, VL); 10 km E Shira, Itkul' Lake, 28.VI 2014, 2 ♂ (AL, MP, VL); Tuva Rep.: Ubsu-Nur Lake, 7.VII 2013, 1 ♀ (MP, VL); 12 km SW Samagaltai, Dyttyg-Khem River, 8.VII 2013, 1 ♂ (MP, VL); idem, 19.VII 2014, 2 ♀ (AL, MP, VL).

DISTRIBUTION. Russia (Leningrad Prov., Moscow Prov., Stavropol Terr., Orenburg Prov., Khakassia Rep., Tuva Rep., Irkutsk Prov.). Trans-Palaeartic, from North-Western Europe to China, Mongolia and Japan, including subspecies (Rosa *et al.*, 2014).

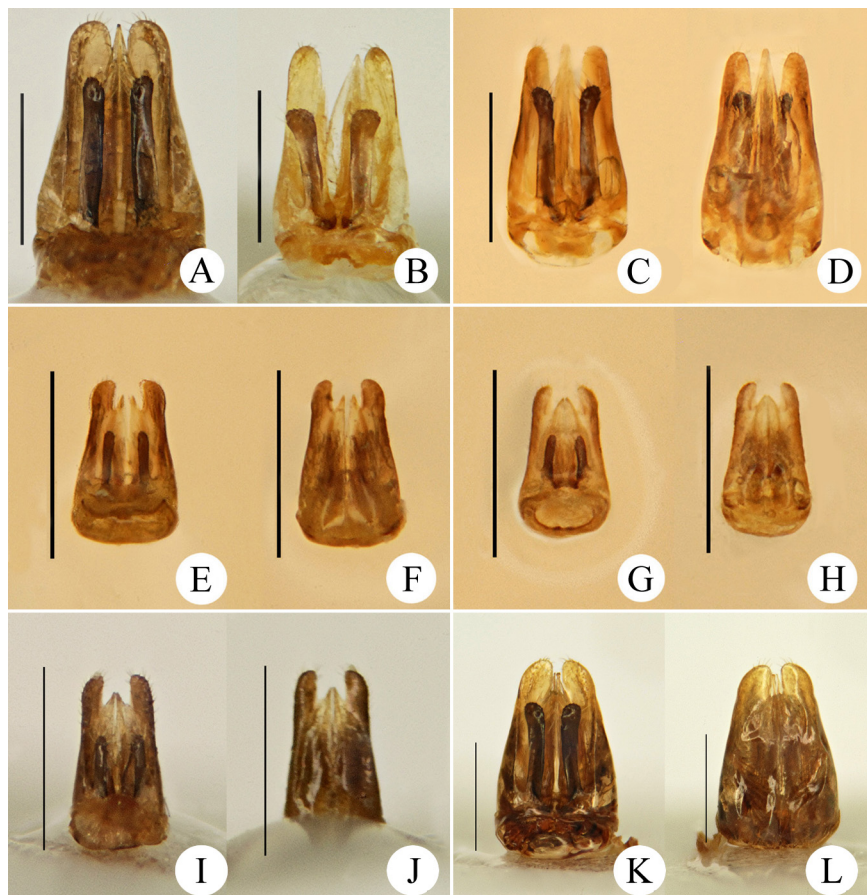


Fig. 13. Male genital capsule. A – *Hedychridium ardens* (Coquebert), Khakassia; B – *H. jucundum* (Mocsáry), Italy; C, D – *H. belokobylskiji* sp. n.; E, F – *H. propodeale* sp. n.; G, H – *H. gabriellae* sp. n.; I, J – *H. longigena* sp. n.; K, L – *H. sibiricum* sp. n. Scale bar = 0.5 mm.

***Hedychridium sibiricum* Rosa, sp. n.**

Figs 12A–F, 13K, L

SPECIMENS EXAMINED: Holotype – ♀, **Russia**: Tuva Rep., south slope of W Tanu-Ola near Soglyi Village, 2000–2800 m, 15–20.VI 2003 [ZIN]. Allotype – ♂, same collecting data [ZIN]. Paratypes: 3 ♂, 1 ♀, same data as holotype [GLA, PRC].

