

# Two Distinctive Amphipods (Crustacea) Collected from the Ariake Sea, Western Japan, with the Description of a New Species

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Two distinctive species of Amphipoda are described from the Ariake Sea in Japan. *Scutischyrocerus japonicus* sp. nov. (Family Ischyroceridae) is characterized by the cylindrical shape and the shield-like coxae 2–5. This new species differs from *S. scutatus* Myers, 1995 in the uropods with peduncles bearing many plumose setae. In the second species, *Ledoyerella clavata* (Hirayama, 1984) comb. nov. (Family Kamakidae), the lateral cephalic lobe is strongly produced, and the gnathopods 1, 2 of both sexes are the same size, with the propodus being almost as long as the carpus. This species can be distinguished from its congeners by the heavily setose posterior margins of pereopods 6, 7 bases. *Ledoyerella spinosa* Ren, 2006 is synonymized with this species.

**Key Words:** Amphipoda, combination, Ischyroceridae, Kamakidae, *Ledoyerella*, morphology, *Scutischyrocerus*, synonym, taxonomy.

## Introduction

The order Amphipoda are small crustaceans belonging to the superorder Peracarida and comprise approximately 10000 described species (Bellan-Santini 2015). In Japan, about 500 species (except for the former suborder Caprelliidea) have been hitherto recorded (Ariyama 2022). West Kyushu including the Ariake Sea is the area whose amphipod fauna has been most studied in Japan and 124 species had been recorded there (Hirayama 1983, 1984a, b, 1985a, b, 1986, 1987, 1988). However, during investigations on benthic fauna of the Ariake Sea carried out by KM in 2005–2006, over 140 amphipod species containing several undescribed species were collected (K. Mori and H. Ariyama, unpublished data), and HA described some species of them in five papers (Ariyama 2009, 2016, 2018, 2019a, b). In the present paper, we describe in detail a new species and a newly combined species collected in the investigations.

## Materials and Methods

The specimens examined were collected from the Ariake Sea using a Smith-McIntyre grab or a dredge. The specimens were dissected and their appendages were drawn using a phase-contrast microscope with an attached drawing tube. Body length (BL) was measured by a curve ruler from the apex of the rostrum along the dorsal margin to the

distal end of the telson. The material examined, including type specimens, is deposited in the Osaka Museum of Natural History, Japan (OMNH).

Abbreviations used in the figures are: A, antenna; AF, accessory flagellum; C, coxa; EP, epimeral plate; F, female; G, gnathopod; L, left; LL, lower lip; M, male; Md, mandible; Mp, maxilliped; Mx, maxilla; P, pereopod; Pl, pleopod; R, right; T, telson; U, uropod; and UL, upper lip.

## Taxonomic Accounts

Suborder **Senticaudata** Lowry and Myers, 2013

Infraorder **Corophiida** Leach, 1814

Parvorder **Caprellidira** Leach, 1814

Superfamily **Photoidea** Boeck, 1871

Family **Ischyroceridae** Stebbing, 1899

[Japanese name: Kamakiri-yokoebi-ka]

Genus ***Scutischyrocerus*** Myers, 1995

[New Japanese name: Kuda-yokoebi-zoku]

*Scutischyrocerus* Myers, 1995: 88.

**Type species.** *Scutischyrocerus scutatus* Myers, 1995, by original designation.

**Diagnosis [emended from Myers (1995)].** Body and coxae forming a cylinder. Head with produced lateral cephalic lobe, anteroventral margin deeply recessed; antennae much shorter than body length, setose posteriorly; antenna

1 peduncular article 1 short, articles 2, 3 elongate, accessory flagellum absent or vestigial; mandibular palp strong, article 2 longest, article 3 rod-shaped; maxilla 1 inner plate triangular, bare; coxa 1 small, produced anteroventrally, coxae 2–5 greatly enlarged, shield-like, coxa 5 with small posterior lobe, coxae 6, 7 small; gnathopods 1, 2, subchelate; pereopods 3, 4 short, bases expanded, carpi partially telescoped into meri, dactyli elongate; pereopods 5–7 progressively longer, bases expanded, dactyli short, curved; uropods 1–3 biramous, peduncles longer than both rami, uropod 3 outer ramus with 2–3 hooks distolaterally; telson short.

**Included taxa.** *Scutischyrocerus japonicus* sp. nov.; *S. scutatus*.

**Remarks.** As the following new information was revealed through the present study, diagnosis of the genus is emended herein: (1) accessory flagellum vestigial, (2) gnathopod 2 except for coxa not so larger than gnathopod 1 in both sexes, and (3) uropod 3 outer ramus with 3 hooks.

*Scutischyrocerus japonicus* sp. nov.

[New Japanese name: Kuda-yokoebi]

(Figs 1–4)

**Material examined.** Holotype: female (OMNH-Ar-12618), 4.7 mm, east of Shimabara City in Nagasaki Prefecture, 32°48.932'N, 130°26.152'E (St. AH11), 35 m depth, bottom sediment unknown, using Smith-McIntyre grab, 18 September 2005. Paratypes: male (OMNH-Ar-12619), 3.9 mm, east of Minami-Shimabara City in Nagasaki Prefecture, 32°39.011'N, 130°23.014'E (St. AG16), 50 m depth, sand bottom, using Smith-McIntyre grab, 12 May 2006; male (OMNH-Ar-12620), 3.6 mm, south of Yushima Island in Kumamoto Prefecture, 32°34.889'N, 130°20.022'E (St. AF18), 9.5 m depth, sand bottom, using dredge, 12 May 2006; male (OMNH-Ar-12621), 3.9 mm, and female with juveniles (OMNH-Ar-12622), 4.8 mm, northwest of Ōyano Island in Kumamoto Prefecture, 32°37.017'N, 130°23.023'E (St. AG17), 58 m depth, sand bottom, using Smith-McIntyre grab, 15 May 2006; male (OMNH-Ar-12623), 2.7 mm, and female (OMNH-Ar-12624), 4.4 mm, north of Amakusakamishima Island in Kumamoto Prefecture, 32°30.934'N, 130°16.962'E (St. AE20), 18 m depth, sandy mud bot-

tom, using dredge, 17 September 2005; female (OMNH-Ar-12625), 4.4 mm, east of Shimabara City in Nagasaki Prefecture, 32°47.055'N, 130°26.063'E (St. AH12), 48 m depth, sandy mud bottom, using Smith-McIntyre grab, 11 November 2005.

