

Vonimetopa longimana sp.n. (Crustacea: Amphipoda: Stenothoidae), a new amphipod species from the Russian coasts of the Sea of Japan

Vonimetopa longimana sp.n. (Crustacea: Amphipoda: Stenothoidae), новый вид бокоплавов из российских прибрежных вод Японского моря

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KEY WORDS: Amphipoda, Stenothoidae, *Vonimetopa*, *Zaikometopa*, Sea of Japan, new species.

КЛЮЧЕВЫЕ СЛОВА: Amphipoda, Stenothoidae, *Vonimetopa*, *Zaikometopa*, Японское море, новый вид.

ABSTRACT. A new amphipod species, *Vonimetopa longimana* sp.n., is described from the coastal shallow waters of the Strait of Tartary (Sea of Japan) off southwestern Sakhalin Island. The new species is assigned to the genus *Vonimetopa* Barnard et Karaman, 1987 due to its similarity in the main morphological characters: in the structure of the mouthparts (palp of mandible 1-articulate, palp of maxilla 1 1-articulate, inner plate of maxilla 2 ordinary, inner plates of maxillipeds well separated), the structure of gnathopods 1 (small, simple, merus incipiently chelate; carpus short, unlobed; propodus elongate, linear), the shape of pleonites (pleonite 3 lacking dorsal process), urosomites (urosomite 1 not carinate posterodorsally) and telson (ordinary, flat). However, *Vonimetopa longimana* sp.n. differs from other the congeners by a long narrow propodus of gnathopod 2 with the vertical palm. The identification key to the species of the genus *Vonimetopa* is provided.

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РЕЗЮМЕ. Описан новый вид амфипод, *Vonimetopa longimana* sp.n., из побережья юго-западного Сахалина (Татарский пролив Японского моря). Новый вид отнесен к роду *Vonimetopa* Barnard et Karaman, 1987 на основании сходства основных признаков: по структуре ротовых придатков (щупик мандибулы 1-члениковый, щупик максиллы 1 1-члениковый, внутренняя лопасть максиллы 2 ординарная, внутренние лопасти максиллипед разделены), гнатопод 1 (маленькие, простые, мерус изначально хелатный; карпус короткий, без лопасти; проподус удлинённый; линейной формы), по форме плеонитов (плеонит 3 без дорсального выроста), по строению уросомитов (уросомит 1 без заднедорсального гребня) и тельсона

(обычный, плоский). *Vonimetopa longimana* sp.n. отличается от других представителей рода длинным узким проподусом гнатопод 2 с вертикальным пальмарным краем. Приведен определительный ключ для видов рода *Vonimetopa*.

Introduction

The genus *Metopelloides* Gurjanova, 1938 was formally proposed within the family Stenothoidae Boeck, 1871 by Gurjanova [1938]. *Metopelloides micropalpa* (Shoemaker, 1930) (previously described by Shoemaker [1930] as *Metopella micropalpa* Shoemaker, 1930) was suggested as the type species of the genus. The newly proposed genus included 6 species, namely *Metopelloides micropalpa* (Shoemaker, 1930) from North Atlantic, *M. shoemakeri* Gurjanova, 1938, *M. stephensi* Gurjanova, 1938, *M. schellenbergi* Gurjanova, 1938, *M. barnardi* Gurjanova, 1938 and *M. tattersalli* Gurjanova, 1938 from the Sea of Japan (North Pacific). Later, Gurjanova [1948, 1951] described 2 new species of the genus: *M. brazhnikovii* Gurjanova, 1948 from the Commander Islands and the coastal waters of the eastern Kamchatka peninsula; and *M. zernovi* Gurjanova, 1948 from the Sea of Japan. Shoemaker [1964] described *Metopelloides dubia* Shoemaker, 1964 from the Pribilof Islands. Coyle & Mueller [1981] described the *M. erythrophthalmus* Coyle et Mueller, 1981 from coastal shallow waters of Alaska [Coyle, Mueller, 1981]. Barnard & Karaman [1987] divided the genus *Metopelloides* Gurjanova, 1938 into 3 different genera: *Metopelloides* Gurjanova, 1938, *Vonimetopa* Barnard et Karaman, 1987 and *Zaikometopa* Barnard et Karaman, 1987.

Currently, the genus *Vonimetopa* Barnard et Karaman, 1987 contains 6 species [Barnard, Karaman, 1987, 1991; Dzhurinskyi, 2013; http://www.marinespecies.org/new_data]: *V. barnardi* (Gurjanova, 1938), *V. brazhnikovii* (Gurjanova, 1948), *V. dubia* (Shoemaker, 1964), *V. schel-*

