

A new species of *Kamimuria* (Plecoptera, Perlidae) from the Russian Far East

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Abstract

A new species of *Kamimuria*, *K. lyubaretsi* (Plecoptera, Perlidae) from the Russian Far East is described and illustrated for the first time. The description includes all life stages and both sexes. Distributional data are presented.

Key words: Plecoptera, Perlidae, *Kamimuria*, Russian Far East, new species

Introduction

Kamimuria Klapálek is a genus widespread in the East Palaearctic and Oriental Regions. The number of species is still unknown, and the type material of many species is lost. The diagnostic characters of *Kamimuria* as presently understood were described by Sivec *et al.* (1988). Their intensive study of the type material of the named species of Perlini in the collections of F. Wu and Y. T. Chu in the Zoological Institute, Academia Sinica, recognized 25 valid *Kamimuria* species. The genus is particularly diverse in China where 19 species were recorded from the Western mountainous subregion (Du *et al.* 1999). Three species inhabit Japan (Kawai & Isobe 1985, Uchida & Isobe 1991). At least three species occur in Himalayan streams (Harper 1976) and two species are known from Siberia and the Russian Far East (Zhiltzova & Levanidova 1984). *Kamimuria lyubaretsi*, new species, is described based on both sexes and all life stages.

Material and methods

Mature nymphs of *K. lyubaretsi* were collected in the Krounovka River on June 19, 2004 and transported to the laboratory in plastic boxes containing wet moss. Boxes were kept in

a refrigerator at 6–8°C at night and in the laboratory at room temperature at 22–24°C during the day. The first reared imagoes emerged June 21, 2004 and mated. Egg masses were extruded the day after copulation.

The aedeagus was everted by gently squeezing live males between fingers just before preservation. Male and female external genitalia were illustrated after KOH treatment. Aedeagus structure was described according to terminology after Sivec *et al.* (1988).

A few egg masses were incubated beginning July 22, 2004. They were kept in 5 ml glass vials with clean stream water. An attempt to simulate field conditions was made by keeping eggs during summer at room temperature during the day, but in a refrigerator at night. During winter, eggs were continuously incubated at 6–8°C. In spring, the eggs were again kept at room temperature during the day and refrigerated at 6–8°C at night. Vials remained at room temperature at 18–20°C for 90 days before first instar larvae hatched on May 17, 2005.

Eggs were placed in 95% ethanol, hand cleaned with forceps, air dried and fixed on specimen stubs with double-sided tape. Specimens were gold coated before examination with a LEO-430 scanning electron microscope.

Adults and larvae were preserved in 75% ethanol and deposited in the Institute of Biology and Soil Sciences, Far Eastern Branch, Russian Academy of Sciences, Vladivostok.

***Kamimuria lyubaretsi* Teslenko sp. n.**

(Figs. 1–13)

Description. Adults triocellate and macropterous. General body color yellowish-brown. Male abdominal sternites 1–4 and 7 simple, well developed hairbrushes on sternites 5 and 6; in female, well pronounced hairbrushes on 5, 6 and 7 abdominal sternites. Head (Fig. 1) pale with dark brown ocellar rectangle, slightly expanded along anterior margins near callosities, interior of ocellar area paler; epicranial suture darkened; pale M-line between compound eyes, a light brown triangle anterior to M-line. Antennae, palpi and legs light brown, cerci pale. Pronotum (Fig. 1) pale with a narrow median pale band, rugosities brownish, anterior corners and lateral pronotal margins dark. Meso- and metascuta with three large, rounded, heavily sclerotized, dark brown spots. Wings transparent, veins brown.

Male. Forewing length 14.2–17.5 mm. Tergites 8 and 9 mesally covered with sensilla basiconica (Fig. 2). The remnant of the epiproct (Fig. 2) consists of a pair of weak sclerites and a median membranous swelling. Hemitergites (Fig. 3) simple, short, finger-like, sparsely covered with long setae and sensilla basiconica apically and medially on posterior edge. Aedeagus (Figs. 4 & 5) with oval membranous basal envelope. Tube weakly sclerotized, with poorly developed, small, flat sclerites; 7 small, brown spines arise near ventral tip of the tube, central spines a little larger than others. Sac membranous, short,

round apically and bearing a pair of long brown heavily sclerotized spines ventrolaterally.

