

Trachelipus species (Isopoda: Oniscidea) of the eastern Black Sea coast

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Abstract

The *Trachelipus* species known up to now from the eastern Black Sea coast (Russia, Georgia, Turkey) are re-described after type material, their diagnostic characters are illustrated, and newly collected material of these species is reported.

Key words: Isopoda, Oniscidea, *Trachelipus*, re-descriptions, eastern Black Sea coast, new records.

Zusammenfassung

Die *Trachelipus*-Arten, die bis jetzt von der Küstenregion des östlichen Schwarzen Meeres bekannt sind, werden mit Abbildungen ihrer diagnostischen Merkmale nachbeschrieben und neue Fundorte dieser Arten werden gemeldet.

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1 Introduction

The terrestrial isopod genus *Trachelipus* is distributed in the temperate forest zone of Europe and western Asia, with the easternmost records from the Elburs Mountains in Iran. Up to now 57 species have been described (SCHMALFUSS 2003, SCHMALFUSS et al. 2004, BORUTZKY 1976). In the Caucasus region the genus is widespread, but only a few species have been described during the last century in a rather insufficient way. This makes it very difficult, if not impossible, to safely identify *Trachelipus* material from that region, which induced us to re-investigate the type material of the described species and to publish comparable illustrations of the diagnostic characters, together with unpublished samples of the species concerned.

Abbreviations

BML	British Museum of Natural History, London, United Kingdom
SMNS	Staatliches Museum für Naturkunde Stuttgart (+ number of isopod collection), Germany
ZSM	Zoologische Staatssammlung München, Germany

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Drs. SH. BARJADZE (Kutaisi/Georgia), S. HUBER (Oberuhldingen/Germany), R. KINZELBACH (Greifswald/Germany), E. KOHLER (Schwäbisch Hall/Germany), J. KONTSCÁN (Budapest/Hungary), T. OSTEN † (SMNS), H. PIEPER (Schwentental/Germany), J. POPOV (Moscow/Russia) and W. RÄHLE (Tübingen/Germany) have donated isopod material used in the article; S. FRIEDRICH (ZSM) has loaned type material of the treated species; Drs. S. SFENTHOURAKIS (Nicosia/Cyprus) and S. TAITI (Florence/Italy) helped to improve the original manuscript. Dr. K. WOLF-SCHWENNINGER (SMNS) operated the scanning electron microscope. To all of them we wish to express our sincere thanks.

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2 The genus *Trachelipus* Budde-Lund, 1908

Diagnostic characters of the genus *Trachelipus*:

1. Tergal parts always more or less tuberculated or granulated.
2. Head always with well-developed lateral and medial frontal lobes, angle between lateral and medial lobe can be less or more than 90°.
3. Hind margin of pereon-epimera 1 concave.
4. Pleon with well-developed epimera, so body-outline continuous.
5. All pleopod-exopodites equipped with open respiratory fields.
6. Well-developed roundish gland-pore fields on pereon-epimera, whose distance from lateral margin varies among species.
7. Noduli laterales on pereon segment 1 in a considerably more medial position than on segments 2–7.

8. Carpus of male pereopod 7 with more or less pronounced ridge.

9. Male pleopod-exopodite 1 with median pointed hind-lobe.

The genus *Trachelipus* shows, except for the different structure of the pleopod-exopodites, great similarity to the genus *Porcellio*, which should, however, be due to convergence, since the respiratory structures plead for different phyletic lines.

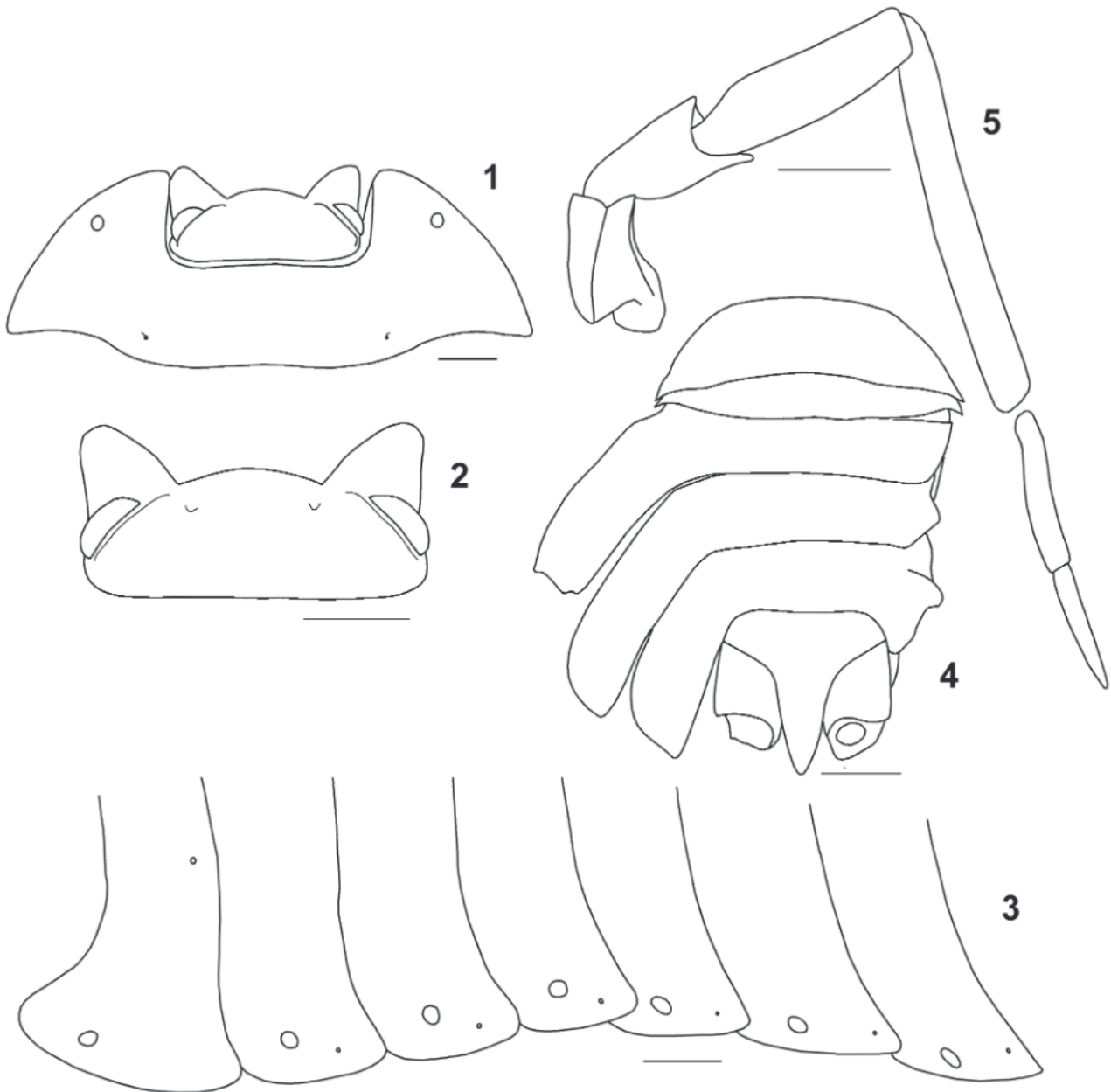
3 The species of *Trachelipus* of the eastern Black Sea coast

