

A New Species of the Stonefly Genus *Alloperla* Banks (Plecoptera, Chloroperlidae) from the Southern Far East

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Abstract—The adults of both sexes and the eggs of a new species, *Alloperla tiunovae* sp. n. (Plecoptera, Chloroperlidae) from the southern part of the Russian Far East, are described and illustrated. *A. tiunovae* is a sibling species of the very similar *A. kurilensis* Zhiltzova, but differs from it in the shape of the epiproct apex, female genital plate, and a fine structure of the chorion surface.

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The species of the genus *Alloperla* Banks, 1906, family Chloroperlidae, are widely distributed in the Nearctic and Eastern Palaearctic Regions. The Nearctic fauna of the genus includes 29 species (Stewart and Stark, 2002). Ten taxa are distributed in the Eastern Palaearctics, including Mongolia, Northeastern China, the Korean Peninsula, and Japan (Zhiltzova and Levandova, 1984; Kim et al., 1998; Zhiltzova and Varykhanova, 1988). More than half of these species inhabit the mountain and foothill streams of the Russian Far East: *A. deminuta* Zapekina-Dulkeit, 1970; *A. mediata* (Navás, 1925); *A. rostellata* (Klapálek, 1923); *A. kurentzovi* Zhiltzova et Zapekina-Dulkeit, 1977; *A. kurilensis* Zhiltzova, 1978; and *A. joosti* Zwick, 1972. The species *A. picta* Zwick, 1973 is known from the Korean Peninsula (Zwick, 1973). In Japan, three more undescribed species have been found (Zhimizu, pers. comm.). A new species of the genus *Alloperla*, collected from Primorskii Territory, in the Komissarovka River running from the spurs of the East-Manchurian Mountains to Lake Khanka, is described in the present paper.

The holotype and paratypes are fixed in 75% ethanol and deposited in the collection of the Institute of Biology and Soil Sciences, Far Eastern Branch of the Russian Academy of Sciences, Vladivostok (IBSS).

Male and female genitalia were sketched after treatment in KOH. Eggs were cleared with pincers in 95% ethanol, then dried, fixed on double sticky paper, and sprayed with gold before examination by means of a LEO-430 scanning electronic microscope.

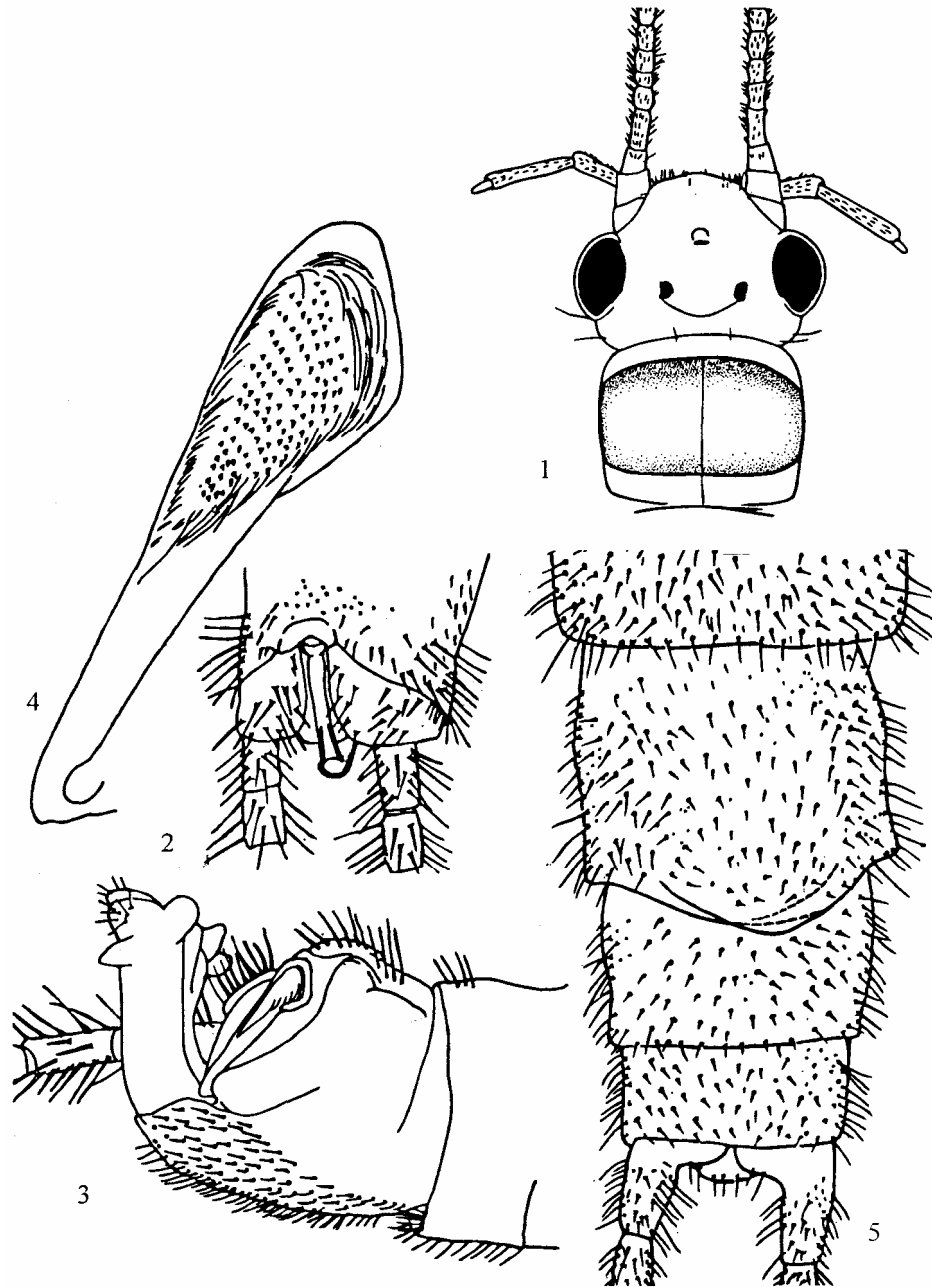
Alloperla tiunovae Teslenko, sp. n.

