

First terrestrial species of the troglobiont genus *Caucasocyphoniscus* Borutzky, 1948 (Isopoda: Oniscidea: Trichoniscidae) from the northwestern Caucasus

Первый наземный вид троглобионтного рода *Caucasocyphoniscus* Borutzky, 1948 (Isopoda: Oniscidea: Trichoniscidae) с северо-западного Кавказа

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КЛЮЧЕВЫЕ СЛОВА: Isopoda, Oniscidea, *Caucasocyphoniscus*, new species, woodlouse, Caucasus.

ABSTRACT. A new species of woodlice, *Caucasocyphoniscus taitii* sp.n. (Trichoniscidae), is described from the Utrish State Nature Reserve located at the Black Sea coast of the northwestern Caucasus west of Novorossiysk. This is the first terrestrial species from the troglobiont genus *Caucasocyphoniscus* Borutzky, 1948. A new diagnosis of the genus is provided. Diagnostic features of the new species as well as affinities within the genus are discussed.

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РЕЗЮМЕ. Описан новый вид мокриц, *Caucasocyphoniscus taitii* sp.n. (Trichoniscidae), из Утришского государственного природного заповедника, расположенного на Черноморском побережье северо-западного Кавказа западнее Новороссийска. Это первый наземный вид из троглобионтного рода *Caucasocyphoniscus* Borutzky, 1948, на основании чего приведен новый диагноз рода. Обсуждаются диагностические признаки нового вида, а также сродство с видами в пределах рода.

Introduction

The genus *Caucasocyphoniscus* Borutzky, 1948 was described from the caves of Sochi environs, the Black Sea coast, NW Caucasus [Borutzky, 1948] based on morphological characters differing it from other genera of the family Trichoniscidae. The only species, *Caucasocyphoniscus cavaticus* Borutzky, 1948, showed a substantial variability between the caves. Being not confident with the status of these forms, E.V. Borutzky

described them as four subspecies, *C. c. cavaticus* Borutzky, 1948, *C. c. adlerensis* Borutzky, 1948, *C. c. chostensis* Borutzky, 1948, and *C. c. msymticus* Borutzky, 1948. Most possible they are four different species, but they definitely deserve a redescription and a molecular analysis to confirm their status. In our studies of soil fauna of Abrau Peninsula, ca. 200 km NW from Sochi along the Black Sea coast, another species belonging to this genus was found in 2004. It was identified by H. Schmalzfuss as *C. cavaticus* and referenced in further faunistic studies as such [Gongalsky, Kuznetsova, 2011; Kuznetsova, Gongalsky, 2012]. A thorough analysis of morphology of this species under the guidance of Dr. S. Taiti and further records of this species aboveground brought us to the conclusion that there is an undescribed species which description is provided below.

Material and Methods

Investigation accomplished by the author in the ecosystems of Abrau Peninsula in 2004 yielded a collection of two woodlice specimens of this genus, one male only. Further extensive search in this territory did not result in new records until series of specimens were found in several locations in Abrau Peninsula in 2017–2021.

The specimens were collected by hand and fixed in 96% ethanol. Terminology used in the species description is mainly based on Vandel [1960]. Processing and dissections were done by using a Leica MZ8 binocular microscope. Micro preparations of diagnostic body appendages were done in euparal (Carl Roth GmbH). Line drawings were executed with the help of an Olympus BX41 microscope supplied with an Olympus U-DA camera lucida. The material is deposited in the collection of the Zoological Museum of Moscow University, Russia (ZMMU), and partly retained in the personal collection of the author (A.N. Severtsov Institute of Ecology and Evolution of Russian Academy of Sciences, Moscow, Russia), as indicated below.