**Type locality.** Ariake Sea, east of Shimabara City in Nagasaki Prefecture, Japan.

**Etymology.** Referring to the type locality.

**Description of female.** Based on holotype (OMNH-Ar-12618, 4.7 mm).

Head (Figs 1, 2). Rostrum indistinct. Eyes small, round, contained in produced cephalic lobe. Antennal sinus very deep. Antenna 1 short, ca. 0.3 times BL, slender; peduncular articles 1–3 with length ratio of 1.0:1.15:1.2, article 1 stout; accessory flagellum vestigial, 1-articulate, with 2 short setae; flagellum with 5 articles, last article minute. Antenna 2 a little longer than antenna 1, ca. 0.35 times BL, slender; peduncular articles 3–5 with length ratio of 1.0:1.75:1.95; flagellum with 3 articles, last article minute, article 2 with 2 long robust setae distally. Upper lip, ventral margin rounded, with many short thin setae. Left mandible with incisor bearing 4 cusps, 3-toothed lacinia mobilis and 3 accessory blades; right mandible with incisor bearing 5 cusps, 2-toothed lacinia mobilis and 3 accessory blades (2 wide and 1 small); molars well developed, fan-shaped seta attached on posterolateral surface of right molar; article length ratio of palps 1.0:4.0:2.25, article 2 slightly curved, article 1 bare, articles 2, 3 setose. Lower lip, outer lobe with mandibular process, distal surfaces of outer and inner lobes covered with short thin setae, medial margin of outer lobe bearing short robust seta. Maxilla 1 with narrow inner plate without seta; outer plate with 9 stout robust setae apically; palp article 1 short, distal tip of article 2 with 5 robust setae and several simple setae. Maxilla 2, outer plate setose distally, inner plate with many setae on distal to medial margins. Maxilliped with inner plate bearing 5 small robust setae and several plumose setae; outer plate broad, distal margin with 8 long-to-short robust setae, medial margin with 2 short robust setae; palp stout, setose medially, article 4 with long, slender nail on tip.

Pereon (Fig. 3). All gnathopods and pereopods short. Gnathopod 1, coxa triangular, margins with several short

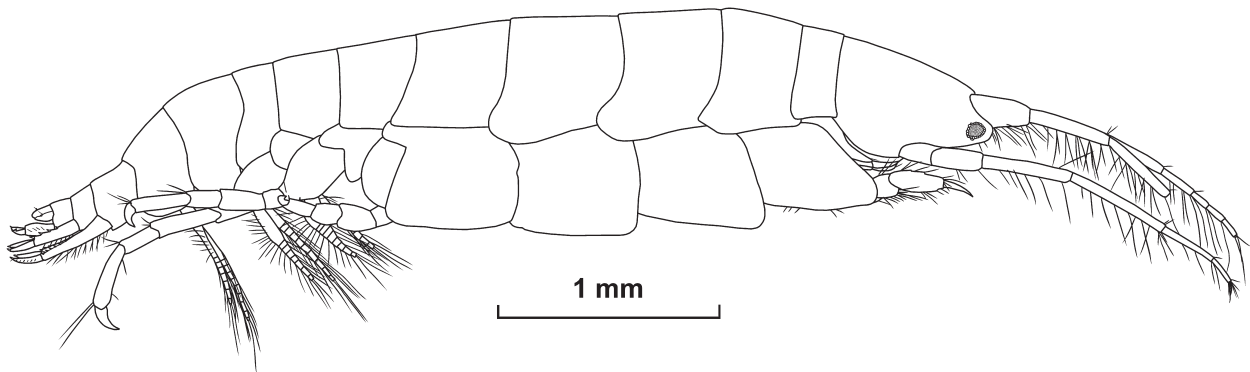


Fig. 1. *Scutischyrocerus japonicus* sp. nov. Holotype, female (OMNH-Ar-12618), 4.7 mm. Habitus. Flagellum of right antenna 1 lost, gnathopod 2 and pereopods 3, 4 hidden by coxae 2–4.

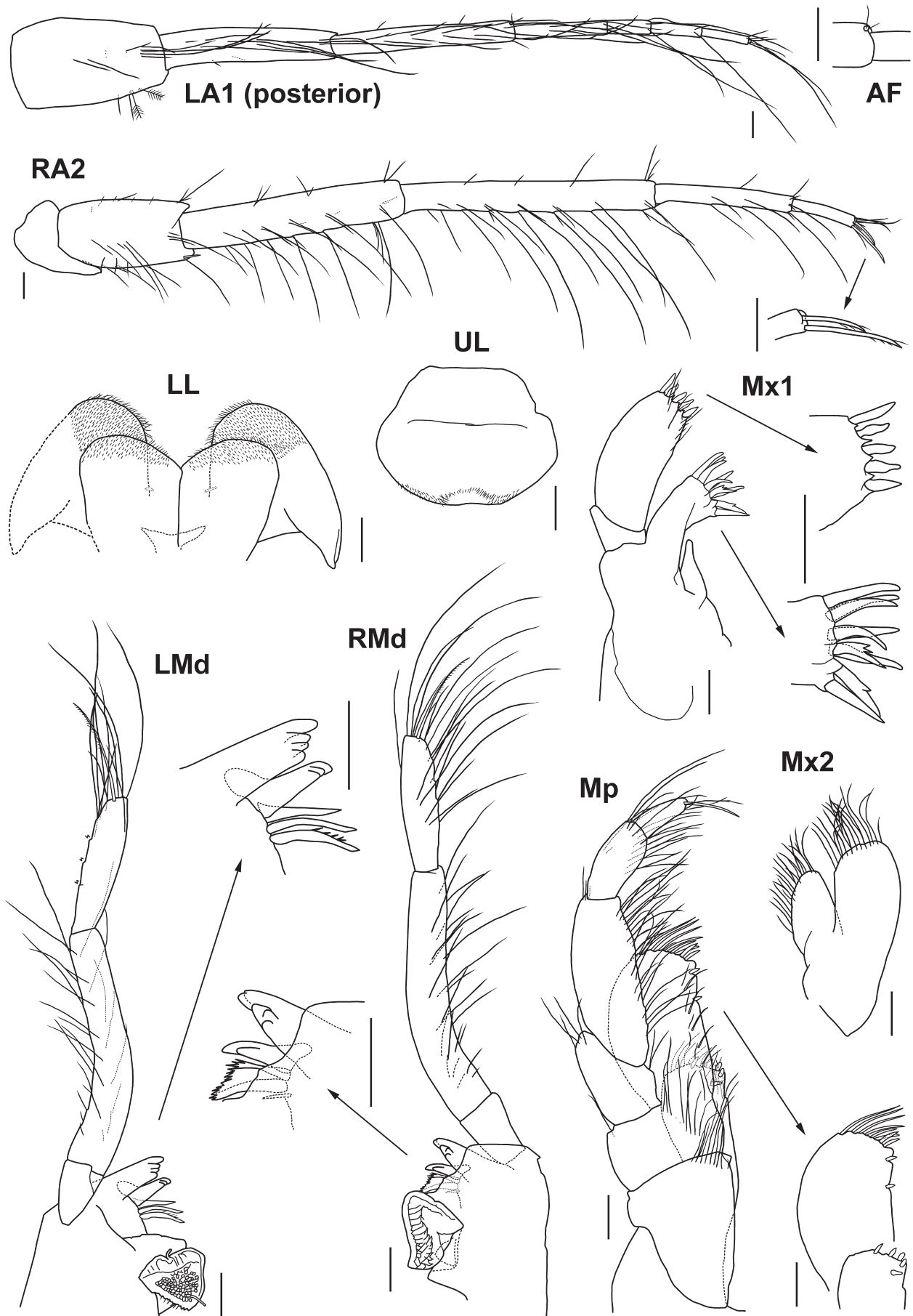


Fig. 2. *Scutischyrocerus japonicus* sp. nov. Holotype, female (OMNH-Ar-12618), 4.7 mm. Scales: 0.05 mm.

