

Six Species of the Family Odiidae (Crustacea: Amphipoda) from Japan, with Descriptions of a New Genus and Four New Species

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Abstract Six species of the family Odiidae (Amphipoda), including four new species, are recorded from Japan: *Postodius imperfectus* Hirayama, 1983; *P. igneus* sp. nov.; *P. ornatus* sp. nov.; *P. striatus* sp. nov.; *Gordonodius zelleri* (Berge, Vader and Coleman, 1999) comb. nov.; and *Antarctodius japonicus* sp. nov. *Postodius imperfectus*, the type species of the genus *Postodius*, is re-described and the diagnosis of the genus is revised. It has been shown that *Postodius zelleri* is distinct from the four species here assigned to *Postodius*, and thus a new genus *Gordonodius* is proposed to accommodate *P. zelleri*. The four species of *Postodius* are morphologically similar for one another, but are differentiated by some minor morphological characters and the coloration in life. *Antarctodius japonicus* is the first representative of the genus from Japanese waters.

Key words: Crustacea, Amphipoda, Odiidae, new genus, new species, Japan.

The amphipod family Odiidae was established by Coleman and J. L. Barnard (1991a) with *Odius* Liljeborg, 1865 as its type genus. Afterwards Berge *et al.* (1999) carried out a cladistic analysis using 46 morphological characters and united the Odiidae to the Ochlesidae Stebbing, 1910. However, Lowry and Myers (in Coleman and Lowry, 2006) questioned the classification of Berge *et al.* (1999). In this study, Odiidae is regarded as a distinct family. The family presently contains 11 species and one subspecies in four genera (J. L. Barnard and Karaman, 1991; Moore, 1992; Brandt and Vassilenko, 1995; Berge *et al.*, 1999; Coleman and Kauffeldt, 2001; Labay, 2010). In Japan, several species of the family have been recorded (Ishimaru, 1994), but only two species, *Postodius imperfectus* Hirayama, 1983, and *P. zelleri* Berge, Vader and Coleman, 1999, are recognized with certainty.

During my survey of the amphipod fauna of Japan, six species referable to the family, including four undescribed species, were obtained. This material enabled me to reassess the status of *Postodius*. The type species of *Postodius*, *P. imper-*

fectus, is re-described on the basis of the holotype and newly obtained specimens, and mistakes in the original descriptions are clarified; three new species referred the genus, viz., *P. igneus* sp. nov.; *P. ornatus* sp. nov.; *P. striatus* sp. nov., are described. It has been found that *Postodius zelleri* is distinct from the four species referred to *Postodius*, and thus a new monotypic genus *Gordonodius* is established to accommodate *P. zelleri*. Furthermore, a new species of the genus *Antarctodius*, *A. japonicus*, is also described.

Materials and Methods

Samples were collected from the coasts from Miyagi to Ehime Prefectures and the bottom of Ariake Sound. Thirty-one individuals were dissected. Drawings were made with the aid of a drawing tube mounted on a phase-contrast microscope. Body length was measured from the apex of the rostrum along the dorsal margin excluding dorsal projections to the posterior end of urosomite 3. The examined specimens, including the type series of the new species, are deposited in

the National Museum of Nature and Science, Tokyo (NSMT), the Osaka Museum of Natural History (OMNH), the Coastal Branch of Natural History Museum and Institute, Chiba (CMNH), and the Amakusa Marine Biological Laboratory, Kyushu University (AMBL).

Systematics

Family **Odiidae** Coleman and J. L. Barnard, 1991

[Japanese name: Subeyokoebi-ka]

Odiidae Coleman and J. L. Barnard, 1991a: 262; Moore, 1992: 913.

Ochlesidae: Berge *et al.*, 1999: 242 (in part).

Emended diagnosis. Body compressed laterally. Rostrum well developed. All pereonites dorsally flush, usually raised into thin keels. Pleonites often with dorsal projections. Antennae short, accessory flagellum present or absent. Mouthparts conically developed. Upper lip narrow, tip asymmetrically incised. Mandible styli-form, incisor minutely toothed, accessory blades strong or absent, molar small and tritulative; palp 3-articulated, attached at almost same level as molar, article 1 shorter than half length of article 3. Lower lip without inner lobes, outer lobes thin. Maxilla 1 with inner plate small, bearing 1–3 apical setae, outer plate conical, palp 1- or 2-articulated. Maxilla 2 with inner plate lacking facial row of setae. Maxillipedal palp 3- or 4-articulated, article 2 expanded distomedially or not. Coxae 1–4 subequal in length or gradually longer, coxae 1–3 weakly tapering, coxa 4 with large acute posterior projection. Gnathopod 1 weak, chelate, carpus and propodus elongate. Gnathopod 2 subchelate, merus and carpus produced posterodistally. Pereopods 5–7 with bases expanded posteriorly. Urosomites free. Uropods biramous, both rami of uropod 1 subequal in length, outer rami shorter than inner in uropods 2 and 3. Telson entire or incised.

Genera included. *Odius* Liljeborg, 1865 (type genus); *Postodius* Hirayama, 1983; *Cryptodius* Moore, 1992; *Antarctodius* Berge, Vader and Coleman, 1999; and *Gordonodius* gen. nov.

Remarks. Based on the cladistic analysis, Berge *et al.* (1999) estimated that the Odiidae was paraphyletic, and consequently the family was synonymized with the Ochlesidae. However, their analysis did not consider characters of taxonomic importance, including 1) the combination of the chelate gnathopod 1 and the subchelate gnathopod 2, and 2) the size and shape of the coxae of pereopods (J. L. Barnard and Karaman, 1991). The first character is unique for the taxa assigned to the Odiidae. With regard to the second character, the taxa assigned to the Odiidae have coxae 1–4 being subequal or becoming gradually longer posteriorly, but species of the Ochlesidae *sensu stricto* all have unequal coxae 1–4 (coxae 1 and 4 are shorter than coxae 2 and 3); coxa 4 has a large acute projection posteriorly in the species of the Odiidae, whereas such a projection is absent in the species of the Ochlesidae *sensu stricto* (Sars, 1895; Stebbing, 1910; K. H. Barnard, 1940; Schellenberg, 1953; J. L. Barnard, 1970, 1972; Gurjanova, 1972; Watling and Holman, 1981; Ledoyer, 1982, 1986; Hirayama, 1983; Thomas, 1983; Coleman and J. L. Barnard, 1991b; Moore, 1992; Brandt and Vassilenko, 1995; Berge *et al.*, 1999; Coleman and Kauffeldt, 2001; Lowry and Myers, 2003; Coleman and Lowry, 2006; Ortiz *et al.*, 2007; Souza-Filho and Serejo, 2008; Labay, 2010). Furthermore, Berge *et al.* (1999) made misinterpretation in some characters used in their analysis. For example, they considered that the distal projection on the carpus of gnathopod 2 does not exceed the mid-length of the propodus in *Postodius imperfectus*, but I confirmed that it actually exceeds it. The number of the articles of the maxilla 1 palp in the genus *Antarctodius* was given as one, but actually there are two articles. In conclusion, phylogenetic analysis based on a revised data is strongly recommended to establish the status of the Odiidae and Ochlesidae, although this is beyond the scope of this paper. In this study, I maintain the Odiidae as a valid family for the time being.

Key to the genera of the family Odiidae in the world

1. Accessory flagellum present.....2
—Accessory flagellum absent.....3
2. Dorsal projections indistinct; maxillipedal
palp 4-articulated; telson minutely cleft
.....*Postodius* Hirayama, 1983
—Dorsal projections distinct; maxillipedal palp
3-articulated; telson entire
.....*Gordonodius* gen. nov.
3. Maxilla 1 palp powerful, 2-articulated
...*Antarctodius* Berge, Vader and Coleman, 1999
—Maxilla 1 palp reduced, 1-articulated4
4. Maxillipedal palp article 2 produced distomedially;
telson entire.....*Cryptodius* Moore, 1992
—Maxillipedal palp article 2 not produced disto-
medially; telson cleft
.....*Odius* Liljeborg, 1865

Genus *Postodius* Hirayama, 1983

[Japanese name: Hime-subeyokoebi-zoku]

Postodius Hirayama, 1983: 97; J. L. Barnard and Karaman, 1991: 400; Coleman and J. L. Barnard, 1991a: 263; Moore, 1992: 913; Ishimaru, 1994: 65; Berge *et al.*, 1999: 246 (in part).