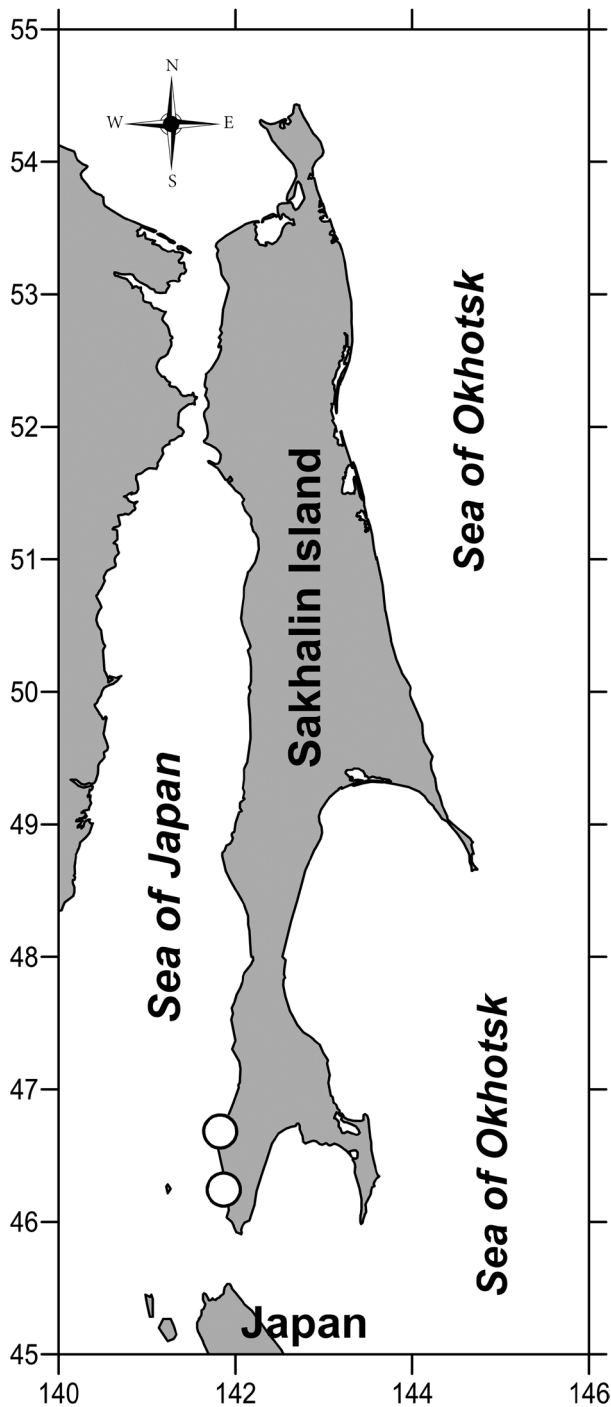


Fig. 1. Distribution of *Vonimetopa longimana* sp.n. on the shelf of Sakhalin Island.

Рис. 1. Распределение *Vonimetopa longimana* sp.n. на шельфе острова Сахалин.

lenbergi (Gurjanova, 1938), *V. shoemakeri* (Gurjanova, 1938), *V. zernovi* (Gurjanova, 1948). Representatives of the genus *Vonimetopa* differ from *Metopelloides* and *Zaikometopa* in the “elongate simple propodus and short lobed carpus of gnathopod 1; and the fully separated inner plates of the maxillipeds” [Barnard, Karaman, 1987, 1991].

At the same time, the recent explorations of the shelf of the Sea of Japan (north-western Pacific) yielded one undescribed species with the features typical of the genus *Vonimetopa*: “antenna 1 lacking nasiform process on article 1; accessory flagellum absent; palp of mandible 1-articulate; palp of maxilla 1 uniaarticulate; inner plate of maxilla 2 ordinary; inner plates of maxillipeds well separated; gnathopod 1 small, simple, article 4 incipiently chelate, article 5 short, unlobed, article 6 elongate, linear; gnathopod 2 weakly enlarged, palm vertical, article 5 short, lobed; pereopods 5–7 with rectilinear article 2; pereonite 4 ordinary; pleonites 4–6 free; pleonite 3 lacking dorsal process” (features according to [Barnard, Karaman, 1987]).

Material and methods

Bottom biotopes were observed underwater with the help of SCUBA equipment in the shelf of south-western Sakhalin Island in the Strait of Tartary (Sea of Japan) in October 2023. Samples were collected by a Scuba-diver using a hand-held benthometer and hand-sorted from the sampler. The specimens were dissected under a stereoscopic microscope “Altami SM0745” and their appendages and mouthparts were mounted in glycerol gel slides. Illustrations were made under an optic microscope “Mikmed-5” with a digital photo camera (DCM-500) and digitally prepared, following a protocol based on Coleman [2003]. All the type material is preserved in ethanol 90% and it is deposited in the Crustacea Collection of the Zoological Museum of Moscow State University (ZMMU).

Setae definitions are based on Watling [Garm, Watling, 2013; Watling, 1989].

Systematics

Family Stenothoidae Boeck, 1871

Subfamily Stenothoinae Boeck, 1871

Genus *Vonimetopa* Barnard et Karaman, 1987

Vonimetopa Barnard et Karaman, 1987: 871. — Barnard, Karaman, 1991: 700.

Metopelloides Gurjanova, 1938: 281, 283, 390 (part). — Gurjanova, 1948: 299 (part); Gurjanova, 1951: 454 (part).

non *Metopelloides*. — Coyle, Mueller, 1981.

TYPE SPECIES. *Metopella dubia* Shoemaker, 1964: 400.

SPECIES COMPOSITION. Including the new species described here, *Vonimetopa* contains 6 species [Barnard, Karaman, 1987, 1991; Dzhurinskyi, 2013; <http://www.marinespecies.org>; new data]: *V. barnardi* (Gurjanova, 1938), *V. dubia* (Shoemaker, 1964), *V. schellenbergi* (Gurjanova, 1938), *V. shoemakeri* (Gurjanova, 1938), *V. zernovi* (Gurjanova, 1948) and *V. longimana* sp.n. (see below).

