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Zapada Ricker, 1952 — a genus of Nemourinae (Plecoptera: Nemouridae) new for Asia

Zapada Ricker, 1952 — новый для Азии род веснянок подсемейства Nemourinae (Plecoptera: Nemouridae)

L.A. Zhiltzova*, V.A. Teslenko**
Л.А. Жильцова*, В.А. Тесленко**

*Zoological Institute, Russian Academy of Sciences, St. Petersburg 199034 Russia.
*Зоологический институт Российской Академии Наук, Университетская набережная, 1, Санкт-Петербург 199034 Россия.
**Institute of Biology and Soil Sciences, Far East Branch, Russian Academy of Sciences, Vladivostok 690022 Russia.
**Биолого-почвенный институт Дальневосточного отделения Российской Академии Наук, Владивосток 690022 Россия.

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КЛЮЧЕВЫЕ СЛОВА: веснянки, Nemouridae, Zapada, Азия.

ABSTRACT: *Amphinemura quadribranchiata* Zhiltzova, 1977, is transferred in the genus *Zapada* Ricker, 1952, so far unknown from Asia. Nymph of *Zapada quadribranchiata* is described.

РЕЗЮМЕ: *Amphinemura quadribranchiata* Zhiltzova, 1977 перенесена в род *Zapada* Ricker, 1952, который до сих пор не был известен в Азии. Описана личинка *Zapada quadribranchiata*.

Introduction

Zhiltzova [1977] described *Amphinemura quadribranchiata* basing on characters of male and female genitalia. Peculiarity of the species, combining features of the genera *Amphinemura* Ris, 1902 and *Nemoura* Latreille, 1796 was already noted in the original description.

The shape of male paraprocts and that of female pregenital plate were related to the features of *Nemoura*, while the presence of cervical gills, simple cerci of male, and structure of epiproct — to those of *Amphinemura*. It was also pointed out that the two simple cervical gills on either side of cervix of *A. quadribranchiata* are not characteristic of *Amphinemura*, whose cervical gills are highly branched. Zhiltzova [1977] emphasized that *A. quadribranchiata* is an isolated species among other species of *Amphinemura*.

The authors have compared *A. quadribranchiata* with the diagnostic characters of the genus *Zapada* Ricker, 1952 in the paper by Baumann [1975] devoted to revision of the world fauna of Nemouridae. The comparison has shown clear distinction between *A. quadribranchiata* and the type species of *Zapada*, *Z. haysi* Ricker, in the structure of male and female genitalia, as well as in the nymph body shape, as designated by Ricker [1952]. It was only the structure of cervical gills that appeared to be unquestionably similar. All the above did not inspire confidence to relate the given species to *Zapada*. Similarity between *A. quadribranchiata* and North-American species *Z. frigida* (Claassen, 1923) in epiproct structure and nymph body shape was ascertained by V. Teslenko during the examination of the collection of Prof. Dr. P. Zwick at the Limnologishe Flussstation des Max-Plank-Instituts für Limnologie in Schlitz. Comparison of *A. quadribranchiata* with male figures of North-American *Zapada* [Baumann et al., 1977] has shown close resemblance of the former to *Z. cinctipes* (Banks, 1897) in male characters, a fact showing unequivocally that *A. quadribranchiata* should be referred to the genus *Zapada* Ricker, 1952 and, therefore, named *Zapada quadribranchiata* (Zhiltzova, 1977) **comb.n.**

A representative of the genus *Zapada* is first recorded for Asia. The genus was previously known for western regions of North America, exclusively. In addition to *Zapada*, three genera of the family Nemouridae namely *Nemoura*, *Amphinemura*, and *Podmosta* Ricker, 1952, are common to North America and Asia.

Material and terminology

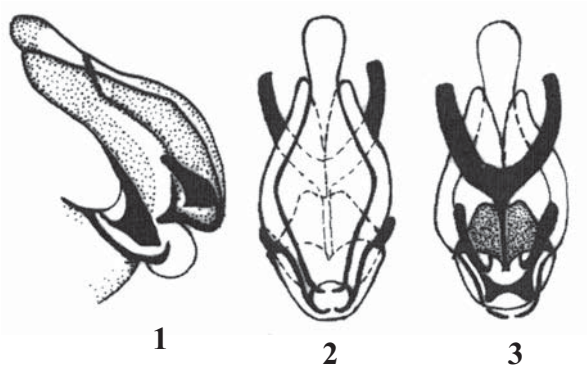
The general terminology follows Baumann [1975]. The examined material is deposited at the Zoological Institute, Russian Academy of Sciences and at the Institute of Biology and Soil Sciences, Far East Branch, Russian Academy of Sciences.