Emended diagnosis. Anterodorsal corner of pereonite 1 strongly produced. Dorsal projections of pereonites 1–6 absent, on pleonites present, but indistinct. Posterolateral margin of pleonite 3 with acute, upwardly directed projection at midpoint. Eyes reniform. Antenna 1 peduncle with article 2 shorter than article 1; accessory flagellum present, 1-articulated; flagellum heavily setose in male. Mandible long; incisor narrow; lacinia mobilis present on left side, slender; palp at the same level as molar. Lower lip with outer lobes long, weakly notched inside. Maxilla 1 with inner plate bearing 2 apical setae, outer plate styliform, with several toothed robust setae on tip; palp 1-articulated, short, with long apical seta. Maxillipedal palp 4-articulated, article 4 minute. Coxae 1–4 progressively becoming wider, equally long; inner surfaces of coxae 2–4 each with “holder structure”, its triangular

process holding anterior coxa together with coxal plate. Gnathopod 1 propodus projected posterodistally, projection with short robust seta; dactylus small, triangular, with several thick setae. Gnathopod 2 propodus wide, palm transverse, distal margin serrated, with 2–3 robust setae on posterodistal corner. Gills present on pereopods 2–6. Dactyli of pereopods 3–7 each with nail. Uropods spinous, inner ramus of uropod 3 relatively wide. Telson minutely cleft, lateral margin with pair of 2 penicillate setae. Female similar to male, but antenna 1 less setose, oostegites present on pereopods 2–5.

Species included. *Postodius imperfectus* Hirayama, 1983 (type species); *P. igneus* sp. nov.; *P. ornatus* sp. nov.; and *P. striatus* sp. nov.

Remarks. Hirayama (1983) established *Postodius* with *P. imperfectus* Hirayama, 1983 as its type species. Reexamination of the holotype has shown that the original diagnosis of the genus contains some mistakes in accessory flagellum, upper lip, maxillipedal palp and telson as stated below; therefore, I rediagnose *Postodius* herein. The three new species described in this study are assigned to *Postodius*, because all the characters coincide with the diagnosis of the genus.

Distribution. Japan.

Key to the species of the genus *Postodius*

1. Anterior margin of basis of pereopod 3 without plumose setae in male and with 0–4 plumose setae in female
.....*P. imperfectus* Hirayama, 1983
—Anterior margin of basis of pereopod 3 with 1–12 plumose setae in male, with more than 11 plumose setae in female2
2. Basis of pereopod 7 relatively broad (Figs. 15G, 16I).....*P. striatus* sp. nov.
—Basis of pereopod 7 relatively narrow.....3
3. Posterior margin of basis of pereopod 7 expanded at 0.65 of length (Figs. 7G, 8J)
.....*P. igneus* sp. nov.
—Posterior margin of basis of pereopod 7 expanded at 0.75–0.8 of length (Figs. 13G, 14I)
.....*P. ornatus* sp. nov.

***Postodius imperfectus* Hirayama, 1983**

[Japanese name: Hime-subeyokoebi]

(Figs. 1–4, 21A)

Postodius imperfectus Hirayama, 1983: 97, figs. 5–8; Ishimaru, 1994: 65; Matsuo *et al.*, 2007: 22.*Material examined.* Holotype: AML-Amph 62, 1 male (2.0 mm), Ariake Sea, June 1976, coll. T. Kikuchi and M. Tanaka.

Other material: NSMT-Cr 21267, 1 female (2.4 mm), Himagajima Island, Aichi Prefecture, 34°42'N, 137°00'E, 5 m deep, among bush of brown alga *Dictyopterus prolifera*, snorkeling, 5 August 2001, coll. H. Ariyama; OMNH-Ar 8376, 1 male (2.8 mm), Kii-nagashima, Mie Prefecture, 34°11'N, 136°20'E, among algae, snorkeling, 3 August 1986, coll. H. Ariyama; NSMT-Cr 21268, 21269, 1 male (3.4 mm), 1 female (4.4 mm), Myojinzaki coast in Misaki, Osaka Prefecture, 34°19'N, 135°06'E, lower intertidal zone, under stone, 14 May 2006, coll. H. Ariyama; OMNH-Ar 8377, 8378, 1 male (3.1 mm), 1 female (3.4 mm), Nagasaki coast in Misaki, Osaka Prefecture, 34°20'N, 135°09'E, lower intertidal zone, under stone, 17 May 2003, coll. H. Ariyama; OMNH-Ar 8379, 1 female (1.8 mm), Iwagi

Island, Ehime Prefecture, 34°16'N, 133°09'E, 3 m deep, among bush of brown alga *Sargassum macrocarpum*, snorkeling, 3 August 2002, coll. H. Ariyama; NSMT-Cr 21270, 1 female (3.7 mm), St. 78 (Matsuo *et al.*, 2007), off Kitairima,, Ariake Sound, 32°36'N, 130°17'E, 43 m deep, gravel bottom, Smith-McIntyre grab, 19 June 2002, coll. M. Azuma and M. Matsuo.

Description. Male (based on NSMT-Cr 21268). Body (Fig. 1) somewhat stout. Eyes large. Dorsal margin of pereonite 7 without projection, pleonites 1 and 2 slightly produced posterodorsally, dorsal margin of pleonite 3 with blunt projection at mid-length, posterolateral margins of pleonites 1 and 2 slightly projected at 0.65 of length and at midlength, respectively.

Antenna 1 (Fig. 2A, A1) stout; ratio of lengths of peduncular articles 1–3 1:0.7:0.5; accessory flagellum slender, tip with 1 plumose and 2 simple setae; flagellum with 7 articles, article 1 elongate. Antenna 2 (Fig. 2B) short, about 0.6 times as long as antenna 1, with ratio of lengths of peduncular articles 3–5 1:1.6:1.6; flagellum with 6 articles.

Left mandible (Fig. 2D, D1) with incisor relatively wide, bearing denticles; lacinia mobilis

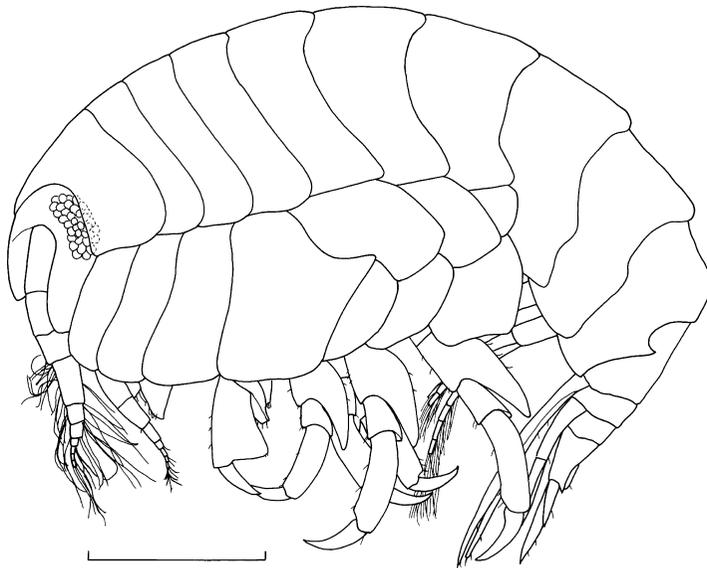


Fig. 1. *Postodius imperfectus* Hirayama, 1983, male (3.4 mm), NSMT-Cr 21268. Habitus, left lateral view. Scale: 0.5 mm.

