


Circumscription and diagnosis of the *Arge ochropus* species–group (Hymenoptera: Argidae), with a description of *Arge gussakovskiji* sp. nov. from the Pamir Mountains in Tajikistan

Объем и диагноз видовой группы *Arge ochropus* (Hymenoptera: Argidae) с описанием *Arge gussakovskiji* sp. nov. с Памира в Таджикистане

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Abstract. The species composition and diagnostic characters of the *Arge ochropus* species–group are reviewed. This species group is circumscribed based on the structure of the genitalia. It contains only four species, including *A. gussakovskiji* sp. nov. described here from the Pamir Mountains in the Gorno-Badakhshan Province of Tajikistan. A key to the Palaearctic species of the *A. ochropus* group is provided. The differences between the *A. ochropus* group and the other species groups of the genus *Arge* Schrank, 1802 with similar coloration are discussed.

Резюме. Рассмотрен видовой состав и диагностические признаки видовой группы *Arge ochropus*. Объем и границы этой видовой группы пересмотрены на основе изучения строения гениталий. В неё включены лишь четыре вида, в том числе *A. gussakovskiji* sp. nov., который описан в данной статье с Памира из Горно-Бадахшанской области Таджикистана. Приводится определительный ключ палеарктических видов группы *A. ochropus*. Обсуждаются различия между группой *A. ochropus* и другими группами видов рода *Arge* Schrank, 1802 со сходной окраской.

Key words: sawflies, description, coloration, sawsheath, Symphyta, Argidae, *Arge*, new species

Ключевые слова: пилильщики, описание, окраска, ножны, Symphyta, Argidae, *Arge*, новый вид

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Introduction

Arge Schrank, 1802 is the largest genus of the family Argidae, including about 400 species worldwide (Taeger et al., 2010; Hara & Shinohara, 2012, 2014; Shinohara & Hara, 2012; Choi et al., 2016; Du et al., 2018; Chen et al., 2020; Wan et al., 2022; etc.). Some attempts to sub-

divide this genus into species groups have been already made (Ermolenko, 1975; Smith, 1989). The most convenient and convincing result was achieved by Smith (1989; see below), but his classification was primarily designed for the Western Hemisphere. More recently, Hara & Shinohara (2008, 2014) and Yan et al. (2009) have distinguished several additional small groups of spe-

cies, significantly fragmenting the classification proposed by Smith (1989).

Smith (1989) divided the Nearctic species of *Arge* into four species groups: *Arge ochropus*, *A. humeralis*, *A. pectoralis*, and *A. clavicornis* groups. According to him, the *A. ochropus* group is distinguished from the other groups by having a slender sawsheath (in posterodorsal view), the lancet with long, stout, annular spines, and the male genitalia with narrow gonostipes and a broad, flat valve at the apex.

Later on, Yan et al. (2009) distinguished the *A. xanthogaster* species-group in East Asia. This species group is similar to the *A. ochropus* group in the features of the lancet structure but differs considerably in the shape of the sawsheath and the structure of the valviceps. Unfortunately, Yan et al. (2009) did not provide a comparison of characters between the *A. xanthogaster* group and the *A. ochropus* group.

Smith (1989) included eleven species in the *A. ochropus* group: *A. cinnabarina* Gussakovskij, 1935, *A. corallina* Gussakovskij, 1935, *A. fumipennis* (F. Smith, 1878), *A. geei* Rohwer, 1912, *A. luteiventris* (Cameron, 1899), *A. nigronodosa* (Motschulsky, 1860), *A. ochropus* (Gmelin, 1790), *A. pagana* (Panzer, 1798), *A. paganiformis* Rohwer, 1925, and *A. xanthogaster* (Cameron, 1876). Ten of these, except the Oriental *A. luteiventris*, are distributed in the Palaearctic. Yan et al. (2009) assigned to the *A. xanthogaster* group seven species including five species previously placed in the *A. ochropus* group: *A. albocaudalica* Wei, Yan et He, 2009, *A. brevigaster* Wei, 1999, *A. geei*, *A. luteiventris*, *A. pagana*, *A. paganiformis*, and *A. xanthogaster*.

In 2018, a specimen of an unrecognised species of *Arge* was collected near Khorog Town (Tajikistan). Subsequently it proved to be conspecific with three other specimens from the collection of the Zoological Institute (St Petersburg), which were collected in the same locality about 90 years ago and labelled by V.V. Gussakovskij as a possibly new species. The features of the sheath and lancet of the saw make it possible to attribute this species to the *Arge ochropus* species-group, although the coloration of the new species distinguishes it from the other members of the group.

In this article, we also provide a new circumscription for the *Arge ochropus* species-group,

based on the examination of the material of different species and analysis of the published data. We also propose an extended diagnosis for this species group. An attempt is made to bring together the views of several authors. In general, we follow the Smith's approach to distinguish the *A. ochropus* species-group primarily based on the structure of the genitalia.

