

# Far Eastern Entomologist

Дальневосточный энтомолог

Journal published by Far East Branch  
of the Russian Entomological Society  
and Laboratory of Entomology, Federal  
Scientific Center of the East Asia  
Terrestrial Biodiversity, Vladivostok

Number 368: 1-10

ISSN 1026-051X

October 2018

<https://doi.org/10.25221/fee.368.1>

<http://urn:lsid:zoobank.org:pub:1BBD5EED-E573-46FB-8B68-33D5352509BC>

## NEW SPECIES OF THE GENUS *BEROSUS* (COLEOPTERA: HYDROPHILIDAE) FROM CENTRAL ASIA AND TRANSCAUCASIA

A. A. Prokin<sup>1, 2)</sup>

1) Papanin Institute for Biology of Inland Waters of the Russian Academy of Sciences, Borok, 152742, Russia. E-mail: [prokina@mail.ru](mailto:prokina@mail.ru)

2) Cherepovets State University, Cherepovets, 162600, Russia.

**Summary.** *Berosus* (*Enoplurus*) *litvinchuki* sp. n. is described from Central Asia and Transcaucasia (Tajikistan, Uzbekistan, Kazakhstan and Azerbaijan). The description is illustrated by photographs and drawing of male genitalia. The new species belongs to *Berosus spinosus* species group and most similar to *B. asiaticus* Kuwert, 1888. A key to species of *Berosus spinosus* species group is also provided.

**Key words:** Coleoptera, Hydrophilidae, *Berosus*, new species, key, Tajikistan, Uzbekistan, Kazakhstan, Azerbaijan,

**А. А. Прокин. Новый вид рода *Berosus* (Coleoptera: Hydrophilidae) из Средней Азии и Закавказья // Дальневосточный энтомолог. 2018. N 368. С. 1-10.**

**Резюме.** Из Средней Азии и Закавказья (Таджикистан, Узбекистан, Казахстан и Азербайджан) описывается *Berosus* (*Enoplurus*) *litvinchuki* sp. n. Описание проиллюстрировано фотографиями и рисунками гениталий самца. Новый вид относится к группе *Berosus spinosus* и наиболее близок к *B. asiaticus* Kuwert, 1888. Приводится определительная таблица видов группы *Berosus spinosus*.

## INTRODUCTION

Totally 26 species of the subgenus *Enoplurus* Hope, 1838 of the genus *Berosus* Leach, 1817 are recorded from the Palearctic Region (Fikáček *et al.*, 2015).

The study of the collection of the Zoological Institute of Russian Academy of Sciences (St. Petersburg, Russia) revealed specimens from Central Asia and Transcaucasia which on the first view look similar to *B. asiaticus* Kuwert, 1888 known from Iraq, Iran, Kuwait, Turkey and China (Xinjiang) (Schödl, 1991; Fikáček *et al.*, 2015). These specimens represent a new species which is described here.

## MATERIAL AND METHODS

Males of the new species were dissected, with the genitalia mounted using water-soluble glue on a label pinned below the respective specimen. Material was examined using an Nikon SMZ-745T stereomicroscope. Habitus photographs were taken using Leica M2-6 stereomicroscope with Cannon Power Shoot S-40 camera (Moscow State University of Education, K.V. Makarov), Leica M165c stereomicroscope and a Leica DFC420 camera (Borissiak Paleontological Institute Russian Academy of Sciences, Moscow), processed in Helicon Focus software and subsequently adapted in Adobe Photoshop CS5. Photographs of males ventrites 5 were studied, measured and photographed under Nikon Eclipse Ni compound microscope (Papanin Institute for Biology of Inland Waters, Borok). Scanning electron micrograph was taken with the aid of JEOL-JSM-6510LV SEM microscope (Tyumen State University, A.N. Bobylev).

For comparative purposes, I have studied specimens of *Berosus asiaticus* Kuwert, 1888 and *B. fisheri* Schödl, 1993 in collections of Natural History Museum (Vienna) and National Museum (Prague), including type material of *B. fisheri*, deposited in Vienna; and specimens of *B. spinosus* (Steven, 1808) and *B. fisheri*, deposited in author's collection (Borok).