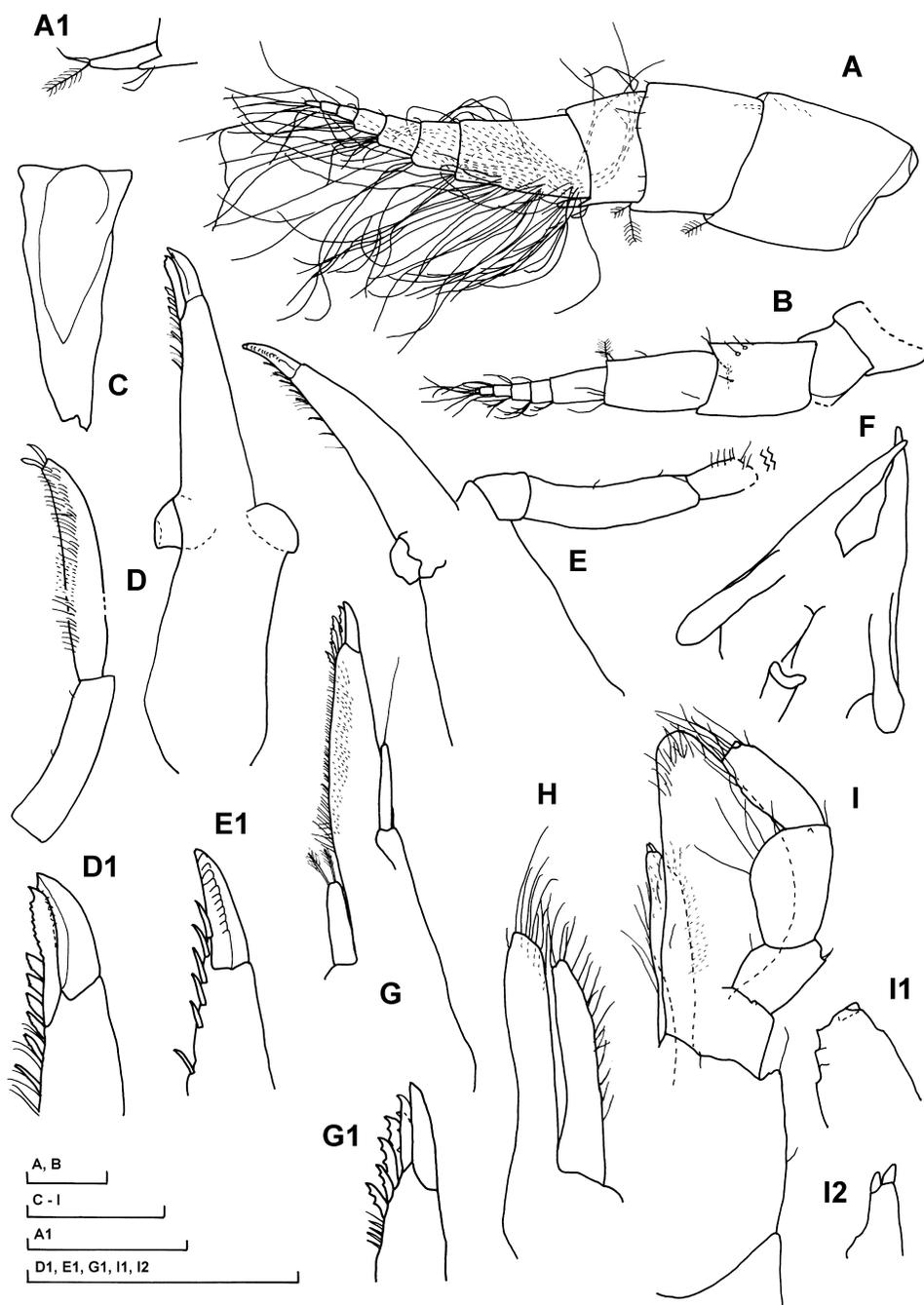


Fig. 2. *Postodius imperfectus* Hirayama, 1983, male (3.4 mm), NSMT-Cr 21268. A, left antenna 1, lateral view; A1, left accessory flagellum, lateral view; B, left antenna 2, lateral view; C, upper lip, dorsolateral view; D, left mandible (palp removed), lateral view; D1, tip of left mandible, lateral view; E, right mandible, medial view; E1, tip of right mandible, medial view; F, lower lip, ventral view; G, left maxilla 1, ventral view; G1, tip of outer plate of left maxilla 1, ventral view; H, right maxilla 2, ventral view; I, left maxilliped, ventral view; I1, tip of palp article 3 of left maxilliped, ventral view; I2, tip of inner plate of left maxilliped, ventral view. Scales: 0.1 mm.

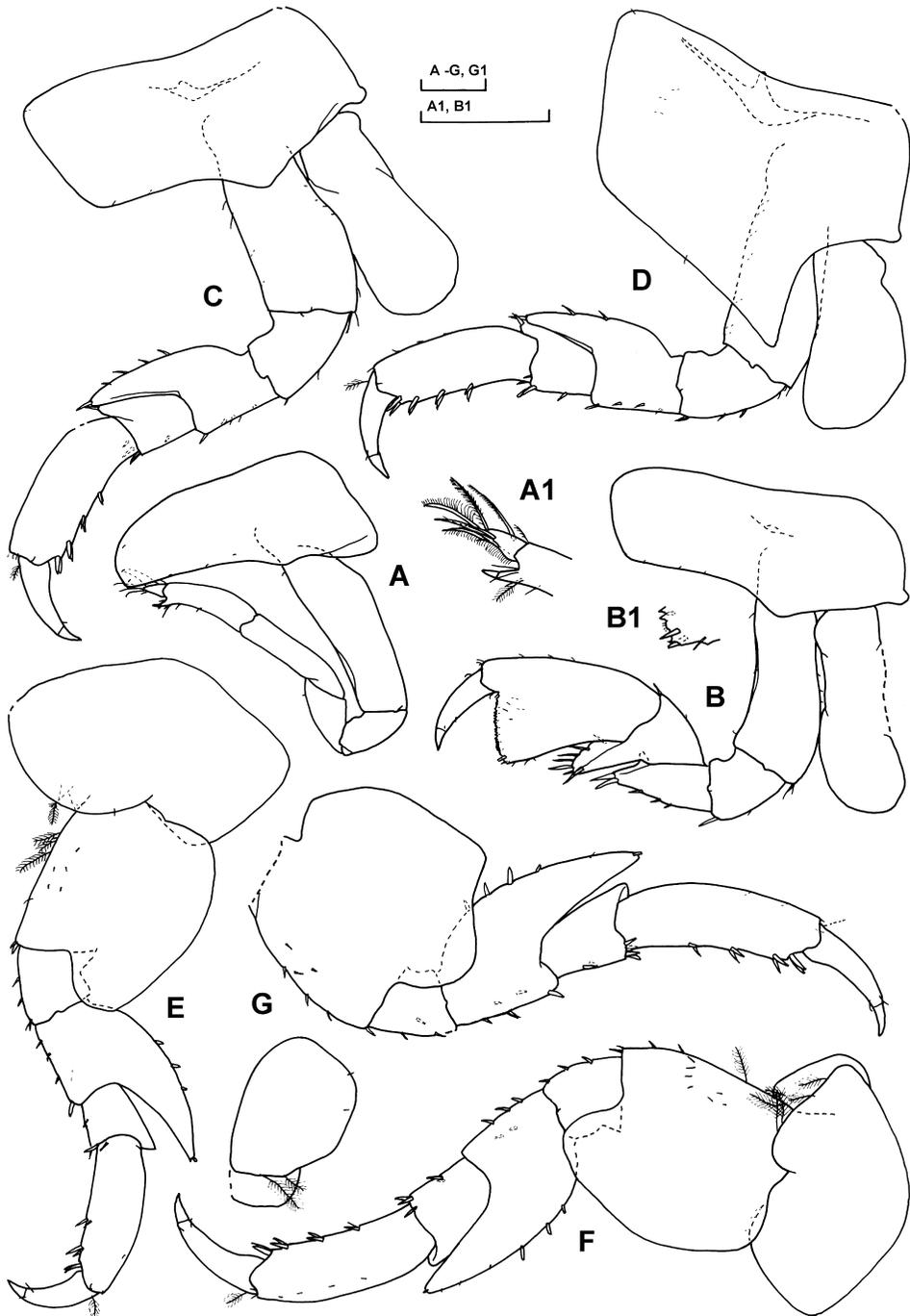


Fig. 3. *Postodius imperfectus* Hirayama, 1983, male (3.4 mm), NSMT-Cr 21268. A, left gnathopod 1, lateral view; A1, tip of left gnathopod 1, lateral view; B, left gnathopod 2, lateral view; B1, posterodistal corner of propodus of left gnathopod 2, lateral view; C–G, left pereopods 3–7 (gills of pereopods 5 and 6 lost), lateral views. Scales: 0.1 mm.

denticulate; accessory blades 6 in number, wide to narrow; palp long, article 3 with numerous fine setae on lateral surface and 2 thick setae on tip. Right mandible (Fig. 2E, E1) with narrow accessory blades. Maxilla 1 (Fig. 2G, G1) with outer plate bearing large spine and 6 serrated robust setae apically, distal half of dorsomedial surface with many short setae. Maxilla 2 (Fig. 2H) with inner plate bearing distal and medial setae, outer plate with several distal setae. Maxilliped (Fig. 2I, I1, I2) with inner plate bearing 2 distal robust setae.

Gnathopod 1 (Fig. 3A, A1) small; coxal plate narrow; basis relatively wide, anterior margin without plumose setae; propodus with 1 robust, 1 plumose and 4 short setae posterodistally; dactylus with 1 needle-shaped seta, 6 plumose setae and 1 short simple seta. Gnathopod 2 (Fig. 3B, B1) larger than gnathopod 1; coxal plate with blunt posterior projection, inner surface with tiny triangular process; basis without plumose setae on anterior margin, bearing robust seta on posterodistal corner; ischium with robust seta on posterodistal corner; merus with 3 and 2 robust setae on posterior margin and posterodistal corner, respectively; carpus with 1 anterodistal and 8 posterodistal robust setae; propodus with 2 robust setae on posterodistal corner; dactylus with nail.

Pereopod 3 (Fig. 3C) larger than gnathopod 2; coxal plate with blunt posterior projection, inner surface with medium triangular process; basis without plumose setae on anterior margin, bearing robust seta on posterodistal corner; ischium with 3 robust setae on posterior margin; merus projected anterodistally, with 4 anterior, 1 anterodistal, 4 posterior and 1 posterodistal robust setae; carpus with 1 anterodistal, 1 posterior and 5 posterodistal robust setae; propodus with 4 couples of robust setae posteriorly; dactylus with plumose seta. Pereopod 4 (Fig. 3D) subequal in length to pereopod 3; coxal plate wide, inner surface with large triangular process; basis without plumose setae on anterior margin, bearing robust seta on posterodistal corner; ischium with 4 robust setae on posterior margin; merus projected

anterodistally, with 2 anterior, 1 anterodistal, 5 posterior and 1 posterodistal robust setae; carpus with 1 anterodistal, 1 posterior and 4 posterodistal robust setae; propodus with 4 couples of robust setae posteriorly; dactylus with plumose seta.