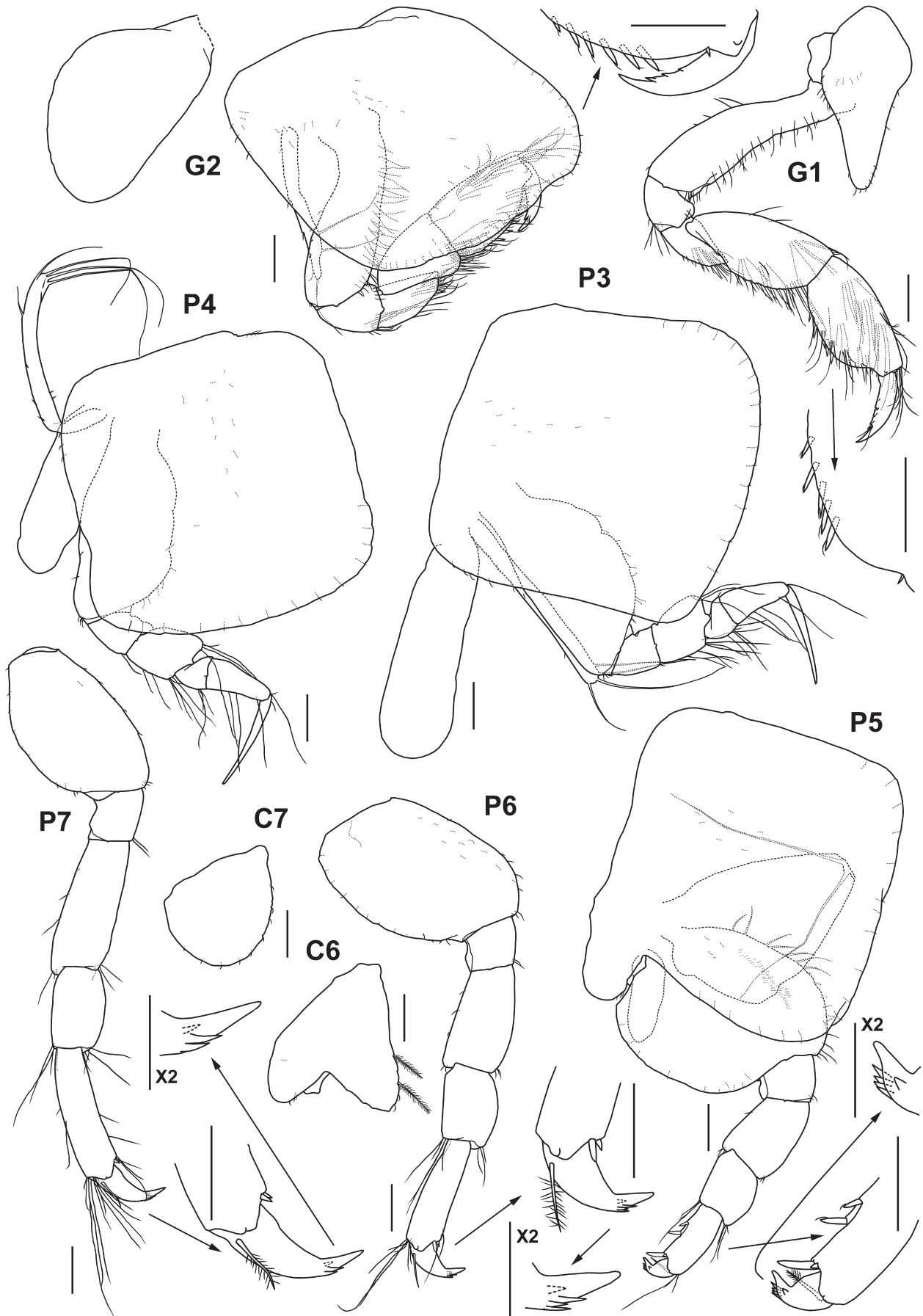


Fig. 3. *Scutischyrocerus japonicus* sp. nov. Holotype, female (OMNH-Ar-12618), 4.7 mm. Gill on coxa 6 lost. Scales: 0.1 mm.

setae; basis slender, slightly curved anteriorly, anterior margin setose, posterior margin with 5 setae; ischium short, posterodistal corner setose; merus lanceolate, posterior–medial surface heavily setose; carpus long, posterior–medial surface heavily setose; propodus ca. 1.1 times as long as carpus, anterodistal corner, medial surface and posterior margin setose, palm oblique, with 5 robust setae; dactylus slightly curved, posterior margin with 3 denticles. Gnathopod 2, coxa roundish square, margins lined with short setae medially, gill wide, oostegite narrow; basis, anterior margin setose, posterior margin with 5 setae; merus setose posterodistally; carpus triangular, short, posteromedial corner heavily setose; propodus ca. 1.3 times as long as carpus, anterodistal corner, anteromedial surface and posterior margin setose, palm oblique, with 6 robust setae; dactylus slightly curved, posterior margin with 3 denticles. Pereopods 3, 4 similar; coxae square, margins lined with short setae medially, gills and oostegites narrow; bases expanded anteriorly in middle, containing silk glands, anterior and posterior margins bearing several and a few setae, respectively; meri short, relatively wide, anterodistal corners and posterior margins setose; carpi short and narrow, posterodistal corners with several setae; propodi long, narrowed distally, anterodistal corners and posterior margins bearing setae; dactyli straight, long. Pereopod 5, coxa square, with linguiform posterior lobe, margins lined with short setae medially, gill small, oostegite broad; basis ovoid, widened posteriorly, anterior margin with 7 plumose setae and several simple setae, posterior margin bearing several short setae; ischium–carpus short and wide, antero- and posterodistal corners of carpus setose; propodus narrow, anterior (posterior on slide) margin and anterodistal (posterodistal on slide) corner each with 2 robust setae; dactylus short, strongly curved, with 5 denticles and plumose seta. Pereopod 6, coxa bilobed, anteroventral margin bearing 2 plumose setae; basis subrectangular, anterior and posterior margins with several short setae; ischium–carpus wide, antero- and posterodistal corners of carpus setose; propodus long, anterodistal corner with 2 robust setae, posterodistal corner setose; dactylus short, strongly curved, with 4 denticles and plumose seta. Pereopod 7, coxa roundish, margins with several short setae; basis oval, anterior and posterior margins with several short setae; ischium–carpus wide, antero- and posterodistal corners of merus and carpus setose; propodus long, anterodistal corner with 2 short robust setae, posterodistal corner setose; dactylus curved, with 3 denticles and plumose seta.

Pleon (Fig. 4). Epimeral plates 1–3 almost rounded posteroventrally, with 4, 6, 1 short setae, respectively. Pleopods, pleopod 2 longest; peduncles with 2, 6, 9 plumose setae in pleopods 1–3, respectively; outer rami shorter than inner rami, former with 9, 8, 8 articles and latter with 10, 10, 9+ articles, respectively. Uropod 1, peduncle long and stout, mediadistal corner pointed, lateral margin bearing many plumose setae, distal half with 6 moderate and 8 small robust setae, mediadistal margin bearing 1 plumose and 10 robust setae; outer ramus ca. 0.45 times length of peduncle, lateral margin lined with 7 robust setae, tip with single robust seta, dorsal surface bearing many short robust setae;

inner ramus ca. 0.8 times as long as outer ramus, with 1 distal and 1 dorsal robust setae. Uropod 2 ca. 0.7 times length of uropod 1; peduncle lateral margin with 7 plumose setae and 4 large and 1 small robust setae, medial margin with 2 robust setae; outer ramus ca. 0.55 times length of peduncle, tip with single robust seta, dorsal surface bearing several short robust setae; inner ramus slightly shorter than outer ramus, with 1 distal and 2 dorsal robust setae. Uropod 3 ca. 65% length of uropod 2, peduncle lateral margin with 6 plumose setae, medial and distal margins each with robust seta; outer ramus ca. 0.35 times length of peduncle, narrowed distally, tip with 3 denticles laterally; inner ramus ca. 75% as long as outer ramus, linguiform, with apical robust seta. Telson rectangular, ca. 1.85 times wider than long, each laterodistal corner with 1 cusp, several denticles and 3 sensory setae.