REMARKS. Gurjanova [1948] described *V. brazhnikovii* (Gurjanova, 1948) from Commander Islands and the eastern coast of the Kamchatka Peninsula. Distinctive features of the new species were “Antennae 1..., the first segment of its peduncle is shorter than the head, strong, equipped with a rounded longitudinal keel on the upper surface, the second segment with the same keel...”. Gnathopod 1 of *V. brazhnikovii* is small, simple, article 5 short, unlobed; article 6 elongate, linear [Gurjanova, 1948]. The listed characters allow us to confidently attribute *V. brazhnikovii* to the genus *Zaikometopa* Barnard et Karaman, 1987.



Fig. 2. *Vonimetopa longimana* sp.n., paratype (3.4 mm), ZMMU Mb-1274: lateral view. Scale 0.5 mm.

Рис. 2 *Vonimetopa longimana* sp.n., паратип (3,4 мм), ZMMU Mb-1274: общий вид латерально. Масштаб 0,5 мм.

Vonimetopa longimana sp.n.
Figs 1–7.

TYPE MATERIAL. Holotype, male, 3.4 mm, Mb-1273, the Sea of Japan, Strait of Tartary, shelf of the western Sakhalin Island (46°43.029'N 141°52.780'E, 0.2 m), sand with brown algae *Stephanocystis crassipes* (Mertens ex Turner) Draisma, Ballesteros, F.Rousseau & T.Thibaut, 2010, 20 May 2023, E.S. Korneev. Paratypes: 1 male, 3.7 mm, Mb-1274, with same data as holotype. 7 males, Mb-1275, with same data as holotype. 4 males, Mb-1278, the Sea of Japan, Strait of Tartary, shelf of the western Sakhalin Island (46°14.873'N 141°53.693'E, 0.2 m), sand. 6 males Mb-1276, the Sea of Japan, Strait of Tartary, shelf of the western Sakhalin Island (46°16.326'N 141°53.542'E, 0.2 m), sand. Paratype: 1 male, 3.4 mm, Mb-1277, the Sea of Japan, Strait of Tartary, shelf of the western Sakhalin Island (46°14.873'N 141°53.693'E, 0.2 m), sand. Paratypes: 240 males, Mb-1279, the Sea of Japan, Strait of Tartary, shelf of the western Sakhalin Island (46°13.268'–46°14.909'N 141°53.576'–141°54.047'E, 0.2–10 m).

TYPE LOCALITY. The western coast of Sakhalin Island, Tatar Strait, Sea of Japan, Far East of Russia (46°43.029'N 141°52.780'E, 0.2 m).

ETYMOLOGY. The species name *longimana* based on a Latin words “longi” (long) and “manus” (hand), that is caused by shape of propodus of gnathopod 2: long, with a long vertical palm. Feminine in gender.

DIAGNOSIS. Antenna 1, peduncular segment 3 and articles of flagellum with aesthetascs. Mandibular palp with 2–3 apical setae and single marginal seta. Lower lip, mediobasal

corner of outer plate with molarized forked seta and numerous thin setulae. Maxilliped, inner plate apically with single robust seta (spine) and 2 simple setae. Gnathopod 1 small, simple, propodus elongate, linear, posterior margin of dactylus with 3–4 short setae. Gnathopod 2 large, anterior margin of basis of pereopods 3–4 with 1–2 short setae distally; propodus elongate, palmar margin vertical. Telson long, linguiform.

DESCRIPTION. Male (3.4 mm). Body is mostly colorless, the pereonites and coxal plate 4 with indistinct pale pink spots. Pereonites, Pleonites, and Urosomites: smooth. Coxal plate 1 small, perfectly hidden by coxal plate 2; coxal plates 2 and 3 large, coxal plate 4 extremely large; coxal plates 5–7 small, perfectly hidden by coxal plate 4.

Head. Rostrum small. Ocular lobes rounded triangular. Eyes colorless in alcohol, round, medium (diameter: ca. 0.26 times as head length). Antenna 1 short, ca. 0.25 times of body length; peduncular articles 1–3 with length ratio of 1.0:0.44:0.3, article 1 stout, with 2 short setulae on antero-distal corner and with single seta on postero-distal corner; accessory flagellum absent, article 3 with single aesthetasc posterodistally; primary flagellum with 9 articles, articles 1–8 each bearing 1–3 aesthetascs posterodistally. Antenna 2 slightly longer than antenna 1, slender; peduncular articles 3–5 with length ratio of 1.0:2.2:1.9, sparsely setose; flagellum with 8 articles, terminal article narrow, articles bearing a crown of short setae distally. Mandibles, incisors wide, with 9–10 distal denticles; lacinia mobilis broad, left one fan-shaped, with 9 denticles, right one