Pereopod 5 (Fig. 3E) subequal in length to pereopod 4; coxal plate lobate, anteroventral margin with 2 plumose setae on inner surface; basis produced posterodistally, bearing 3 plumose and 2 short robust setae on anterior margin, 2 robust setae on anterodistal corner, and 5 short setae on anterolateral surface; ischium with 3 robust setae on anterior margin; merus projected posterodistally, projection reaching about 0.15 length of propodus, margin with 3 anterior, 1 anterodistal, 3 posterior, and 1 posterodistal robust setae, anteromedial surface with short robust seta; carpus with 1 anterior and 3 anterodistal robust setae; propodus with 3 couples of robust setae anteriorly; dactylus with plumose seta. Pereopod 6 (Fig. 3F) almost 1.1 times as long as pereopod 5; coxal plate lobate, anteroventral margin with 6 plumose setae; basis produced posterodistally, bearing 1 plumose and 2 robust setae on anterior margin, 2 robust setae on anterodistal corner, and 7 short robust setae on anterolateral surface; ischium with 3 robust setae on anterior margin; merus projected posterodistally, projection reaching about 0.15 length of propodus, margin with 3 anterior, 3 posterior and 1 posterodistal robust setae, anteromedial surface bearing 2 robust setae; carpus with 2 anterior and 3 anterodistal robust setae; propodus with 4 couples of robust setae anteriorly; dactylus with plumose seta. Pereopod 7 (Fig. 3G) subequal in length to pereopod 6; coxal plate small, unlobed, anterior margin with 2 plumose setae; basis wide, roundish, produced posterodistally, posterior margin expanded at 0.65 of length, anterior margin with 3 robust setae, but without plumose setae, anterodistal corner with robust seta, anterolateral surface with 3 short robust setae; ischium with 2 anterior and 1 anteromedial robust setae; merus projected posterodistally, projection reaching about 0.15 length of

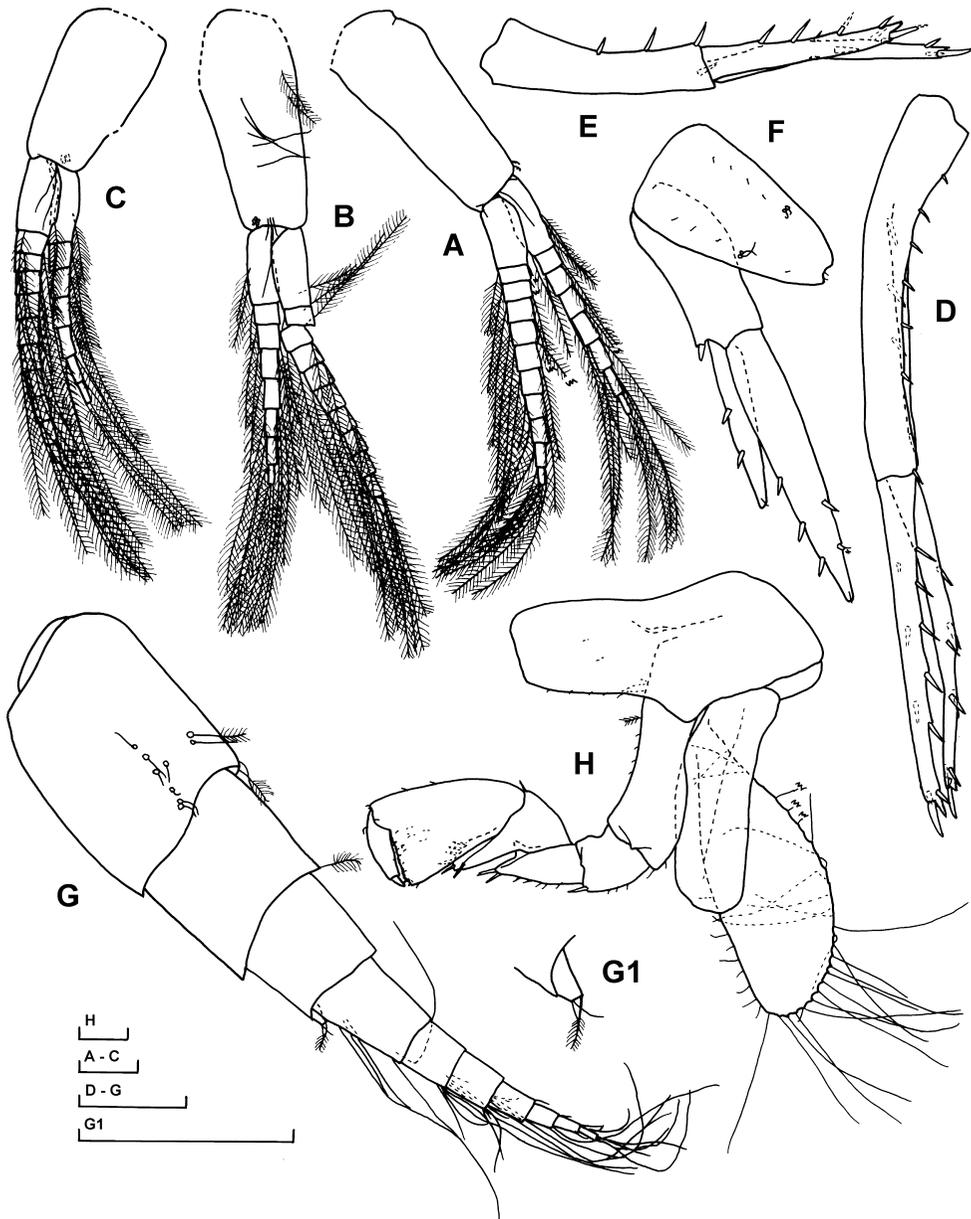


Fig. 4. *Postodius imperfectus* Hirayama, 1983. A–F, male (3.4 mm), NSMT-Cr 21268; G, G1, H, female (4.4 mm), NSMT-Cr 21269. A, right pleopod 1, anterior view; B, left pleopod 2, anterior view; C, left pleopod 3, posterolateral view; D, E, left uropods 1, 2, lateral views; F, left uropod 3 and telson, dorsal view; G, left antenna 1, medial view; G1, left accessory flagellum, medial view; H, left gnathopod 2, lateral view. Scales: 0.1 mm.

propodus, margin with 2 anterior, 1 anterodistal, 4 posterior and 1 posterodistal robust setae, anteromedial surface bearing 2 short robust setae; carpus with 2 anterior and 4 anterodistal robust

setae; propodus with 4 couples of robust setae anteriorly.

Pleopods (Fig. 4A–C) relatively long, pleopod 3 shortest; peduncles each with 2 coupling

hooks, peduncle of pleopod 2 bearing 2 plumose and 8 simple setae, peduncles of pleopods 1 and 3 bare; outer rami longer than inner, outer and inner rami with 11 and 7–8 articles, respectively. Uropod 1 (Fig. 4D) long; peduncle bearing 6, 4 and 1 robust setae on lateral margin, medial margin and distolateral corner, respectively; outer ramus with 5 lateral, 3 medial and 3 terminal robust setae, inner ramus with 2 lateral, 3 medial and 4 terminal robust setae. Uropod 2 (Fig. 4E) short, about 0.65 length of uropod 1; peduncle bearing 3 and 1 robust setae on lateral margin and distomedial corner, respectively; outer ramus with 3 lateral and 3 terminal robust setae, inner ramus with 2 lateral, 1 medial and 4 terminal robust setae. Uropod 3 (Fig. 4F) somewhat shorter than uropod 2; peduncle with distolateral robust seta; outer ramus about 0.6 length of inner ramus, with 2 lateral robust setae and terminal short seta, inner ramus with 3 lateral and 2 medial robust setae and terminal short seta. Telson (Fig. 4F) longish triangular, incised tip with 2 short setae.

Female (NSMT-Cr 21269). Eyes smaller than those of male. Antenna 1 (Fig. 4G, G1) more slender than that of male; ratio of lengths of peduncular articles 1–3 1:0.6:0.5; accessory flagellum tiny, tip with 1 plumose and 2 simple setae; flagellum with 7 articles. Gnathopod 2 (Fig. 4H) subequal to that of male except for oostegite, but basis with 3 plumose setae on anterior margin; anterior margins of pereopods 3–7 also with 2–10 plumose setae. Peduncles of pleopods 1–3 with 29, 15 and 2 plumose setae, respectively.

Coloration in life (female, NSMT-Cr 21269; Fig. 21A). Body and appendages whitish, light orange internal organs seen through; eyes bright red, flagellar articles 1 of both antennae red; dorsal margins of pereonites 1–7 and pleonites 1–3 each with dark red spot; coxae 1–4 each with 2 light orange blotches; coxa 5, bases of pereopods 5–7, pleonites 1–3 and urosomite 1 each with light orange blotch.