Materials and methods

Specimens were examined using an Olympus SZ61 stereomicroscope. Colour photographs were obtained using an Olympus SZX10 stereomicroscope with an Olympus OM-D E-M1 camera. Image stacking was performed with Helicon Focus 5.0. Images of the genitalia were taken in temporary slides (in glycerol) using a TouPCam 14.0 MP digital camera via a Micromed 3 microscope.

Terminology and abbreviations used for morphological features, sculpture and body measurements follows Viitasaari (2002) and Lacourt (2020). Terminology of sawfly genitalia follows Ross (1945). The names of species and synonyms are given according to Taeger et al. (2010).

The holotype and two paratypes of the new species are deposited at the Zoological Institute of the Russian Academy of Sciences (St Petersburg, Russia; ZISP); one paratype is deposited at the Institute of Systematics and Ecology of Animals of Siberian Branch of Russian Academy of Sciences (Novosibirsk, Russia; ISEA). Labels of the type specimens are cited verbatim, with explanations in given brackets.

For analysis of the diagnostic characters, more than 1000 specimens of 13 species of *Arge* were examined, including *A. altaica* Gussakovskij, 1935 from ISEA collection, *A. xanthogaster* from Deutsches Entomologisches Institut (Müncheberg, Germany; DEI), and the material of other species from ZISP collection.

We examined the material of the following two species from the *A. ochropus* group: *A. carinifrons* Enslin, 1917 (Armenia – 1 specimen, Azerbaijan – 1 specimen, Georgia – 2 specimens, Russian European part – 1 specimen) and *A. ochropus* (Armenia – 4 specimens, Azerbaijan – 26 specimens, Georgia – 9 specimens, Iran – 1 specimen, Kazakhstan – 105 specimens, Kyrgyzstan – 5 specimens, Mongolia – 16 specimens, Poland – 1 specimen, Russia,

European part – 161 specimens, Russia, Siberia – 130 specimens, Tajikistan – 37 specimens, Turkmenistan – 8 specimens, Ukraine – 10 specimens, Uzbekistan – 5 specimens).

We also examined the additional material of the following species from other groups: *A. pagana* – 405 specimens, *A. paganiformis* – 1 specimen, *A. xanthogaster* – 2 specimens, *A. cinnabarina* – 2 specimens (2 syntypes), *A. corallina* – 5 specimens (2 syntypes and 3 non-type specimens), *A. nigronodosa* – 6 specimens, *A. beckeri* Tournier, 1889 – 41 specimens, *A. altaica* – 1 specimen, *A. nigrovaginata* Malaise, 1931 – 42 specimens, *A. sogdiana* Zhelochovtsev, 1976 – 2 specimens, and *A. suspicax* Konow, 1908 – 28 specimens.

The following species were examined based on the original descriptions and illustrations to them: *Arge albocaudalica*, *A. brevigaster*, *A. fumipennis*, *A. geei*, *A. indicura* Shinohara et Hara, 2009, *A. luteiventris*, *A. simlaensis* (Cameron, 1877), and *A. stecki* Benson, 1939.

Results

Order Hymenoptera

Family Argidae

Subfamily Arginae

Genus *Arge* Schrank, 1802

Arge gussakovskiji sp. nov.

(Figs 1A–D, F–H, L, 2A–I, 3A, B, I, J)

Holotype. Tajikistan, Gorno-Badakhshan Prov., “Kala-i-Vamar [Rushon], Tajikistan, E. Luppova [leg.], 12.vii.[19]37”, female (ZISP).

Paratypes. Tajikistan, Gorno-Badakhshan Prov.: “Kala-i-Vamar [Rushon], Z.[apadnyi = West] Pamir, Tajik[istan], E. Luppova [leg.], 1.vii.[19]37”, 1 male (ZISP); “[Tajikistan] k.[ishlak = vill.] Sokhcharv, bl.[iz’ = nr.] Khoroga [Khorog], 28.vi.[19]37, L. [E. Luppova leg.]”, 1 female (ZISP); “Tajikistan, GBAO [Gorno-Badakhshanskaya avtonomnaya oblast’ = Badakhshan Mountainous Autonomous Prov.], Ishkoshim r-n [rayon = Distr.], s.[elo = vill.] Dasht, h-2572 m, 36°40.80’N, 71°41.304’E, 7.09.2018, Isrorova K. [leg.]”, 1 female (ISEA).

Description. *Female* (Figs 1A–D, F–H, L, 3A, B, I). Body length 8.9–9.2 mm; fore wing length 8.7–9.0 mm.

Colour. Head and thorax black without metallic reflection; abdomen yellow, tergites 1–5 with

black spots decreasing in size towards apex; sawsheath completely black, without metallic reflection. Flagellum dark brown to black. Mandible apically reddish. Palpi dark brown to black. All legs black, without metallic reflection, with yellow spurs, pulvilli and claws; hind tibia medially faintly brownish. Wings uniformly infuscate; intercostal cell darkened slightly more strongly than rest of wing; pterostigma and veins black. Setae on head, thorax, legs and sawsheath black; abdomen with yellow setae; wings with blackish setae. Surface generally smooth and polished; punctures on anterior part of head relatively dense, generally separated from each other.

