

KAMAKA TADITADI, A NEW MARINE SPECIES FROM PAPUA NEW GUINEA (CRUSTACEA: AMPHIPODA: COROPHIOIDEA)

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Abstract

Thomas, J.D. and Barnard, J.L., 1991. *Kamama taditadi*, a new marine species from Papua New Guinea (Crustacea: Amphipoda: Corophioidea). *Memoirs of the Museum of Victoria* 52: 311–318.

Kamaka taditadi is a new marine species of a genus heretofore found in fresh and brackish waters of Japan, eastern Siberia and Vietnam. Our species was found in almost fully saline seawater in an embayment near Madang, Papua New Guinea. The new species differs from the three previously known species in the thick male antenna 2 and the odd eusirid form of male gnathopod 2; it also is characterized, but not necessarily uniquely, in the short coxae 2–7, sparsity of spines on uropods 1–2, broad apex of mandibular palp and weak merus of pereopods 3–4.

Introduction

The discovery of *Kamaka taditadi* sp. nov. from marine waters of Papua New Guinea is remarkable because previous species of the genus have been found only in fresh to brackish waters of the Asian mainland from eastern Siberia through Japan to Vietnam. *Kamaka* is known primarily as a stream, river and lake genus. Our species was collected in almost fully saline seawaters in an embayment next to the dock at the Christensen Research Institute in Madang, Papua New Guinea.

We take the opportunity to modernize the diagnosis of the genus, provide a new key to the species and list the species and all of their literature citations. The distribution of each species is briefly stated and geographic codes from Barnard and Barnard (1983) are appended in brackets.

Corophiidae

Kamaka Derzhavin

Kamaka Derzhavin, 1923: 188 J.L. Barnard, 1973: 19.

Type species. *Kamaka kuthae* Derzhavin, 1923 (monotypy).

Description. Body subcylindrical, slightly depressed, smooth, urosomites 1–2 coalesced, 3 free from 2 but coalesced with telson, marked ventrally by sutures.

Rostrum short, supra-antennal line almost absent except in defining ocular lobes, ocular lobes elongate, very produced forward, blunt, antennal sinus deep. Head longer than

pereonites 1–2 together. Eyes medium, on apices of stalked ocular lobes.

Antennae of medium length, 1 shorter than 2, both slender or antenna 2 stout in male in one species, peduncular article 3 of antenna 1 scarcely to slightly shorter than 1, either article 1 or 2 longest, accessory flagellum absent, main flagellar articles very few. Antenna 2 peduncular article 3 scarcely elongate, flagellar articles 3–7.

Epistome not produced anteriorly [new observation]. Labrum subrounded, incised, produced forward from epistome (lateral view). Mandible normal, palp strong, very slender, article 1 elongate, article 3 rectilinear or weakly clavate, shorter than 2. Labium with entire outer lobes, with well developed inner lobes, mandibular lobes short, pointed. Inner plate of maxilla 1 short, without setae, outer plate with 9–10 spines, palp 2-articulate. Plates of maxilla 2 ordinary, inner plate with only few or no medio-marginal setae. Inner plate of maxilliped with distal plumose setae, outer plate very long, with spines on medial margin, palp with 4 articles, article 2 long, article 3 unlobed, article 4 short, stubby, with medium nail and setae.

Coxae quite variable, either relatively long and lobuliform, or only coxa 1 large and coxae 2–7 short, weakly overlapping, of various sizes and shapes, progressively elongate from 2 to 4, coxa 1 dilated, produced forward, coxa 2 shorter than 1, coxa 4 longer or shorter than coxa 1, not lobed, coxa 5 at least as long as 4, coxa 7 smaller than anterior coxae.

Gnathopods 1–2 diverse, male gnathopod 2 greatly larger than 1, gnathopod 1 poorly subchelate, article 5 long, sublinear, unlobed, longer

than 6. Gnathopod 2 enlarged, weakly subchelate, propodochelate in male, with article 2 not dilated nor setose, article 5 very short, unlobed, article 6 dilated, with false chela or large process on posteroproximal margin, dactyl long.

Pereopods 3–4 normal, similar, with slender article 2, article 4 weakly dilated, dactyls short. Pereopods 5–7 similar to each other, progressively longer, with weakly expanded article 2, pereopod 5 much shorter than pereopod 7, dactyl of pereopods 5–7 short to medium in length, curved.