Remarks. During this study, I have reexamined the holotype of *Postodius imperfectus*. It has

been clarified that Hirayama's (1983) original description contains mistakes in some important points as follows: (1) the accessory flagellum of the antenna 1 is actually present, although Hirayama (1983) stated that it was absent; (2) the "upper lip with entire tip" is another organ (probably pharynx), while the tip of the true upper lip is invisible because the portion is obscured by dust; (3) the maxillipedal palp is four-articulated, contrary to "three-articulated" in the original description; and (4) the telson is actually minutely incised, rather than entire. The newly obtained specimens from Aichi, Mie, Osaka and Ehime prefectures closely agree with the holotype. In addition, the propodus of male gnathopod 2 (Fig. 3B) is narrower than that illustrated in the original description. The present examination of all specimens indicates that the length-width ratio becomes larger with the body size.

Distribution. Known only from Japan. Aichi, Mie, Osaka and Ehime Prefectures (present study). Ariake Sound (Hirayama, 1983; Matsuo *et al.*, 2007; present study). From lower intertidal zone to depth of 43 m.

Habitat. Under stones, among algae and on gravel bottom.

Postodius igneus sp. nov.

[New Japanese name: Homura-subeyokoebi]

(Figs. 5–8, 21B)

Material examined. Holotype: NSMT-Cr 21271, male (5.8 mm), Nazumado, Hachijo Island, Izu Islands, 33°09'N, 139°43'E, 10 m deep, SCUBA, 16 June 2009, coll. K. Tanaka.

Paratypes: NSMT-Cr 21272–21274, 1 female (9.7 mm), 1 male (5.4 mm), 1 female (7.4 mm), same data as holotype; OMNH-Ar 8380, 8381, 1 male (4.9 mm), 1 female (9.6 mm), same data as holotype; CMNH-ZC 02401, 1 female (9.1 mm, not dissected), same data as holotype.

Description. Holotype male. Body (Fig. 5) stout. Eyes medium. Pereonite 7, pleonites 1 and 2 slightly produced posterodorsally, dorsal margin of pleonite 3 produced mid-posteriorly, pos-

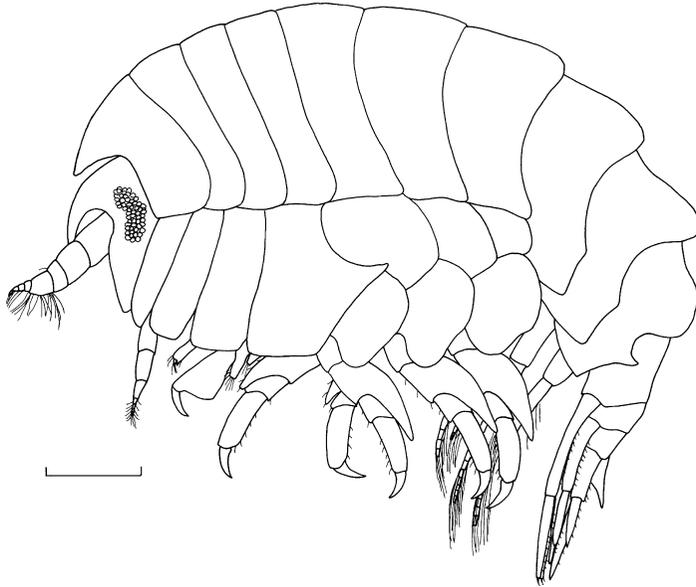


Fig. 5. *Postodius igneus* sp. nov., holotype, male (5.8 mm), NSMT-Cr 21271. Habitus, left lateral view. Scale: 0.5 mm.

terolateral margins of pleonites 1 and 2 slightly projected at 0.65 of length.

Antenna 1 (Fig. 6A, A1) stout, short; ratio of lengths of peduncular articles 1–3 1 : 0.7 : 0.4; accessory flagellum tiny, tip with plumose seta; flagellum with 6 articles, article 1 relatively short, anterior margin of article 1 shorter than posterior. Antenna 2 (Fig. 6B) subequal in length to antenna 1, with ratio of lengths of peduncular articles 3–5 1 : 1.5 : 1.2; flagellum with 5 articles.

Left mandible (Fig. 6D) with incisor relatively wide; accessory blades indistinct, anterior margin distal to palp expanded; palp long, article 3 with many fine setae on lateral surface and 3 setae on tip. Right mandible (Fig. 6E) subequal to left except for lacinia mobilis. Maxilla 1 (Fig. 6G, G1) with outer plate bearing large spine and 7 robust setae apically, distal half of dorsomedial surface with many short setae. Maxilla 2 (Fig. 6H) with inner plate bearing distal setae, outer plate with distal setae and lateral fine setae. Maxilliped (Fig. 6I, I1) with inner plate bearing 3 distal robust setae.

Gnathopod 1 (Fig. 7A, A1) small; coxal plate narrow; basis relatively wide, anterior margin

without plumose setae; propodus with 1 robust, 2 plumose and 2 short setae posterodistally; dactylus with 1 needle-shaped and 6 plumose setae. Gnathopod 2 (Fig. 7B, B1) larger than gnathopod 1; coxal plate with blunt posterior projection, inner surface with tiny triangular process; basis without plumose setae on anterior margin, bearing 2 robust setae on posterodistal corner; ischium with robust seta on posterodistal corner; merus with 5, 2 and 3 robust setae on posterior margin, posterodistal corner and distal margin, respectively; carpus with 2 anterodistal and 12 posterodistal robust setae; propodus with 2 robust setae each on posterior margin and posterodistal corner; dactylus with nail.

Pereopod 3 (Fig. 7C) larger than gnathopod 2; coxal plate with blunt posterior projection, inner surface with medium triangular process; basis with 4 plumose setae on anterior margin, posterior margin bearing 1 plumose and 3 robust setae, posterodistal corner with 3 robust setae; ischium with 3 robust setae each on posterior margin and posterodistal corner; merus projected anterodistally, with 4 anterior, 1 anterodistal, 7 posterior and 2 posterodistal robust setae; carpus with 1