Head. Head behind eyes weakly expanded. Distance between eyes 1.1–1.2 times vertical diameter of eye; eye with vertical diameter 1.7–1.8 times its horizontal diameter. Postocellar area weakly convex, without anterior and lateral furrows. Ocellar area between ocelli and frontal area clearly concave. Distance between median fovea and front ocellus 1.3–1.4 times width of front ocellus. POL 1.1–1.4 times OCL, 1.2–1.5 times OOL. Median fovea not deep. Interantennal carinae sharp, dorsally becoming blunt, roundly curved inward and clearly separated from each other (Fig. 1C) by a wide smooth fossa situated in frontal area, ventrally fused together into small median supraclypeal carina at top of supraclypeal area. Supraclypeal area distinctly convex, without median carina, smooth with distinct individual punctures. Malar space 1.1–1.6 times the width of front ocellus. Clypeus distinctly sunk below supraclypeal carina, then almost flattened ventrally; its ventral margin roundly concaves medially to one half of its length.

Antenna. Antennal length 1.2–1.3 times maximum head width; flagellum slightly compressed, clavate, with a single carina, weakly curved basally and widely rounded at apex.

Thorax. Mesonotum smooth and shiny, with scattered punctures; scutellum flat.

Legs. Middle and hind tibia with preapical spurs; spurs simple.

Wings. In fore wing, cell *1Rs2* with anterior length 1.1 times its posterior length and crossvein *3r-m* strongly angularly curved (Fig. 1F). In both wings, wing margin between veins *Rs* and *Cu* ciliate, without glabrous marginal area. Marginal setae as long as width of vein *M*. Basal and cubital veins converging to same point.