DIAGNOSIS. *Hedychridium sibiricum* sp. n. resembles *H. purpurascens* (Dahlbom, 1854), *H. alpestre* Semenov et Nikol'skaya, 1954 and *H. trossulus* Semenov, 1954 for habitus, coloration and long whitish setae on head and metasoma. Nevertheless, it is easily recognizable through the punctured scapal basin, without broad cross-ridging (Fig. 12A) (largely medially cross-ridged in the other three species); deep and large punctuation on mesoscutum and mesoscutellum (various in the other

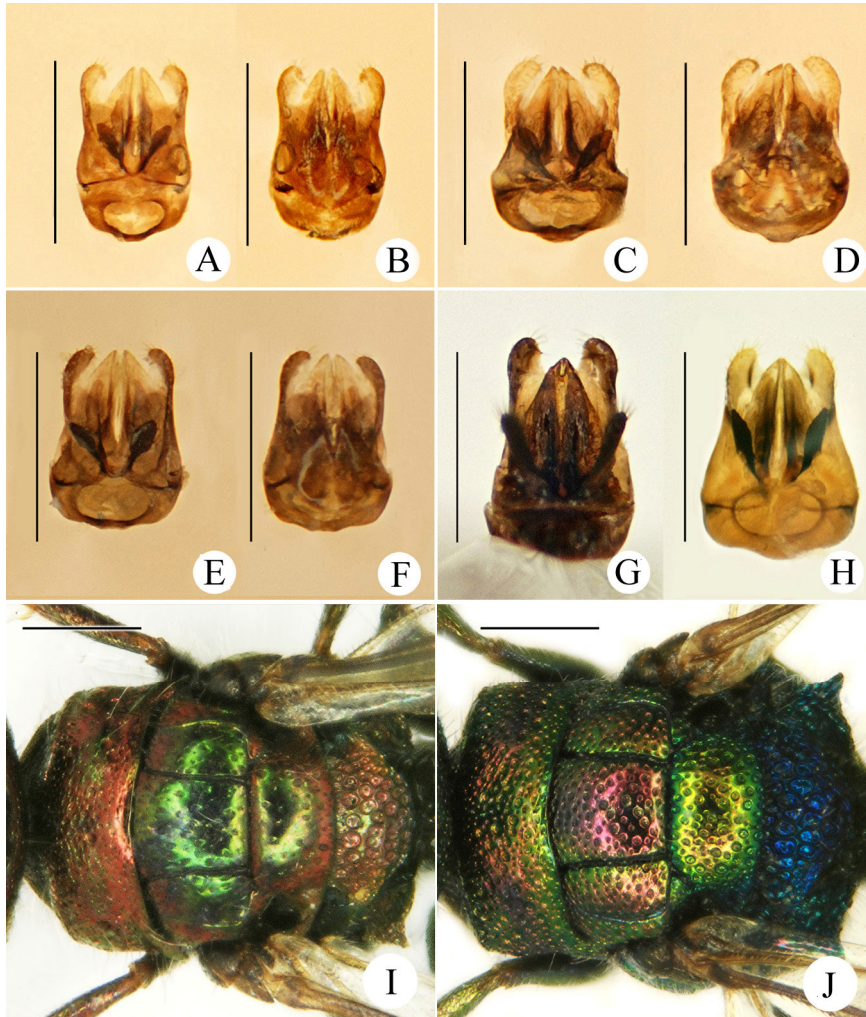


Fig. 14. Male genital capsule (A–H) and mesosoma, dorsal view (I, J). A, B – *H. proshchalykini* sp. n.; C, D – *H. leleji* sp. n.; E, F – *H. luktionovi* sp. n.; G – *H. cupreum* (Dahlbom), Czech Rep.; H – *H. asianum* Linsenmaier, Altai; I – *H. cupreum*; J – *H. asianum*. Scale bar = 0.5 mm.

species); short setae on metanotal margins (longer in the other species); large size and shape of genitalia (*vs.* shortened). Shape of genitalia (Fig. 13K, L) and punctuation on face place this species within the *H. ardens* group s. str., in which, however, as for external features or colour pattern no other species resembles *H. sibiricum* sp. n.

DESCRIPTION. *Female.* Body length 5.5–6.0 mm. Fore wing length 3.3–3.5 mm. OOL = 2.2 MOD; POL = 1.9 MOD; MS = 0.7 MOD; relative length of P : F1 : F2 : F3 = 1 : 1.6 : 1.0 : 0.8.

Head. Face nearly flat, densely punctate, with contiguous punctures on frons (Fig. 12A); size of punctures decreasing from frons to clypeus; with minute punctures on lower face and malar spaces; scapal basin medially impunctate. Clypeus mostly polished, subantennal space 1.5 MOD. Facial longitudinal midline deep and evident only on upper scapal basin (Fig. 12A). Post-ocellar vertex with small, even and dense punctures. Ocellar triangle isosceles and posterior ocelli with pit along external margin.

Mesosoma. Pronotum, with coarse, irregularly sized and contiguous punctures. Mesonotum and mesoscutellum with double punctuation due to punctures of two sizes, with polished interspaces, up to 1 PD apart. Mesopleuron with uneven punctures (Fig. 12B). Metascutellum with large, contiguous areolate punctures. Propodeal teeth triangle shaped, with acute teeth (Fig. 12C). Forewing basal vein 1.5 times as long as RS stub, medially distinctly bending.