Total length (TL) was calculated as a sum of the length of elytra from base to the apex near the suture, pronotum and head. Length of male genitalia (LG) was calculated as a sum of the length of the phallobase and parameres in lateral view. The proportion of total body length and male genitalia length (TL/LG) was also calculated.

Holotype and paratypes of new species are deposited in the collection of the Zoological Institute of Russian Academy of Sciences (St. Petersburg, Russia).

## TAXONOMY

**Genus *Berosus* Leach, 1817**

**Subgenus *Enoplurus* Hope, 1838**

***Berosus spinosus* species group**

DIAGNOSIS (based on Schödl, 1991). Pronotal punctation at most weakly darkened in the range of pronotal dark spots; elytra divergend at apex, inner elytral

projections more or less rounded; last abdominal ventrite never with apical emargination; parameres evenly curved in dorsal view.

COMPOSITION. This group consists of six species including new one.

### List of species with description of new species

List of the species of *Berosus spinosus* species group is given below. Asterisk (\*) indicates the country in which type locality is situated; question (?) indicates doubtful record.

#### ***Berosus (Enoplurus) asiaticus* Kuwert, 1888**

Fig. 22

DISTRIBUTION. China (?), Iran\*, Iraq, Kuwait, Turkey.

#### ***Berosus (Enoplurus) fisheri* Schödl, 1993**

Figs 13, 15, 17

DISTRIBUTION. China\*, Mongolia, Russia (Far East).

#### ***Berosus (Enoplurus) fulvus* Kuwert, 1888**

DISTRIBUTION. Austria, China, Denmark, Finland, France\*, Great Britain, Germany, Hungary, Iran, Kazakhstan (Asian), Mongolia, The Netherlands, Russia (south of European territory, West and East Siberia), Spain, Sweden, Turkey (Asian part), Turkmenistan, Uzbekistan.

#### ***Berosus (Enoplurus) jaechi* Schödl, 1991**

DISTRIBUTION. China, Egypt, France, Greece\*, Italy, Spain, Turkey (Asian part), former Yugoslavia.