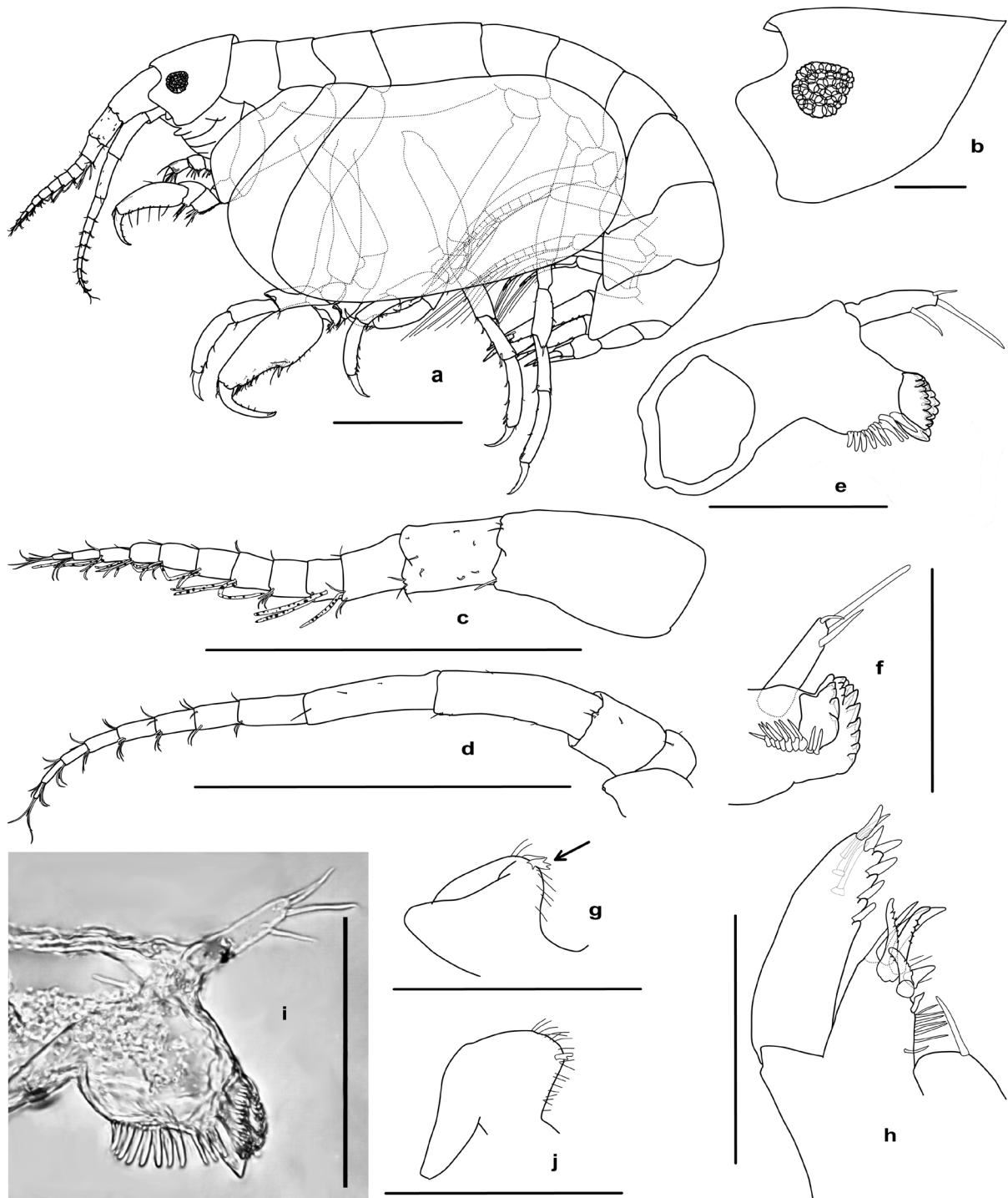


Fig. 3. *Vonimetopa longimana* sp.n., holotype (3.4 mm), ZMMU Mb-1273: a — lateral view, b — cephalon, c — antenna 1, d — antenna 2, e — left mandible, f — right mandible, g, j — lower lips 1/2, h — maxilla 1; paratype (3.7 mm): i — left mandible. Scales: a, c, d — 0.5 mm, b, e–j — 0.1 mm.

Рис. 3. *Vonimetopa longimana* sp.n., голотип (3,4 мм), ZMMU Мб-1273: а — общий вид латерально, б — голова, с — антенна 1, д — антенна 2, е — левая мандибула, ф — правая мандибула, г, j — нижняя губа 1/2, h — максилла 1; паратип (3,7 мм): i — левая мандибула. Масштаб: а, с, d — 0,5 мм, б, е–j — 0,1 мм.

rectangular, with 4 denticles; accessory blades 9–11 in left, 9 in right; palp 1-articulate, relatively short, slender, with 2–3 apical “E” setae and single marginal “D” seta. Lower lip, outer plate with mandibular lobe, with molarized forked seta and numerous thin setulae. Maxilla 1 with small inner plate bearing single

seta; outer plate with 7 large robust setae and one small robust seta apically, medial margin bearing several feeble setae; palp 1-articulate, tip of palp acutely projected, with 2 robust setae, medial margin lined with 4 robust setae, with a subapical row of 3 setae. Maxilla 2, inner plate triangular, tip with several setae;