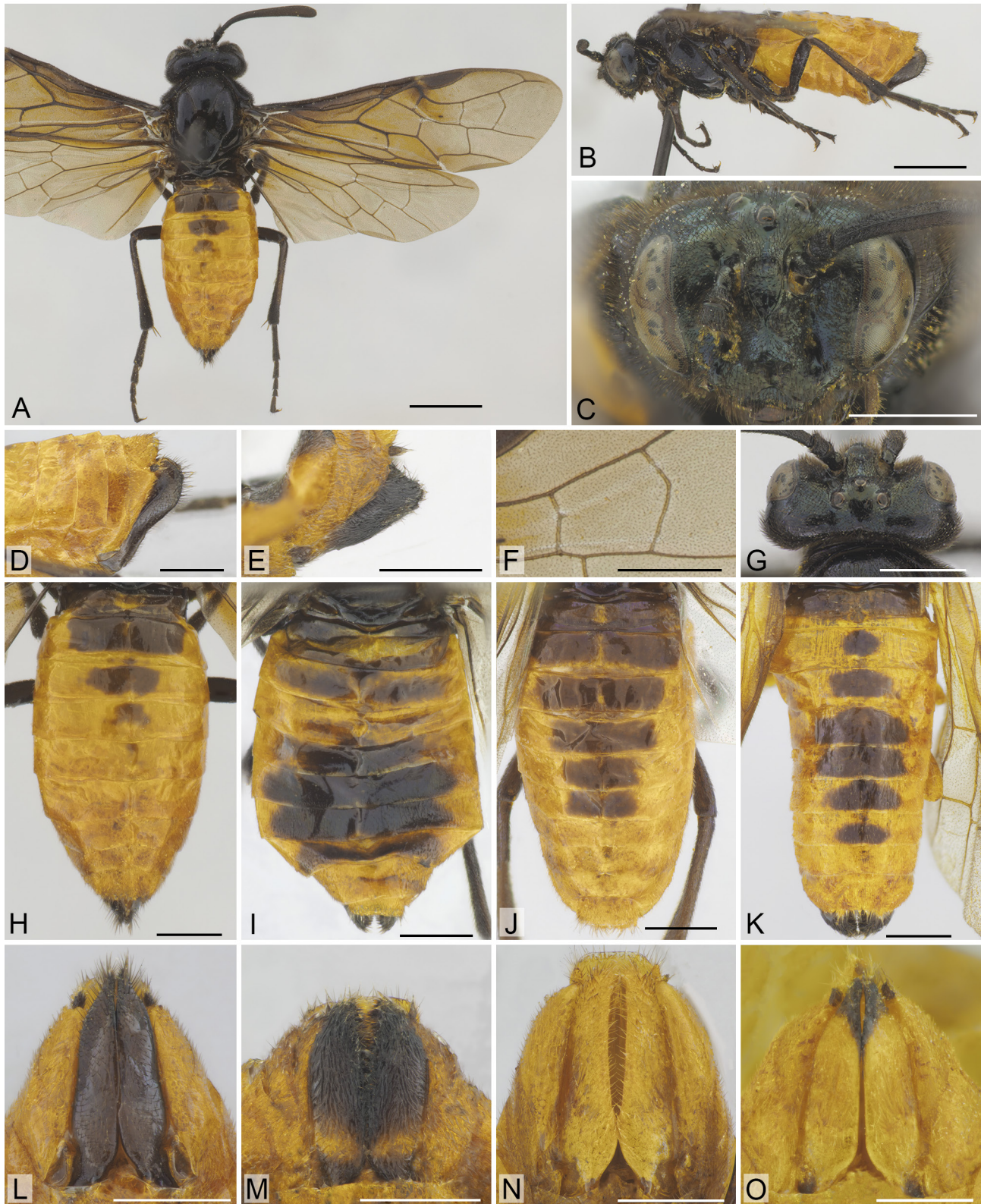


Fig. 1. *Arge* spp., females. **A–D, F–H, L**, *A. gussakovskiji* sp. nov., holotype; **E, I, M**, *A. altaica* Gussakovskij, 1935 (vicinity of Lake Teletskoe, Altai Republic, Russia); **J, N**, *A. xanthogaster* (Cameron, 1876) (Paiwan, Taiwan); **K**, *A. suspicax* Konow, 1908 (southern Primorskiy Territory, Russia); **O**, *A. ochropus* (Gmelin, 1790) (vicinity of Krasnodar, Russia). Habitus, dorsal view (A); habitus, lateral view (B); head, anterior view (C); sawsheath,

Abdomen. Abdomen with terga 1–7 almost glabrous dorsally; subsequent terga setose. Posterior margin of sternum 7 with weakly developed rounded median protrusion. Sawsheath ventrally sharp, articulated at right angles, with long black setae directed backwards; in lateral view, sawsheath incised at base, in middle ventrally convex; apical margin of sawsheath widely rounded; its inner surface smooth. Lance with several linear membranous areas (Fig. 3I) and groups of minute setae along ventral margin; its dorsal margin apically with finely serrate crest, with deep fossa from middle to base and with two carinae at base. Lancet dorsally curved, with concave ventral margin and 15 serrulae (Fig. 3A). Lancet with long, stout, annular spines (ctenidia) most pronounced on annuli 6–12, largest ctenidium exceeding length of annulus. Length of ctenidia sharply decreasing towards ventral margin of lancet. Sparse, small, simple ctenidia present between bases of large annular ctenidia. All annuli nearly straight. Serrulae finely dentate along anterior edge, with short back slope (Fig. 3B).

Male (Figs 2A–I, 3J). Body length 6.7 mm; fore wing length 6.3 mm.

Coloration as in female, but black spots on abdominal tergites reaching tergite 7. Flagellum ventrally brownish yellow. Interantennal carinae dorsally acute and angularly elevated, ventrally fused without supraclypeal carina. Distance between eyes 1.3 times vertical diameter of eye; vertical diameter of eye 1.6 times its horizontal diameter. POL 0.8 times OCL, 1.3 times OOL. Antennal length 1.6 times maximum head width; flagellum with single carina. In fore wing, cell *1Rs2* with anterior length 1.1 times its posterior length. Subgenital plate in ventral view with rounded posterior margin. Genitalia as in Fig. 2G, H; gonostipes narrow. Harpe short, about as long as width at base, widest near base, rounded apically. Valviceps in dorsal view (Fig. 2G) apically angular, expanded with rounded wide lateral lobe at middle; in lateral view (Fig. 3J) with dorsal lobe long and turned at right angle, apex widely rounded, dorsal apodemal projection small and triangular. Ventral lobe with rounded apex clearly directed posteriorly.

lateral view (D–E); fore wing, cell *1Rs2* (F); head, dorsal view (G); abdomen, dorsal view (H–K); sawsheath, ventral view (L–O). Scale bars: 2 mm (A, B), 1 mm (C–O).

Comparison (see also Table 1). In coloration, the male and female of the new species are similar to those of *A. altaica*, *A. indicura*, *A. nigrovaginata*, *A. pagana*, *A. sogdiana*, *A. stecki*, *A. suspicax*, and *A. xanthogaster*, but easily recognised by the narrow and sharp sheath dorsally (Fig. 1L). *Arge gussakovskiji* **sp. nov.** is similar to *A. indicura*, *A. suspicax* and *A. xanthogaster* in having the black spots on tergites but differs from these species in the number and shape of spots (Fig. 1H–K). The new species differs from *A. indicura*, *A. sogdiana*, *A. stecki*, and *A. nigrovaginata* also in the absence of blue metallic sheen on dark parts of the body. Using the key by Gussakovskij (1935), *A. gussakovskiji* **sp. nov.** runs to *A. altaica* but differs from the latter in the large body size, pattern of spots on tergites, and the shape of sawsheath (Fig. 1D, E). Of all these species, only *A. xanthogaster* and *A. pagana* have the lancet with long annular ctenidia (Fig. 3E, G), but they differ from the new species in the shape of teeth (Fig. 3F, H). In the male, the new species differs from the compared species (except for *A. altaica*, with male unknown) in having the valviceps with a ventral lobe bent posteriorly and a long, rounded dorsal lobe (Fig. 3J–M).