**Description of male.** Based on paratype (OMNH-Ar-12619, 3.9 mm). Body smaller than that of female. Morphology generally similar to female except for gnathopods and oostegites. Gnathopod 1 (Fig. 4M-G1) almost same as that of female; but basis stouter, anterior margin with a few setae, carpus wider, propodus ca. 1.2 times as long as carpus, palm with small projection and 4 robust setae. Gnathopod 2 (Fig. 4M-G2) relatively short (length of carpus + propodus ca. 12% of BL); coxa longer than that of female; basis stouter, anterior margin with a few setae; carpus shorter; propodus robust, ca. 1.95 times as long as carpus, palm with distinct angular projection and 5 robust setae.

**Variation.** Male (paratype, OMNH-Ar-12621, 3.9 mm) and 2 females (paratypes, OMNH-Ar-12624, 4.4 mm, and OMNH-Ar-12625, 4.4 mm): antenna 2 flagellum with 5 articles, last article minute, article 4 with 2 long robust setae distally (that of holotype with 3 articles probably due to regeneration).

**Coloration of ethanol-preserved specimens.** Eyes light brown, other parts faded.

**Remarks.** The present specimens apparently belong to the Ischyroceridae owing to the outward denticles on the uropod 3 outer ramus. In the family, only *Scutischyrocerus* possesses both the cylindrical shape and the shield-like coxae 2–5. A single species has been described in the genus: *S. scutatus* from Papua New Guinea (Myers 1995). *Scutischyrocerus japonicus* sp. nov. can be distinguished from *S. scutatus* by the smaller male gnathopod 2 with short propodus (length of carpus + propodus ca. 22% of BL in *S. scutatus*), the female gnathopod 2 with setose basis, and the uropods with peduncles bearing many plumose setae.

**Habitat.** 9.5–58 m depth, sand or sandy mud bottom.

**Distribution.** Japan: Ariake Sea (present study).

Famil **Kamakidae** Myers and Lowry, 2003

[Japanese name: Kamaka-yokoebi-ka]

Genus **Ledoyerella** Myers, 1973

[Japanese name: Rudowaie-yokoebi-zoku]

*Ledoyerella* Myers, 1973: 266; Barnard and Karaman 1991: 206; Myers and Lowry 2003: 473.

**Type species.** *Lembos caputphotis* Ledoyer, 1968, by

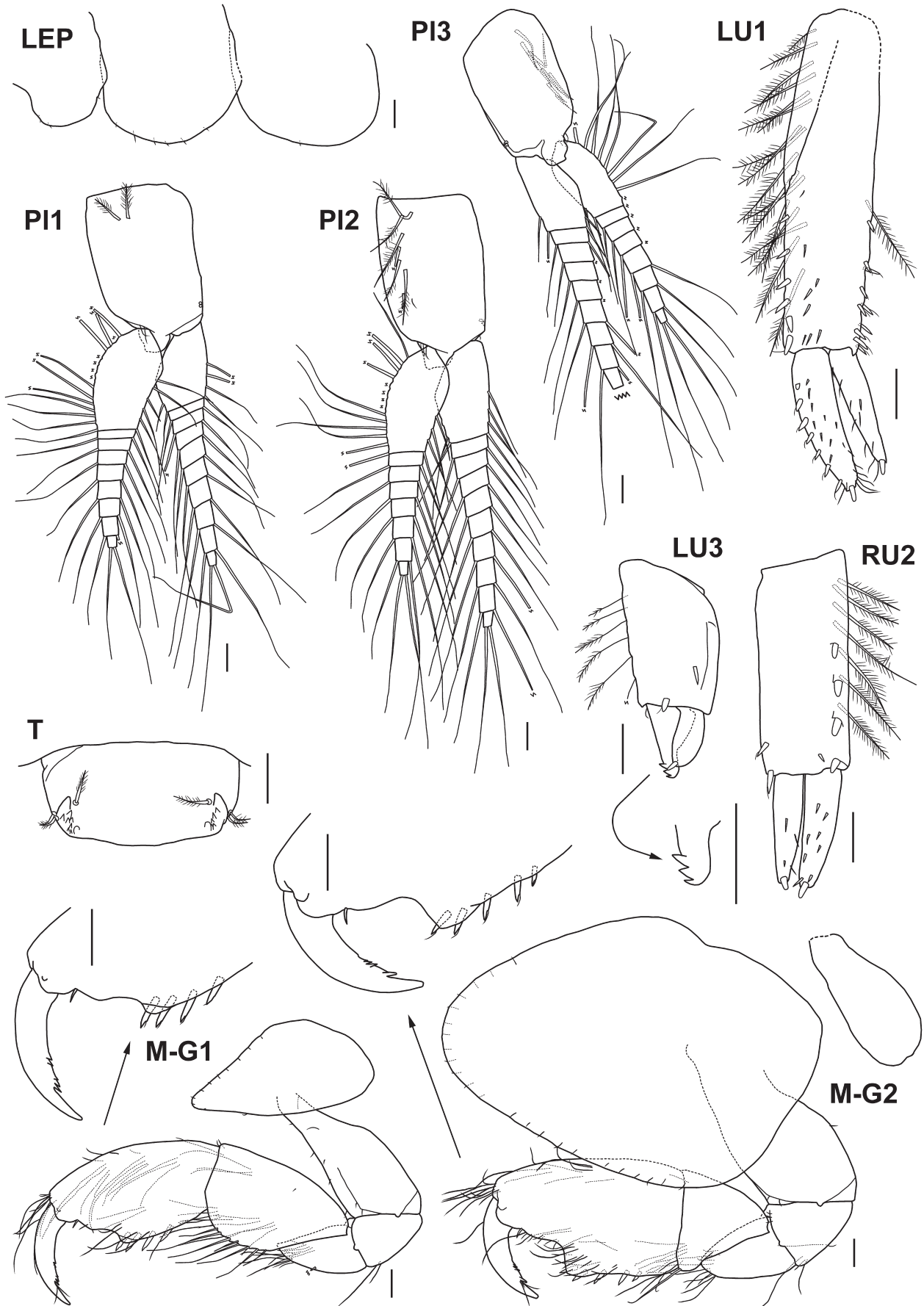


Fig. 4. *Scutischyrocerus japonicus* sp. nov. All but M, holotype, female (OMNH-Ar-12618), 4.7 mm; M, paratype, male (OMNH-Ar-12619), 3.9 mm. Gill on male coxa 2 lost. Scales: 0.05 mm.

original designation.