Trachelipus caucasicus (Verhoeff, 1918)
(Figs. 1–8 and map Fig. 9)

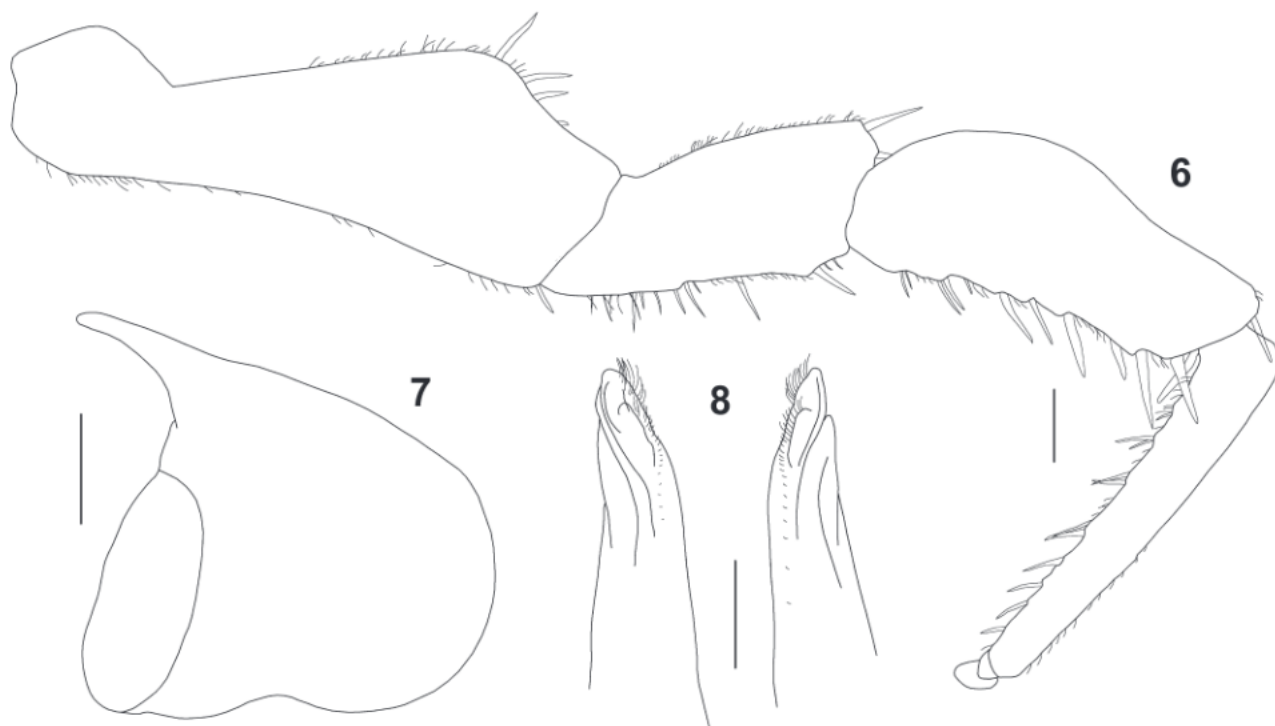
Synonym: *Tracheoniscus caucasicus*.

Bibliography

VERHOEFF 1918: 112; VERHOEFF 1933: 107.



Figs. 1–5. *Trachelipus caucasicus*, lectotype, ♂, 18.1 × 11.0 mm (Georgia, ZSM). – 1. Head and pereon-tergite 1, dorsal view. 2. Head, dorsal view. 3. Pereon-epimera 1–7 with gland-fields and noduli laterales, dorso-lateral view. 4. Pleon, dorsal view. 5. Antenna. – Scales: 1 mm.



Figs. 6–8. *Trachelipus caucasicus*, lectotype, ♂, 18.1 × 11.0 mm (Georgia, ZSM). – 6. Pereopod 7, frontal view. 7. Pleopod-exopodite 1, dorsal view. 8. Apices of pleopod-endopodites 1. – Scales: 0.2 mm (6), 0.3 mm (7–8).

Type material re-examined

Lectotype, herewith designated to fix identity of species: ♂ (18.0 × 11.0 mm, formerly dried and pinned, with slide preparation of pereopod 7 and pleopod 1), western Caucasus, Georgia, Abkhazia, Black Sea coast, near Gagra (= Gagri, between Sochi and Sokhumi), leg. LIGNAU, date ? (ZSM, Reg. Nr. A 20111536).

Paralectotype: 1 ♀ (10.6 × 6.3 mm), same collecting data as lectotype (ZSM, Reg. Nr. A 20111537).

New material

Russia: 2 ♀♀, 5 immat., Black Sea coast, Dagomys NW of Sochi, leg. J. POPOV, 10.–14.VII.1987 (SMNS 13013).