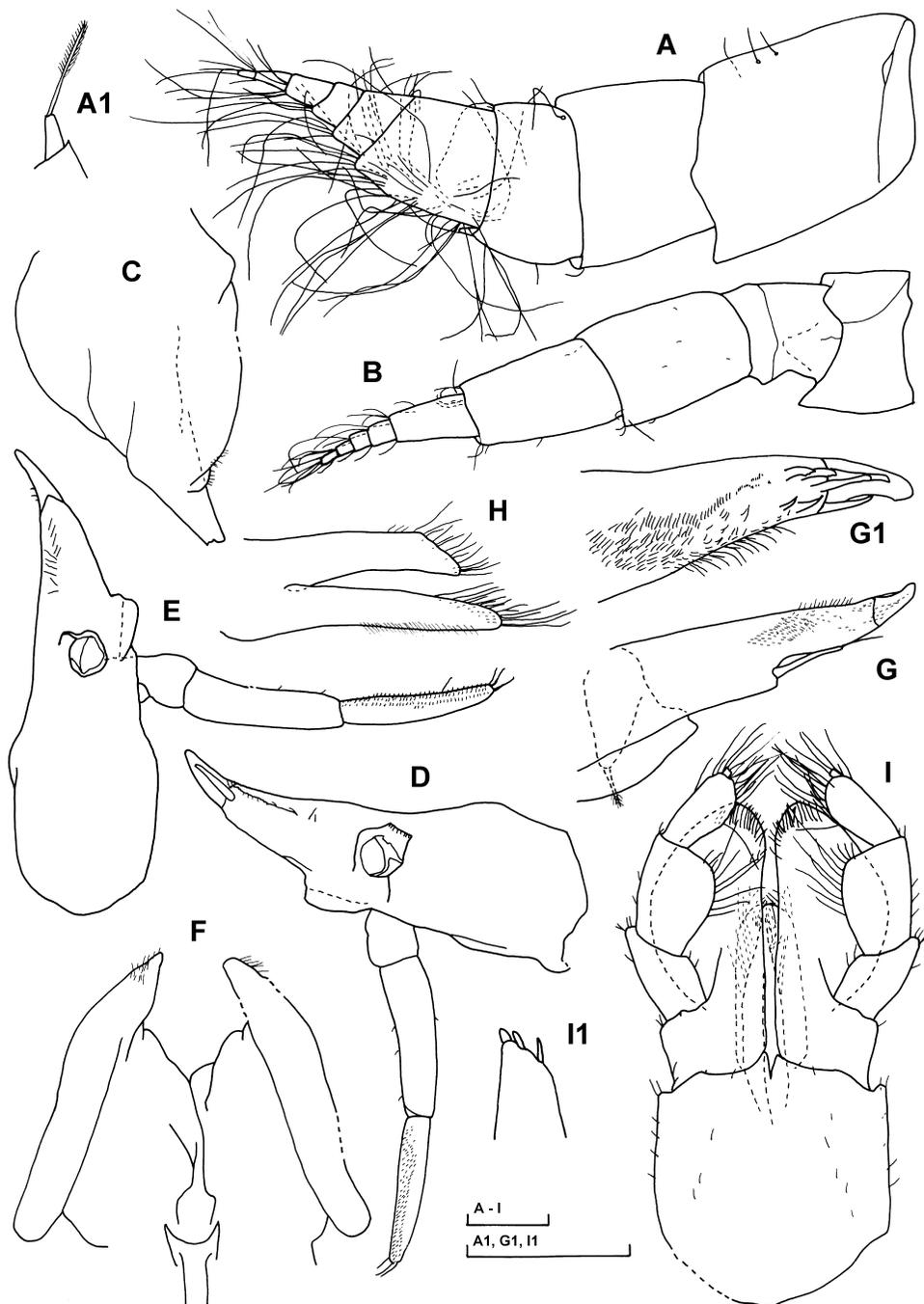


Fig. 6. *Postodius igneus* sp. nov. A-E, A1, G-I, G1, I1, holotype, male (5.8 mm), NSMT-Cr 21271; F, paratype, female (9.7 mm), NSMT-Cr 21272. A, left antenna 1, lateral view; A1, left accessory flagellum, medial view; B, left antenna 2, lateral view; C, upper lip, dorsolateral view; D, left mandible, medial view; E, right mandible, medial view; F, lower lip, ventral view; G, left maxilla 1, ventral view; G1, tip of outer plate of left maxilla 1, dorsal view; H, left maxilla 2, ventral view; I, maxilliped, ventral view; I1, tip of left inner plate of maxilliped, ventral view. Scales: 0.1 mm.

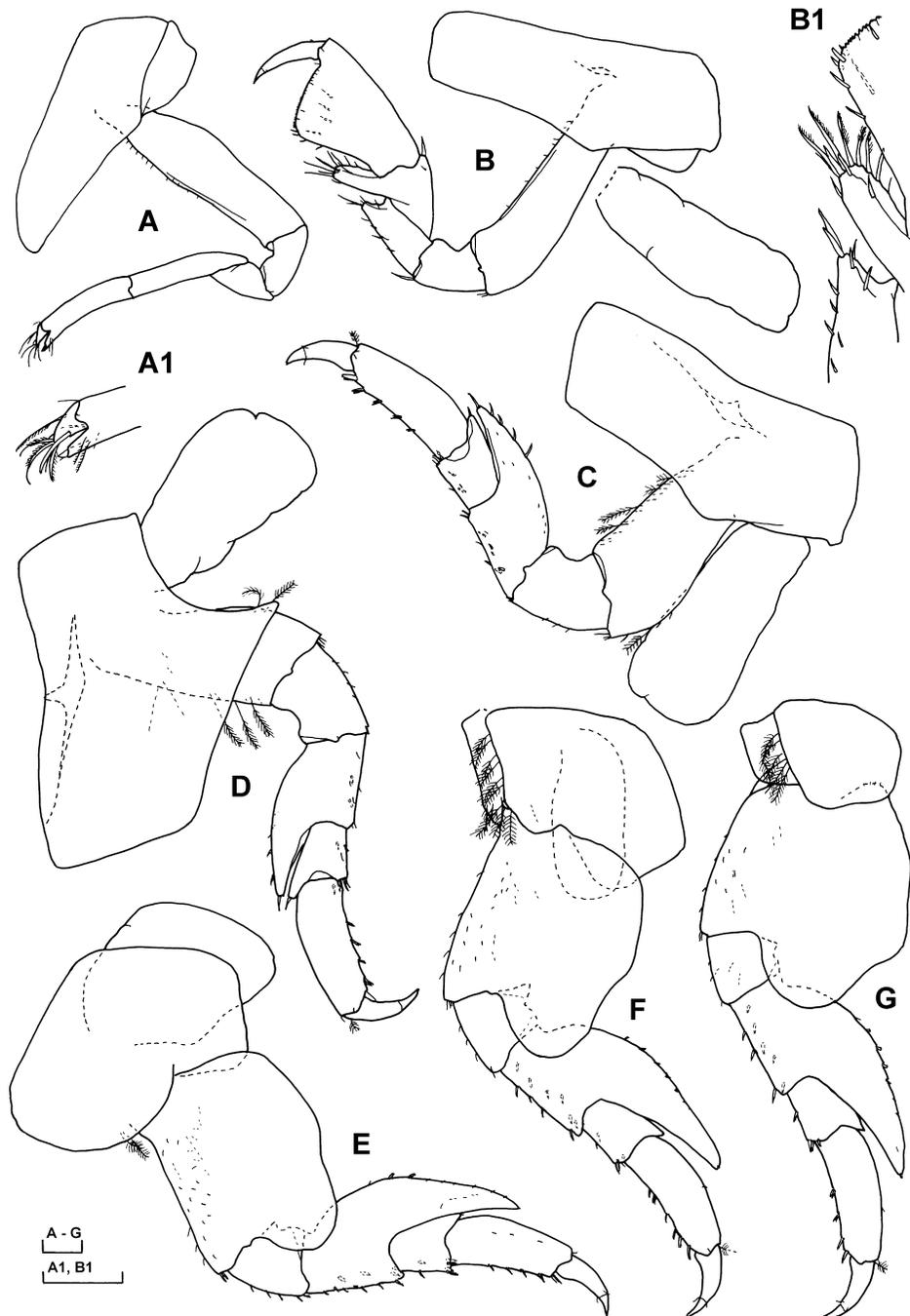


Fig. 7. *Postodius igneus* sp. nov., holotype, male (5.8 mm), NSMT-Cr 21271. A, left gnathopod 1, lateral view; A1, tip of left gnathopod 1, lateral view; B, left gnathopod 2, lateral view; B1, posterior part of merus-propodus of left gnathopod 2, lateral view; C–G, left pereopods 3–7, lateral views. Scales: 0.1 mm.