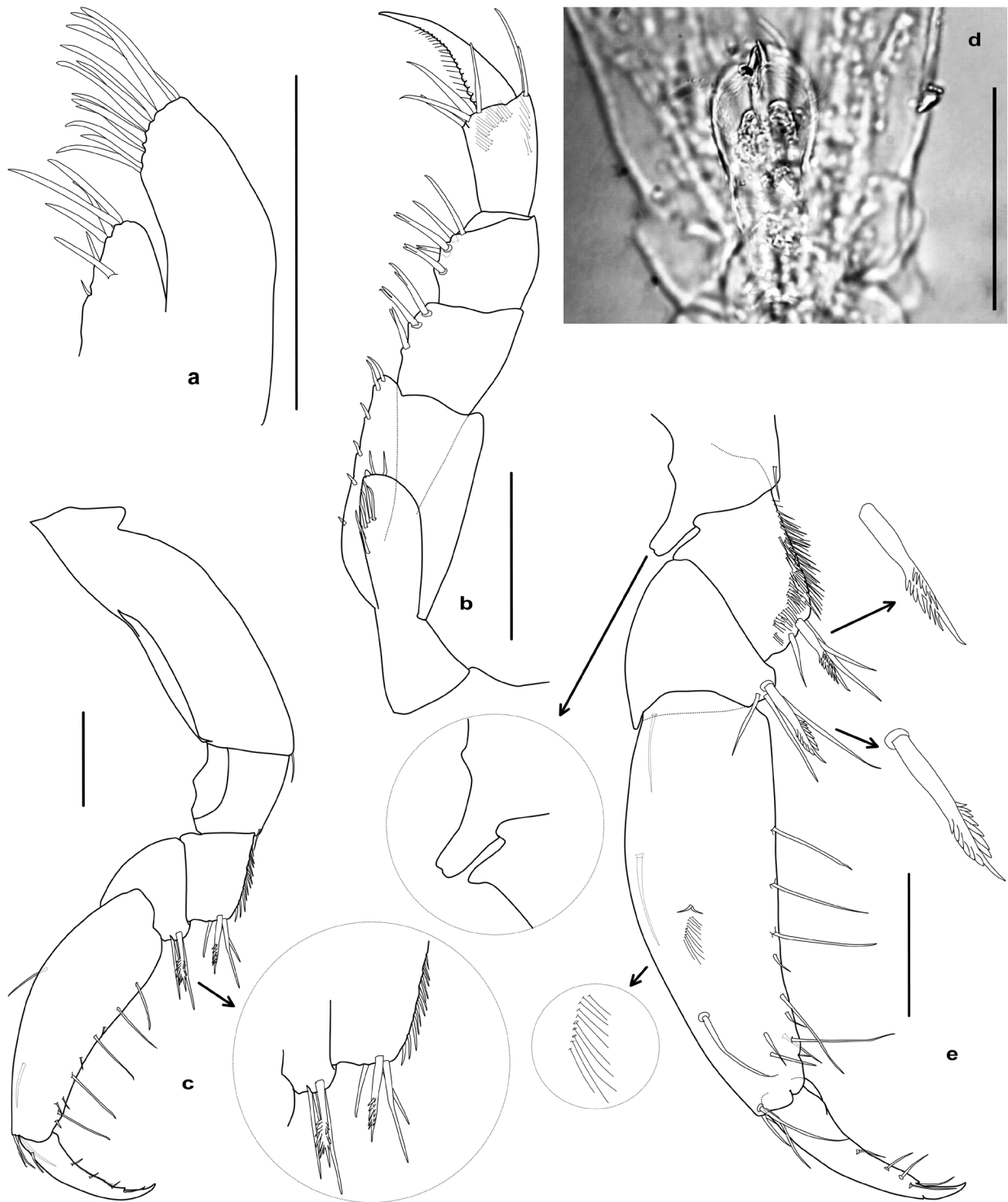


Fig. 4. *Vonimetopa longimana* sp.n., holotype (3.4 mm), ZMMU Mb-1273: a — maxilla 2, b — maxilliped, c — pereopod 1, outer side; paratype (3.7 mm), ZMMU Mb-1274: d — inner plates of maxilliped, e — pereopod 1, inner side. Scale 0.1 mm.

Рис. 4. *Vonimetopa longimana* sp.n., голотип (3,4 мм), ZMMU Mb-1273: а — максилла 2, б — ногочелюсти, с — переопод 1, наружная сторона; паратип (3,7 мм), ZMMU Mb-1274: d — внутренняя лопасть ногочелюстей, e — переопод 1, внутренняя сторона. Масштаб 0,1 мм.

outer plate longer, subrounded and setose distally. Maxilliped enlarged; distal margins of inner plates each bearing one robust spine-like seta and 2 short setae; distomedial lobe of outer plate short, tip with 2 short robust setae, lateral margin with a row of 4 short robust setae; palp stout, length ratios of articles 1–4 being as 1:1.0:1.1:1.5, articles 1–3 wide, medial margins of articles 1

and 2 with several robust bifurcate setae, article 3 with a group of 4 robust setae on distomedial corner, article 4 slightly curved, medial margin bearing a row of numerous feeble setae.

Pereon. Gnathopod 1 small; basis stubby, anterior margin smooth, posterodistal corner with one seta; ischium with anterodistal process, merus densely pubescent posteriorly, with 3



Fig. 5. *Vonimetopa longimana* sp.n., holotype (3.4 mm), ZMMU Mb-1273: a — pereopod 2, outer side, b — pereopod 2, inner side, c, d — pereopod 3. Scales: a, b — 0.5 mm; c, d — 0.1 mm.