Material. Holotype: ♂, Far East, Primorskii Territory, Komissarovka River, Komissarovo Vill.,

28.V.1998, T.M. Tiunova. Paratypes: 2 ♂, 7 ♀, Far East, Primorskii Territory, Komissarovka River, near Komissarovo Vill., 28.V.1998, T.M. Tiunova.

Description. Body rather small, pale, weakly sclerotized; body length 4.5–4.8 mm in males, 5.5–6.5 mm in females; length of fore wing 5.0–5.3 mm in males, 5.8–7.0 mm in females; wingspan 10.5–11.0 mm in males, 12–15 mm in females. Body and legs pale yellow, head with dark eyes and ocelli (Fig. 1); palpi pale yellow; antennae brown, except for several basal segments. Arcs of prescutum, prealary bridge, U-shaped lines on meso- and metanotum, and also tarsi, all brownish. Wings hyaline, with colorless veins. Abdominal tergites I–IX with narrow, pale brown stripe more distinct in females. Cerci yellowish, short, 9-segmented.

Male (Figs. 2–4). Abdominal tergite IX slightly elevated along posterior margin, with small emargination medially and 2 small, rounded, weakly sclerotized projections at sides of emargination (Fig. 2); in lateral view, abdominal sternites VIII and IX with tufts of pale setae along posterior margins (Fig. 3). Posterior margin of sternite IX elongate, covered with denser and shorter setae (Fig. 3). Tergite X split medially into 2 hemitergites with attenuate and obtusely rounded posterior margins (Fig. 3). Sides of hemitergites with tufts of pale setae dorsally. Epiproct pale brown, moderately sclerotized, sitting on rounded membranous base (Fig. 2), dorsally narrow, long, slightly widened at base, widened and rounded at apex. In lateral view, epiproct very narrow at base, sharply widened toward apex (Fig. 4). Apex of epiproct separate, wide, slanting backward, and obtusely rounded (Fig. 4). Narrow basal part of epiproct connected with sclerotized stripe