Etymology. The new species is named in honour of the well-known Russian hymenopterologist, Vsevolod Vladimirovich Gussakovskij (1904–1948). According to the labels, he examined the holotype and one of the paratypes in 1938 and marked them with a “?” sign, but did not describe this species.

Distribution. Tajikistan.

Host plant. Unknown.

Emended diagnosis of *Arge ochropus* species-group

Species of the *Arge ochropus* group share the following combination of characters: Vertical diameter of eye 1.7–2.0 times its horizontal diameter in female, and 1.3–1.5 in male. Postocellar area weakly convex, with anterior and lateral furrows obscure or absent. Supraclypeal area medially carinate or not carinate. Clypeus usually flattened lateroventrally, with ventral margin more or less

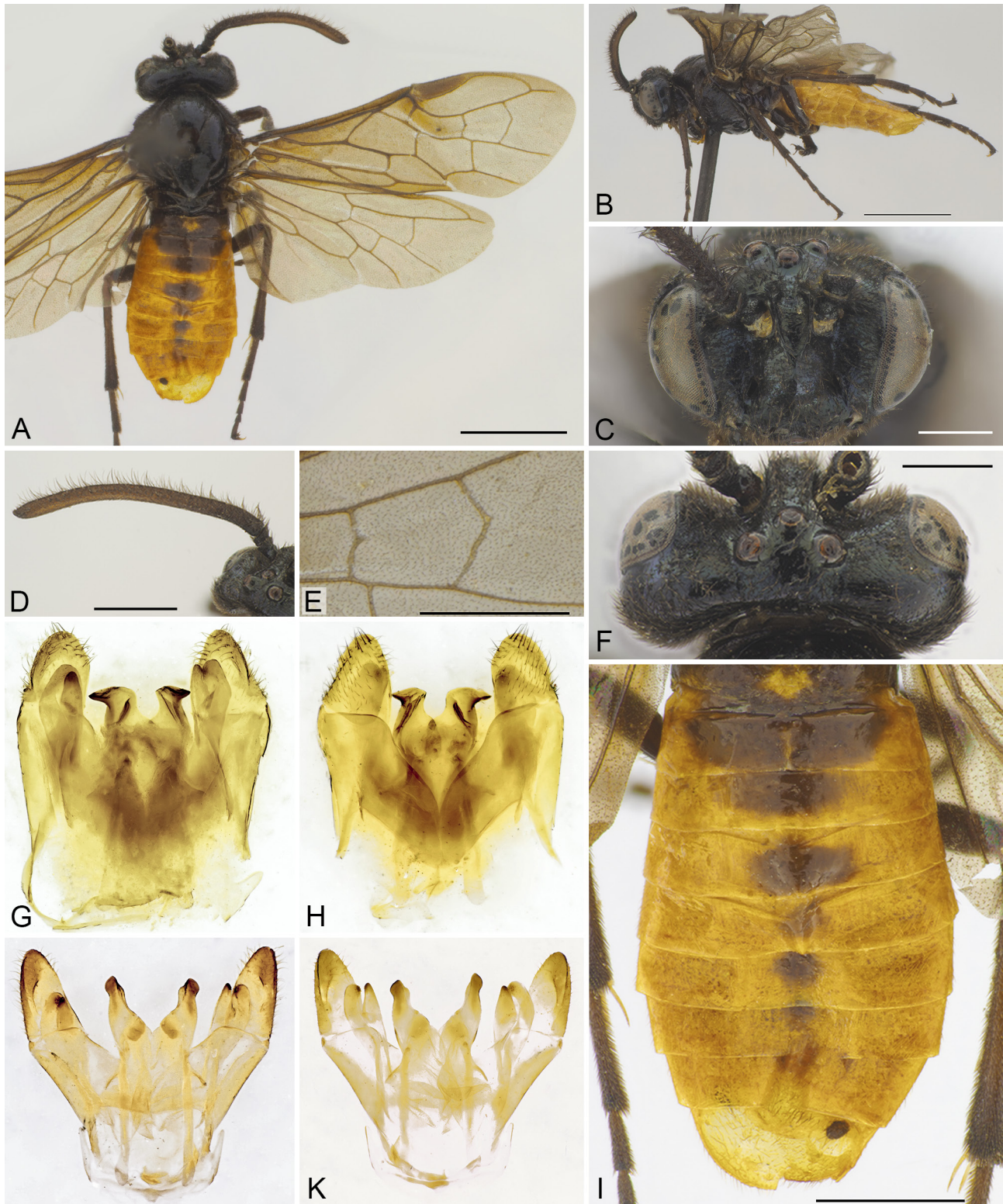


Fig. 2. *Arge* spp., males. A–I, *A. gussakovskiji* sp. nov., paratype; J–K, *A. ochropus* (Gmelin, 1790) (vicinity of Krasnodar, Russia). Habitus, dorsal view (A); habitus, lateral view (B); head, anterior view (C); antenna, dorsal view (D); fore wing, cell *1Rs2* (E); head, dorsal view (F); genital capsule, dorsal view (G, J); genital capsule, ventral view (H, K); abdomen, dorsal view (I). Scale bars: 2.0 mm (A, B), 0.5 mm (C, F), 1 mm (D, E, I).