Рис. 5. *Vonimetopa longimana* sp.n., голотип (3,4 мм), ZMMU Mb-1273: а — переопод 2, наружная сторона, б — переопод 2, внутренняя сторона, с, д — переопод 3. Масштаб: а, б — 0,5 мм; с, д — 0,1 мм.

simple setae and one specific robust comb seta distally; carpus short, posterior margin with 2–3 simple setae and one specific robust comb seta; propodus long, simple, slightly narrowed distally, without palm, with 2 setae along anterior margin and with a row of 5 rare long setae and few tiny setae along posterior margin, inner surface with a short row of numerous feeble

setae; dactylus slightly curved inside, with a row of 3–4 short setae along posterior margin. Gnathopod 2 stout; basis straight, anterior margin lined with 3–4 evenly-spaced rare short setae, posterodistal corner with short seta; ischium, posterodistal corner with 2 setae; merus rounded distally, posterior margin smooth, posterodistally with 2–3 setae; carpus with posterior

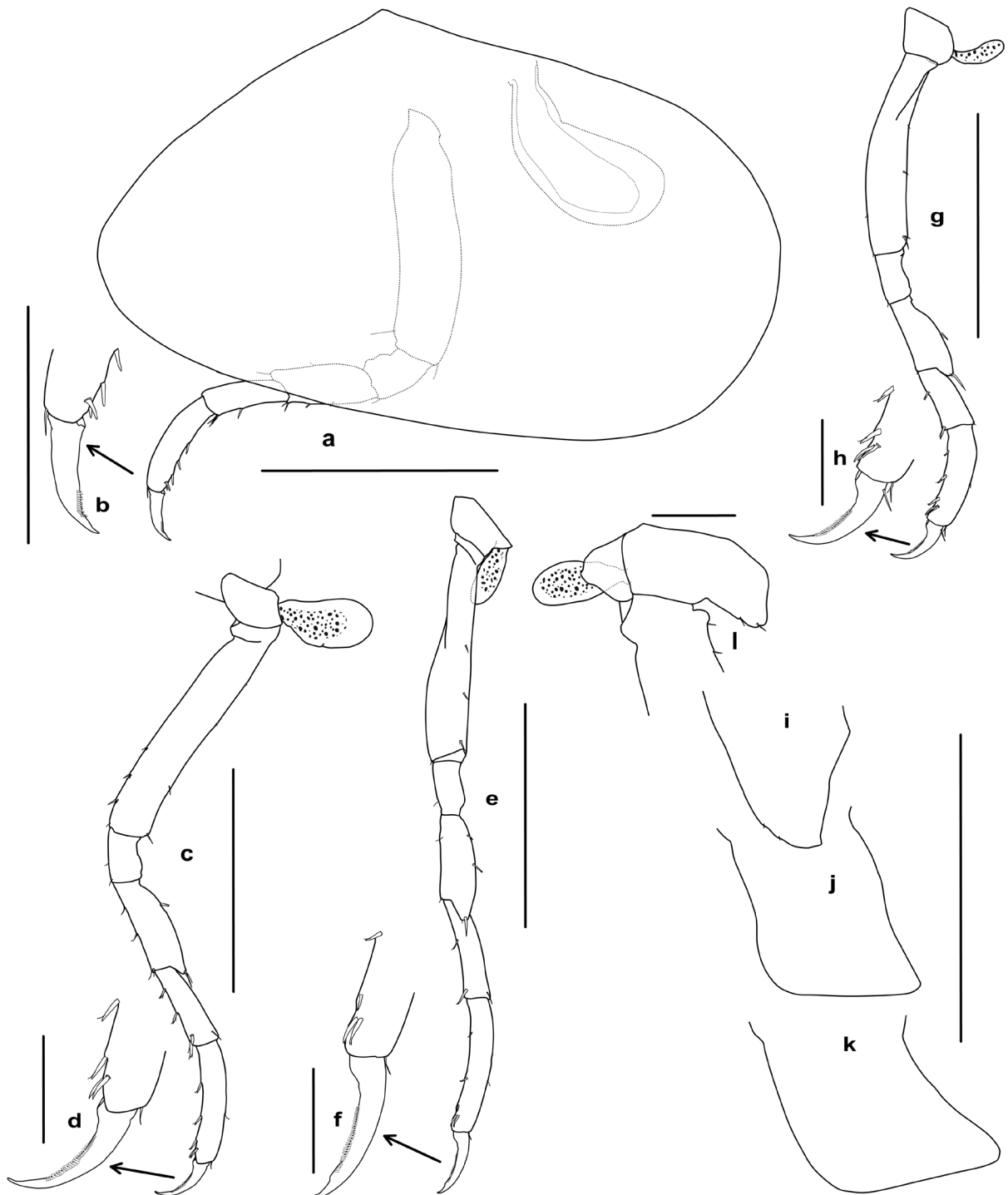


Fig. 6. *Vonimetopa longimana* sp.n., holotype (3.4 mm), ZMMU Mb-1273: a, b — pereopod 4, c, d — pereopod 5; e, f — pereopod 6, g, h — pereopod 7, i, j, k — epimeral plates 1–3; paratype (3.7 mm), ZMMU Mb-1274: l — coxa 7. Scales: a, c, e, g, i, j, k — 0.5 mm, b, d, f, h, l — 0.1 mm