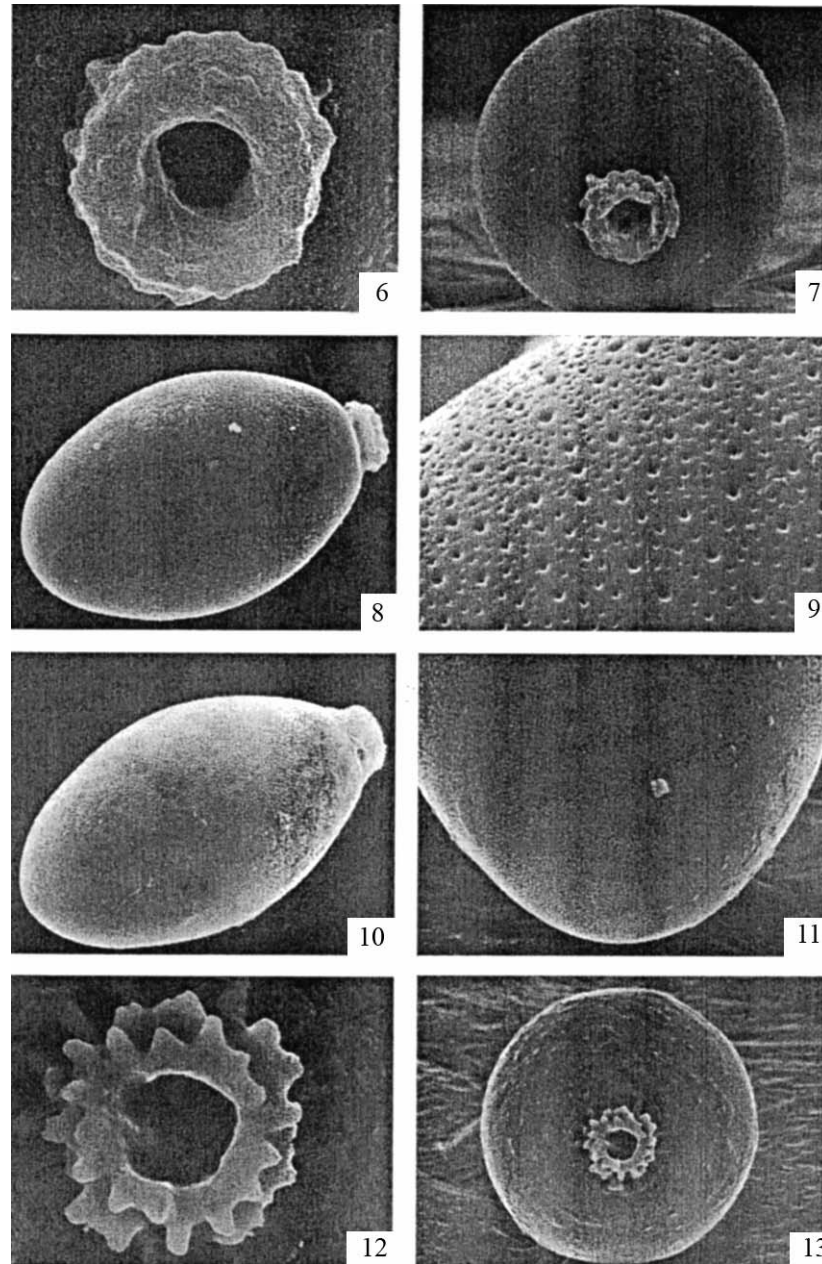
Figs. 1–5. *Alloperla tiunovae* sp. n.: (1) head and pronotum; (2) end of male abdomen, dorsal view; (3) end of male abdomen, dorsal view, with penis laterally; (4) epiproct of male, lateral view; (5) end of female abdomen, ventral view.

which horizontally laying in depression of tergite IX and terminating with heavily sclerotized, scapiform anchor. Penis (Fig. 3) in form of 2 symmetrical lobes, each lobe bearing 1 rounded dorsal, and slightly pointed ventral lobe. Apex of penis split into 2 obtusely pointed lobes covered with several short, fine, colorless setae.

Female (Fig. 5). Abdominal sternite VIII arcuately elongate posteriorly, with wide rounded and slightly pointed medial projection.

Eggs oval (Fig. 8); collar (Fig. 7) short and wide, its base with several sparse vertical lines; surface of anchor plate with sparse spherical structures (Fig. 6). Surface of chorion with puncture-shaped depressions varying in size and depth and distributed confusedly but uniformly from poles to equator (Fig. 9).

Etymology. The species is named after Tatyana Mikhailovna Tiunova, a well-known ephemeropterologist.



Figs. 6–13. *Alloverla* Banks, egg: (6–9) *A. tiunovae* sp. n. [(6) surface of anchor plate; (7) collar; (8) egg, lateral view; (9) surface of chorion]; (10–13) *A. kurilensis* [(10) egg, lateral view; (11) surface of chorion; (12) surface of anchor plate; (13) collar.

Distribution. The southern Far East of Russia, spurs of the East-Manchurian Mountains. As the East-Manchurian Mts. are situated at the border with North-eastern China, this species may well be found in the streams of China.

Comparative diagnosis. The continental species *Alloverla tiunovae* sp. n. is habitually similar to the insular *A. kurilensis* Zhiltzova (Zhiltzova, 1978) distributed in streams of the southern part of Kunashir (Southern Kuril Islands) and Hokkaido (Japan) is-

lands. *A. tiunovae* sp. n. and *A. kurilensis* seem to be sibling species diverged under the conditions of geographical isolation of the Kuril Islands and the continental coast of the Sea of Japan. *A. tiunovae* sp. n. differs from *A. kurilensis* in the shape of the male epiproct gradually widening from the narrow basal part to the apex (Zhiltzova, 1978). The epiproct apex of *A. tiunovae* sp. n. forms a separate wide part laterally, the body of the epiproct sharply narrows toward its base. The genital plate of the female of *A. tiunovae*

sp. n. is widely rounded, without the marked triangular projection typical of the female of *A. kurilensis*. The structure of the surface of eggs of *A. tiunovae* sp. n. differs in the chaotic alternation of depressions varying in size and depth. The depressions on the surface of eggs of *A. kurilensis* are shallow and similar in size and depth (Figs. 10–13).

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