Metasoma. T1, T2 and T3 with dense, minute punctures; T1 anterior declivity medially impunctate; T2 with posterior margin impunctate (Fig. 12D); T3 with narrow apical brownish rim.

Coloration. Head and mesosoma metallic green; propodeum and mesopleuron partially green-blue to bluish, with weak golden-green hue; metasoma dorsally metallic red, ventrally black with a large and defined golden-red spot on S2. Legs metallic green with brown tarsi, tarsi on the outer surface sometimes darkened, with or without a slightly metallic reflection; scape and pedicel metallic green, flagellum black. Tegulae non-metallic.

Vestiture. Body with dense, whitish, relatively long setae (1.5 MOD long), on metasoma laterally with short, both appressed and erect longer setae (1.5 MOD). Legs with short erect setae.

Male. Similar to female, but with more olive-green color on mesosoma and pale brown tarsi. Silvery pubescence, fine, dense on outer third of lower face. Genital capsule distinctly large (0.9 mm) as in Fig. 13K, L.

DISTRIBUTION. Russia (Tuva Rep.).

ETYMOLOGY. The specific name *sibiricum* (male, adjective) refers to the type locality in Siberia.

***Hedychridium turcicum* Arens, 2010, stat. n.**

Figs 15A–E

Hedychridium valesiense turcicum Arens, 2010: 428. Holotype – ♂, Turkey: Kars Prov., 20 km W Sarıkamış, 2200 m [Luzern] (*roseum* group).

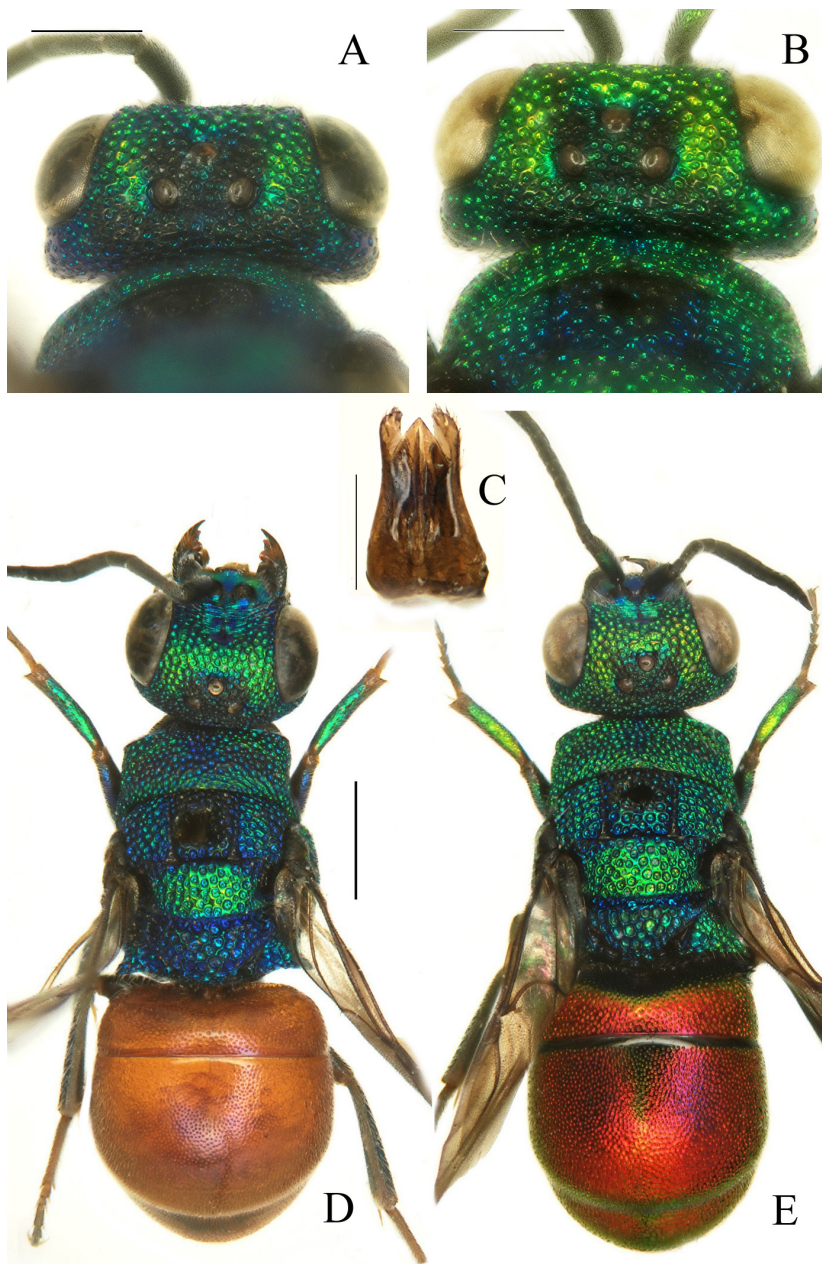


Fig. 15. *Hedychridium turcicum* Arens. A, D – ♀: A – head, ♀, dorsal view; B – head, ♂, dorsal view; C – genital capsule, ♂, dorsal view; D – habitus, ♀, dorsal view; E – habitus, ♂, dorsal view. Scale bar = 0.5 mm.