**Diagnosis [emended from Barnard and Karaman (1991)].** Body subcylindrical. Head, lateral cephalic lobe very produced forward, anteroventral margin deeply recessed; antennae slender, peduncular article 2 of antenna 1 longest, accessory flagellum with 3–5 articles; mandibular palp strong, article 3 shorter than 2; maxilla 1 inner plate with 1–2 apical setae on tip; coxae small, relatively short; gnathopods 1, 2 in both sexes of subequal size, moderately large, subchelate, carpi usually as long as propodi, basis of gnathopod 2 dilated in male; pereopods 3, 4 normal, bases slender; pereopods 5–7 similar to each other, progressively longer, with weakly expanded bases; urosomite 3 denticulate dorsally; uropods 1–3 biramous, both rami subequal, longer than peduncle, peduncles of uropods 1, 2 usually with interramal process, uropod 3 outer ramus with vestigial article 2; telson fleshy, entire, short.

**Included taxa.** *Ledoyerella caputphotis*; *L. clavata* (Hirayama, 1984) comb. nov. (= *L. spinosa* Ren, 2006); *L. haleiwa* (Barnard, 1970); *L. isochelata* (Ledoyer, 1972); *L. kunensis* Zettler and Myers, 2018.

**Remarks.** Barnard and Karaman (1991) stated “peduncular article 3 of antenna 1 slightly longer than 1” in the diagnosis of *Ledoyerella* and they regarded this character as important in the key to genera of Corophiidae-Ischyroceridae. However, *Ledoyerella* species have various antenna 1: article 3 longer in *L. caputphotis*, subequal in *L. haleiwa*, or shorter in *L. clavata* and *L. kunensis* (Ledoyer 1968, 1982; Zettler and Myers 2018; present study). In addition to this, the diagnosis is emended in the number of setae on the maxilla 1 inner plate, added the shape of the urosomite 3 and summarized as a whole.

*Ledoyerella clavata* (Hirayama, 1984a) comb. nov.

[Japanese name: Nozoki-kompira-sokoebi]

(Figs 5–8)

*Lembos clavatus* Hirayama, 1984a: 80, figs 95, 96.

*Ledoyerella spinosa* Ren, 2006: 383, fig. 164. syn. nov.

**Material examined.** Male (OMNH-Ar-12626), 7.2 mm, east of Shimabara City in Nagasaki Prefecture, 32°45.061'N, 130°25.983'E (St. AH13), 43 m depth, sandy mud bottom, using Smith-McIntyre grab, 11 November 2005; male (OMNH-Ar-12627), 6.6 mm, between Shimabara City in Nagasaki Prefecture and Tamana City in Kumamoto Prefecture, 32°51'N, 130°26'E (St. AH10), 24 m depth, sandy mud bottom, using Smith-McIntyre grab, 11 November 2005; ovigerous female (OMNH-Ar-12628), 9.9 mm, northwest of Ōyano Island in Kumamoto Prefecture, 32°37.017'N, 130°23.023'E (St. AG17), 58 m depth, sand bottom, using dredge, 15 May 2005; ovigerous female (OMNH-Ar-12629), 7.4 mm, between Minami-shimabara City in Nagasaki Prefecture and Misumi Town in Kumamoto Prefecture, 32°40.982'N, 130°26.024'E (St. AH15), 29 m depth, sandy mud bottom (almost sand), using dredge, 13 November 2005; female (OMNH-Ar-12630), 5.8 mm, same place and date, using Smith-McIntyre grab.

**Type locality.** Tomioka Bay in Kumamoto Prefecture, Japan (Hirayama 1984a).

**Description of male.** Based on male (OMNH-Ar-12626, 7.2 mm).

Head (Figs 5, 6). Rostrum small. Eyes small, oval, contained in produced cephalic lobe. Antennal sinus deep. Antenna 1 short, ca. 0.6 times BL, slender; peduncular articles 1–3 with length ratio of 1.0:1.45:0.75, article 1 stout, posterodistal corner with single robust seta, articles 2, 3 weakly setose posteriorly; accessory flagellum 5-articulate, setose apically; flagellum with 14 articles, last article short, article 11 bearing aesthetasc at posterodistal end. Antenna 2 shorter than antenna 1 (ca. 0.5 times BL), slender; peduncular articles 3–5 with length ratio of 1.0:2.2:2.15, setose posteriorly; flagellum with 9 articles, articles 5–9 each with 2 robust setae. Upper lip subrounded ventrally, ventral margin bearing many setae. Mandibles, both incisors with 5 cusps, both laciniae mobilis 4-toothed, left accessory blades 12 in

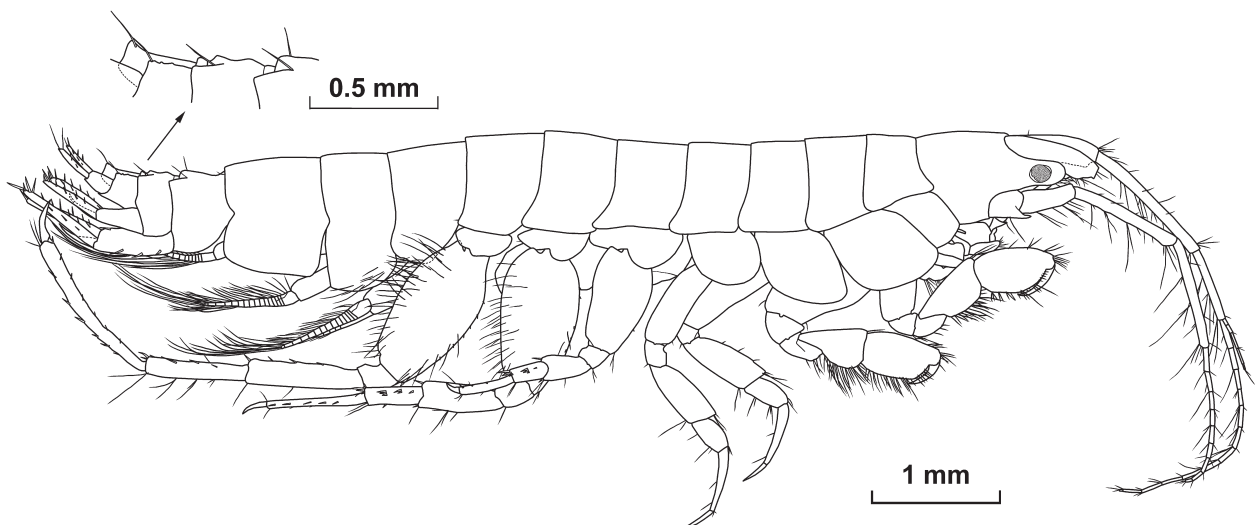


Fig. 5. *Ledoyerella clavata* (Hirayama, 1984). Male (OMNH-Ar-12626), 7.2 mm. Habitus.