Table 1. Comparative morphology of species of the genus *Arge* similar to *A. gussakovskiji* sp. nov.

Species	Wings uniformly infusate	Legs completely black	Black spots on tergites	Blue metallic reflection	Sheath narrow and sharp dorsally	Lancet with long annular ctenidia
<i>A. gussakovskiji</i> sp. nov.	+	+	+	–	+	+
<i>A. altaica</i> Gussakovskij, 1935	+	+	+	–	–	–
<i>A. indicura</i> Shinohara et Hara, 2009	+	+	+	+	–	–
<i>A. nigrovaginata</i> Malaise, 1931	+	+	–	+	–	–
<i>A. pagana</i> (Panzer, 1797)	+	+	–	–	–	+
<i>A. sogdiana</i> Zhelochovtsev, 1976	+	+	+	–	–	–
<i>A. stecki</i> Benson, 1939	–	+	+	+	–	–
<i>A. suspicax</i> Konow, 1908	–	–	+	+	–	–
<i>A. xanthogaster</i> (Cameron, 1876)	+	+	+	–	–	+

incised medially (in anterior view). In fore wing, cell *1Rs2* with anterior length exceeding its posterior length; crossvein *3r-m* angularly curved (Fig. 1F). In both wings, wing margin between veins *Rs* and *Cu* ciliate, without glabrous marginal area; marginal setae as long as width of vein *M*.

In female, sawsheath in posterodorsal view very narrow and sharp (Fig. 1H); in lateral view, sawsheath with basal convexity on ventral margin, not indented, convex and broadly rounded at the apex, its inner side not spinose; sawsheath longer than hind femur. Lance with apical crest distinct and weakly serrate on dorsal margin, several narrow membranous parts on middle annuli, groups of minute setae at intervals along ventral margin, and dorsobasally with scale-like sculptures (Fig. 3I). Lancet with long, stout, annular spines (ctenidia) on all annuli except first basal ones (Fig. 3A, C); all annuli nearly straight. Lancet with 15–16 serrulae; distance between first and second serrulae not longer than distance between second and third serrulae. Each serrula finely dentate along its anterior edge, with short back slope. Spiculella absent.

In male, penis valve in dorsal or ventral view rounded apically (Fig. 3J, K). Gonostipes in ventral view tapering towards apex, with apical width about as long as basal width of harpe (Fig. 2H, K). Harpe in ventral view widest near base, roundly narrowing apically. Valviceps short, its apex reaches level of middle of harpe or shorter.

In the general appearance, the members of the *A. ochropus* group are recognised by the follow-

ing combination of characters: head black; thorax black or partly red, without metallic sheen; abdomen completely yellow, with only sheath apically or completely black, and sometimes with a small black spot in centre of tergites in basal half of abdomen; sawsheath strongly compressed laterally and sharp dorsally; setae on mesopleuron black; coloration of legs variable from completely black to red with apices of tibiae and apices of tarsomeres black; wings subhyaline or infusate, costal cell strongly darkened.

Species included. Four species: *A. carinifrons*, *A. gussakovskiji* sp. nov., *A. ochropus*, and *A. simlaensis*.

Notes. Our examination of the material of four species previously attributed to the *A. ochropus* group (*A. fumipennis*, *A. nigronodosa*, *A. cinnabarina*, and *A. corallina*) revealed that these species belong to the *A. xanthogaster* group. Thus, the number of the known species in the *A. xanthogaster* group has increased from seven to eleven (*A. albocaudalica*, *A. brevigaster*, *A. cinnabarina*, *A. corallina*, *A. fumipennis*, *A. geei*, *A. luteiventris*, *A. nigronodosa*, *A. pagana*, *A. paganiformis*, and *A. xanthogaster*).

The *A. nipponensis* species-group includes twelve species and is characterised by coloration similar to the *A. ochropus* group (Wan et al., 2022). The members of the *A. nipponensis* group can be distinguished from those of the *A. ochropus* group by the structure of the genitalia (gonostipes and valve) and, in females, by the lancet without stout annular spines.