SPECIMENS EXAMINED. **Russia:** Krasnoyarsk Terr.: Berezovyi, 1.VII.2012, 1 ♀, 6 ♂ (MP, VL); 10 km NW Minusinsk, Bystraya River, 9.VII.2014, 1 ♀ (AL, MP, VL).

DISTRIBUTION. *Russia (Krasnoyarsk Terr.).

REMARKS. Arens (2010) recently described *Hedychridium turcicum* (from Sarıkamış, Eastern Turkey) as subspecies of *H. valesiense* Linsenmaier, 1959. The type series is based on a male holotype and a female paratype, collected in a different locality (Erciş, Van Province). The female interestingly shows some distinctive diagnostic features, such as genae in dorsal view with divergent angles, non typical for *H. valesiense* but linked to other species within the *roseum* species-group.

Arens (2010) suggested that this taxon has probably a distribution restricted to mountains, because it was not collected in other places where species of the *roseum* species-group are usually common.

The finding of some male and female specimens of *H. turcicum* in Siberia is not surprising and this species could be very likely a Euro-Siberian, boreo-montane chrysidid, found on the highest mountain of Anatolia as ancestral refuge population and still commonly distributed in Siberia and possibly central Asia, where distributional data are not available. Based on our material, including male and female collected in the same locality, we observe that the female shows the typical shape of the head (Fig. 14A), with rounded posterior genae, similar to those of the male (Fig. 15B), and the female paratype of *H. turcicum* could be therefore related to another possibly undescribed species. Other diagnostic characters, such as shape of scapal basin, porus, sculpture, etc. match among male and female. Taking in consideration the diagnostic characters listed by Arens (2010), as the large metallic spot on S2 (without metallic spot in *H. valesiense*) and the slightly different shape of genitalia, we consider *H. turcicum* as a distinct species and we here upgrade it to specific rank.

The main difference occurring between the Siberian and Turkish population is the punctuation on disc of T2, which is distinctly double in the Turkish population, whereas simple, even and dense in the Siberian population.

DISCUSSION

Considering the scarcity of records for Central Asia, Far East and Mongolia, it is not possible to analyze the chorology of Siberian Chrysididae. Based on the few known data, the Siberian Chrysididae fauna seems to include mostly widespread Trans-Palaeartic species, but an apparently large number of endemic species is also present, some species being also distributed in Mongolia (e.g. *Pseudochrysis gengiskhan*); the rest of fauna consists mostly of Euro-Siberian species. Anyway, we still expect an higher number of Chrysidid species, because the Asian part of Russia encompasses a number of distinct climatic zones, which extend across the territory in latitudinal zones including good quality habitats for Chrysididae, such as: grasslands; temperate broadleaf forests in humid-temperate continental climate, in a narrow strip of the southern West Siberian Lowland; a broad belt of dry steppe climate in the southern part of Western Siberia, extending eastwards in mountain basins along the extreme fringes of Siberia and the Russian Far East.