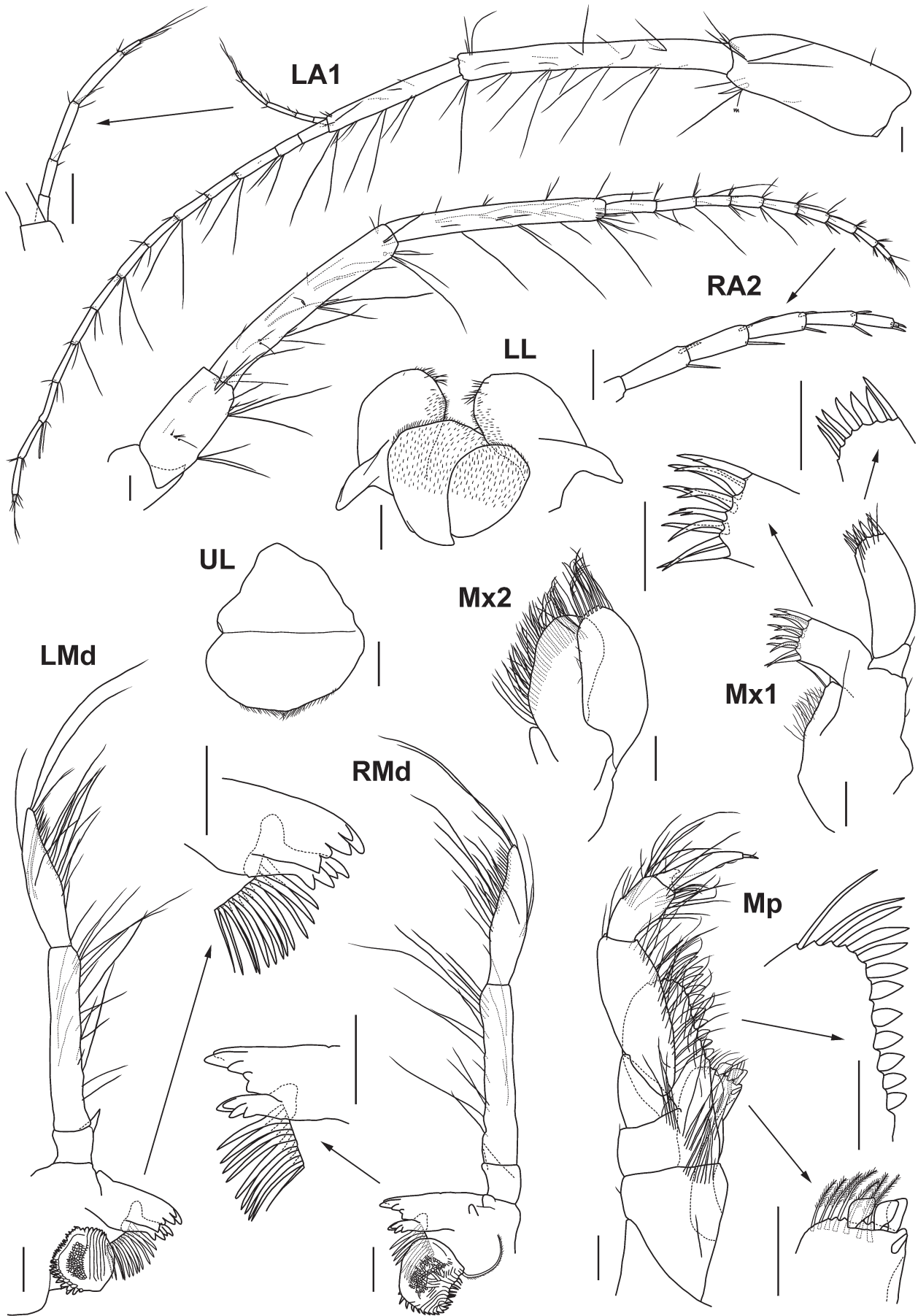


Fig. 6. *Ledoyerella clavata* (Hirayama, 1984). Male (OMNH-Ar-12626), 7.2 mm. Scales: 0.1 mm.



number and right ones 10; molars well-developed; palps slender, article length ratio 1.0:5.0:3.85, article 1 with acute spine distally, article 2 straight, article 3 semifalcate, articles 2, 3 setose. Lower lip, outer lobe with short mandibular process, mediolateral corners setose, ventromedial surface of outer lobe and ventral surface of inner lobe covered with short setae. Maxilla 1, inner plate conical, tip with 1 long and 1 short setae, medial margin bearing many feeble setae; outer plate with 10 distal robust setae; palp article 1 short, article 2 bearing 7 robust and 7 slender setae apically. Maxilla 2, inner plate with distal and medial setae and mediofacial row of setae, outer plate setose on distal margin. Maxilliped with inner plate bearing 3 quadrate and 1 slender robust setae and 7 plumose setae; outer plate with 12 long-to-short robust setae mediolaterally; palp relatively slender, article 2 long, with many medial setae, article 3 with dorsolateral triangular process, setose distally and medially, article 4 bearing apical short nail.

Pereon (Fig. 7). Gnathopod 1, coxa roundish rhomboidal, margin with a few short setae; basis a little wide, posterior margin and medial surface each with 3 long setae; ischium short, posterodistal corner setose; merus short, posterior margin and mediolateral surface heavily setose; carpus long triangular, posterior–medial surface densely setose, anterodistal corner setose; propodus slightly longer than carpus, anterodistal corner, medial surface and posterior margin setose, palm defined by 3 robust setae; dactylus slightly curved, posterior margin with many denticles. Gnathopod 2, coxa rhomboidal; basis stout, posterior margin with 3 long setae; ischium short; merus setose on anterodistal and posterodistal corners; carpus long triangular, posterior margin densely setose; propodus ca. 1.1 times as long as carpus, anterodistal corner setose, posterior margin heavily setose, palm without projection, defined by 2 robust setae; dactylus slightly curved, posterior margin denticulate. Pereopod 3 almost same length as gnathopods; coxa rhomboidal; basis narrow, posterior margin with long seta; merus relatively long, antero- and posterodistal corners setose; carpus short; propodus long and narrow; dactylus straight. Pereopod 4 similar to pereopod 3 except for roundish coxa. Pereopod 5 shorter than pereopod 4; coxa bilobed; basis roundish rectangular, with lateral ridge, posteroproximal corner slightly projected, anterior margin with 5 small robust setae; merus with single robust seta each on antero- and posterodistal corners; carpus with single robust seta on anterodistal corner, and with 1+3+5 robust setae posteriorly; propodus with 1, 4, 1 robust setae on anterior margin, anterodistal corner and posterior margin, respectively; dactylus short, curved, with plumose seta. Pereopod 6 ca. 1.6 times as long as pereopod 5; coxa short, bilobed; basis roundish rectangular, with lateral ridge, posteroproximal corner slightly projected, anterior margin with many small robust setae and 7 plumose setae, posterior margin with many plumose setae laterally and medially; merus with single robust seta each on antero- and posterodistal corners; carpus with 2 robust setae on anterior margin, single robust seta on anterodistal corner, and 1+2+3+4 robust setae posteriorly; propodus long, with 5 anterior and 6 posterior robust setae; dactylus

short, with plumose seta. Pereopod 7 ca. 1.3 times as long as pereopod 6; coxa short, slightly lobate; basis roundish rectangular, with lateral ridge, posteroproximal corner triangularly projected, anterior margin with many small robust setae and 9 plumose setae, posterior margin bearing many plumose setae laterally and medially; merus with 1, 2, 1 robust setae on anterodistal corner, posterior margin and posterodistal corner, respectively; carpus with 4, 3, 2 robust setae on anterior margin, posterior margin and posterodistal corner, respectively; propodus very long, with 6 anterior and 7 posterior robust setae; dactylus short, curved, with plumose seta.