Sternal processes of thorax absent [new observation]. Coxal gills slender, present on segments 2–6 [new observation]. Pleopods normal. Epimeron 3 not bisinuate.

Uropods 1–2 biramous, stout, rami slightly unequal, shorter (1) or longer (2) than peduncle, peduncle of uropod 1 with ventrodiscal process. Uropod 3 small, uniramous, single ramus short, with vestigial article 2, obtuse and setose distally, peduncle as long as or longer than ramus, but otherwise short and dilated medially. Telson entire, short, broader than long, semicircular, poorly armed.

Female. Antennae weaker. Coxae not different from male. Gnathopods small, gnathopod 2 slightly larger than 1, weakly subchelate, article 5 as long as or almost as long as 6, unlobed. Oostegites narrow, present on coxae 2–5.

Variables. Major deviations from the typical appearance of most species in this genus are:

Male antenna 2 exceptionally long (type), very stout (*K. taditadi*), coxa 5 like coxa 4 and not lobed (*K. biwae*); peduncle of uropod 3 not dilated medially (*K. biwae*).

In constructing the key to species given below, we found few characters easy to express; there are various subtle differences among the species in shapes of various coxae and legs but we are uncertain as to the variability of these characters between the sexes and among instars. Firm identification continues to require examination of the original descriptions and figures of each species.

Distribution. Fresh and brackish waters, east Asia from Viet Nam to eastern Siberia, Kamchatka, Sakhalin, Kuriles, Japan, and New Guinea, 5 species.

Relationship. Even though *Chevalia* has coalesced urosomites 1–2 and *Rakiroa* has coalesced urosomites 2–3, *Kamaka* is unique in the Corophioidea: not only are urosomites 1–2 coalesced but the telson and urosomite 3 are coalesced.

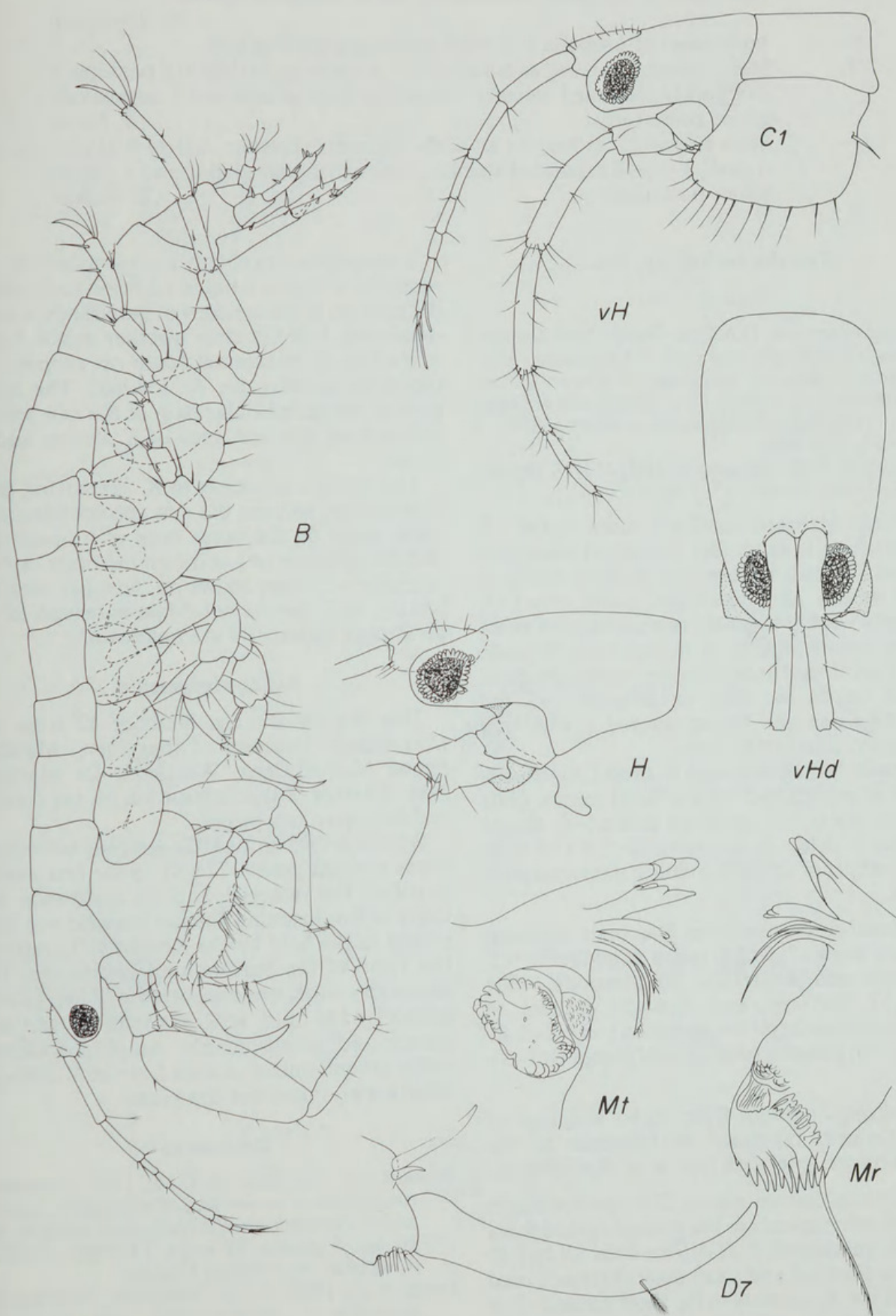
Species. *K. biwae* Ueno, 1943 Lake Biwa, Japan [027]; *K. derzhavini* Gurjanova, 1951 Kamchatka, marine littoral [279]; *K. kuthae* Derzhavin, 1923b, 1930a (Ueno, 1935a, 1936, 1936b) (Gurjanova, 1951) east Siberia, Kamchatka, Sakhalin, Kuriles, northern Japan, freshwaters [013]; *K. palmata* Dang, 1968 Vietnam, freshwater [954]; *K. taditadi* Thomas and Barnard, herein, Papua New Guinea, marine sublittoral [597].