Georgia: 1 ♀, W, Guria Mts., 20 km S of Santredia, leg. RÄHLE, 4.IX.2000 (SMNS 13065). – 2 ♀♀, 1 juv., NW, Inguri valley, 15 km N of Jvari, wet forest, leg. RÄHLE, 30.VIII.2000 (SMNS 13066). – 2 ♀♀, Imereti region, Chiatura district E of Kutaisi, village Darkveti, cave Samerskhlekld, leg. BARJADZE, 20.VIII.2011 (SMNS 13105).

Turkey: 1 ♂, 1 ♀ (20 mm long), NE, province Erzurum, Çoruh Nehri valley, Çamlıkaya, 1000 m, leg. KINZELBACH, 28.VII.1988 (SMNS 11387). – 3 ♂♂, 3 ♀♀, NE, province Erzurum, Çoruh Nehri valley, near Artvin, Taşlica, 1000 m, leg. PIEPER, 30.IX.1996 (SMNS 11442). – 2 ♂♂, 1 ♀, 1 juv., NE, province Erzurum, 30 km E of Artvin, E of Ardanuç, 1400 m, *Picea* forest, leg. SCHMALFUSS, 27.VII.2001 (SMNS 11514). – 10 ex., NE, province Erzurum, Black Sea coast, Hopa, leg. OSTEN, 25.VI.1987 (SMNS 11233). – 3 ♂♂, 3 ♀♀, NE, province Erzurum, 60 km NE of Artvin, below pass of Savşat, 2200 m, leg. PIEPER, 28.IX.1996 (SMNS 11443). – 1 ♀, 1 juv., NE, province Erzurum, 70 km SW of Artvin, 10 km N of Yusufeli, river bank, leg. SCHMALFUSS, 22.VII.2001 (SMNS 11503).

Diagnostic characters

Maximum dimensions: 20.0 × 11.5 mm.

Coloration: Tergal parts blackish brown, posterior parts of epimera yellowish, juveniles and sometimes females with mottled tergites.

Cuticular structures: Tergites granulated; glandular fields on pereon-epimera 2–7 more than their diameter away from lateral margin (Fig. 3).

Frontal part of head with triangular lateral lobes, central lobe flat and rounded, much shorter than lateral lobes, with angles of more than 90° between lateral and central lobes (Figs. 1, 2); epimera of pereon-segment 1 with deep rounded posterior concavity (Figs. 1, 3). Telson with deep lateral angles and pointed apex (Fig. 4). Antenna see Fig. 5, proximal segment of flagellum slightly longer than distal one. Carpus of male pereopod 7 proximally with rounded enlargement (Fig. 6). Exopodite of male pleopod 1 with narrow and comparatively short hind lobe, medial margin straight (Fig. 7), endopodites of male pleopod 1 see Fig. 8.

Distribution

From the region of Sochi (Russia, Black Sea coast) through western Georgia to the northeastern part of Turkey (see map Fig. 9).



Fig. 9. Records of *Trachelipus caucasicus*.

Trachelipus gagriensis (Verhoeff, 1918) = nomen dubium
Synonym: *Tracheoniscus gagriensis*.

Bibliography

VERHOEFF 1918: 110, figs. 1–2; VERHOEFF 1933: 107.

Type material re-examined

Holotype: 1 ♂ (length, according to VERHOEFF 1918, 8.75 mm, width 3.8 mm, with slide preparation of pereopod 7 and pleopod 1), western Caucasus, Georgia, Abkhazia, Black Sea coast, near Gagra (= Gagri, between Sochi and Sokhumi), leg. LIGNAU, date ? (ZSM, Reg. Nr. A 20111538).

Remarks

The single type specimen is a juvenile male whose diagnostic characters do not yet exhibit those of the adult males of *Trachelipus* (pereopod 7, pleopod-exopodite 1). Therefore it is impossible to identify the species with safety and we consider *T. gagriensis* a nomen dubium.

Trachelipus razzautii (Arcangeli, 1913)

(Figs. 10–14 and map Fig. 15)

Synonyms: *Porcellio razzautii*, *Tracheoniscus brentanus*, *T. kigatensis*, *T. larvi*, *T. simrothi*.

Bibliography

A complete reference list of the species is found in SCHMALFUSS (2003). The following publications treat the records around

the Black Sea, described as *T. kigatensis*: VERHOEFF 1943: 17, 20, figs. 23, 27 (European shore of Bosphorus); VERHOEFF 1949: 29; SCHMIDT 1997: 204.