Genus *Zapada* Ricker, 1952

Nemoura (*Zapada*) Ricker, 1952: 54 [Type species: *Nemoura haysi*, Ricker, 1952].

Zapada: Illies, 1966: 250; Baumann, 1975: 30; Baumann et al., 1977: 41; Stewart, Stark, 1993: 190.

Initially, the genus *Zapada* was established by Ricker [1952] as a subgenus of the *Nemoura*. According to Baumann [1975] this genus is characterized by 1) a single, simple gill on



Figs. 1–3. *Zapada quadribranchiata*: epiproct in lateral, dorsal, and ventral view.

Рис. 1–3. *Zapada quadribranchiata*: эпипрокт, вид сбоку, сверху и снизу.

either side of lateral cervical sclerites; 2) large angular outer paraproctal lobes; 3) a short, broad epiproct with a well developed dorsal sclerite.

By the number and shape of cervical gills and, partly, by well-developed dorsal sclerite of the epiproct *A. quadribranchiata* is transferred to the genus *Zapada*, although paraprocts of *A. quadribranchiata* are not identical with the above mentioned character (2); paraprocts look like a single lobe, the inner lobe reduced to a sclerotized narrow band on inner surface of medial margin; outer lobe lacking. *Zapada*, however, is not the only genus with the above type of cervical gills. *Sphaeronemoura* from East Asia [Shimizu, Sivec, 1998] also has two simple gills, although it differs from *Zapada* in the strongly swollen cerci and the epiproct structure.

Zapada is the most common genus of Nemouridae in the west of North America including Alaska. Up-to-date, nine species of this genus have been recorded there: *Z. frigida* (Ricker, 1952), *Z. haysi* (Ricker, 1952), *Z. chila* (Ricker, 1952), *Z. cinctipes* (Claassen, 1923), *Z. columbiana* (Claassen, 1923), *Z. oregonensis* (Claassen, 1923), *Z. cordillera* (Baumann et Gaufin, 1971), *Z. gracier* (Baumann et Gaufin, 1971), and *Z. wahkeena* (Jewett, 1925). The Asian *Z. quadribranchiata* is closer to *Z. cinctipes* by the structure of epiproct, the number of cervical gills in the latter species being 3 or 4, ocassionaly, 5.

In his comprehensive study, Baumann [1975] presumed the occurrence of *Zapada* in eastern Asia.

Zapada quadribranchiata (Zhiltzova, 1977), **comb.n.**

Figs. 1–14.

Amphinemura quadribranchiata Zhiltzova, 1977: 3.

Amphinemura quadribranchiata Zhiltzova, 1979: 62; Levanidova & Zhiltzova, 1979: 559; Zhiltzova & Levanidova, 1984: 39 (misidentification of the material from the Kuril Islands); Teslenko et al., 1997: 196, Table 1 (quoting of misidentification).

DESCRIPTION. Male. Epiproct (Figs. 1–3) moderately elongated, dorsally widened and rounded at mid-length, narrowing toward rounded apex: dorsal sclerite skittle-shaped, widened mediodorsally and narrowed at epiproct base; two symmetrical lateral parts, noticeably shorter than dorsal sclerite closely adjoining to it laterally; lateral parts closely approximated ventrally, narrow dorsally and comparatively