#### ***Berosus (Enoplurus) litvinchuki* Prokin, sp. n.**

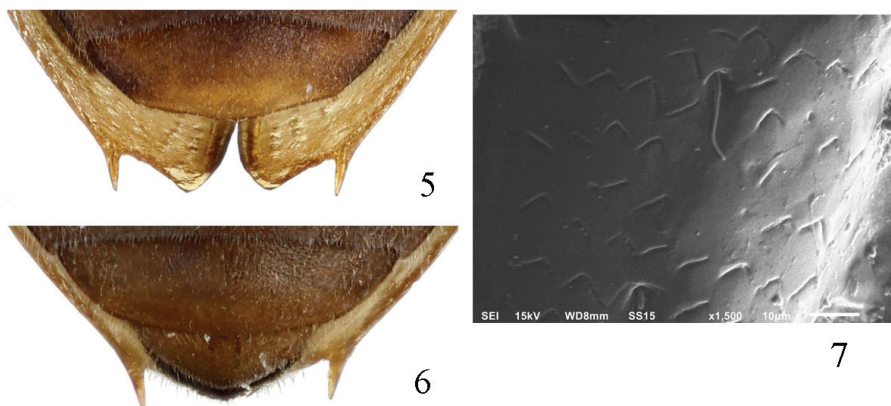
Figs 1–11, 16, 18, 19

MATERIAL. Holotype: ♂, South **Tajikistan**: Gorno-Badakhshan Autonomous Oblast, Nizhgar, 37.005°N, 72.461°E, h=2738 m, 19.VII 2013, leg. S. Litvinchuk. Paratypes: **Tajikistan**: same label data as the holotype, 2♂, 6♀. **Uzbekistan**: Samarkand Province, vicinities of Samarkand city, 39°39'N, 66°57'E, [18]96, 6♂, 6♀, leg. A. Barshevsky; Chimboy (=Shimbay or Chimbai), N from Nukus, 42°56'N, 59°46'E, 18.IV [1]875, 1♂, leg. Dorandt. **Kazakhstan**: Kyzylorda Province, Zhulek (=Dzhulek), 44°17'21"N, 66°25'53"E, Orenburg-Tashkent railway, Syr Darya River, end of VII – beginning of VIII [19]10, 1♂, leg. Kozhanchikov. **Azerbaijan**: Dzhahalilabad Province, Geok Tapa (=Göytəpə in Dzhahalilabad vicinities), 39°11'17"N, 48°40'46"E, on light of electric-arc lamp, 28.VI [19]01, 3♂, 2♀, leg. R. Schmidt (collection of A. Jakovleff).



Figs. 1–4. Habitus of *Berosus litvinchuki* sp. n. 1 – male, dorsal view; 2 – the same, ventral view; 3 – female, dorsal view; 4 – the same, ventral view.

ADDITIONAL MATERIAL EXAMINED (the females probably belonging to the new species): **Tajikistan**: Khatlon Province, Bobo-Safid, vicinities of Farkhor (=Parkhar), Panj River, 37°30'N, 69°24'E, 29.VII [1]934, 1♀, leg. Luppova. **Kazakhstan**: Aktobe Province, "Bolshiye Barsuki" steppe (sands in Kyrgyz steppe, N Aral Sea), vicinities of Shalkar (=Chelkar), 47°50'N, 59°37'E, 19.VI [19]07, 1♀, leg. V. Androsov; East Kazakhstan Province, Zaisan city, 47°28'N, 84°52'E, 23.VI 1965, 1♀, leg. I. Sukacheva.

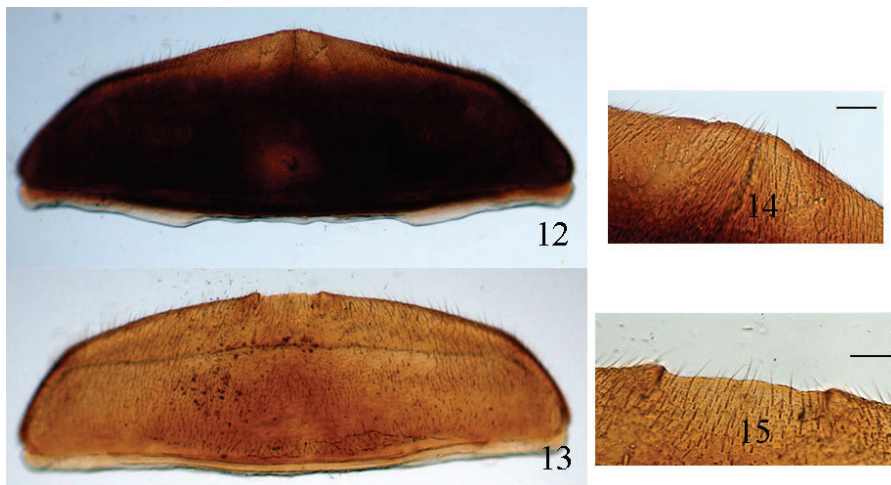


Figs. 5–7. *Berosus litvinchuki* sp. n. 5 – male ventrites IV, V and apex of elytra; 6 – the same, female; 7 – microsculpture of female elytra.



Figs. 8–11. Ventrite V of *Berosus litvinchuki* sp. n. 8, 10 – male; 9, 11 – female; 8, 9 – general view; 10, 11 – details of the apex. Scale bar for 8, 9 = 1 mm; 10, 11 = 0.2 mm.