Female. Forewing length 18.7–20.8 mm. Subgenital plate (Fig. 6) wide and weakly produced over basal third of sternite 9. Sternites 6–8 with dark, mesal, T-shaped band. Sternite 9 (Fig. 6) with medial pale area. Vagina (Fig. 7) membranous, accessory glands absent; spermathecal stalk short; spermatheca resembling a large sac.

Eggs. Length 440 μm , width at equator 320 μm ; collar short but wide, with ribs on the sides (Fig. 10); anchor mushroom-shaped with long pedicel. Chorionic sculpturing in the form of puncture-like follicle cell impressions, impressions have equal depth on the equator and poles (Figs. 11 & 12).

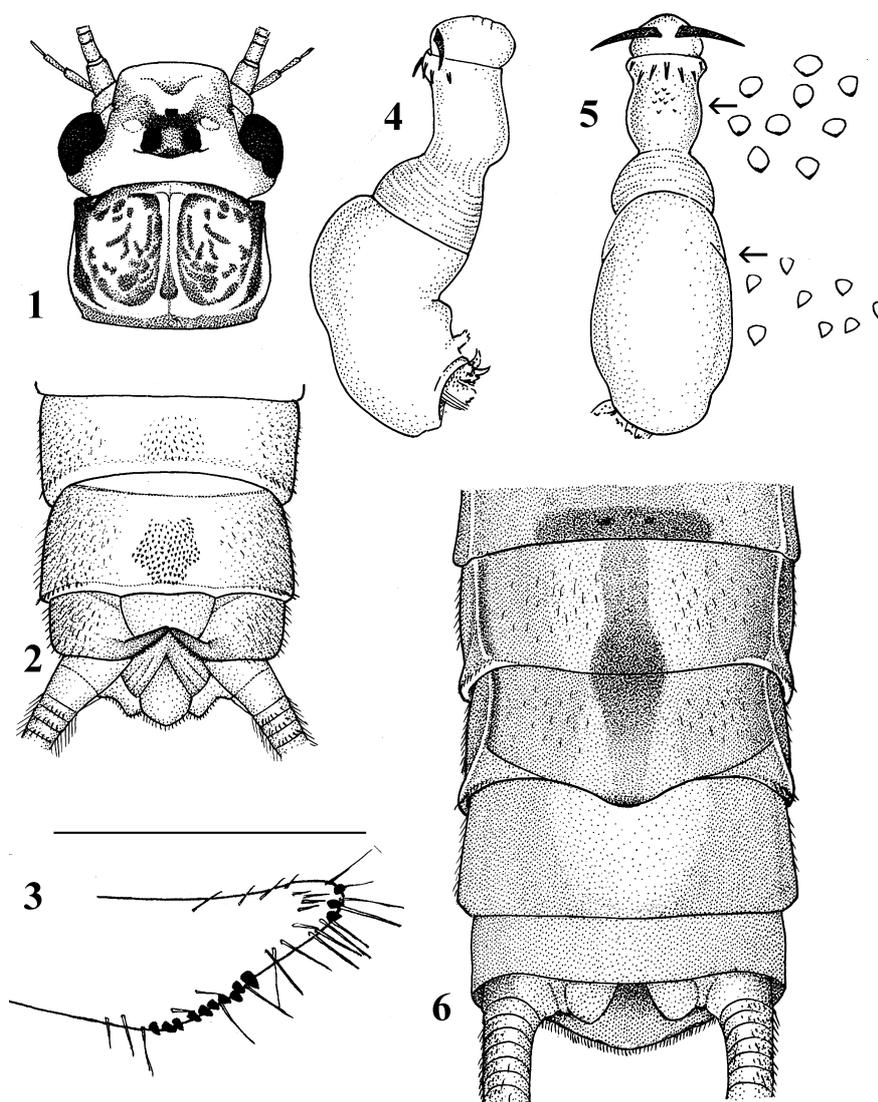


FIGURE 1–6. *Kamimuria lyubarezi* sp. nov.: 1. Adult head pattern. 2. Terminal abdominal segments of male, dorsal. 3. Left hemitergum, lateral. 4. Aedeagus, lateral. 5. Aedeagus, ventral, 6. Female genital plate. Scale (mm): 3 = 0.5.

First instar larvae. Body length (mean \pm SD) 1064 ± 43 μm ($n=9$), head capsule width across compound eyes 235 ± 12 μm . Antennae nine-segmented, cerci three-segmented with the last segment only with fine apical sensilla, not setae (Fig. 8). Thoracic gills absent. Tarsi are three-segmented, the eyes have several ommatidia. A few short setae occur on the occiput, longer setae along the thoracic margins and along posterior margins of the abdominal segments.