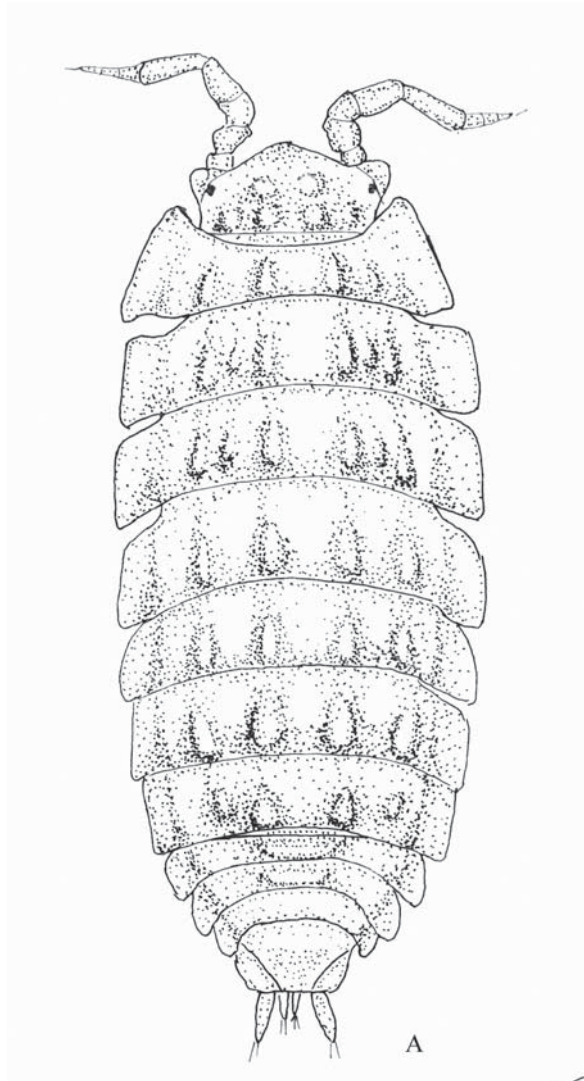


Fig. 1. Dorsal view of male paratype *Caucasyphoniscus taitii* sp.n., from Abrau Peninsula, northwestern Caucasus.

Рис. 1. Габитус сверху паратипа *Caucasyphoniscus taitii* sp.n., самец, с полуострова Абрау, северо-западный Кавказ.

Taxonomy

Class Malacostraca Latreille, 1802

Order Isopoda Latreille, 1817

Family Trichoniscidae Sars, 1899

Genus *Caucasyphoniscus* Borutzky, 1948

Caucasyphonethes: Schmalzfuss, 2003; Gongalsky, Kuznetsova, 2011; Kuznetsova, Gongalsky, 2012; Turbanov *et al.*, 2016; Golovatch *et al.*, 2018.

Type species *Caucasyphoniscus cavaticus* Borutzky, 1948 by monotypy.

DIAGNOSIS. Body wide, with well-developed epimera, weakly convex. Head with numerous rounded conical tubercles. Pereionial tergites with 2(3)+2(3) well-developed longitudinal ribs shortened anteriorly and posteriorly. Pereionial ribs in cross-section triangular with rounded or sharp apex, never projecting posteriorly beyond tergite margins. Pleonal tergites 3 and 4 with one unpaired low conical tubercle, entire or weakly bifurcating at apex. Other tergites of the pleon and telson without tubercles. Dorsal surface of pereion and head coarse.

Caucasyphoniscus taitii sp.n.

Figs 1–5.

Caucasyphonethes cavaticus: Gongalsky, Kuznetsova, 2011; Kuznetsova, Gongalsky, 2012 (pro parte); Dimitriou, Sfenthourakis, 2022.

MATERIAL. Holotype: ♂ (ZMMU Mc-1452), Russia, Krasnodar Region, Utrish, 2nd Topolnaya Valley (44.7425° N, 37.4981° E), broadleaf forest, VI.2004, K. Gongalsky leg. Paratypes: 2 ♂♂ (on slides), 2 ♀♀ (ZMMU Mc-1453), Russia, Krasnodar Re-