Key to the Species of *Kamaka*

Note: ? on carpus indicates our uncertainty on drawings in the literature

1. Male gnathopod 2 of eusirid form, palmar excavation broad and shallow, male antenna 2 stout *K. taditadi*
- Male gnathopod 2 not of eusirid form, palmar excavation narrow and deep, male antenna 2 slender 2
2. Male gnathopod 2 with thumb strongly extending beyond apex of propodus to form true chela with dactyl, male coxa 1 twice as long (anteroposteriorly) as wide (dorsoventrally) *K. palmata*
- Male gnathopod 2 with thumb not exceeding apex of propodus, male coxa 1 less than 1.5 times as long as wide 3

Figure 1. *Kamaka taditadi*, new species, unattributed figures = holotype, male "s", 1.93 mm; v = female "v", 2.96 mm. Legend: Capital letters in figures refer to parts; lower case letters to left of capital letters refer to specimens and to the right refer to adjectives as described below (unattributed main specimen of each plate is not labeled on left side of capital letters): B, body; C, coxa; D, dactyl; G, gnathopod; H, head; I, inner plate or ramus; J, urosome; L, labium; M, mandible; O, outer plate or ramus; P, pereopod; R, uropod; S, maxilliped; T, telson; V, palp; W, pleon; X, maxilla; Y, oostegite; Z, gill; d, dorsal; m, medial; r, right; s, setae removed; t, left.



- 3. Inner rami of uropods 1–2 lacking dorsal marginal spines *K. dershavini*
- Inner rami of uropods 1–2 with dorsal marginal spines 4
- 4. Male antenna 2 as long as pereonites 1–6 together, article 4 of pereopods 3–4 poorly expanded apically, ?carpus of male gnathopod 1 extensively setose posteriorly *K. biwae*
- Male antenna 2 as long as all body segments together, article 4 of pereopods 3–4 well expanded apically, ?carpus of male gnathopod 1 poorly setose posteriorly *K. kuthae*

***Kamaka taditadi* sp. nov.**

Figures 1–4

Material examined. Holotype: Papua New Guinea, Madang, sand sample near dock of Christensen Marine Institute adjacent to Nagada Harbour, 0.3 m, medium-fine quartz sand, J.D. Thomas and J. Clark, 14 Jan 1989, United States National Museum 253717 (male "s", 1.93 mm).