Рис. 6. *Vonimetopa longimana* sp.n., голотип (3,4 мм), ZMMU Mb-1273: а, б — переопод 4, с, д — переопод 5; е, ф — переопод 6, г, h — переопод 7, и, j, k — эпимеральные пластинки 1–3; паратип (3,7 мм), ZMMU Mb-1274: л — коксальная пластинка 7. Масштаб: а, с, е, г, и, j, k — 0,5 мм, б, д, ф, h, л — 0,1 мм.

lobe pubescent posteriorly, posterodistally with 2–3 specific robust comb setae; propodus long, narrow, slightly broadened medially, ca. 2.5–3 times length of carpus, anterodistal corner setose, palm vertical, slightly concave, with a dense row of short numerous setae, defined from posterior margin by low projection, palm corner with 2 robust spine-like setae; dactylus

curved posteriorly, posterior margin with a row of 4–6 short setae. Pereopod 3 slender, shorter than gnathopod 2; basis, anterior and posterior margins with few short setae along distal 1/3; propodus ca. 1.4 times as long as carpus, posterior margin with 1+2+1 setae in the distal half; dactylus narrow, 0.4 times as long as propodus, with a short comb of tiny spines in the distal

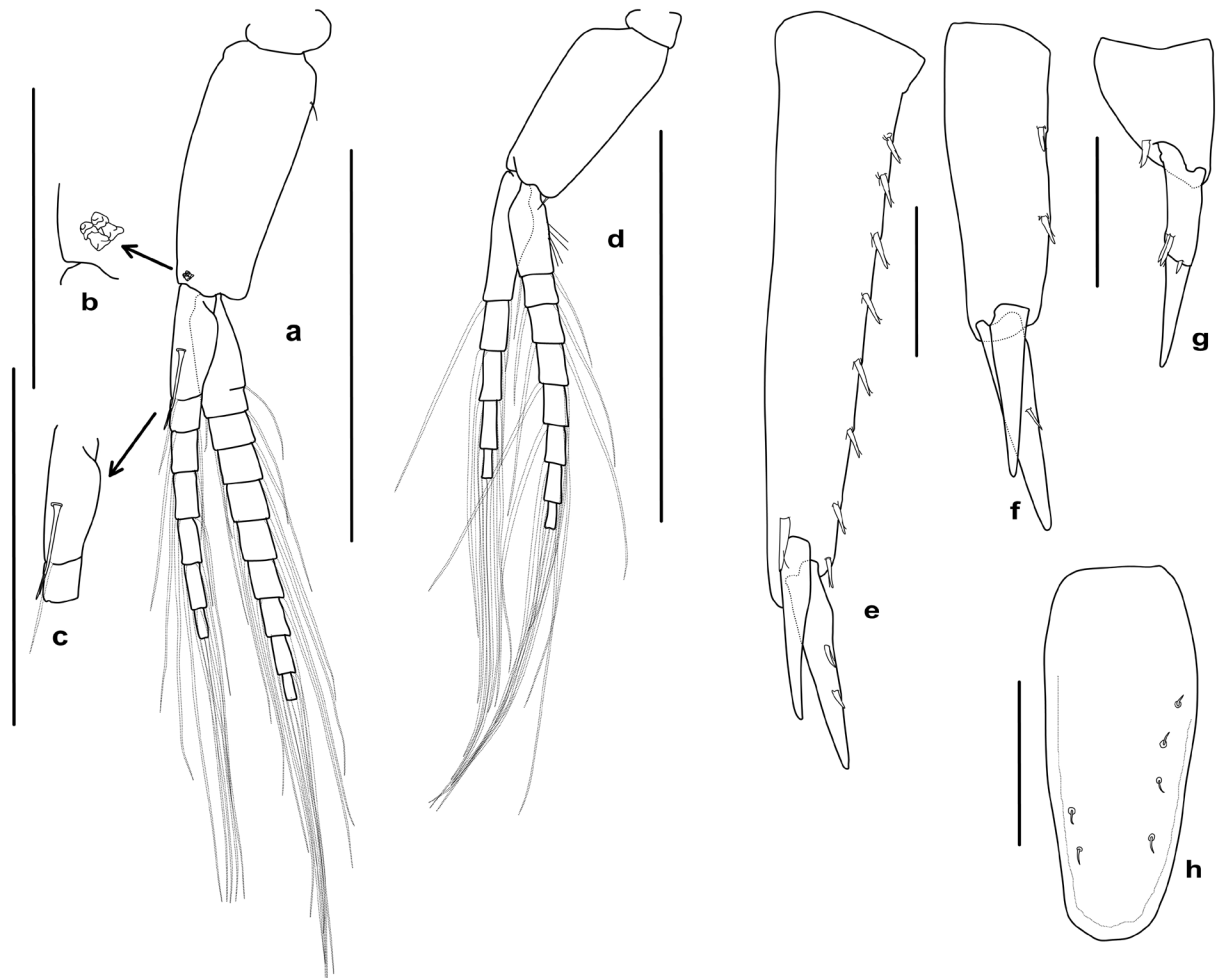


Fig. 7. *Vonimetopa longimana* sp.n., holotype (3.4 mm), ZMMU Mb-1273: a — pleopod 1, b — retinacula (coupling spines) of pleopod 1, c — coupling setae of pleopod 1, d — pleopod 3, e — uropod 1, f — uropod 2, g — uropod 3, h — telson. Scales: a, d — 0.5 mm, b, c, e, f, g, h — 0.1 mm