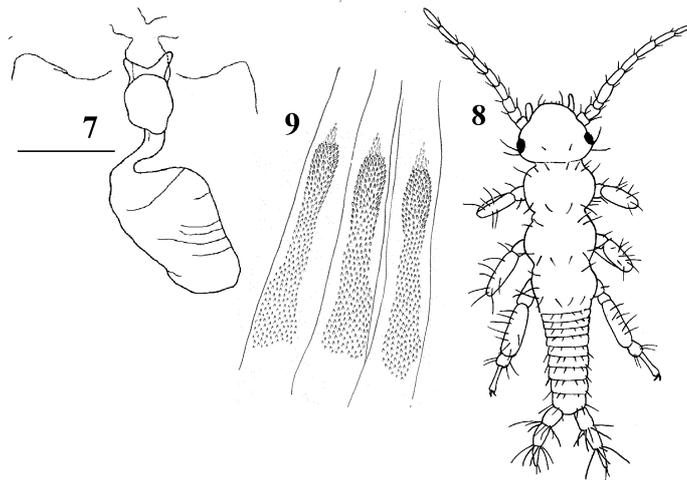


FIGURE 7–9. *Kamimuria lyubarezi* sp. nov: 7. Female genitalia, vagina, spermathecum. 8. First instar larva. 9. Proventricular bands. Scale (mm): 7, 8 = 0.5.

Larvae. Length of mature male nymphs (excluding cerci) 12.5–13.5 mm ($n=7$), female 17.3–19.0 mm ($n=5$); cerci of males 11.0–11.5; cerci of female 13.0 mm. General body color pale brown with contrasting pale and brown pattern on dorsum of head and thorax (Fig. 13). Occiput with a few long hairs between epicranial arm and complete transverse occipital ridge.

Head (Fig. 13) with brown area delimited by epicranial arms, M-line and T-shaped spot forward of anterior ocellus pale; interocellar area brown with a small, paler, rounded spot; three pairs of pale spots aligned anterior of epicranial arms; occiput pale.

Pronotum (Fig. 13) dark brown on lateral pronotal fields and on anterior and posterior margins, lateral margins pale, median band brownish; disk with contrasting pale rugosities; lateral pronotal fringe complete, consisting of mixed long and short setae. Meso- and metanotum (Fig. 13) with pair of anteromedial pale patches, interrupted by brown mesal band anteriorly; a pale spot posteromedially; wingpad bases pale, covered with thick setae anterolaterally; two rows long, sparse, mesal hairs arranged along ecdysial suture, may be more pronounced in younger larvae. Proventriculus with only major, longitudinal bands (Fig. 9), armed with up to 12 acanthae at base, 7 near midlength, and 10–12 near rounded swollen apex. Those at apex more heavily sclerotized than elsewhere. Legs covered with black clothing hairs. Tibia and tarsi unicolorous, pale, femora with

brownish band anterodorsally; femora and tibia covered with short red setae, especially along dorsal and ventral margins, and fringed with silky swimming hairs along dorsal margins.