Paratypes: Type locality, USNM 253718 (female "u", 2.45 mm; female "v", 2.96 mm).

Diagnosis. Male antenna 2 very stout; coxae 2–7 of short form in genus (see *Variables*); male gnathopod 2 of eusirid-form, propodus suborbicular or weakly almond-shaped, palm very long and only weakly excavate compared with other known species; merus of pereopods 3–4 weak, poorly produced anterodistally; marginal (non-apical) spines on rami of uropods 1–2 not exceeding one per ramus; uropod 1 with well developed interramal tooth.

Female "v". With 8 eggs in brood pouch. Article 5 of pereopod 5 with 2 facial spines. Gills large on coxae 2–4, small on coxae 5–6, absent on coxa 7. Setae on oostegites 2–5 = 1–9–9–9. Outer ramus of uropod 2 with 2 dorsomarginal spines.

Additional descriptive notes. Pleopods ordinary; coupling hooks 2; length ratios of peduncle versus outer and inner rami for pleopods 1–3 = 39:78:67, 34:70:65, and 30:65:59; articles on outer and inner rami for pleopods 1–3 = 8–8, 8–6, and 7–5; setae on peduncles of pleopods 1–3 = 2–2–2.

Etymology. *Taditadi*, from Riwo language of New Guinea, "spotted" in reference to the purple-brown splotches typical of this species.

Relationship. See key above. This species differs from all other species in the strange eusirid form of male gnathopod 2. It differs from all but *K. biwae* in the thick and short male antenna 2, and from all but *K. palmata* in the short coxae 2–7. It differs from *K. palmata* and *K. biwae* in the much sparser spination on uropods 1–2.

This species is probably most similar to *K. palmata* from Vietnam but in addition to the above differences, it has article 4 of pereopods 3–4 less dominant. It is not clear whether or not *K. palmata* has an interramal tooth on uropod 1, a character positive for *K. taditadi*. The broad apex of the mandibular palp of the new species differs from the thin apex of *K. kuthae* and *K. biwae*.

This species is similar to *K. dershavini*, from Kamchatka, because the new species has only 1 fewer spine on the outer rami of uropods 1–2 and the presence of 1 spine on the inner rami of uropods 1–2; these spines on the inner rami are lacking in *K. dershavini*. Male antennae for *K. dershavini* apparently are unknown.

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References

- Barnard, J.L. and Barnard, C.M., 1983. *Freshwater Amphipoda of the world, I. Evolutionary patterns and II. Handbook and bibliography*. xix, 830 pp., 50 figs, 7 graphs, 98 maps, 12 tables. Hayfield Associates: Mt Vernon, Virginia.
- Dang, N.T., 1968. Novye bokoplavy (Amphipoda) presnykh i solonovatykh vod severnogo v'etnama. *Zoologicheskii Zhurnal* 47: 212–222, 4 figures.