Рис. 7. *Vonimetopa longimana* sp.n., голотип (3,4 мм), ZMMU Mb-1273: а — плеопод 1, б — ретинакула (соединительные шипы) плеопода 1, с — соединительные щетинки плеопода 1, д — плеопод 3, е — уропод 1, ф — уропод 2, г — уропод 3, h — тельсон. Масштаб: а, d — 0,5 мм, б, с, е, ф, г, h — 0,1 мм.

part of posterior margin. Pereopod 4 slender, similar to pereopod 3; propodus, posterior margin with 1+1+2 robust setae in the distal half. Pereopod 5 longer than pereopod 4; basis straight, anterior margin lined with 3 tiny setae in the distal 1/3; merus with short posterodistal process, merus and carpus, anterior margin each with 2–3 short robust setae; propodus thin, anterior margin with 1+1+1+2 short robust setae; dactylus narrow, 0.4 times as long as propodus, with a long comb of tiny spines along anterior margin. Pereopod 6 slightly longer than pereopod 5; basis straight, distally slightly swollen, anterior margin smooth; merus posterodistally produced at 0.2 of carpus length, acute, tip with seta; carpus, anterior margin bearing 2 short robust setae; propodus slightly curved forward, anterior margin with 1+1+2 short robust setae; dactylus narrow, 0.5 times as long as propodus, with a long comb of tiny spines along anterior margin. Pereopod 7 shorter than pereopod 6; basis thin, slightly curved backwards, shorter than that of pereopod 6, anterior margin smooth; merus broadened in the distal half, posterodistally produced at 0.17 of carpus length, tip with seta; carpus short, shorter than propodus, anterior margin bearing 2 short robust setae; propodus slightly curved forward, anterior margin with 1+1+2 short robust setae; dactylus narrow, 0.5 times as long as propodus, with a long comb of tiny spines along anterior margin.

Pleon. Epimeral plates 1–3, posterodistal corners strongly, moderately, and weakly produced, respectively; ventral margins bare. Pleopods slender, pleopod 3 the shortest; peduncles with paired retinacula (coupling spines) on inner distal margin; inner ramus shorter than outer ramus, coupling basis of inner ramus with single specific stout two-pointed plumose seta on inner margin; inner ramus of pleopods 1 and 2 with 7 articles, inner ramus of pleopod 3 with 5 articles, outer ramus of pleopods 1 and 2 with 9 articles, outer ramus of pleopod 3 with 8 articles. Uropod 1 long; peduncle with 8 dorsolateral robust setae; rami short, 0.3 times as long as peduncle, outer ramus longer than inner ramus, with 2 dorsal robust setae, inner ramus smooth. Uropod 2 ca. 0.7 times as long as uropod 1, peduncle with 2 dorsolateral robust setae; rami 0.7 times as long as peduncle, outer ramus longer than inner ramus, with single dorsal robust seta, inner ramus smooth. Uropod 3 ca. 0.7 times as long as uropod 2, peduncle with one dorsodistal robust seta; single ramus 2-articulate, article 1 with 2 dorsodistal robust setae, article 2 subequal to article 1, tip acute. Telson ca. 2.4 times longer than broad, with a row of 2–4 tiny setulae along lateral margins each.

Female unknown. Probably morphologically close to the females of *V. barnardi*, which were numerous in the sampling area.

REMARKS. *V. longimana* sp.n. is characterized by a long narrow propodus of gnathopod 2 with the vertical palm, which is unique within the genus.

ECOLOGY. *V. longimana* sp.n. found in the depth range of 0–10 m in the various bottom grounds from sands to rock. The water temperature in the habitat of the species varied from 3.7 to 14.7°C in May and June.

DISTRIBUTION. The coastal shallow waters of the Strait of Tartary (Sea of Japan) off southwestern Sakhalin Island.

KEY TO SPECIES OF GENUS *VONIMETOPA* BARNARD ET KARAMAN, 1987

1. Gnathopod 2; propodus long, narrow, slightly broadened medially, palm vertical, slightly concave, defined from posterior margin by low projection (Fig. 5a, b).....
*Vonimetopa longimana* sp.n.
 – Gnathopod 2 subchelate; propodus, palm horizontal (perpendicular to posterior margin) or oblique..... 2
2. Gnathopod 1; dactylus along the inner (posterior) margin is seated with a close row of flat, short, spine-shaped setae or with a brush of dense, very short setulae..... 3.
 – Gnathopod 1; dactylus with 1–6 long setae along inner (posterior) margin only 5
3. Gnathopod 1; propodus with a dense row (more than 10) of long setae along the posterior margin *Vonimetopa dubia* (Shoemaker, 1964)
 – Gnathopod 1; propodus with 5–6 long setae along the posterior margin 4
4. Gnathopod 1; dactylus along the inner (posterior) margin is seated with a close row of flat, short, spine-shaped setae only
 *Vonimetopa shoemakeri* (Gurjanova, 1938)
 – Gnathopod 1; dactylus along the inner (posterior) margin is seated with a brush of dense, very short setulae and 3 long setae
 *Vonimetopa zernovi* (Gurjanova, 1948)
5. Gnathopod 2; propodus, palm horizontal (perpendicular to posterior margin)
*Vonimetopa barnardi* (Gurjanova, 1938)
 – Gnathopod 2; propodus, palmar margin is oblique.....
 *Vonimetopa schellenbergi* (Gurjanova, 1938)

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