DESCRIPTION. Habitus (Figs. 1–4). Body oval, length 3.9–5.4 (average 4.75) mm. Head yellow, shiny, with a pair of black longitudinal spots from base along stem of Y-suture; punctuation consisting of rounded punctures, distance between punctures approximately equal to their diameter, punctures more aggregate near internal margin of eye. Central part of clypeus usually with obsolete punctuation. Labrum yellow, not shiny because of dense punctuation, punctures smaller than on head. Submentum trapezoid, shiny with rare small punctures. Pronotum yellow, shiny, with a pair of vaguely defined dark spots anteromesally, with punctuation at most weakly darkened in range of dark pattern; punctuation dense, distance between punctures more than twice bigger than their diameter; lateral margin of pronotum with narrow bead. Scutellum elongate triangular, sometimes concave. Elytra yellow, shiny, with blackened, narrow, well impressed striae and interval intervals, in females weakly shagreened, as seen on SEM by zigzag grooves (Fig. 7) and bearing rare setae on posterior half; brownish spots consisting of isolated punctures of irregular



Figs. 12–15. Male ventrite V of *Berosus* spp. 12, 14 – *B. spinosus* (Steven, 1808); 13, 15 – *B. fisheri* Schödl, 1993; 12, 13 – general view; 14, 15 – details of the apex. Scale bar for 14, 15 = 0.2 mm.

shape present in humeral area, along suture in anterior third and behind the midlength, and along the lateral margin. Elytral apices divergent, with rounded internal apex and small apical teeth of the same shape in both sexes (Figs. 5, 6). Abdominal ventrites 1–4 with sharp teeth on the outer margin, first without median keel, fifth without emargination, entire semicircular (Figs. 8–11). Aedeagus small, length 1.4–2.1 mm (1.64 average), with the length of phallobase (0.5–1.0 mm, average 0.7) nearly equal or slightly shorter to parameres (0.8–1.1 mm, average 0.9); phallobase weakly curved, almost straight, is at an obtuse angle to the parameres in lateral view; parameres wide (spatulate) at apex; median lobe slightly bent at apically in lateral view (Figs. 16, 18, 19).

VARIATION. Form of dark spots of the pronotum and black spots of the head, as well as coloration of the elytra are variable. Old specimens are darker than newly collected; their general color is brown, not yellow.

DIFFERENTIAL DIAGNOSIS. New species is similar to *Berosus spinosus* but differs from latter in the relatively smaller size of the body and aedeagus, not so robust phallobase and more weakly shagreened female elytra. New species is distinguishable from *B. fisheri* by the male ventrite 5 without toothlets at the posterior margin. The new species is recognizable from *B. asiaticus* by entire last abdominal ventrite, the parameres more expanded at apex, and by usually bigger aedeagus (also in relation to the body length) and phallobase usually equal or slightly shorter to parameres.

DISTRIBUTION. Tajikistan (Nizhgar, ?Bobo-Safid); Uzbekistan (Samarkand, Chimboy); Kazakhstan (Zhulek, ?Zaysan, ?Shalkar); Azerbaijan (Geok Tapa near Dzhailabad). Records of *B. asiaticus* Kuwert, 1888 from China (Xinjiang) and Asian Turkey (Fikáček *et al.*, 2015) probably also belongs to this species.

BIOLOGY. Not known, because most part of specimens was collected at light, others have no habitat information on the labels.

ETYMOLOGY. The new species is dedicated to the collector of the holotype, Spartak Litvinchuk.