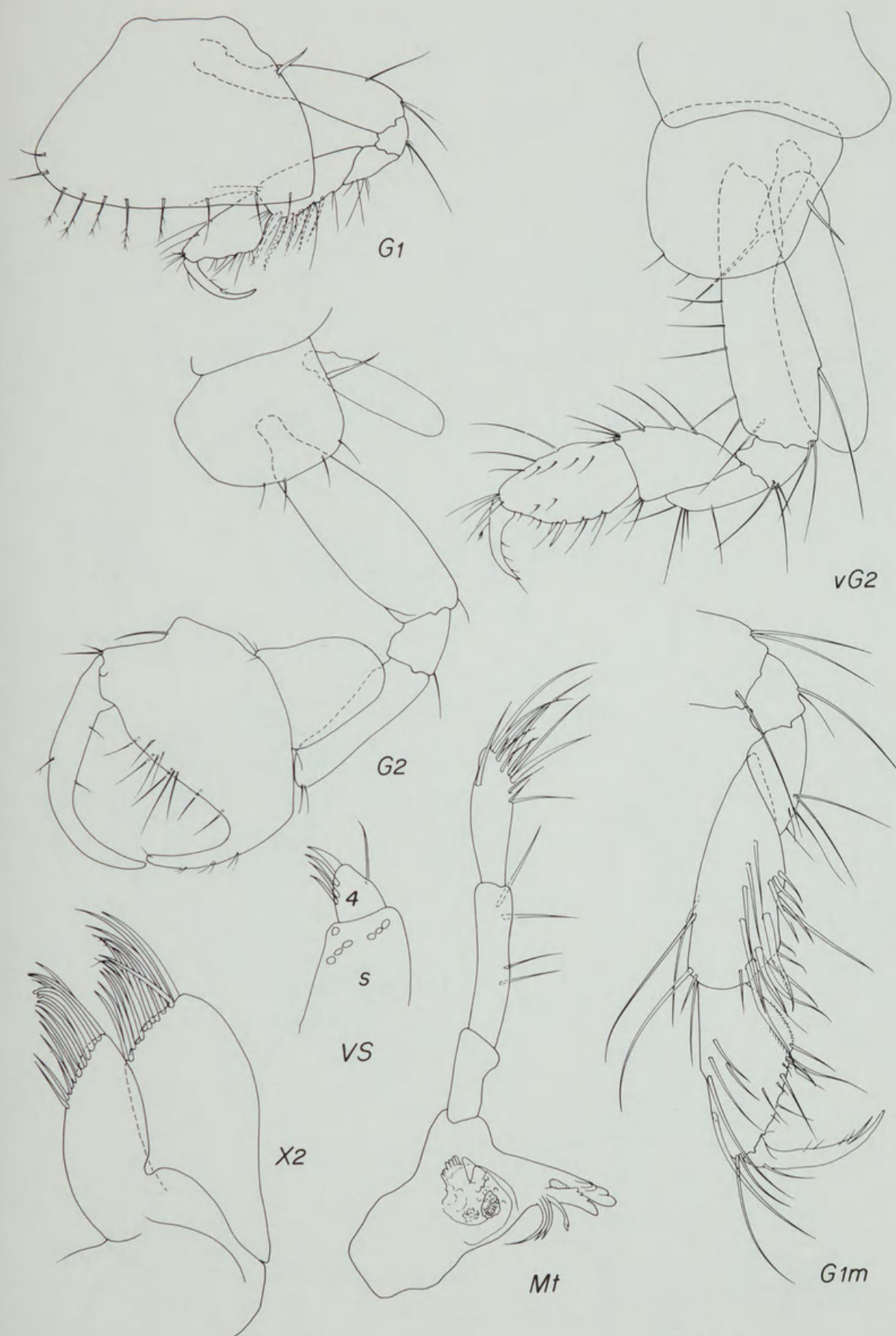


Figure 2. *Kamaka taditadi*, new species, unattributed figures = holotype, male "s", 1.93 mm; v = female "v", 2.96 mm.