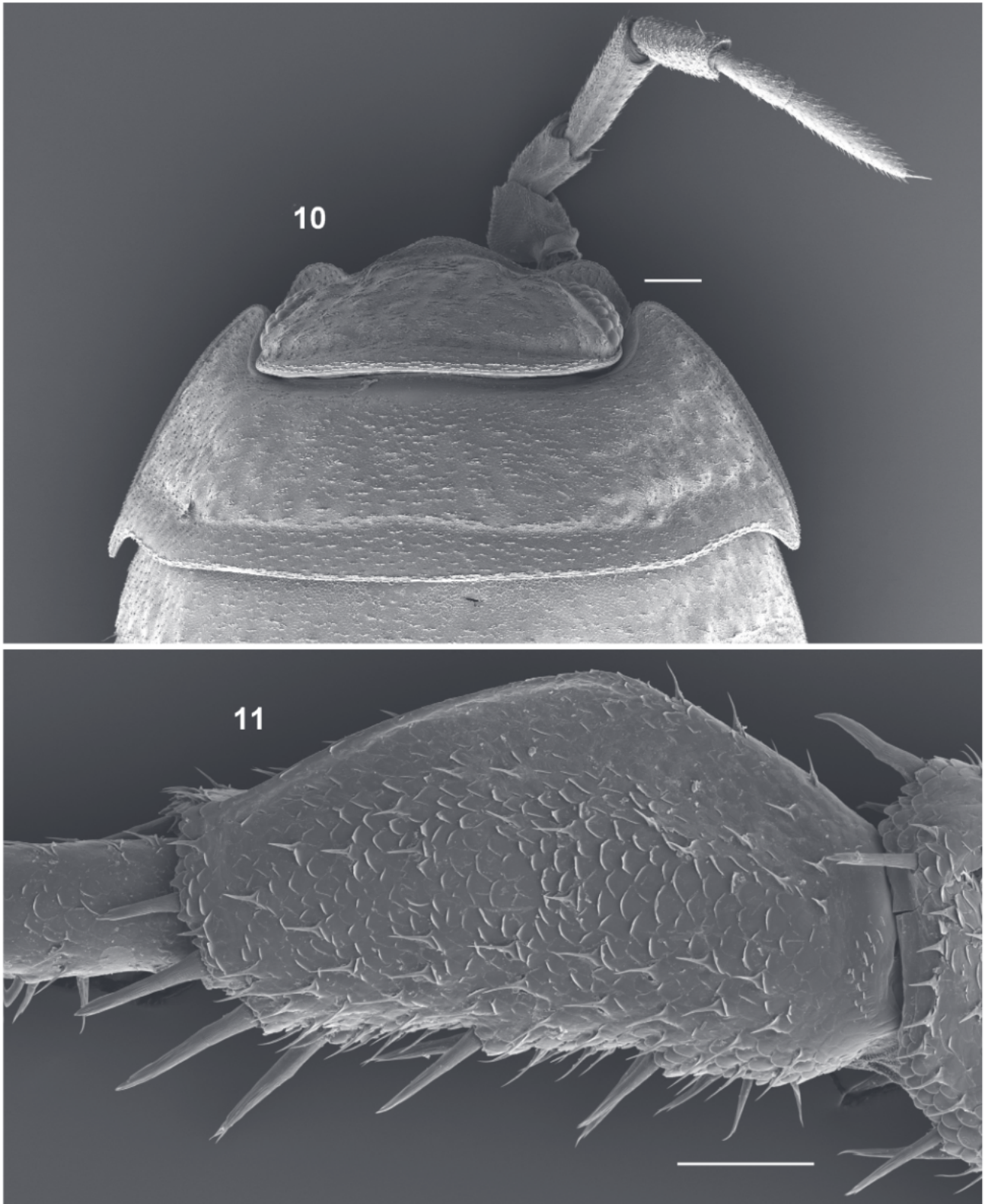
New material

Russia: 12 ex., SW-Russia, Rostov region, near village Konigin, Medvežia ravine, leg. D. KHISAMETDINOVA & A. EVSUKOV, 16.VI.2009 (SMNS 13127). – 34 ex., northwestern Caucasus, Republic of Adygea, Lago-Naki Plateau, alpine meadow, 1800 m, leg. D. KHISAMETDINOVA & A. EVSUKOV, 24.VI.2010 (SMNS 13110). – 1 ♀, northwestern Caucasus, Republic of Adygea, near village Dakhovskaya, Skalisty Ridge, eastern slope, 800 m, leg. D. KHISAMETDINOVA & A. EVSUKOV, 30.VI.2010 (SMNS 13120). – 9 ex., SW-Russia, Krasnodarsky Krai, Apsheronsky District, near Stanitsa Temnolesskaya, *Carpinus* forest, leg. D. KHISAMETDINOVA & Y. KOCHETOV, 16.VIII.2011 (SMNS 13123).

Turkey: 2 ♀♀, southwestern Black Sea coast, 20 km NE of Zonguldak, Hisarönu, leg. E. KOHLER, VIII.1973 (SMNS 11005). – 2 ♂♂, NE-Anatolia, 40 km S of Trabzon, Province Gümüşhane, 15 km NE of Manastir, Cehennem Valley, leg. E. KACHIKOV, 15.V.2011 (SMNS 11594).

Bulgaria: 1 ♀, SW-Bulgaria, 30 km N of Blagoevgrad, Rila Monastery, 800 m, forest, leg. S. HUBER, 6.VIII.2005 (SMNS 5559).

Greece: 1 ♂, eastern Macedonia, prefecture Sérres, N of Sérres, 900 m, 41°14'N/23°40'E, leg. J. KONTSCHÄN, 30.III.2007 (SMNS 1138). – 16 ex., NE-Aegean island Lésvos (Lesbos), Skála Sikamiás, beach, leg. F. ERHARD & H. SCHMALFUSS, 18.V.1995 (SMNS 2508). – 3 ♀♀, NE-Aegean island Lésvos (Lesbos), 12 km W of Mitilíni, leg. F. ERHARD & H. SCHMALFUSS, 17.–21.V.1995 (SMNS 2506). – 17 ♀♀, NE-Aegean island Lésvos (Lesbos), 5 km N of Eresós, leg. F. ERHARD & H. SCHMALFUSS, 9.V.1995 (SMNS 2492).



Figs. 10–11. *Trachelipus razzautii*, ♂, 5.6 × 3.2 mm (Russia, Rostov region, SMNS 13127, SEM-photographs). – 10. Head and pereon-tergite 1, dorsal view. 11. Carpus 7, caudal view. – Scales: 0.2 mm (10), 0.1 mm (11).

Diagnostic characters

Maximum dimensions: ♂ 7.2 × 3.5 mm, ♀ 9.2 × 4.2 mm.

Coloration: Light brown with pronounced yellowish muscle spots, two rows of light streaks on bases of pereon-epimera and one median row, posterior corners of pereon-epimera and uropods yellowish.

Cuticular structures: Tergites slightly granulated (Fig. 10); glandular fields on pereon-epimera situated at lateral margin.