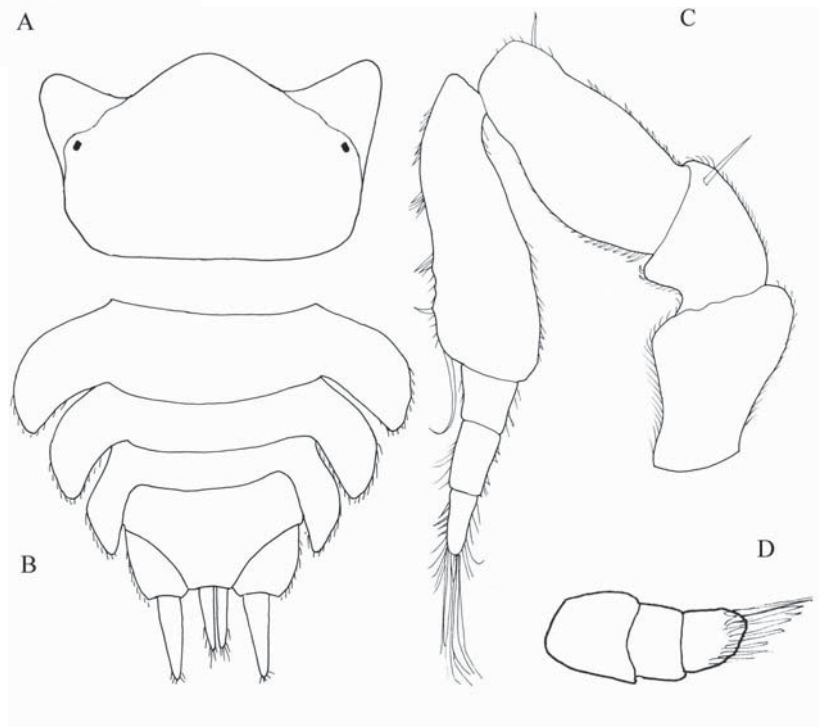


Fig. 2. *Caucasyphoniscus taitii* sp.n.: A — outline of head; B — outline of pleon, telson and uropods; C — antenna; D — antennula (male, paratype).

Рис. 2. *Caucasyphoniscus taitii* sp.n.: A — голова; B — плеон, тельсон и уropоды; C — антеннула; D — антенна (самец, паратип).