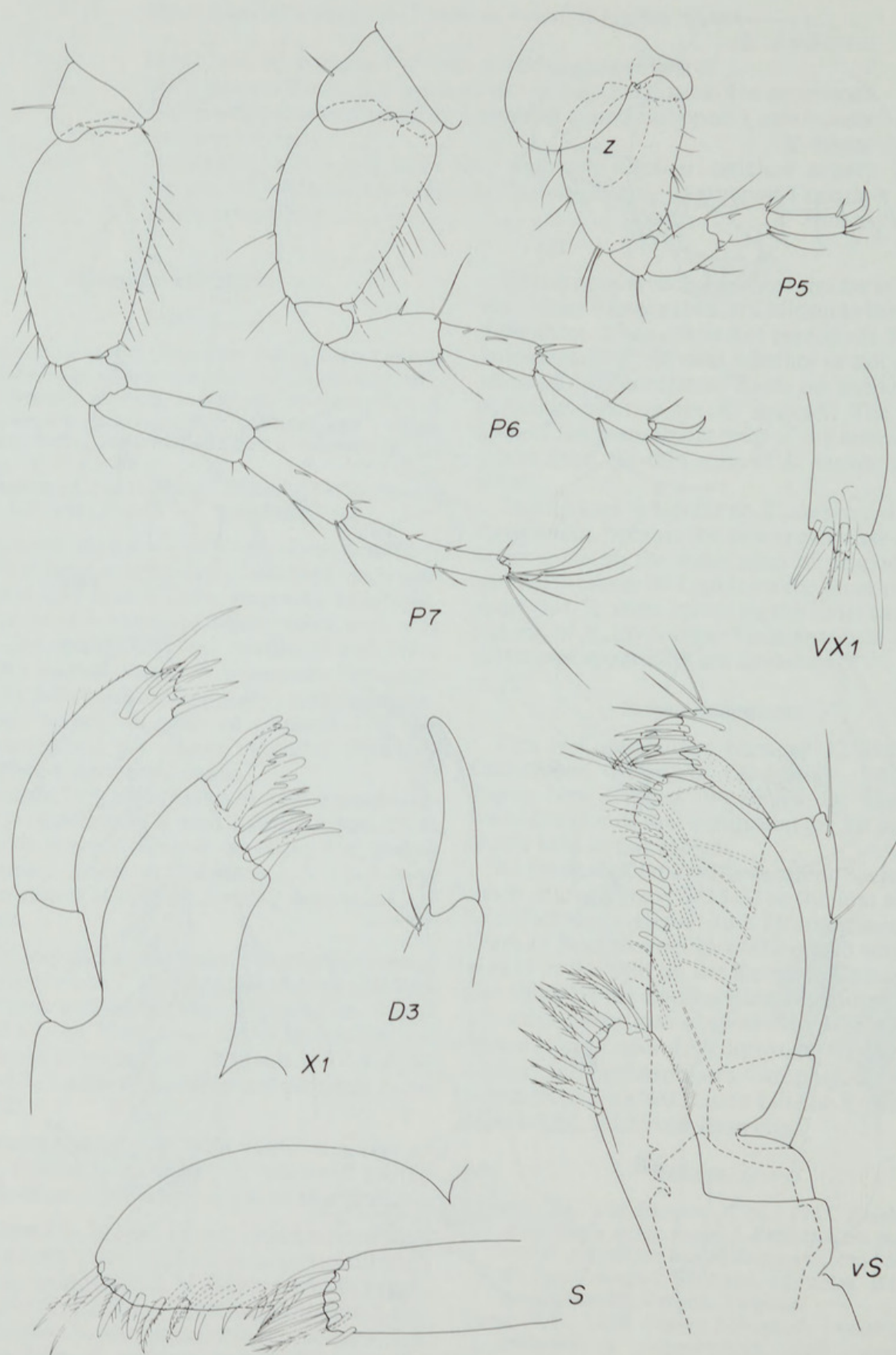


Figure 3. *Kamaka taditadi*, new species, unattributed figures = holotype, male "s", 1.93 mm; v = female "v", 2.96 mm.