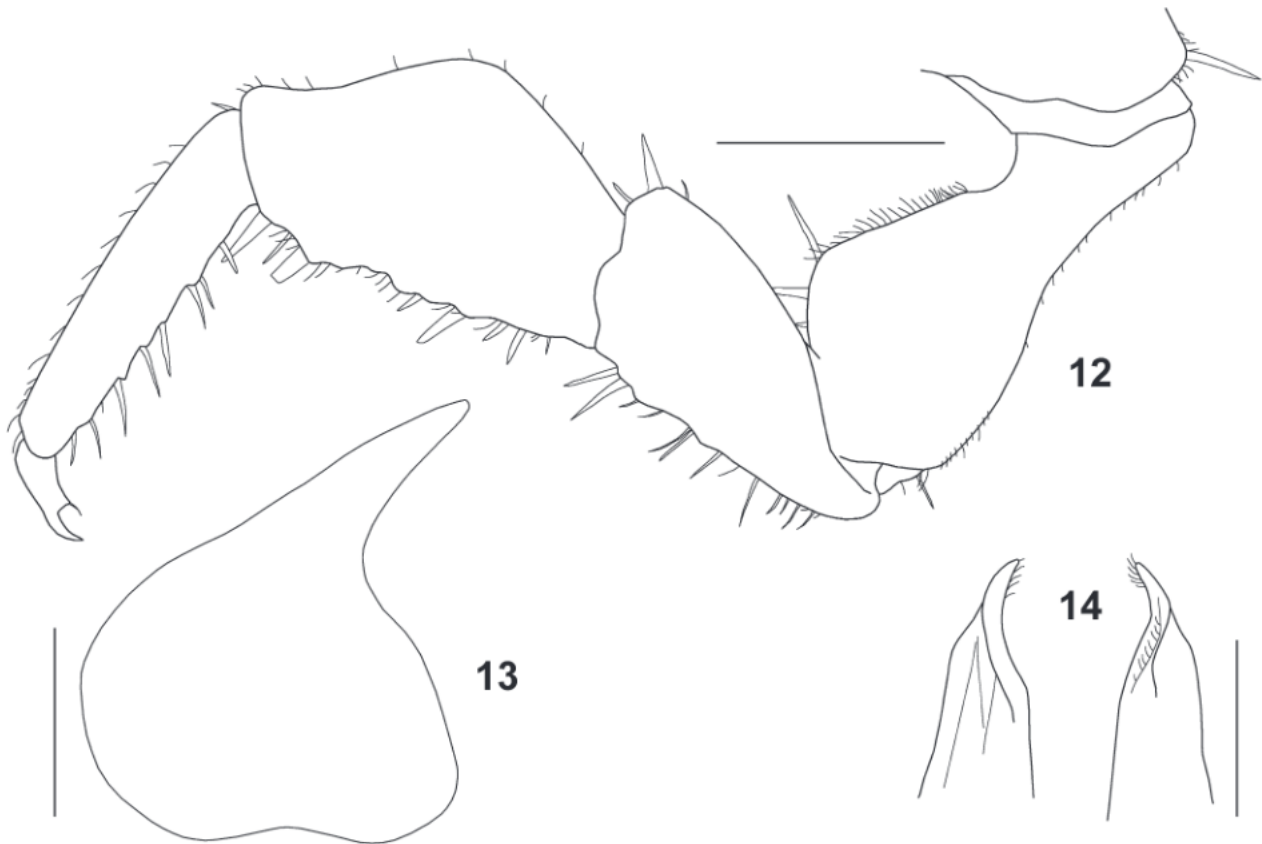
Frontal part of head with trapezoidal lateral lobes, central lobe rounded, longer than lateral lobes, with angles of more than 90° between lateral and central lobes; epimera of pereon-segment 1 with rounded posterior concavity (Fig. 10). Telson laterally with rounded concavities and pointed apex. Antenna with distal segment of flagellum nearly twice as long as proximal one (Fig. 10). Carpus of male pereopod 7 with well-developed rounded ridge (Figs. 11–12). Exopodite of male pleopod 1 with long narrow hind lobe, medial margin straight (Fig. 13), endopodites of male pleopod 1 see Fig. 14.

Distribution

Northern Italy; Slovenia; SW-Bulgaria; Greece: north-eastern mainland and Aegean island Mitilini (= Lés-vos); Turkey along Black Sea coast; southwestern Russia around eastern Black Sea (for records around Black Sea see map Fig. 15).

Remarks

The treated material is identified as *Trachelipus razzautii*. SCHMIDT (1997: 204) synonymized *Tracheoniscus larii* Verhoeff, 1927, *T. brentanus* Verhoeff, 1927, *T. simrothi* Verhoeff, 1936 (all from Italy) and *T. kigatensis* Verhoeff, 1943 (from the Black Sea) with *T. razzautii*. We found slight differences between the specimens from northern Italy and those from around the Black Sea, e. g. the median frontal lobe is shorter and more rounded in the Italian specimens (compare Fig. 10 with fig. 69 in SCHMIDT 1997: 211). Considering a certain intraspecific variability and the fact that the sexual male characters are identical in samples from Italy and the Black Sea region we treat these populations as conspecific.



Figs. 12–14. *Trachelipus razzautii*, ♂, 7.2 × 3.5 mm (Russia, Rostov region, SMNS 13127). – 12. Pereopod 7, frontal view. 13. Pleopod-exopodite 1, ventral view. 14. Apices of pleopod-endopodites 1. – Scales: 0.4 mm (12–13), 0.3 mm (14).



Fig. 15. Records of *Trachelipus razzautii* around the Black Sea. Further to the west the species is known from the northern Greek mainland (material examined), southwestern Bulgaria (material examined), Slovenia and northern Italy (see bibliography).

BORUTZKY (1976) has described *Trachelipus sarmaticus* from Saporoshje in the Ukraine. The author remarked that the new species is close to *T. razzautii* and *T. kigatensis*. During a visit to the Moscow State University Museum the junior author of the present article tried to investigate the types of *T. sarmaticus*, but the type specimens could not be found. At present we suspect that *T. sarmaticus* is conspecific with *T. razzautii*, but this question can only be answered if specimens from the type locality are available for investigation.

Trachelipus lignaui (Verhoeff, 1918)
(Figs. 16–21 and map Fig. 22)

Synonym: *Tracheoniscus lignaui*.

Bibliography

VERHOEFF 1918: 111, figs. 3–4; VERHOEFF 1933: 106; SCHMIDT 1997: 243.