Table 1. Updated list of Siberian Chrysididae

№	Taxon	Siberian regions
Subfamily Cleptinae		
Genus <i>Cleptes</i> Latreille, 1802		
1	<i>C. dauriensis</i> Móczár, 1997	14
2	<i>C. nitidulus</i> (Fabricius, 1793)	7
4	<i>C. semiauratus</i> (Linnaeus, 1761)	Siberia [no loc.]
3	<i>C. semicyaneus</i> Tournier, 1879	11
5	<i>C. striatipleuris</i> Rosa, Forshage, Paukkunen et Soon, 2015	Siberia [no loc.]
Subfamily Chrysidinae		
Tribe Elampini		
Genus <i>Omalus</i> Panzer, 1801		
6	<i>O. aeneus</i> (Fabricius, 1787)	3, 7–11, 13, 14
7	** <i>O. berezovskii</i> (Semenov, 1932)	8**, 9**
Genus <i>Pseudomalus</i> Ashmead, 1902		
8	<i>P. auratus</i> (Linnaeus, 1758)	3, 6, 8–12
9	** <i>P. nipponicus</i> (Tsuneki, 1970)	10**
10	** <i>P. punctatus</i> (Uchida, 1927)	8**, 10**, 13**
11	<i>P. pusillus</i> (Fabricius, 1804)	2, 6, 8–14
12	* <i>P. triangulifer</i> (Abeille de Perrin, 1877)	6*–9*, 11*, 13*, 14*
13	<i>P. violaceus</i> (Scopoli, 1763)	11, 14
Genus <i>Philoctetes</i> Abeille de Perrin, 1879		
14	<i>Ph. bidentulus</i> (Lepelletier, 1806)	8, 11, 12
15	<i>Ph. cynthiae</i> Rosa, 2017	9
16	* <i>Ph. horvathi</i> (Mocsáry, 1889)	9*, 10*
17	* <i>Ph. kuznetsovi</i> Semenov, 1932	11*
18	<i>Ph. lyubae</i> Rosa, 2017	9
19	<i>Ph. mongolicus</i> (du Buysson, 1901)	8, 9, 13–14
20	<i>Ph. sareptanus</i> (Mocsáry, 1889)	11, 12
21	<i>Ph. stackelbergi</i> (Semenov, 1932)	7
22	<i>Ph. truncatus</i> (Dahlbom, 1831)	3, 9–12
Genus <i>Chrysellampus</i> Semenov, 1932		
23	<i>Ch. duplipunctatus</i> Tsuneki, 1948	14
Genus <i>Elampus</i> Spinola, 1806		
24	<i>E. agnolii</i> Rosa, 2017	9
25	<i>E. albipennis</i> (Mocsáry, 1889)	11, 12
26	<i>E. bidens</i> (Förster, 1853)	2, 11, 12
27	<i>E. caeruleus</i> Dahlbom, 1854	10
28	<i>E. coloratus</i> Rosa, 2017	9
29	<i>E. constrictus</i> (Förster, 1853)	6, 12, 14
30	* <i>E. foveatus</i> (Mocsáry, 1914)	11*
31	** <i>E. pallasi</i> (Semenov, 1967)	11**
32	<i>E. panzeri</i> (Fabricius, 1804)	2, 6, 7, 11–14
33	* <i>E. petri</i> (Semenov, 1967)	9*, 14*
34	* <i>E. ussuriensis</i> (Semenov, 1967)	13*, 14*

Table 1. Continue

№	Taxon	Siberian regions
Genus <i>Holopyga</i> Dahlbom, 1845		
35	* <i>H. amoenula occidenta</i> Linsenmaier, 1959	10*
36	<i>H. chrysonota chrysonota</i> (Förster, 1853)	2, 7–13
37a	<i>H. generosa asiatica</i> Trautmann, 1926	6, 8–10
37b	<i>H. generosa generosa</i> (Förster, 1853)	3, 4*, 6*, 7, 8*–10*, 11, 12
38	* <i>H. ignicollis</i> Dahlbom, 1854	6*–8*, 10*, 11*
39	** <i>H. lucida</i> (Lepeletier, 1806)	11**
40	<i>H. metallica</i> (Dahlbom, 1854)	11
41	** <i>H. minima</i> Linsenmaier, 1959	8–10**
Genus <i>Hedychridium</i> Abeille de Perrin, 1878		
42	<i>H. ardens ardens</i> (Coquebert, 1801)	2, 3, 6–12, 14
43	** <i>H. asianum</i> Linsenmaier, 1997	7**, 9–12**
44	<i>H. belokobylskiji</i> Rosa, 2017	8–10
45	* <i>H. cupreum</i> (Dahlbom, 1845)	8*, 9*, 11*
46	* <i>H. femoratum</i> (Dahlbom, 1854)	8–10*
47	<i>H. gabriellae</i> Rosa, 2017	9
48	<i>H. leleji</i> Rosa, 2017	9
49	<i>H. loktionovi</i> Rosa, 2017	7
50	<i>H. longigena</i> Rosa, 2017	11
51	<i>H. propodeale</i> Rosa, 2017	8–10
52	<i>H. proshchalykini</i> Rosa, 2017	9
53	<i>H. purpurascens</i> (Dahlbom, 1854)	3
54	<i>H. roseum</i> (Rossi, 1790)	7–14
55	<i>H. arensi</i> Rosa, 2017	9
56	<i>H. sculpturatum</i> (Abeille de Perrin, 1877)	3
57	<i>H. sibiricum</i> Rosa, 2017	9
58	** <i>H. turcicum</i> Arens, 2010	10**
Genus <i>Hedychrum</i> Latreille, 1802		
59	<i>H. chalybaeum</i> Dahlbom, 1854	6, 9–12, 14
60	<i>H. gerstaeckeri gerstaeckeri</i> Chevrier, 1869	3, 6, 10, 13
61	<i>H. longicolle</i> Abeille de Perrin, 1877	3
62	<i>H. niemelai</i> Linsenmaier, 1959	4, 8–13
63	<i>H. nobile</i> (Scopoli, 1763)	3, 4, 7–12, 14
64	<i>H. rutilans ermak</i> Semenov, 1967	7, 8–11, 14
65	<i>H. simile</i> Mocsáry, 1889	Eastern Siberia [no loc.]
66	<i>H. virens virens</i> Dahlbom, 1854	3
Tribe Chrysidini		
Genus <i>Euchroeus</i> Latreille, 1809		
67	** <i>E. mongolicus</i> Tsuneki, 1947	12*
68	<i>E. par</i> (Semenov, 1967)	12
69a	<i>E. purpuratus irradians</i> (Semenov, 1910)	10
69b	<i>E. purpuratus purpuratus</i> (Fabricius, 1787)	2, 6, 8, 10, 12
70	<i>E. victorius</i> Rosa, 2017	8