***Berosus (Enoplurus) spinosus* (Steven, 1808)**

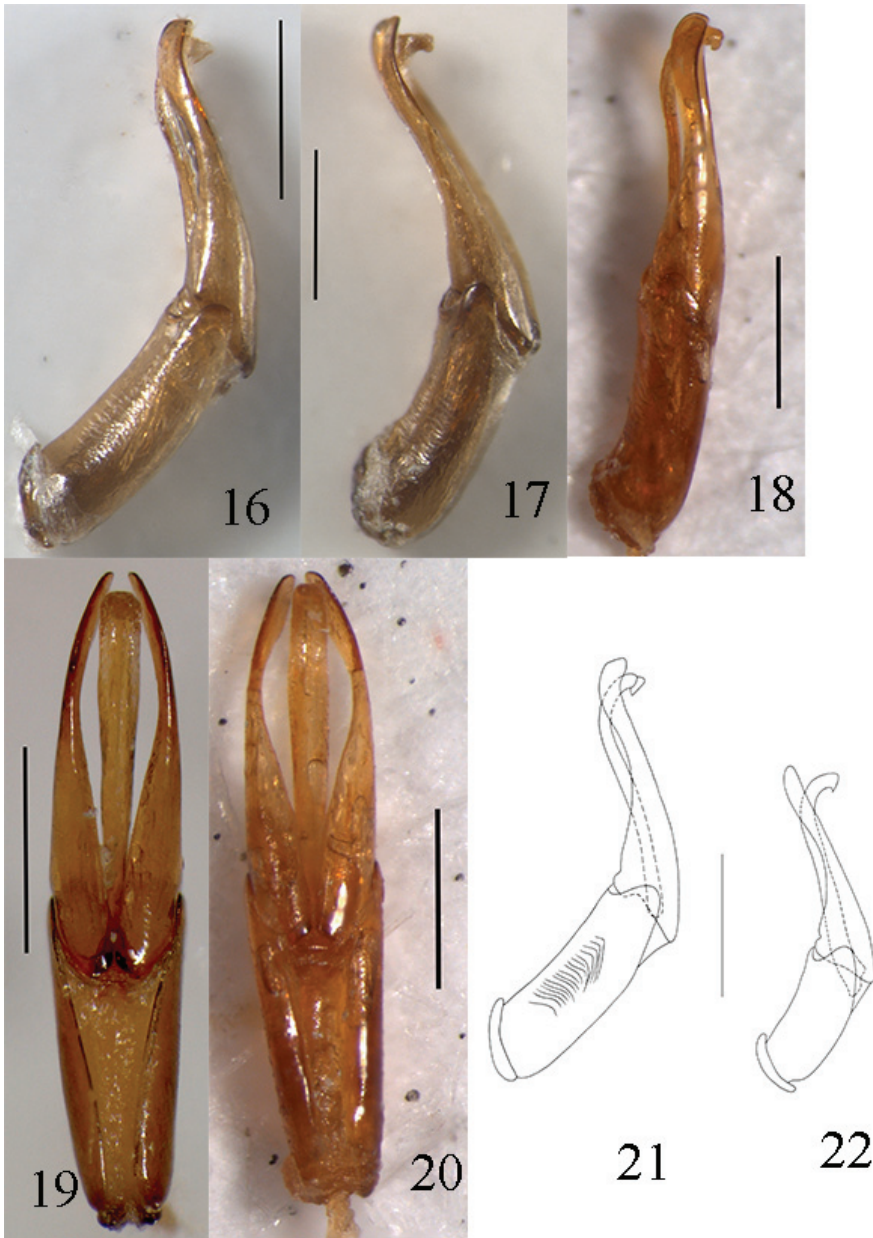
Figs 12, 14, 18, 20

DISTRIBUTION. Afghanistan, Albania, Austria, Azerbaijan, Belarus, Bosnia Herzegovina, Bulgaria, China, Croatia, Denmark, Estonia, Finland, France, Georgia, Germany, Great Britain, Greece, Hungary, Iran, Italy, Kazakhstan (Asian part), Kyrgyzstan, Latvia, Macedonia, Mongolia, Montenegro, The Netherlands, Norway, Poland, Romania, Russia (south\* and center of European part, West Siberia), Slovakia, Slovenia, Sweden, Turkey, Ukraine, Tajikistan, Tunisia, Turkmenistan, Uzbekistan.

**Key to species of *Berosus spinosus* species group**

1. Labrum dark brown to black ..... 2
- Labrum pale ..... 3
2. Pronotum without spots or dark patterns; abdominal ventrite 5 without toothlets at the posterior margin ..... *B. fulvus*
- Pronotum with geminate, mostly clearly distinct pattern; abdominal ventrite 5 with small toothlets at posterior margin ..... *B. jaechi*
3. Total body length usually more than 5.5 mm; length of aedeagus more than 2.1 mm ..... 4
- Total body length less than 5.5 mm; length of aedeagus less than 2.1 mm; abdominal ventrite 5 without toothlets at posterior margin (Figs. 8–11) ..... 5





Figs. 16–22. Male genitalia of *Berosus* spp. 16, 19, 21 – *B. litvinchuki* sp. n.; 17 – *B. fisheri* Schödl, 1993; 18, 20 – *B. spinosus* (Steven, 1808); 22 – *B. asiaticus* Kuwert, 1888 (redrawn from Schödl, 1991); 16, 17, 18, 21, 22 – lateral view; 19, 20 – ventral view; Scale bar = 0.5 mm.