Type material re-examined

Lectotype, herewith designated to fix identity of species: 1 ♂ (length, according to VERHOEFF 1918, 7.5 mm, width 3.6 mm, with slide preparation of pereopod 7 and pleopod 1); western Caucasus, Georgia, Abkhazia, Black Sea coast, near Gagra (= Gagri, between Sochi and Sokhumi), leg. LIGNAU, date ? (ZSM, Reg. Nr. A 20111540).

New material

Russia: 1 ♂, Black Sea coast, near Sochi, Dagomys, leg. J. POPOV, 10.VII.–14.VII.1987 (SMNS 13104). – 4 ♂♂, 1 ♀, north-western Caucasus, Republic of Adygea, 60 km S of Maikop, near settlement Nickel, bank of Zolotoy river, *Fagus* and *Carpinus* forest, 700 m, leg. D. KHISAMETDINOVA, A. EVSUKOV, 13.–19.VI.2010 (SMNS 13117). – 1 ♂, ?subadult, Black Sea coast, Krasnodarsky kray, near village Novomichailovskiy, leg. D. KHISAMETDINOVA, 16.VIII.2004 (SMNS 13129). – 1 ♂, 1 ♀, Rostov-on-Don, greenhouse of State University, leg. D. KHISAMETDINOVA, 30.VIII.2007 (SMNS 13121).

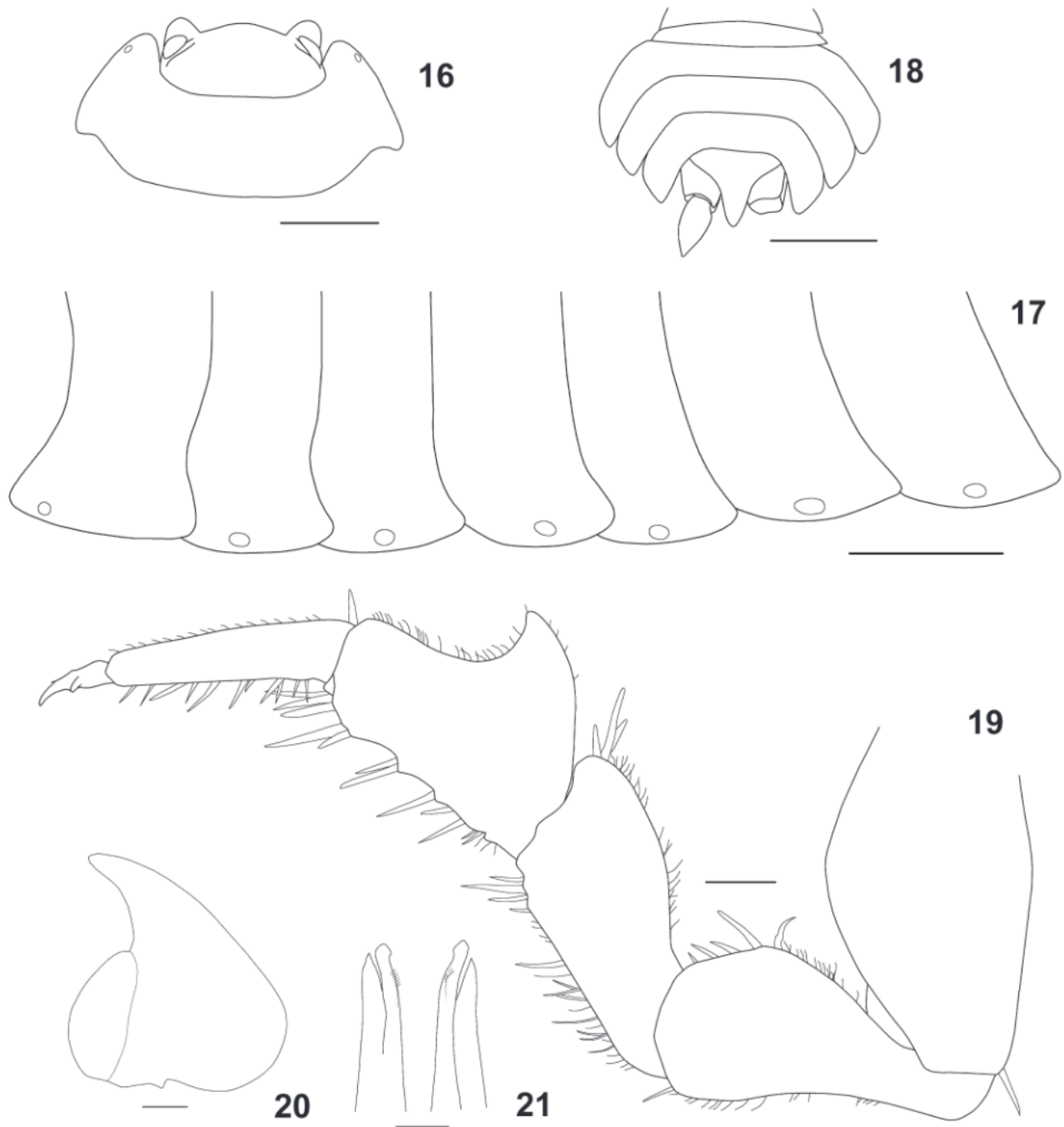
Diagnostic characters

Maximum dimensions: 8.5 × 3.7 mm.

Coloration: Light brown with usual light muscle spots, two rows of light streaks on bases of pereon-epimera, posterior parts of pereon-epimera, antennae and uropods yellowish.

Cuticular structures: Tergites only very slightly granulated; glandular fields on pereon-epimera situated at lateral margin (Fig. 17).

Frontal part of head with semicircular lateral lobes, central lobe flat and rounded, slightly longer than or at the same level with lateral lobes, with angles of more than 90° between lateral and central lobes; epimera of pereon-segment 1 with rounded posterior concavity (Fig. 16). Telson laterally with rounded concavities and pointed apex



Figs. 16–21. *Trachelipus lignai*, lectotype, ♂, 7.5 × 3.6 mm (Georgia, ZSM). – 16. Head and pereon-tergite 1, dorsal view. 17. Pereon-epimera 1–7 with gland-fields, dorso-lateral view. 18. Pleon, dorsal view. 19. Pereopod 7, frontal view. 20. Pleopod-exopodite 1, dorsal view. 21. Apices of pleopod-endopodites 1. – Scales: 1 mm (16–18), 2 mm (19–21).