Table 1. Continue

№	Taxon	Siberian regions
Genus <i>Pseudochrysis</i> Semenov, 1891		
71	** <i>P. fahringeri</i> Trautmann, 1926	7**, 8**, 10**
72	<i>P. gengiskhan</i> Rosa, 2017	9
73	<i>P. incrassata</i> (Spinola, 1838)	14
74	<i>P. neglecta</i> (Shuckard, 1837)	3, 7–12
Genus <i>Chrysis</i> Linnaeus, 1761		
75	<i>Ch. amurensis</i> Semenov, 1967	4, 7, 8
76	<i>Ch. angolensis</i> Radoszkowski, 1881	14
77	<i>Ch. angustula angustula</i> Schenck, 1856	11
78	* <i>Ch. bicolor</i> Lepeletier, 1806	2*, 11*, 13*
79	* <i>Ch. brevitarsis</i> Thomson, 1870	9*
80	** <i>Ch. buda</i> Bohart, 1991	12**
81	<i>Ch. buechneri</i> Semenov, 1892	Siberia (?)
82	<i>Ch. carnifex</i> Mocsáry, 1889	Eastern Siberia [no loc.]
83	** <i>Ch. castigata</i> Linsenmaier, 1951	9**, 12**
84	<i>Ch. cerastes</i> Abeille de Perrin, 1877	7
85	** <i>Ch. chinensis</i> Mocsáry, 1912	7**, 8**, 14**
86	<i>Ch. comparata</i> Lepeletier, 1806	Siberia
87	** <i>Ch. consanguinea</i> Mocsáry, 1889	7–9**, 11**
88	* <i>Ch. cylindrica</i> Eversmann, 1858	13*
89	<i>Ch. dauriana</i> Linsenmaier, 1959	7, 9–12, 14
90	* <i>Ch. decora</i> Mocsáry, 1887	3*
91	<i>Ch. fasciata</i> Olivier, 1791	3, 11, 12
92	<i>Ch. fouqueti csikiana</i> (Mocsáry, 1912)	6
93	* <i>Ch. frivaldszkyi</i> Mocsáry, 1882	7–11*
94	<i>Ch. fulgida</i> Linnaeus, 1761	1, 3, 6–12, 14
95	<i>Ch. galloisi</i> du Buysson, 1908	12
96	* <i>Ch. gracillima</i> Förster, 1853	7*
97	<i>Ch. graelsii</i> Guérin-Méneville, 1842	4, 8–10, 12
98	<i>Ch. ignita</i> (Linnaeus, 1758)	3, 7, 11, 12, 14
99	* <i>Ch. illigeri</i> Wesmael, 1839	7*, 9–13*
100	<i>Ch. inaequalis inaequalis</i> Dahlbom, 1845	Siberia
101	<i>Ch. inconsueta</i> Rosa, 2017	7
102	<i>Ch. indigotea indigotea</i> Dufour et Perris, 1840	Siberia
103	<i>Ch. iris</i> Christ, 1791	8, 9
104	<i>Ch. japonica</i> Cameron, 1887	14
105	<i>Ch. leachii</i> Shuckard, 1837	7
106	<i>Ch. longula longula</i> Abeille de Perrin, 1879	7, 11, 12
107	* <i>Ch. mediadentata</i> Linsenmaier, 1951	11*
108	<i>Ch. mediata</i> Linsenmaier, 1951	3, 13, 14
109	** <i>Ch. mysticalis</i> Linsenmaier, 1959	7**, 9**, 10**, 14**
110	** <i>Ch. nox</i> Semenov, 1954	7**
111	<i>Ch. obtusidens</i> Dufour et Perris, 1840	3
112	<i>Ch. pavesii</i> Rosa, 2017	7