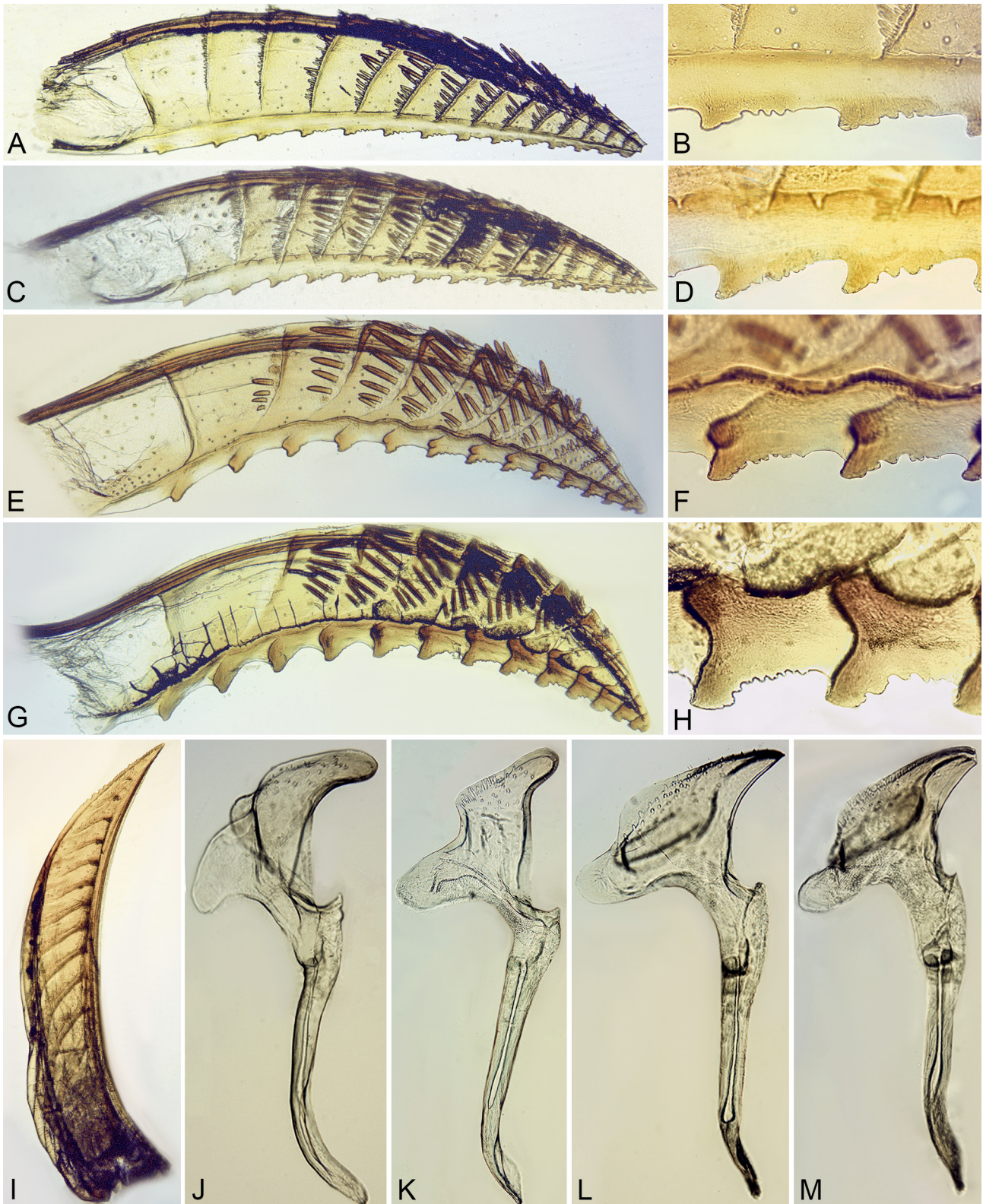


Fig. 3. *Arge* spp. **A, B, I, J,** *A. gussakovskiji* sp. nov., female (**A, B, I**) and male (**J**); **C, D, K,** *A. ochropus* (Gmelin, 1790), female (vicinity of Krasnodar, Russia; **C, D**) and male (vicinity of Krasnodar, Russia; **K**); **E, F, L,** *A. pagana* (Panzer, 1798), female (vicinity of Krasnodar, Russia; **E, F**) and male (vicinity of Krasnodar, Russia; **L**); **G, H, M,** *A. xanthogaster* (Cameron, 1876), female (Paiwan, Taiwan; **G, H**) and male (Paiwan, Taiwan; **M**). Lancet, lateral view (**A, C, E, G**); median serrulae of lancet (**B, D, F, H**); lance, lateral view (**I**); penis valves, lateral view (**J–M**).

Distribution. The members of the *A. ochropus* group are distributed in the Palaearctic, especially in the south: *A. carinifrons* is known from the Caucasus, *A. gussakovskiji* sp. nov., from Tajikistan, *A. simlaensis*, from Pakistan and India, and *A. ochropus* occurs throughout the Palaearctic, including its northern parts.