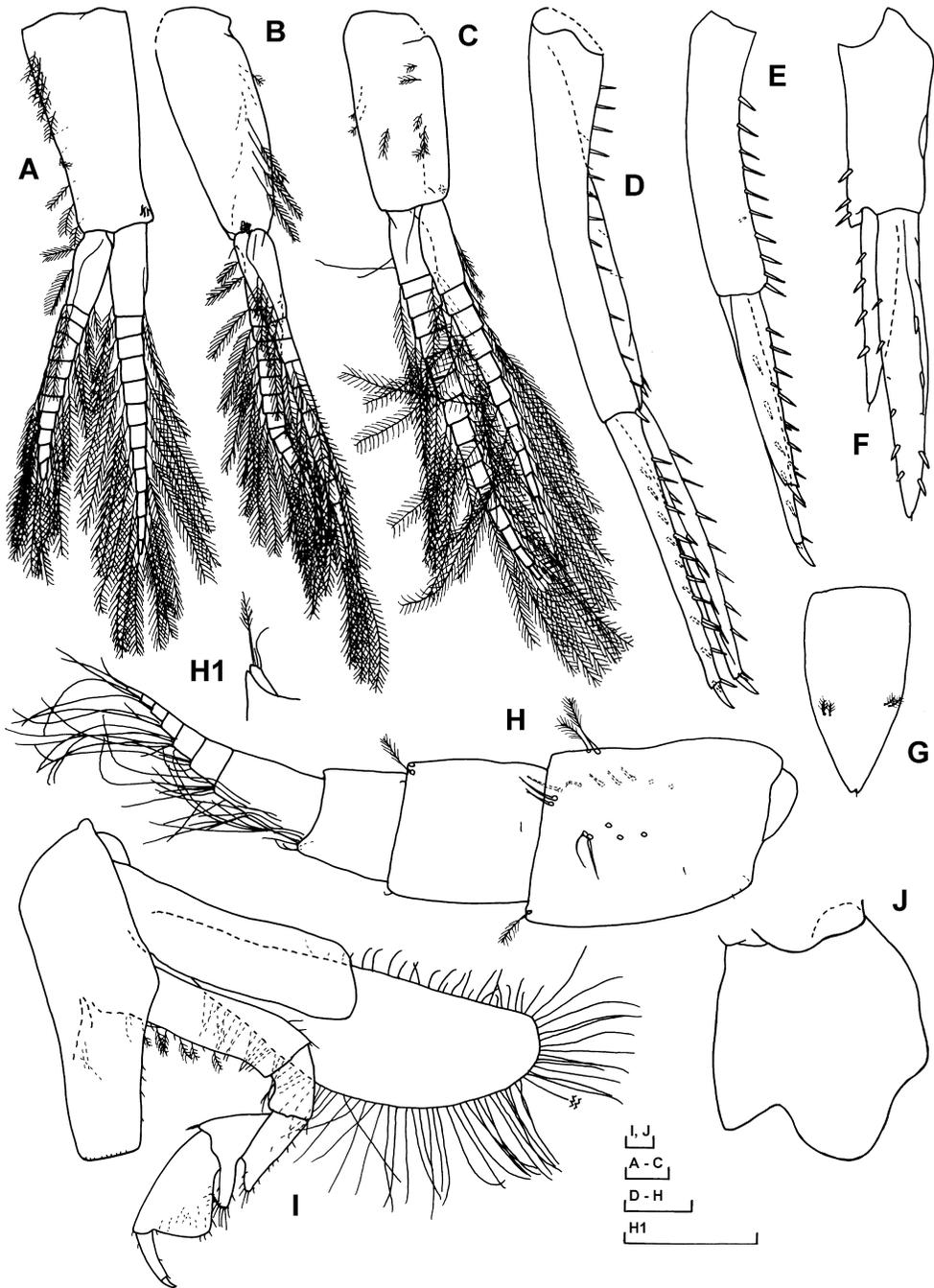


Fig. 8. *Postodius igneus* sp. nov. A–G, holotype, male (5.8 mm), NSMT-Cr 21271; H–J, H1, paratype, female (9.7 mm), NSMT-Cr 21272. A, left pleopod 1, posterior view; B, left pleopod 2, medial view; C, left pleopod 3, posterior view; D, E, left uropods 1, 2, lateral views; F, left uropod 3, dorsal view; G, telson, dorsal view; H, left antenna 1, lateral view; H1, left accessory flagellum, lateral view; I, left gnathopod 2, lateral view; J, basis of left pereopod 7 (setae omitted), lateral view. Scales: 0.1 mm.

anterodistal, 4 posterior and 5 posterodistal robust setae; propodus with 5 couples of robust setae posteriorly; dactylus with plumose seta. Pereopod 4 (Fig. 7D) subequal in length to pereopod 3; coxal plate wide, inner surface with large triangular process; basis with 5 and 2 plumose setae on anterior and posterior margins, respectively, bearing 3 robust setae on posterodistal corner; ischium with 4 and 1 robust setae on posterior margin and posterodistal corner, respectively; merus projected anterodistally, with 3 anterior, 1 anterodistal, 8 posterior and 2 posterodistal robust setae; carpus with 1 anterodistal, 4 posterior and 6 posterodistal robust setae; propodus with 5 couples of robust setae posteriorly; dactylus with plumose seta.

Pereopod 5 (Fig. 7E) about 1.1 times as long as pereopod 4; coxal plate lobate, anteroventral margin with 2 plumose setae on inner surface; basis produced posterodistally, posterior margin weakly expanded at mid-length, anterior margin with 3 robust setae distally, anterodistal corner bearing 3 robust setae, anterolateral surface with 15 short robust setae, anteromedial surface with 8 short robust setae and 2 long setae; ischium with 5 robust setae on anterior margin; merus projected posterodistally, projection reaching about mid-length of propodus, margin with 7 anterior, 2 posterior and 1 posterodistal robust setae, anteromedial surface bearing 4 robust setae; carpus with 3 anterior, 4 anterodistal and 1 posterodistal robust setae; propodus with 5 couples of robust setae anteriorly. Pereopod 6 (Fig. 7F) subequal in length to pereopod 5; coxal plate lobate, anterior margin with 12 plumose setae; basis produced posterodistally, posterior margin weakly expanded at mid-length, anterior margin with 5 robust setae, anterodistal corner bearing 3 robust setae, anterolateral and anteromedial surfaces with 15 and 5 short robust setae, respectively; ischium with 5 robust setae on anterior margin; merus projected posterodistally, projection reaching about mid-length of propodus, margin with 4 anterior, 5 posterior and 1 posterodistal robust setae, anteromedial surface bearing 6 robust setae; carpus with 2 anterior and 4 an-

terodistal robust setae; propodus with 1 single and 5 couples of robust setae anteriorly; dactylus with plumose seta. Pereopod 7 (Fig. 7G) somewhat shorter than pereopod 6; coxal plate small, unlobed, anterior margin with 8 plumose setae; basis relatively wide, produced posterodistally, posterior margin expanded at about 0.65 of length, anterior margin with 4 robust setae, anterodistal corner bearing 3 robust setae, anterolateral and anteromedial surfaces with 6 and 5 short robust setae, respectively; ischium with 4 robust setae on anterior margin; merus projected posterodistally, projection reaching about 0.45 length of propodus, margin with 3 anterior, 5 posterior and 1 posterodistal robust setae, anteromedial surface with 5 robust setae; carpus with 2 anterior and 5 anterodistal robust setae; propodus with 4 couples of robust setae anteriorly; dactylus with plumose seta.

Pleopods (Fig. 8A–C) relatively long, pleopod 1 shortest; peduncle of pleopod 1 with 13 plumose setae and 5 coupling hooks (abnormal, 2 in all paratypes), peduncle of pleopod 2 with 10 plumose setae, 2 simple setae and 5 coupling hooks (abnormal, 2 in all paratypes), peduncle of pleopod 3 with >10 plumose setae and 2 coupling hooks; outer rami longer than inner, outer and inner rami with 12–16 and 11–13 articles, respectively. Uropod 1 (Fig. 8D) long; peduncle bearing 13, 7 and 1 robust setae on lateral margin, medial margin and distolateral corner, respectively; outer ramus with 11 lateral, 8 medial and 3 terminal robust setae, inner ramus with 5 lateral, 7 medial and 3 terminal robust setae. Uropod 2 (Fig. 8E) short, about 0.8 length of uropod 1; peduncle bearing 10 and 1 robust setae on lateral and medial margins, respectively; outer ramus with 6 lateral and 3 (1 lost) terminal robust setae, inner ramus with 4 lateral, 5 medial and 3 terminal robust setae. Uropod 3 (Fig. 8F) somewhat shorter than uropod 2; peduncle with 3 distolateral robust setae; outer ramus about 0.6 length of inner ramus, with 4 lateral robust setae and terminal short seta, inner ramus with 6 (1 lost) lateral and 5 (1 lost) medial robust setae and 1 terminal short seta. Telson (Fig. 8G) longish

triangular, incised tip with short seta.

Paratype female (NSMT-Cr 21272). Eyes smaller than those of male holotype. Antenna 1 (Fig. 8H, H1) more slender than that of male holotype; ratio of lengths of peduncular articles 1–3 1:0.6:0.3; accessory flagellum tiny, tip with 1 plumose and 2 short setae; flagellum with 7 articles, article 1 elongate. Gnathopod 2 (Fig. 8I) subequal to that of male holotype except for oostegite, but basis with 8 plumose setae on anterior margin; anterior margins of gnathopod 1 and pereopods 3–7 also with plumose setae. Pereopod 7 basis (Fig. 8J) subequal to that of male holotype.

Paratype male (NSMT-Cr 21273, 5.4 mm). Antenna 1 subequal in shape to that of female paratype (NSMT-Cr 21272), but flagellum more setose.

Coloration in life (paratype female, NSMT-Cr 21274; Fig. 21B). Body and appendages bright orange, eyes red; pereonite 1 with U-shaped black–blue line, pereonites 2–4 each with L-shaped black–blue line, pereonite 5 with large blue quadrate mark connected with black line, pereonites 6 and 7 each with L-shaped black–

blue line, pleonites 1 and 2 each with black curved line; coxa 1 with blue waved mark, coxa 3 with 3 black blotches, coxa 4 with blue mark, coxa 5 with black curved line; bases of pereopods 5 and 6 each with blue mark.

Remarks. The four species here assigned to *Postodius* are morphologically very similar for one another. Differences among these four species are summarized in Table 1. *Postodius igneus* sp. nov. can be distinguished from the other three species in the elongated projections of the meri of pereopods 5–7 and the coloration in life.

Distribution. Hachijo Island, Izu Islands, 10 m deep (present study).

Habitat. Rocky bottom.

Etymology. From the Latin *igneus* (=flame-color), referring to the body coloration.

***Postodius ornatus* sp. nov.**

[New Japanese name: Nishiki-subeyokoebi]

(Figs. 9–12, 21C)

Material examined. Holotype: NSMT-Cr

Table 1. Comparison among four species of *Postodius*.