Pleon (Fig. 8). Epimeral plates 1–3 rounded posteroventrally, ventral margins with 6 lateral, 12 lateral+4 medial, and 3 medial plumose setae, respectively. Pleopods, pleopod 3 shortest; each peduncle with many plumose setae; outer rami much shorter than inner rami, outer rami with 15, 16, 14 articles, and inner rami with 14, 14, 13 articles, respectively. Urosomites 1, 2 posterior margins each with pair of dorsolateral projections; urosomite 3 with pair of denticulate dorsal ridges (Fig. 5). Uropod 1 long; peduncle with 5 dorsolateral, 3 dorsomedial and 4 medial robust setae, ventrodistal end with long inter-ramal process (45% length of peduncle); both rami almost same length as peduncle, outer ramus a little shorter than inner ramus, former with 5 dorsolateral, 1 dorsomedial and 4 terminal robust setae, latter bearing 3 dorsolateral, 3 dorsomedial and 5 terminal robust setae. Uropod 2 short, ca. 0.65 times as long as uropod 1; peduncle with 3 dorsolateral, 1 dorsomedial and 1 medial robust setae, ventrodistal end with long inter-ramal process (82% length of peduncle); outer ramus ca. 1.2 times as long as peduncle, shorter than inner ramus (ca. 0.9 times), outer ramus with 5 dorsolateral, 2 dorsomedial, 2 medial and 5 terminal robust setae, inner ramus bearing 3 dorsolateral, 4 dorsomedial and 4 terminal robust setae. Uropod 3 very short, ca. 0.6 times as long as uropod 2; peduncle short, with 1 ventrolateral and 1 mediolateral robust setae, laterodistal corner with 2 long thick setae; outer ramus slender, ca. 1.4 times as long as peduncle, lateral margin with 2 long thick setae, medial margin with 2 robust setae, tip bearing small second article, 4 long thick setae and 1 robust seta; inner ramus narrowed distally, shorter than outer ramus (ca. 0.85 times), with 2 lateral and 3 medial robust setae, tip bearing 1 robust and 1 slender setae. Telson wider than long, laterodistal corners each with 1 cusp and 2+1 setae.

**Description of female.** Based on ovigerous female (OMNH-Ar-12628, 9.9 mm). Generally similar to male except for eyes, gnathopods and oostegites. Eyes located at tip of produced cephalic lobe. Gnathopod 1 (Fig. 8F-G1) almost same as that of male, but basis posterior margin and medial surface with 4 and 6 long setae, respectively, propodus subequal in length to carpus, palm defined by 2 robust setae. Gnathopod 2 (Fig. 8F-G2) almost same as that of male, but coxa semioval, basis narrower than that of male, posterior margin with 1+2 long setae, propodus ca. 1.05 times as long as carpus, palm defined by 2 large and 2 small robust setae.

**Coloration of ethanol-preserved specimens.** Eyes

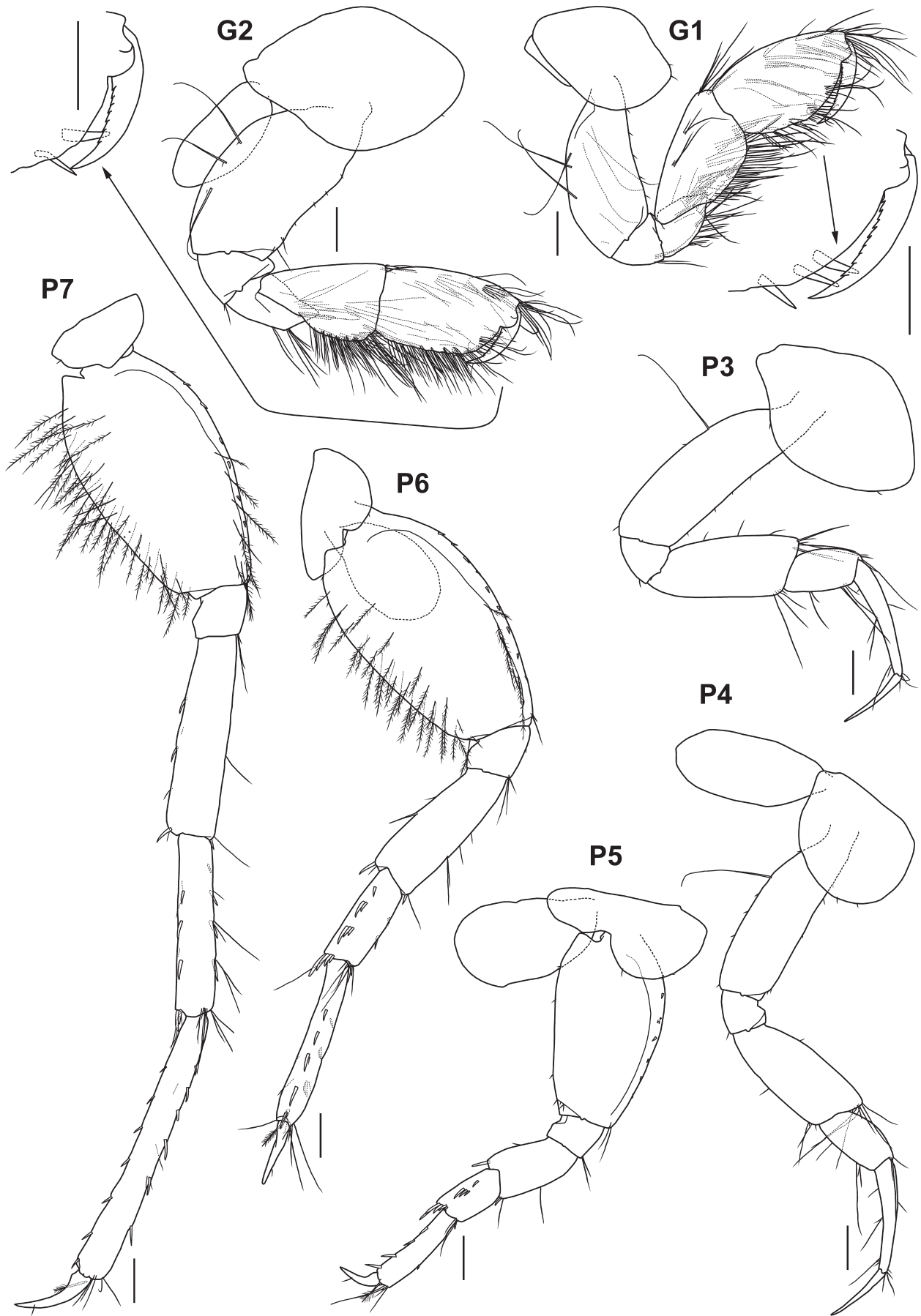


Fig. 7. *Ledoyerella clavata* (Hirayama, 1984). Male (OMNH-Ar-12626), 7.2 mm. Gill on coxa 3 lost. Scales: 0.2 mm.