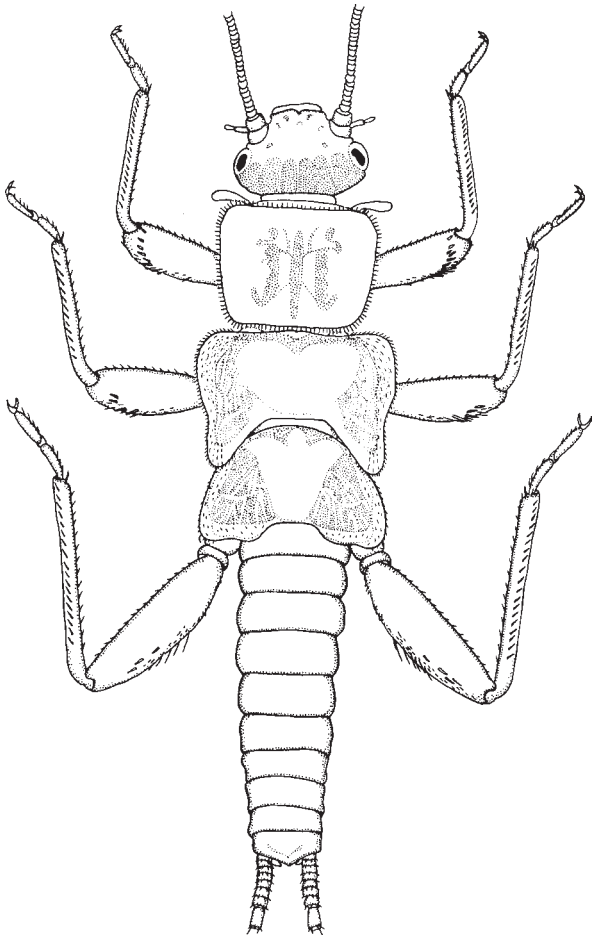


Fig. 4. Nymph of *Zapada quadribranchiata*, habitus.

Рис. 4. Личинка *Zapada quadribranchiata*, общий вид.

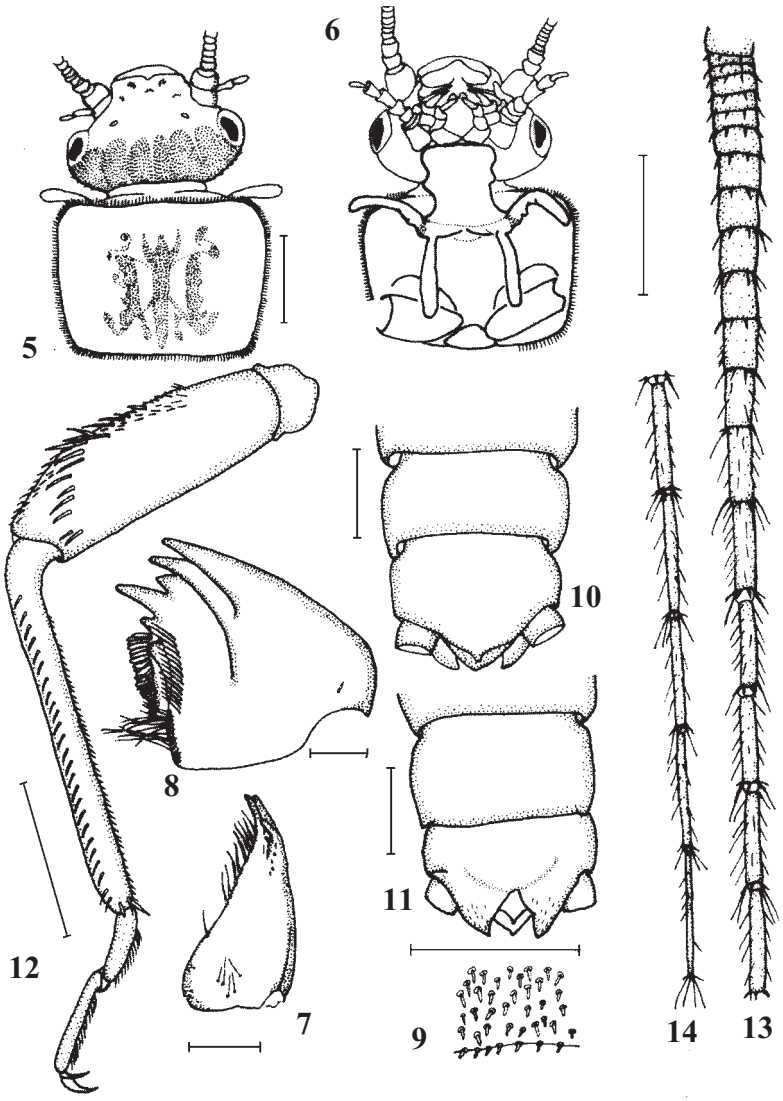
wide in lateral view; basal sclerites as two small, triangular, sclerotized patches located near basolateral corners; ventral sclerite heavily sclerotized, trapeziform at base, with lateral knobs at basolateral corners, flat, modified into a fork-shaped structure extending upward dorsally; lateral knobs small, rounded, visible in lateral view. Subgenital plate wide, not devided into basal and apical parts, gradually narrowing from mid-length toward pointed apex. Vesicle large, elongated, noticeably widened at apex. Paraprocts as single lobes, inner lobe reduced to a sclerotized narrow band on inner surface of medial margin; outer lobe lacking.