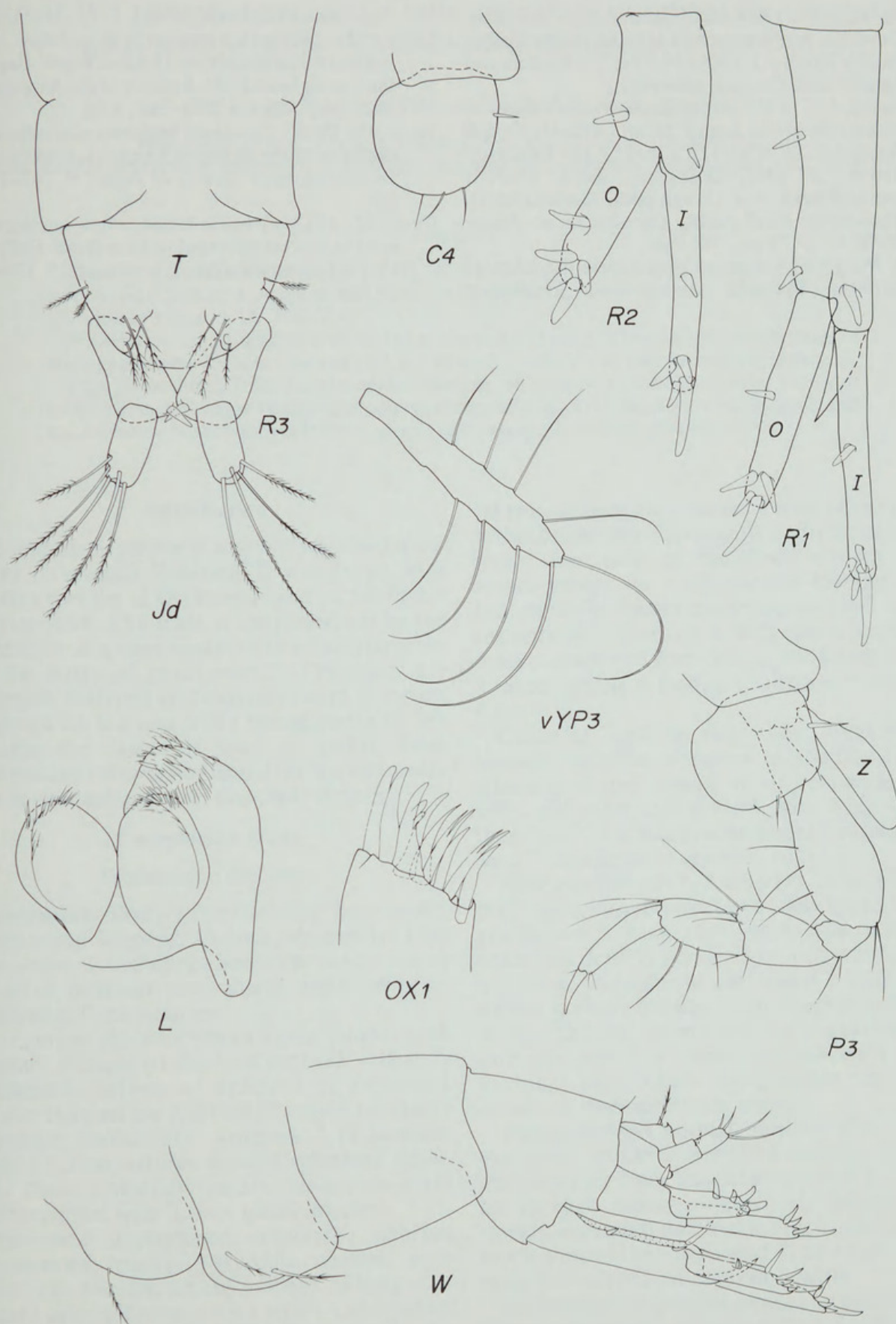


Figure 4. *Kamaka taditadi*, new species, unattributed figures = holotype, male "s", 1.93 mm; v = female "v", 2.96 mm.

- Derzhavin, A.N., 1923. Malacostraca der Susswasser-Gewasser von Kamtschatka. *Russki Gidrobiologicheskii Zhurnal* 2: 180-194, 7 pls. [In Russian and English with German summary.]
- Derzhavin, A.N., 1930. Arctic elements in the fauna of peracarids of the Sea of Japan. *Hydrobiological Journal SSSR* 8(10-12): 326-329. [In Russian.]
- Gurjanova, E. 1951. Bokoplavy morej SSSR i sopredel'nykh vod (Amphipoda-Gammaridea). *Akademiya Nauk SSSR, Opredeliteli po Faune SSSR* 41: 1029 pp., 705 figs.
- Ueno, M., 1935. Crustacea collected in the lakes of southern Sakhalin. *Annotationes Zoologicae Japanenses* 15: 88-93, 4 figs.
- Ueno, M., 1936a. Crustacea Malacostraca of the northern Kurile Islands (Inland Water Fauna of the Kurile Islands II). *Bulletin of the Biographical Society of Japan* 6: 241-246, 1 fig.
- Ueno, M., 1936b. Crustacea Malacostraca collected in the lakes of the Island of Kunasiri. *Bulletin of the Biogeographical Society of Japan* 6: 247-252, 1 fig.
- Ueno, M., 1943. *Kamaka biwae*, a new amphipod of marine derivative found in Lake Biwa. *Bulletin of the Biogeographical Society of Japan* 13: 139-143, 28 figs.



1991. "Kamaka taditadi, a new marine species from Papua New Guinea (Crustacea: Amphipoda: Corophioidea)." *Memoirs of the Museum of Victoria* 52, 311–318.

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