4. Male abdominal ventrite 5 without toothlets at posterior margin (Figs. 12, 14), phallobase with a slightly concave upper margin in lateral view (Figs 18, 20) ...  
 ..... *B. spinosus*
- Male abdominal ventrite 5 with toothlets at the posterior margin (Fig. 13, 15), phallobase with a concave upper margin (Fig. 17) ..... *B. fischeri*
5. Total body length 4.0–5.0 mm. Last abdominal ventrite apical emargination very weakly marked. Length of aedeagus 1.2–1.6 mm. LG/TL = 0.24–0.33 (0.27); phallobase (0.5–0.6) usually shorter to parameres (0.6–1.0), which slightly expanded at the top (Fig. 21) ..... *B. asiaticus*
- Total body length 3.9–5.4 mm. Last abdominal ventrite entire. Length of aedeagus 1.4–2.1 mm. LG/TL = 0.30–0.42; phallobase (0.5–1.0 mm) equal or slightly shorter to parameres (0.8–1.1), which more expanded at the top (Figs 16, 19, 22) ..... *B. litvinchuki* **sp. n.**

## DISCUSSION

New species is belonging to yellow-labrum subgroup of *Berosus spinosus* species group *sensu* Schödl (1991, 1993), which probably can be considered as an independent group of species standing close to black-labrum subgroup (which includes *B. fulvus* and *B. jaechi*). Species of the yellow-labrum subgroup (*B. asiaticus*, *B. fischeri*, *B. spinosus* and *B. litvinchuki* sp. n.) are very similar in external morphology and can be reliably identified only using aedeagus morphology and size proportions (total and relative to the body length). This situation urges the need to study the *Berosus spinosus* group using the molecular methods that can help to clarify the species limits and their ranges.

## ACKNOWLEDGEMENTS

I am very grateful to K.V. Makarov (Moscow State University of Education, Moscow, Russia) for preparation habitus photographs, A.P. Rasnitsyn (Paleontological Institute Russian Academy of Sciences, Moscow) for the opportunity to use Leica stereomicroscope with camera, and A.N. Bobylev (Tyumen State University, Tyumen, Russia) for the help in preparation of scanning electron micrograph; A.G. Kirejtshuk (Zoological Institute, St. Petersburg, Russia), M.A. Jäch (Natural History Museum, Vienna, Austria) and M. Fikáček (National Museum, Prague, Czech Republic) for the opportunity to study collections. I am also glad to M. Fikáček for valuable comments on manuscript. Work was performed in the framework of the Russia state assignment (theme number AAAA-A18-118012690105-0).

## REFERENCES

- Fikáček, M., Angus, R. B., Gentili, E., Jia, F., Minoshima, Y. N., Prokin, A., Przewoźny, M. & Ryndevich, S.K. 2015. Family Hydrophilidae. P. 37–76. *In*: Löbl, I. & Löbl, D. (Eds.) *Catalogue Palaearctic Coleoptera. Vol. 2/1. Hydrophiloidea – Staphilinoidea. Revised and updated edition*. Brill, Leiden-Boston.

- Schödl, S. 1991. Revision der Gattung *Berosus* Leach 1. Teil: Die paläarktischen Arten der Untergattung *Enoplurus* (Coleoptera: Hydrophilidae). *Koleopterologische Rundschau*, 61: 111–135.
- Schödl, S. 1993. Nachtrag zur Revision der paläarktischen und orientalischen Arten der Gattung *Berosus* Leach (Untergattung *Enoplurus* Hope) (Insecta: Coleoptera: Hydrophilidae). *Entomological Problems*, 24(2): 29–34.