Female. Sternite VII noticeably enlarged and swollen, appearing as a wide, rounded pregenital plate. Sternite VIII membranous, subgenital plate lacking. Paraprocts short, pointed.

The nymph is first described herein.

MATERIAL: Russian Far East: 1 nymph, Silinka River, Amur River Basin, 25.07.74, T. Kuznetsova leg.; 23 nymphs, Sikhote Stream, Bikin River Basin, 29.06.79, O. Timoshkin leg.; 3 nymphs, Kamenka River, Razdolnaya River Basin, 27.04.72, I. Levanodova leg.

DESCRIPTION. Nymph (Figs. 4–14). Body length 6.2–7.5 mm, length of cerci 5.7–6.7 mm, of antennae 4.5–4.7 mm. Cerci 30-segmented; antennae of about 80 segments. Body



Figs. 5–14. *Zapada quadribranchiata*, nymph characters: 5 — head and pronotum; 6 — cervical gills; 7 — right lacinia; 8 — right mandible; 9 — abdominal clothing hairs; 10–11 — male terminalia, dorsally (10) and ventrally (11); 12 — foreleg; 13–14 — cercus, basal, middle (13), and apical (14) section. Scales are 0.1 mm (7, 8); 0.5 mm (5, 6, 10, 11, 13, 14) long respectively.

Рис. 5–14. *Zapada quadribranchiata*, личинка: 5 — голова и переднеспинка; 6 — шейные жабры; 7 — правая лациния; 8 — правая мандибула; 9 — кроющие волоски брюшка; 10–11 — конец брюшка самца, вид сверху (10) и снизу (11); 12 — передняя нога; 13–14 — средняя (13) и апикальная (14) части церка. Маштаб: 0,1 мм (7, 8); 0,5 мм (5, 6, 10, 11, 13, 14).

light brownish or yellowish. Head light, with a faint reddish occiput (Fig. 5). Compound eyes small. Cervical gills as in adults — two gills on either side of cervix, simple, long, slender and finger-like, length of each gill about 8 times exceeding its width (Fig. 6), cervical sclerite looking like a thin sclerotized bar inside each pair of gills.

Lacinia triangular, palmate with few short bristles at base (Fig. 7). Mandible with unserrated teeth and inner row of hairs not extending to serrate molar; tuft of long hairs at molar inner end (Fig. 8).

Pronotum with a faint reddish pattern in mesal part, butterfly-shaped, subrectangular, a little wider than longer; slightly wider anteriorly, with obtuse rounded corners; fringed with marginal, closely set short bristles, denser at corners (Figs. 4, 5). Mesonotum anteriorly 1.25 times wider than pronotum, with projected and rounded anterolateral corners. Meso- and metanotum (Fig. 4) brownish, fringes of tiny clothing hairs along lateral margins present; wingpads strongly widened at shoulders, base of wingpads with short spinules.

Abdominal segments unicolourly brownish, bristles absent, only tiny clothing hairs present, visible at the magnification more than 100 times (Fig. 9). The last abdominal tergite with a triangular projection posteriorly, male larva with a developing epiproct (Figs. 10, 11). Paraprocts tongue-shaped, prolonged.

Femur of forelegs with a longitudinally-transverse patch of stout colorless bristles on epicodorsal surface and few bristles of medium length medioposteriorly (Fig. 12). The patch of bristles on epicodorsal surface absent on other legs, and only few bristles of medium length present medioposte-

riorly. Tibiae of all legs with an outer submarginal row and inner marginal row of short bristles (Fig. 12). Fringe of silky setae absent.

Cercus (Fig. 13) segments with a posterior circlet of short, stout bristles; two lateral bristles of medium length; fine dorsoventral intercalary hairs visible behind segment 10. In its apical third, cercus segments thin and strongly elongated. Length of the last cercal segment about 15 times exceeding its width (Fig. 14).

DISTRIBUTION. *Z. quadribranchiata* was described from a small stream of the Kedrovaya River Basin, Southern Prymorye. The species was also found in small streams of the Ussuri and Amur River Basins as well as in the rivers flowing down into the Sea of Japan in the North of Primorye; in the coast of the Sea of Okhotsk, in the Chelasin River (Maya River Basin) and Lantar River basins, also in the Dukcha River, Magadan Area.

BIOLOGY. Adults emerged from late April to mid-June. Few adults were registered in late October in the North of Primorye [Potikha, Zhiltzova, 1996]. From emergence records follows that *Z. quadribranchiata* has two generations annually, which seems highly unlikely, being not supported by life history studies.

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