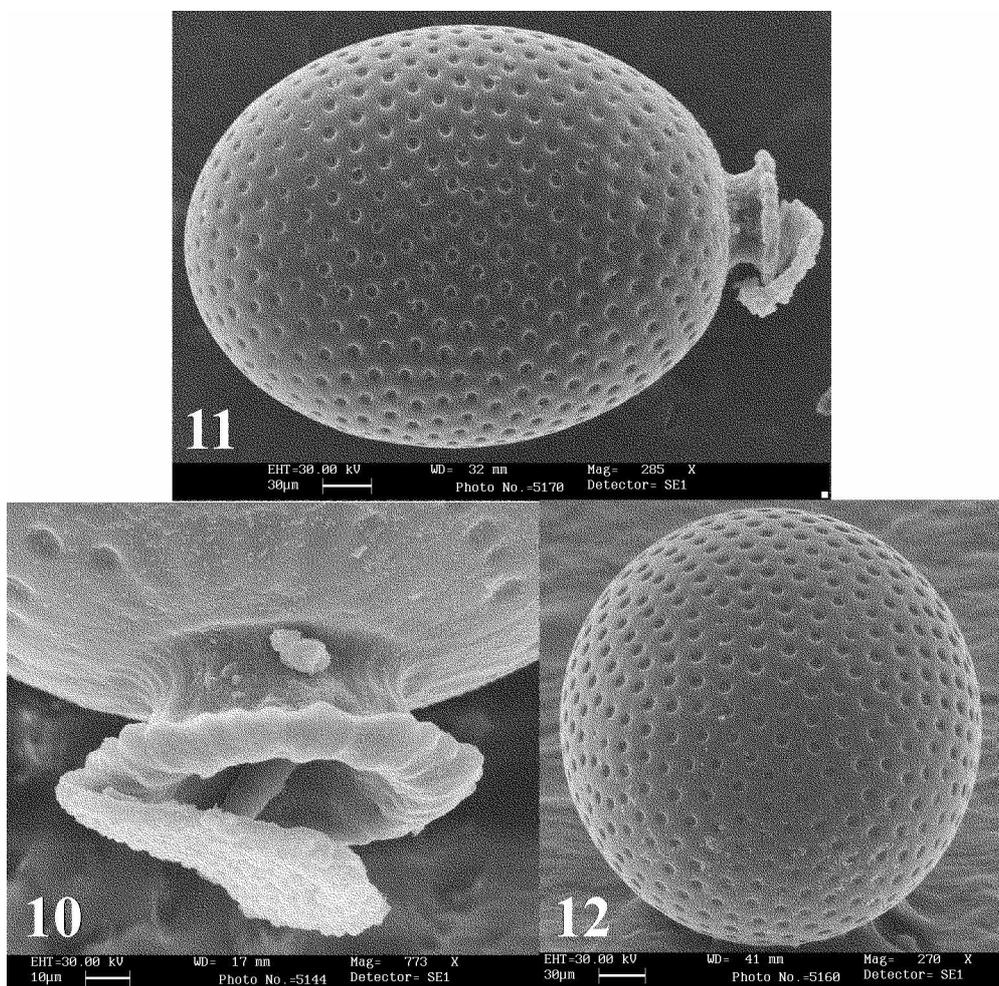


FIGURE 10–12. *Kamimuria lyubarezi* sp. nov.: 10. Anchor and pedicel of egg. 11. Egg, lateral. 12. Pole of egg.

Abdominal terga unicolorous, brown (Fig. 13), covered with black clothing hairs and sparse intercalary setae; male abdominal sternites pale, female abdominal sternites 9 and 10 light brown; posterior tergal margins with fringe of stout, red setae and sparse long, fine setae; sparse mesal row of long black hairs pronounced on 7–10 abdominal terga. Cerci pale with ventral fringe of long, silky swimming hairs (Fig. 13) most numerous on basal segments. Anal gills absent.

Material examined: Holotype, male. Russia. Primorsky Region, Krounovka River, Razdolnaya River Basin (43°41.8129'N 131°36.5019'E), collected 19.VII.2004, reared, 21.VII.2004, V. Teslenko. Paratypes: 10 males, 6 females, reared, same place,

21–25.VII.2004; 12 larvae, same place, 19.VII.2004; female, Medvediza Stream, Krounovka River Basin, Razdolnaya River Basin (43° 33.7319'N 131° 27.8002'E), 14.VIII.2002, T. Tiunova; female, Kievka River Basin, near Laso settlement (43° 22.9126'N 133° 55.0280'E), 24.VII.2005, S. Storozhenko.