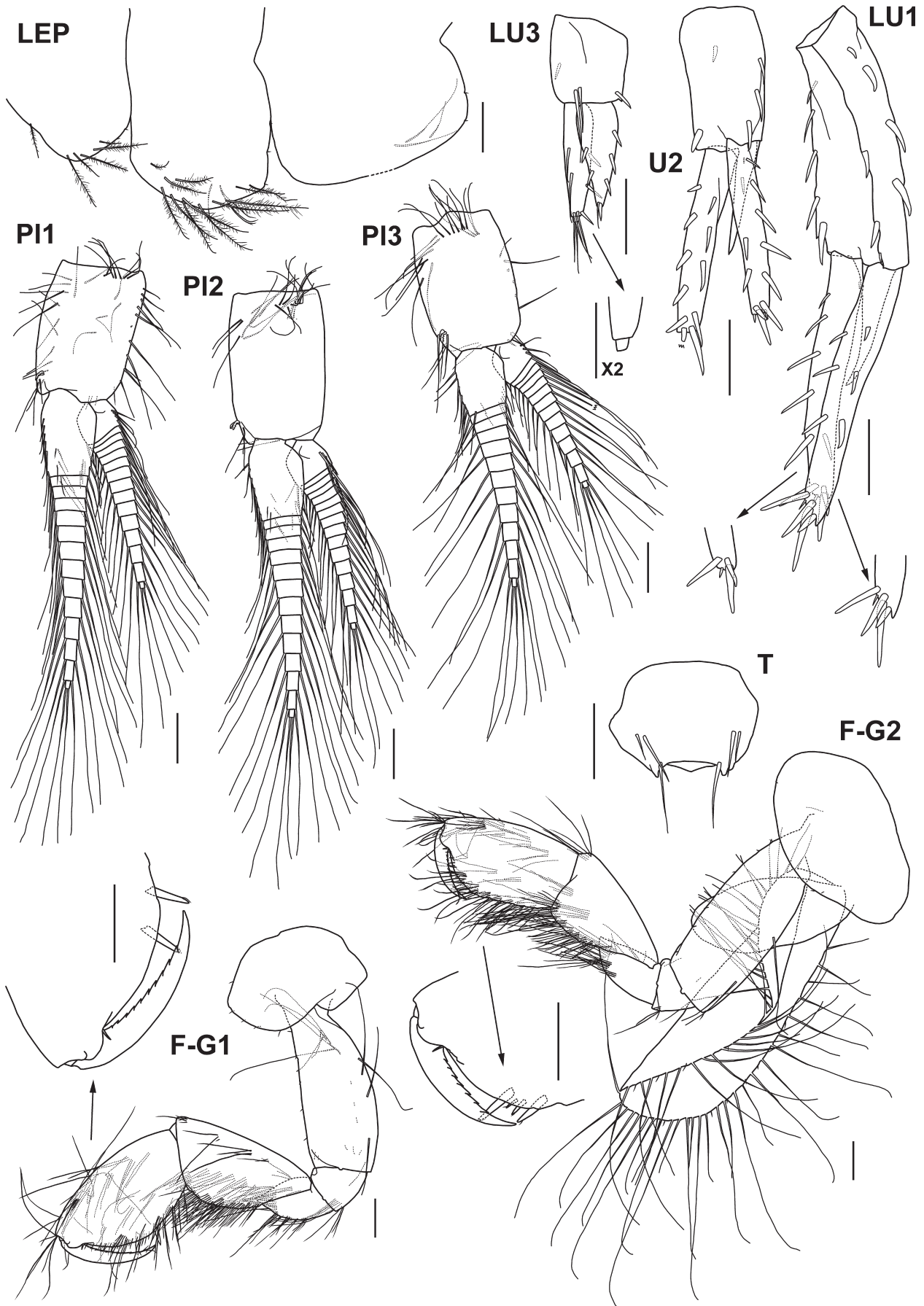


Fig. 8. *Ledoyerella clavata* (Hirayama, 1984). All but F, male (OMNH-Ar-12626), 7.2 mm; F, ovigerous female (OMNH-Ar-12628), 9.9 mm. Scales: 0.2 mm.

Table 1. Comparison of the present specimens with *Ledoyerella* species and *Lembos clavatus*.

	<i>Ledoyerella</i>					<i>Lembos</i>	
	<i>caputphotis</i>	<i>haléwa</i>	<i>isochelata</i>	<i>kunensis</i>	<i>spinosa</i>	<i>clavatus</i>	
Antenna 1 peduncular articles	1 < 3	1 = 3	?	1 > 3	1 = 3	?	
accessory flagellum	5	3-4	?	3	5	?	
Mandibular palp article 1	with spine	smooth	smooth	smooth	with spine	?	
article 2	slender	slender	slender	broad	slender	?	
article 3	oblong	oblong	clavate	clavate	semifalcate	?	
Male sternal process	absent	absent	present	absent	?	?	
Male gnathopod 1 basis	ordinary	ordinary	ordinary	expanded	?	?	
carpus, propodus	C < P	C = P	C < P, C = P	C > P	?	?	
palm	oblique, smooth	oblique, smooth	oblique, almost smooth	transverse, with projection	?	?	
robust setae on palm	3	1	2-3	0	?	?	
Male gnathopod 2 carpus, propodus	C < P	C < P	C < P, C = P	C > P	?	?	
palm	oblique, smooth	oblique, with projection	oblique, with projection	transverse, with projection	?	?	
robust setae on palm	1	1	1	0	?	?	
Female gnathopod 1 carpus, propodus	C < P	?	C < P	C > P	C = P	C = P	
robust setae on palm	3	1	2	1	2	2?	
Female gnathopod 2 carpus, propodus	C < P	C = P	C < P	C = P	C < P	C < P	
robust setae on palm	2	1-2	2	1	2	?	
Pereopods 3, 4 dactylus/propodus	0.4	0.85	0.65-0.7	0.5	0.5	0.6-0.65	
Pereopod 6 basis posterior margin	weakly setose	not setose	not setose	not setose	heavily setose	heavily setose	
Pereopod 7 basis posterior margin	weakly setose	not setose	not setose	not setose	heavily setose	heavily setose	
Uropod 2 inter-ramal process	present	present	present	absent	present	present	
Distribution	Madagascar	Hawaii, Madagascar	Madagascar	Namibia, Angola	China	Japan	
References	Ledoyer (1968, 1972, 1982)	Barnard (1970), Ledoyer (1982)	Ledoyer (1972, 1979, 1982)	Zettler and Myers (2018)	Ren (2006)	Hirayama (1984a)	

brown; other parts faded, but brown pigments remaining faintly on head, pereonites 4–6 and pleonite 2.

**Remarks.** The present specimens are characterized by (1) strongly produced lateral cephalic lobe, (2) same-sized gnathopods 1, 2 in both sexes, (3) propodi of gnathopods almost as long as carpi, (4) peduncles of uropods 1, 2 each with inter-ramal process, (5) inner ramus of uropod 3 almost same length as outer ramus, and (6) fleshy telson. These characters agree with those of the genus *Ledoyerella*. Among the *Ledoyerella* species, *L. spinosa* from China is similar to the present specimens (Table 1), although there are trifling differences (ex. the maxilla 1 palp is narrower in *L. spinosa*). The present material is also morphologically identical with material described from a single female specimen by Hirayama (1984a) under the name *Lembos clavatus*. Publication of *Lembos clavatus* is prior to that of *L. spinosa* (Hirayama 1984a; Ren 2006), and thus, *L. spinosa* appears to be synonymous with *L. clavata*. This species can be distinguished from its congeners by the acute distal spine on the mandibular palp article 1, the semifalcate article 3 of the mandibular palp, the heavily setose posterior margins of the pereopods 6, 7 bases, and the male gnathopod 2 palm lacking projection.

**Habitat.** 3–105 m depth, sand or sandy mud bottom.

**Distribution.** Japan: Tomioka Bay (Hirayama 1984a), Ariake Sea (present study). China: Hainan Island (Ren 2006). East China Sea (Ren 2006).

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