(Fig. 18). Antenna with distal segment of flagellum about 2.5 times as long as proximal one. Carpus of male pereopod 7 distally with big and sharply pointed enlargement

(Fig. 19). Exopodite of male pleopod 1 with broad but long hind lobe, medial margin convex (Fig. 20), endopodites of male pleopod 1 see Fig. 21.



Fig. 22. Records of *Trachelipus lignaii*.

Distribution

Russia, Black Sea coast from Gagra in the south (between Sochi and Sokhumi) to Novomichailovskiy in the north, and inland in the Republic of Adygea south of Maikop (see map Fig. 22). The record from a greenhouse in Rostov-on-Don may be due to anthropogenic introduction.

Trachelipus longipennis (Budde-Lund, 1885) = nomen dubium

Synonym: *Porcellio longipennis*.

Bibliography

BUDDE-LUND 1885: 91; SCHMIDT 1997: 244; JEPPESEN 2000: 246.

Remarks

BUDDE-LUND (1885: 91) reports this species from the northwestern part of Georgia (Abkhazia) and from the Crimea. SCHMIDT (1997: 244) has investigated type material (parts of two females) housed in the BML, suggesting the possibility that this material is conspecific with *T. lutshnikii*. As no illustrations exist and as no safe conclusions on the identity of the species can be drawn from females we consider this taxon for the time being as a nomen dubium.

Trachelipus lutshnikii (Verhoeff, 1933)

(Figs. 23–29 and map Fig. 30)

Synonym: *Tracheoniscus lutshnikii*.

Bibliography

VERHOEFF 1933: 107, figs. 16–17; SCHMIDT 1997: 244.

Type material re-examined

Lectotype, herewith designated to fix identity of species: slide preparation of male pereopods 7 and male pleopods 1 and 2, southern Russia, coast of Black Sea, near Sochi, VII.1931, leg. V. LUTSHNIK, date? (ZSM).

Paralectotype: ♀ with marsupium, formerly dried and pinned, 12.0 × 6.6 mm, collecting data as lectotype (ZSM, Reg. Nr. A 20111541).

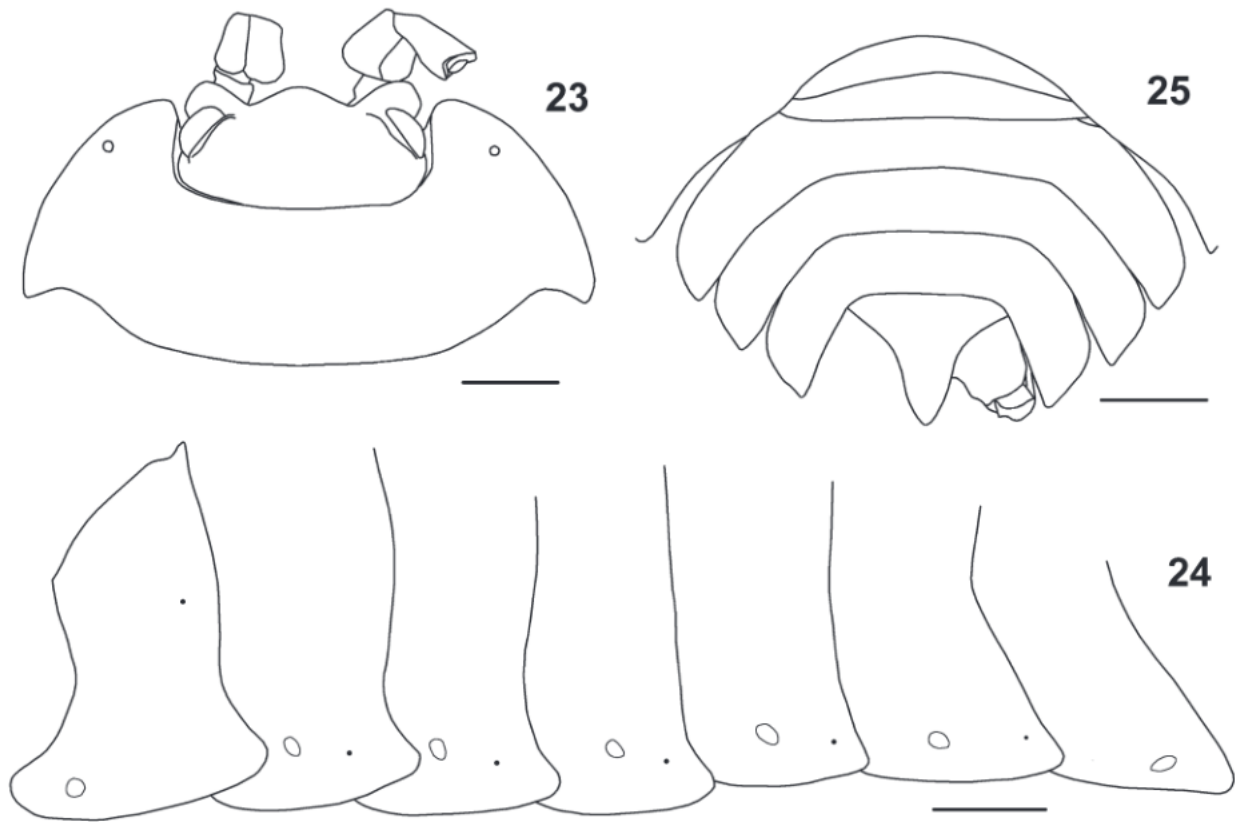
New material

Russia: 5 ♂♂, coast of Black Sea, Krasnodarsky kray, near village Novomichailovskiy, along stream, under rotten trees, leg. D. KHISAMETDINOVA, 16.VIII.2004 (SMNS 13063).