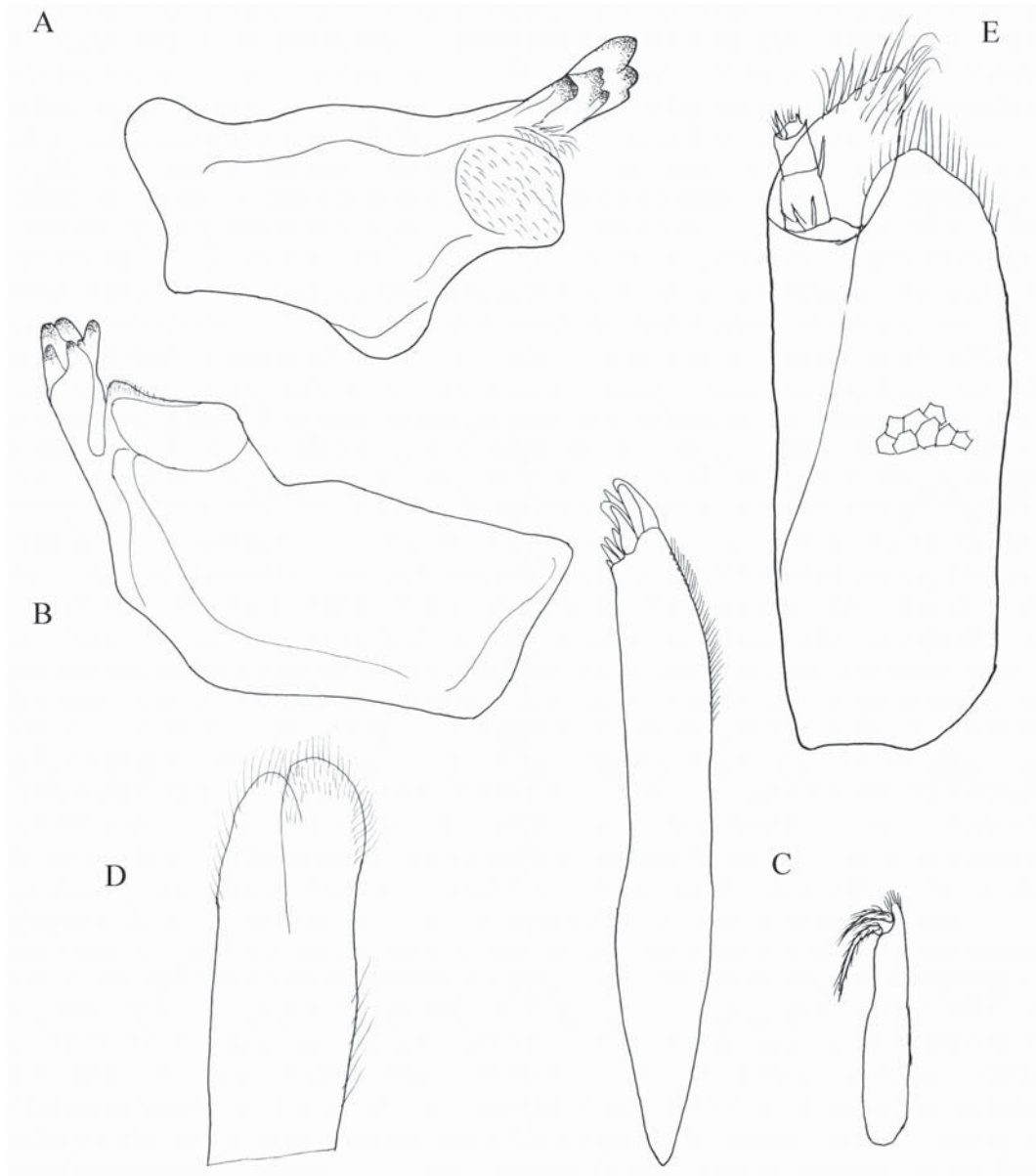


Fig. 3. *Caucasocyphoniscus taitii* sp.n.: A — left mandible; B — right mandible; C — maxillula; D — maxilla; E — maxilliped (male, paratype).

Рис. 3. *Caucasocyphoniscus taitii* sp.n.: A — левая мандибула; B — правая мандибула; C — максиллула; D — максилла; E — максиллипед (самец, паратип).

gion, Utrish (44.71964° N, 37.442133° E), cliffs facing the sea, VI.2021, K. Gongalsky leg.; 1 ♂, 1 ♀ (on slide) (personal collection of K. Gongalsky), same locality, VII.2021, D. Korobushkin leg.; 2 ♂♂, 2 ♀♀ (ZMMU Mc-1454), 2 ♂♂, 2 ♀♀ (personal collection of K. Gongalsky), Russia, Krasnodar Region, Abrau, Limanchik (44.6711° N, 37.5918° E), under log lying on shore of lake, IV.2017, I. Marin leg.

DIAGNOSIS. A species of *Caucasocyphoniscus* characterized by 2+2 rows of tubercles on pereonites, and transversal tubercles on 3 and 4 pleon tergites; antennal flagellum with three articles of equal length; male exopod of pleopod 1 with outer margin convex in the sagittal part.

DESCRIPTION. Somatic characters. Maximum body length: male 2.3 mm; female 2.7 mm. Holotype body length 2.2 mm. Body colorless. Epimera of pereonial segments 2–7 flat-

tened. Pereonites 2–3 with 3+3 rows of tubercles, pereonites 1 and 4–7 with 2+2 rows, pleonites 3 and 4 with one transversal elongated tubercle (Fig. 1). Dorsal surface of cephalon and tergites coarse. Body relatively elongated; outer margin of pleon continuous with that of pereon (Fig. 1). Cephalic lobes well developed (Fig. 2A); median lobe triangular with rounded apex (Fig. 2C). Eyes consisting of single ommatidium. Posterior margin of segment 1 sinuous at sides (Fig. 1). Telson with distal part trapezoidal, apex sharply cut (Fig. 2B).

Appendages. Antenna reaching rear margin of pereonite 2; flagellum with 3 articles, of equal length (Fig. 2C). Antennula with three articles (Fig. 2D); segments 1 and 3 subequal in length, segment 2 shorter; segment 3 with tuft of aesthetascs at apex.