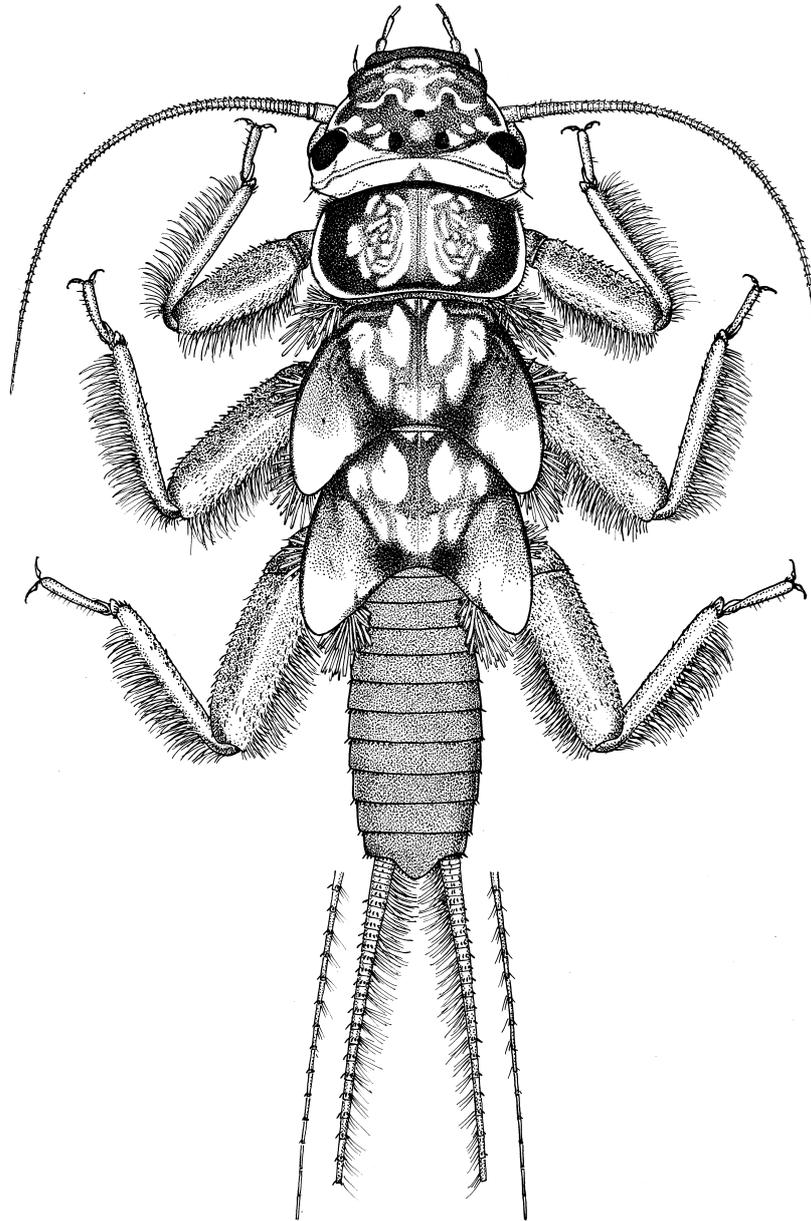


FIGURE 13. *Kamimuria lyubaretsi* sp. nov., larval, habitus.

Distribution. This species was found in the southern Primorsky Region, mostly in the East Manchurian Mountains in the Krounovka River, Razdolnaya River Basin. The headwaters of the Razdolnaya River are situated in the East Manchurian Mountains, in

China. Probably the distribution of *K. lyubaretzi* is not restricted to the Russian part of the Razdolnaya River Basin, but this requires confirmation.

Remarks. The male of *K. lyubaretzi* is similar to *K. exilis* (McLachlan), *K. tibialis* (Pictet), *K. senticosa* Harper, and *K. himalayana* Harper in external genital features (Harper 1976, Zhiltzova & Zapekina-Dulkeit 1986, Uchida & Isobe 1991). The new species has 7 small spines ventrally near the tip of the tube (Figs. 4 & 5) and a pair of longer spines ventrally on the sac (Figs. 4 & 5). These spines are lacking on tubes and sacs of *K. senticosa*, *K. himalayana*, *K. crocea* Harper, *K. tibialis* and *K. uenoi* Konho whose aedeagal armature have been illustrated by Harper (1976) and Uchida & Isobe (1991). How the male of *K. lyubaretzi* differs from the male of *K. exilis* is still unknown, because the aedeagus of *K. exilis* has not been described. According to preliminary examinations, the aedeagus of *K. exilis* has a few small and longer spines, which suggests similarity with *K. lyubaretzi*. To confirm or disprove this suggestion a study of the internal genital features of *K. exilis* should be carried out. The female genital plate of *K. lyubaretze* is wider than in the other species mentioned, and has no medial notch. The other *Kamimuria* species have a notched plate.

Eggs of *Kamimuria lyubaretzi* sp. n. remind one of the eggs of *K. uenoi*, but differ in depth of impressions on the chorion: chorionic impressions of *K. uenoi* are of variable depth and always deeper on the equator than on the poles (Uchida & Isobe 1991). The depth of impressions on *K. lyubaretzi* eggs is the same from the equator to the poles (Figs. 11 & 12). The eggs of other *Kamimuria* species are unknown. Larvae of the new species differ from that illustrated for *K. tibialis*, *K. uenoi* and *K. exilis* (Teslenko & Zhiltzova 1989) in that they lack the pale, T-shaped spot forward of the anterior ocellus (Fig. 13).

Etymology. The species is named after Valeriy Lyubaretz, who collected stoneflies in remote Far Eastern Russian rivers and streams during 15 years.

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