Table 1. Continue

№	Taxon	Siberian regions
113	** <i>Ch. popovi</i> Semenov, 1954	7**
114	<i>Ch. proauriceps</i> Rosa, 2017	10
115	* <i>Ch. pseudobrevitarsis</i> Linsenmaier, 1951	7–10*
116a	** <i>Ch. rutilans extranea</i> Linsenmaier, 1959	8**
116b	<i>Ch. rutilans rutilans</i> Olivier, 1791	6–9, 11, 12
117	* <i>Ch. schencki</i> Linsenmaier, 1968	3*
118	<i>Ch. sexdentata</i> Christ, 1791	Siberia (?)
119	<i>Ch. sibirica</i> Rosa, 2017	9, 12
120	<i>Ch. solida</i> Haupt, 1957	10
121	<i>Ch. soror</i> Dahlbom, 1854	10–12
122	<i>Ch. speciosa</i> Radoszkowski, 1877	Western Siberia
123	<i>Ch. succincta</i> Linnaeus, 1767	12, 14
124	<i>Ch. taczanovskii</i> Radoszkowski, 1877	Siberia (?)
125	<i>Ch. uljanini sickmanni</i> Mocsáry, 1892	Eastern Siberia [no loc.]
126	<i>Ch. viridula</i> Linnaeus, 1761	7, 9–12
127	<i>Ch. zetterstedti</i> Dahlbom, 1845	6, 11
Genus <i>Pentachrysis</i> Lichtenstein, 1876		
128	<i>P. amoena</i> (Eversmann, 1858)	2
Genus <i>Trichrysis</i> Lichtenstein, 1876		
129	<i>T. cyanea</i> (Linnaeus, 1758)	3, 7–12, 14
Genus <i>Chrysura</i> Dahlbom, 1845		
130	** <i>Ch. alticola</i> (Semenov, 1912)	7**
131	<i>Ch. austriaca</i> (Fabricius, 1804)	Siberia [no loc.]
132	<i>Ch. dichroa</i> (Dahlbom, 1854)	3
133	<i>Ch. hirsuta</i> (Gerstaecker, 1869)	11–13
134	<i>Ch. radians</i> (Harris, 1776)	11, 12
135	** <i>Ch. trimaculata</i> (Förster, 1853)	9**
Genus <i>Stilbum</i> Spinola, 1806		
136	<i>S. calens</i> (Fabricius, 1781)	12, 14
Tribe Parnopini		
Genus <i>Parnopes</i> Latreille, 1797		
137	<i>P. grandior</i> (Pallas, 1771)	4 + Eastern Siberia
138	<i>P. popovii</i> Eversmann, 1858	10–12, 14

REMARKS. Species: [**] – new for Russian fauna; [*] – new for Siberian regions; [no loc.] – no locality given in literature, only “Siberia” or “Western Siberia” or “Eastern Siberia”. The numbering of the regions as in Fig. 1 in the previous issue (Rosa *et al.*, 2017b): **Western Siberia:** 1 – Tyumen Prov.; 2 – Omsk Prov.; 3 – Tomsk Prov.; 4 – Novosibirsk Prov.; 5 – Kemerovo Prov.; 6 – Altai Terr.; 7 – Altai Rep. **Eastern Siberia:** 8 – Khakassia Rep.; 9 – Tyva Rep.; 10 – Krasnoyarsk Terr., 11 – Irkutsk Prov.; 12 – Buryatia Rep.; 13 – Sakha Rep. (Yakutia); 14 – Zabaikalskiy Terr.

One hundred thirty-eight species from 17 genera are recorded from Siberia, but our data about the distribution of chrysidids within the regions are spotted (Table 1, Fig. 16) because of pure sampling in some areas. Sixty four species from 15 genera

are distributed in Western Siberia while 106 species in 16 genera inhabit Eastern Siberia. The highest number of cuckoo wasps (51 species in 11 genera) is recorded for Tuva Rep. (Eastern Siberia), whereas only one species is recorded from Kemerovo and Tyumen Provinces (Western Siberia). In the last decade we increased (ca. 1.7x) the number of known chrysidid species from Siberia; however, it is still low compared with the number of chrysidids known from the European part of Russia (around 300 species). We expect a higher of species for Siberia, likely more than 200 species, considering taxa found in bordering areas, such as Urals, Primorskij Terr. and Altai mountains, and not yet recorded in Siberia.