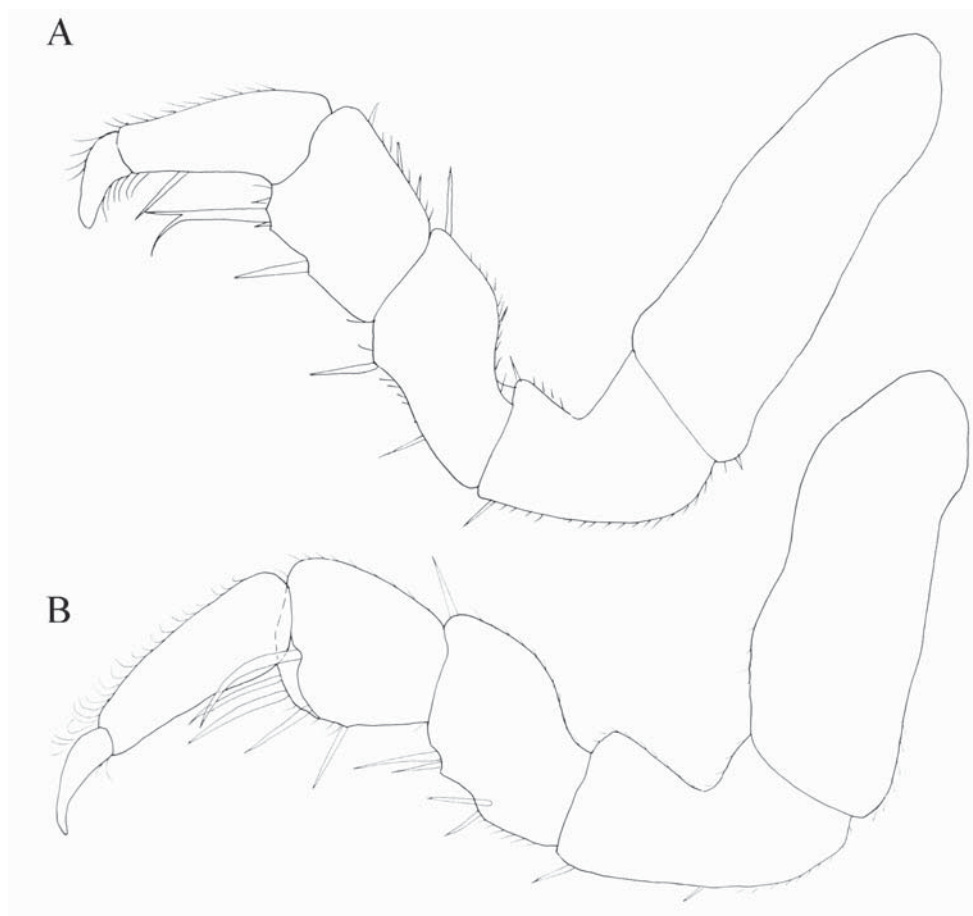


Fig. 4. *Caucoscyphoniscus taitii* sp.n.: A — pereopod 1; B — pereopod 7 (male, paratype).

Рис. 4. *Caucoscyphoniscus taitii* sp.n.: A — переопод 1; B — переопод 7 (самец, паратип).

Left mandible as in Fig. 3A. Right mandible as in Fig. 3B. Maxillula (Fig. 3C): apical edge of outer endite bearing 9 teeth into two groups, 4 medial teeth slenderer and 5 lateral teeth stouter, all simple. Maxilla with bilobate edge, both lobes covered with short setae (Fig. 3D). Maxilliped: endite with rounded penicil at apex; palp with long setae on apical part (Fig. 3E). Uropods (Fig. 2B) with protopods flattened; exopod slightly longer than endopod.

Male: Pereiopods (Fig. 4A–B). Pereiopod 1 and 7 ischium strongly arched. Carpus 1 with setae split on tip (Fig. 4A).

Pleopod 1 (Fig. 5A): exopod long and narrow with outer margin concave; endopod with simple tip. Pleopod 2 (Fig. 5B): exopod oval with medial pointed triangular process; endopod much longer than exopod, narrow, with parallel sides and simple tip. Pleopod 3–5: exopods (Fig. 3C–E) almost squared, slightly decreasing in size from 3 to 5. Genital papilla as in Fig. 5F.

REMARK. The species is assigned to the genus *Caucoscyphoniscus* since it has 3+3 rows of tubercles on pereonites 2–3. Penicils are not visible on figures possibly due to fixation in pure alcohol (S. Taiti, pers. comm.) as they present in other Haplophthalminae [Vandel, 1960; Taiti, Montesanto, 2018]. There is only another species belonging to this genus. These two species differ in the following: (i) *C. taitii* sp.n. has eyes; (ii) instead of 3+3 rows on pereonial segments 1 and 4–7, it has 2+2 rows of tubercles; (iii) it lives aboveground, not a troglobiont.

DISTRIBUTION. The species has been found between Sukko River and Lake Abrau on Abrau Peninsula so far. It was first found in broadleaved forests (*Carpinus betulus*, *Tilia caucasica*, *Fagus orientalis*, *Quercus petraea*, *Fraxinus excelsior*) growing on the slopes of the Navagir Ridge about 3 km away from the sea [Gongalsky, Kuznetsova, 2011]. Recent findings are on water naturally oozing from the cliffs facing the Black Sea.