Partial key to species groups of the genus *Arge*

1. Sheath slender (in posterodorsal view) (Fig. 1H, J); lancet with long, stout, annular spines (Fig. 3A, C, E, G); male genitalia with gonostipes narrow and penis valve broad and flat at apex (Fig. 3J–M). 2
- Sheath broad (in posterodorsal view) (Fig. 1L, K); lancet without stout annular spines; male genitalia with differently-shaped gonostipes and penis valve **other groups**
2. Sawsheath (in ventral view) sharply tapered towards the pointed apex (Fig. 1L, O). Lancet slightly curved dorsally, with simple serrulae (Fig. 3A–D); in males, valviceps rounded at apex (in lateral view) (Fig. 3J–K). ***A. ochropus* group**
- Sawsheath subparallel (in ventral view), weakly tapering towards the flat and blunt apex (Fig. 1N). Lancet strongly curved dorsally, with spiculella (voluminous double serrulae) (Fig. 3E–H); in males valviceps, pointed at apex (in lateral view) (Fig. 3L–M) ***A. xanthogaster* group**

Note. Here, we do not provide a key to the other species groups proposed by Smith (1989). Recently, new species groups have been designated by different authors (Hara & Shinohara, 2008, 2014; Yan et al., 2009), splitting the existing groups, but their circumscription and the characters suitable for their identification have not been adequately formulated. Therefore, developing a key to the remaining species groups will require an extensive further research based on a detailed study of each group.

Key to the Palaearctic species of the *Arge ochropus* species-group

1. Some of abdominal tergites yellow with distinct black spots in centre; sawsheath black (Fig. 1L). ***A. gussakovskiji* sp. nov.**
- Abdominal tergites completely yellow; sawsheath yellow, only sometimes its apex black (Fig. 1N–O) 2
2. Costal cell of fore wing only faintly darkened, almost indistinguishable from rest of wing. All veins brownish black ***A. simlaensis***
- Costal cell of fore wing strongly darkened, contrast-

- ing with rest of wing. Pterostigma, costal and subcostal veins black, other veins yellow 3
3. Flagellum of antenna black, but sometimes partly or even completely red. Ventral margin of clypeus with a deep notch, without median carina. ***A. ochropus***
 - Flagellum mainly red, darkened at base and apex. Ventral margin of clypeus with a weak notch and clear median carina ***A. carinifrons***

Discussion

The subgeneric classification in the large genus *Arge* is poorly developed for the Palaearctic in contrast to the species of the Western Hemisphere (both Americas) (Smith, 1989). Most of the Palaearctic species are not mentioned in the key to species groups proposed by Smith (1989). On the other hand, species groups based on coloration and used for the Palaearctic (Ermolenko, 1975) are rather doubtful. Different authors (Ermolenko, 1975; Smith, 1989; Hara & Shinohara, 2008, 2014; Yan et al., 2009; Wan et al., 2022) considered the composition of such species groups differently and proposed numerous small species complexes, which often overlap.

The new species described here demonstrates very clearly that coloration should not serve as the most important character in defining species groups within *Arge*, and that progress towards understanding the Palaearctic groups must include a study of the genital structures of both sexes. The new species should undoubtedly be assigned to the *A. ochropus* group sensu Smith (1989) according to the shape of the sheath (Fig. 1L, N, O) and the structures of the female saw (Fig. 3A–H), as well as to the characters of the male genitalia (Fig. 3J–M). In the classification to species groups by Ermolenko (1975), his group “Ochropusformis” (*A. ochropus* group sensu Ermolenko) includes *A. ochropus*, *A. pyreneica* André, 1879 (now synonymised with *A. ochropus*) and *A. beckeri*. Following his classification, the rare southern species *A. carinifrons*, which is similar to *A. ochropus* in colour, should belong to the same group. However, the colour pattern of *A. gussakovskiji* sp. nov. does not fit this group and is rather similar to the *A. pagana* species-group (“Paganiformis”) of Ermolenko (1975) or the *A. xanthogaster* species-group of Yan et al. (2009). Summarising, morphological features of the genital structures in

both sexes of *A. gussakovskiji* sp. nov. show its relationships with the *A. ochropus* species-group sensu novo, although in coloration it is far from the *A. ochropus* group sensu Ermolenko (1975) but is close to the *A. xanthogaster* group. Thus, once again the need is shown for developing a well-founded system of species groups for the Palaearctic and Oriental species of *Arge*.

Acknowledgements

The authors thank A. Taeger (Eberswalde, Germany) and S.A. Belokobylskij (ZISP, St Petersburg, Russia) for their help and patient support. We thank A. Liston (Müncheberg, Germany), M. Prous (Tartu, Estonia) and Yu. Sundukov (Vladivostok, Russia) for their very useful comments and language improvement of the manuscript. This work was based on the taxonomic collection of ZISP and was partially funded by the State Research Project No. 122031100272-3 for S.A. Basov.

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Received 25 February 2024 / Accepted 19 April 2024. Editorial responsibility: M.Yu. Proshchalykin & A.A. Przhiborova