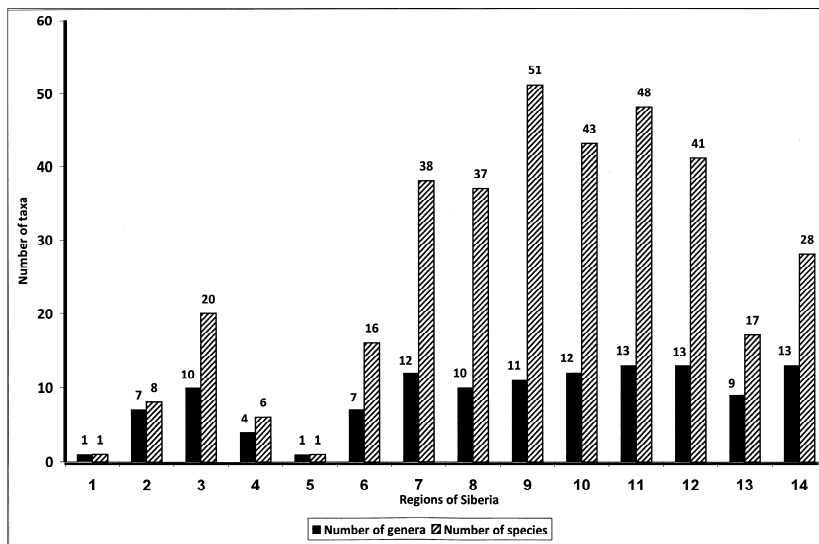


Fig. 16. Distribution of Chrysididae within the regions of Western and Eastern Siberia (the numbering of Siberian regions see the Table 1).

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REFERENCES

Additional to the list in the first part (Rosa *et al.*, 2017b)

- Abeille de Perrin, E. 1878. *Diagnoses de Chrysidides nouvelles*. Published by the author, Marseille. 6 pp.
- Arens, W. 2010. Revision der *Hedychridium roseum*-Gruppe in Kleinasien (Hymenoptera: Chrysididae), mit Neubewertung zahlreicher europäischer Taxa und Beschreibung zweier neuer Arten. *Linzer biologische Beiträge*, 42: 401–458.
- Dahlbom, A.G. 1854. *Hymenoptera Europaea praecipue borealia, formis typicis nonnullis specierum generumve Extraneorum propter nexum systematicum associatis, per familias, genera, species et varietates disposita atque descripta*. 2. *Chrysis in sensu Linnæano*. Friedrich Nicolai, Berlin, xxiv + 412 pp. + 12 pls. DOI: <http://dx.doi.org/10.5962/bhl.title.15890>
- Dalla Torre, C.G. de 1892. *Catalogus hymenopterorum 6. Chrysididae (Tubulifera)*. Wilhelm Engelmann, Lipsiae, ix + 118 pp. DOI: <http://dx.doi.org/10.5962/bhl.title.10348>
- Gogorza, J. 1887. Crisídidos de los alrededores de Madrid. *Anales de la Sociedad Española de Historia Natural*, 16: 17–88.
- Mocsáry, A. 1914. Chrysididae plerumque exoticae novae. *Annales Historico-Naturales Musei Nationalis Hungarici*, 12(1): 1–74.
- Linsenmaier, W. 1969. The chrysidid wasps of Palestine (Hym., Chrysididae). A faunistic catalogue with descriptions of new species and forms. *Israel Journal of Entomology*, 4: 343–375.
- Paukkunen J., Rosa, P., Soon, V., Johansson, N. & Ødegaard, F. 2014. Faunistic review of the cuckoo wasps of Fennoscandia, Denmark and the Baltic countries (Hymenoptera: Chrysididae). *Zootaxa* 3864(1): 1–67. DOI: <http://dx.doi.org/10.11646/zootaxa.3864.1.1>
- Rosa, P., Belokobylskii, S.A. & Zaytseva, L.A. 2017a. The Chrysididae types described by Semenov-Tian-Shanskij and deposited at the Zoological Institute of the Russian Academy of Sciences, Saint Petersburg (Insecta, Hymenoptera). *Proceedings of the Zoological Institute RAS*, Suppl. 5, 266 pp.
- Rosa, P., Proshchalykin, M. Yu., Lelej, A.S. & Loktionov, V.M. 2017b. Contribution to the Siberian Chrysididae (Hymenoptera). Part 1. *Far Eastern Entomologist*, 341: 1–44. DOI: <https://doi.org/10.25221/fee.341.1>
- Spinola, M. 1806–1808. *Insectorum Liguriaae species novae aut rariores, quas in agro Ligustico nuper detexit, descripsit et iconibus illustravit, Maximilianus Spinola, adjecto catalogo specierum auctoribus jam enumeratarum, quae in eadem regione passim occurrunt*. Yves Gravier, Genuae, (1806) 1: xvii + 160 + 2 pls.; (1807) 2: ii + 1–82; (1808) 2: 83–262 + 5 pls. [dating after Passerin d'Entrèves, 1983]. DOI: <http://dx.doi.org/10.5962/bhl.title.65985>