Diagnostic characters

Maximum dimensions: 14 mm long (VERHOEFF 1933), the biggest specimen of the recently collected material is 12.0 × 6.0 mm.

Coloration: In the fresh specimens the upper parts are dark brown with usual light muscle spots, posterior parts of epimera yellowish.



Figs. 23–25. *Trachelipus lutshnikii*, paralectotype, ♀, 11.5 × 6.8 mm (Russia, Sochi, ZSM). – 23. Head and pereon-tergite 1, dorsal view. 24. Pereon-epimera 1–7 with gland-fields and noduli laterales, dorso-lateral view. 25. Pleon, dorsal view. – Scales: 1 mm.

Cuticular structures: Tergites granulated; glandular fields on pereon-epimera 2–7 more than their diameter away from lateral margin (Fig. 24).

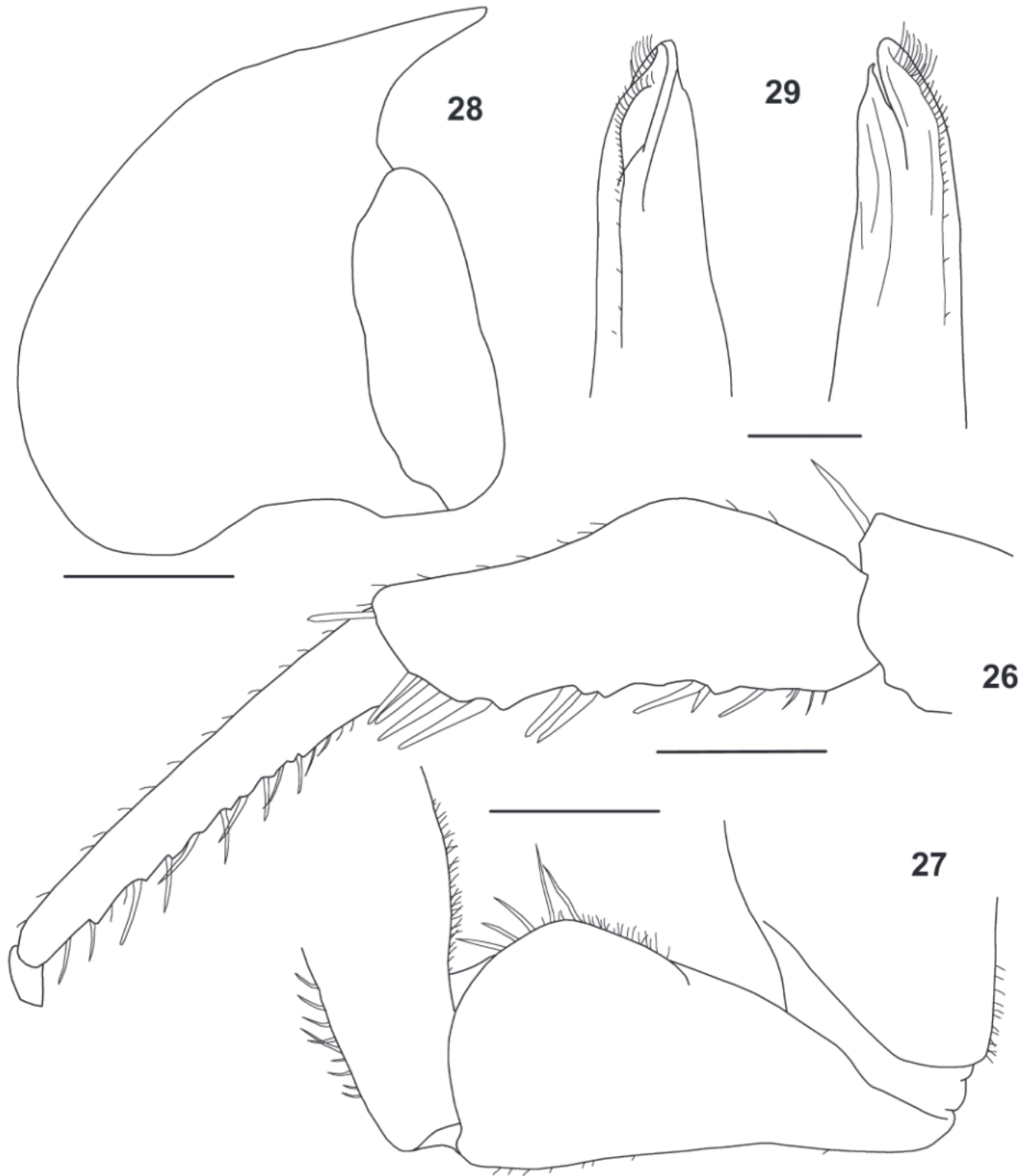
Frontal part of head with trapezoidal lateral lobes, central lobe rounded, slightly shorter than lateral lobes, with angles of more than 90° between lateral and central lobes; epimera of pereon-segment 1 with rounded posterior concavity (Figs. 23, 24). Telson laterally with rounded concavities and pointed apex (Fig. 25). Antenna with distal segment of flagellum about 2.5 times as long as proximal one. Carpus of male pereopod 7 proximally with moderate ridge (Fig. 26), ischium 7 ventrally straight (Fig. 27). Exopodite of male pleopod 1 with short, narrow pointed hind lobe, medial margin convex (Fig. 28), endopodites of male pleopod 1 see Fig. 29.

Distribution

Southwestern Russia, northeastern coast of Black Sea (map Fig. 30).

4 References

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Figs. 26–29. *Trachelipus lutshnikii*, lectotype, ♂, slide preparation (Russia, Sochi, ZSM). – 26. Carpus 7, frontal view. – 27. Ischium 7. – 28. Pleopod-exopodite 1, dorsal view. 29. Apices of pleopod-endopodites 1. – Scales: 0.3 mm (26–28), 0.2 mm (29).



Fig. 30. Records of *Trachelipus lutshnikii*.

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VERHOEFF, K. (1949): Über Land-Isopoden aus der Türkei. III. – *İstanbul Üniversitesi Fen Fakültesi Mecmuası (Serı B)* **14**: 21–48.

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