ETYMOLOGY. The species is dedicated to Dr. Stefano Taiti, who helped the author to distinguish this species.

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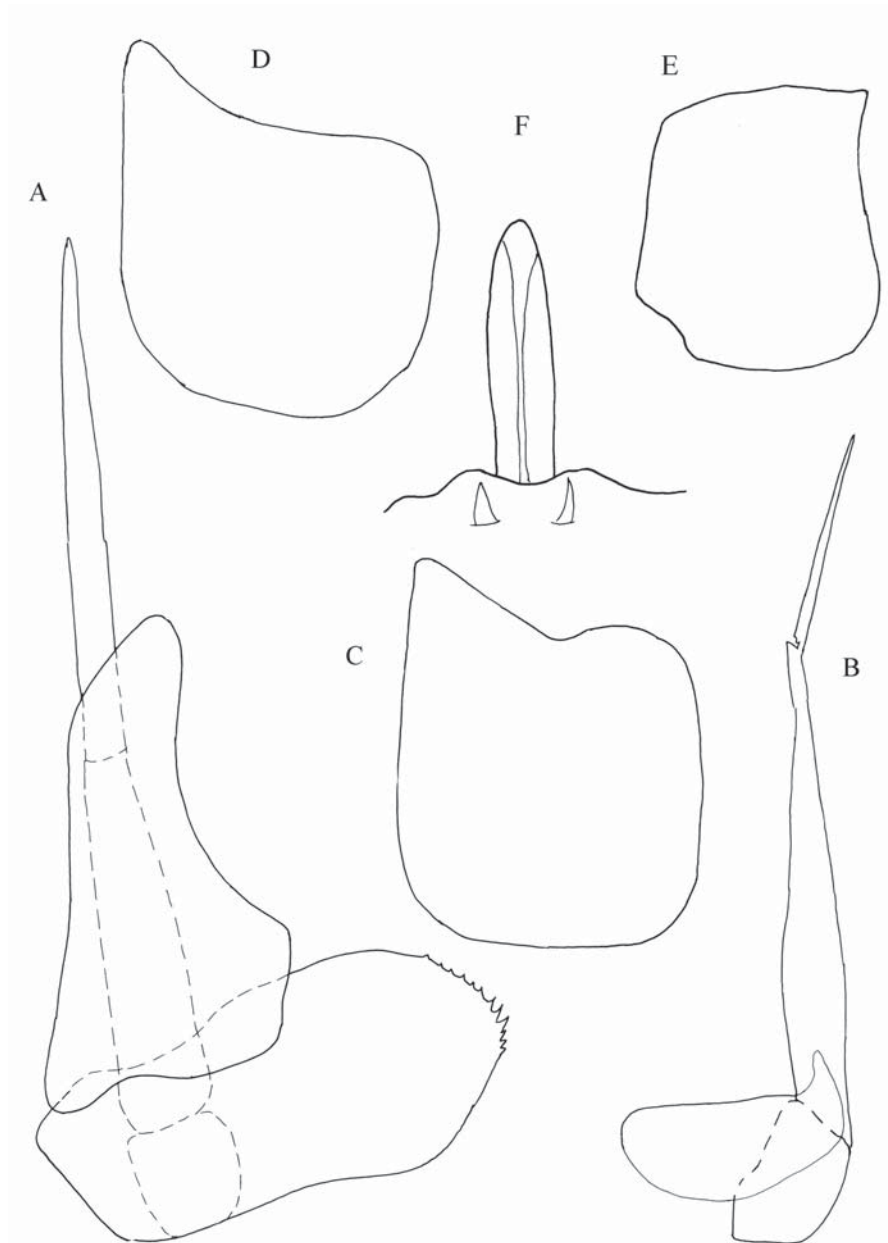


Fig. 5. *Caucasocyphoniscus taitii* sp.n.: A — pleopod 1; B — pleopod 2; C — exopod of pleopod 3; D — exopod of pleopod 4; E — exopod of pleopod 5; F — genital papilla (male, paratype).

Рис. 5. *Caucasocyphoniscus taitii* sp.n.: A — плеопод 1; B — плеопод 2; C — экзопод плеопода 3; D — экзопод плеопода 4; E — экзопод плеопода 5; F — генитальная папилла (самец, голотип).

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