Characters/species	<i>P. imperfectus</i> Hirayama, 1983	<i>P. igneus</i> sp. nov.	<i>P. ornatus</i> sp. nov.	<i>P. striatus</i> sp. nov.
Maximum body length	3.4 mm in male, 4.4 mm in female	5.8 mm in male, 9.7 mm in female	4.0 mm in male, 10.4 mm in female	4.8 mm in male, 10.0 mm in female
Eyes in male	large	medium	large	medium
Expansion on anterior margin of mandible	absent	present	present	present
Plumose setae on anterior margin of basis of pereopod 3	absent in male, 0–4 setae in female	3–4 setae in male, 11–17 setae in female	5 setae in male, >15 setae in female	1–12 setae in male, >20 setae in female
Posterodistal projections of meri of pereopods 5–7	short, reaching about 0.15 length of propodus	long, reaching about 0.45–0.50 length of propodus	medium, reaching about 0.25–0.35 length of propodus	medium, reaching about 0.25–0.35 length of propodus
Basis of pereopod 7	relatively broad, posterior margin expanded at 0.65 of length	relatively narrow, posterior margin expanded at 0.65 of length	relatively narrow, posterior margin expanded at 0.75–0.80 of length	relatively broad, posterior margin expanded at 0.65–0.70 of length
Uropods	weakly spinous	strongly spinous	strongly spinous	strongly spinous
Coloration in life	whitish with light orange blotches and dark red spots	bright orange with black–blue lines and blue quadrate marks	orange with dark blue lines and red spots	reddish orange with light blue lines

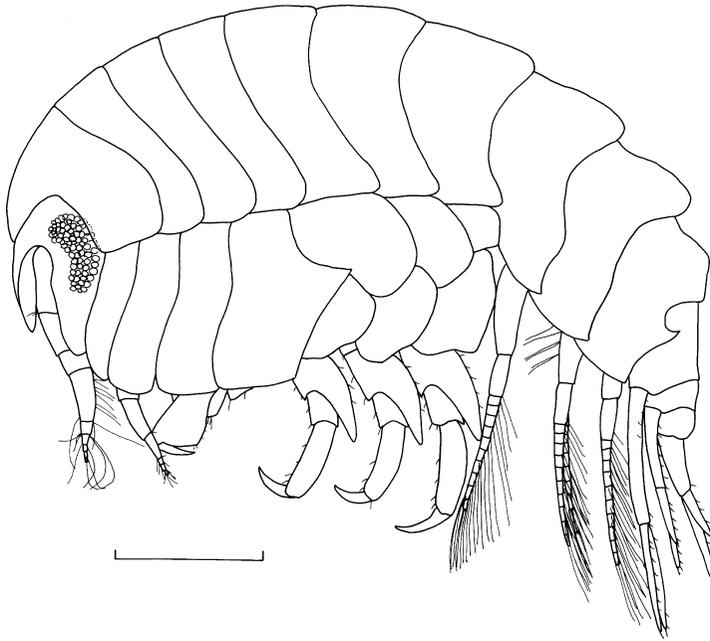


Fig. 9. *Postodius ornatus* sp. nov., holotype, male (4.0 mm), NSMT-Cr 21275. Habitus, left lateral view. Scale: 0.5 mm.

21275, male (4.0 mm), Nishi-izu, Shizuoka Prefecture, 35°02'N, 138°47'E, 18–22 m deep, on rock or artificial structure, SCUBA, 8 April 2010.

Paratypes: NSMT-Cr 21276, ovigerous female (6.9 mm), same data as holotype; OMNH-Ar 8382, 1 ovigerous female (10.4 mm), same data as holotype; CMNH-ZC 02402, 2 females (8.7, 4.2 mm, not dissected), same data as holotype.

Description. Holotype male. Body (Fig. 9) stout. Eyes large. Pereonite 7, pleonites 1 and 2 slightly produced posterodorsally, dorsal margin of pleonite 3 with blunt projection at mid-length, posterolateral margin of pleonite 1 slightly projected at 0.75 of length.

Antenna 1 (Fig. 10A, A1) stout, short; ratio of lengths of peduncular articles 1–3 1 : 0.6 : 0.3; accessory flagellum tiny, tip with 1 plumose and 1 simple setae; flagellum with 6 articles, article 1 long. Antenna 2 (Fig. 10B) 0.75 length of antenna 1, with ratio of lengths of peduncular articles 3–5 1 : 2 : 1.8; flagellum with 5 articles.

Left mandible (Fig. 10D) with incisor relatively wide, denticulate; accessory blades indistinct,

anterior margin distal to palp expanded; palp long, article 3 with many fine setae on lateral surface and 2 thick setae on tip. Right mandible (Fig. 10E) subequal to left except for lacinia mobilis. Maxilla 1 (Fig. 10G, G1, G2) with outer plate bearing large spine and 5 serrated robust setae apically, distal half of dorsomedial surface with several short setae, serrated robust seta and many short setae. Maxilla 2 (Fig. 10H) with inner plate bearing distal setae and medial fine setae, outer plate with distal setae and lateral fine setae. Maxilliped (Fig. 10I, I1) with inner plate bearing 3 distal robust setae, base with 5 plumose setae.

Gnathopod 1 (Fig. 11A, A1) small; coxal plate narrow; basis relatively wide, anterior margin without plumose setae; propodus with 1 robust, 2 plumose and 3 short setae posterodistally; dactylus with 1 needle-shaped and 6 plumose setae. Gnathopod 2 (Fig. 11B, B1) larger than gnathopod 1; coxal plate with blunt posterior projection, inner surface with tiny triangular process; basis without plumose setae on anterior margin, bearing robust seta on posterodistal corner; ischium

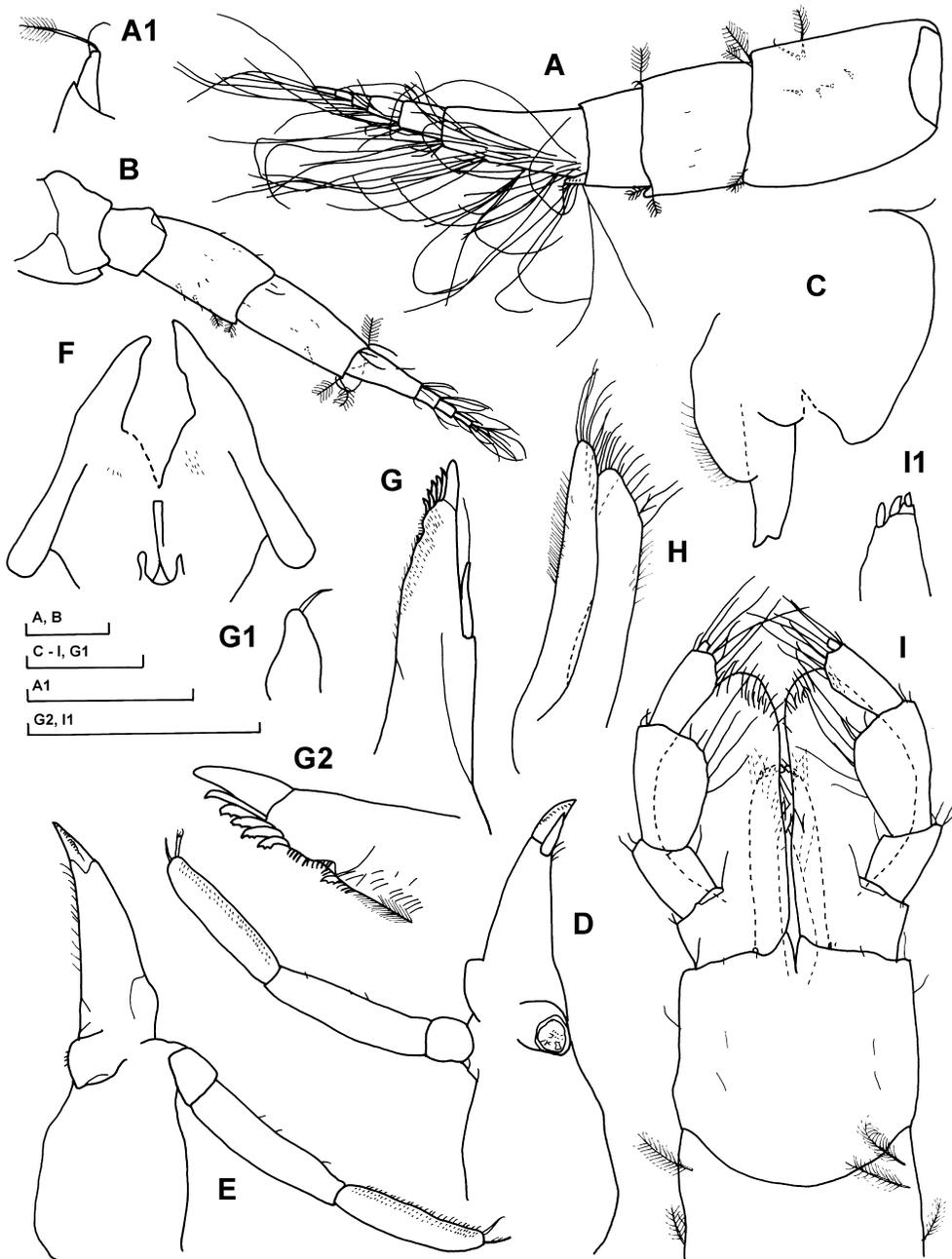


Fig. 10. *Postodius ornatus* sp. nov., holotype, male (4.0 mm), NSMT-Cr 21275. A, left antenna 1, lateral view; A1, left accessory flagellum, lateral view; B, left antenna 2, medial view; C, upper lip, ventral view; D, left mandible, medial view; E, right mandible, medial view; F, lower lip, ventral view; G, left maxilla 1, ventral view; G1, inner plate of left maxilla 1, dorsal view; G2, tip of outer plate of left maxilla 1, ventral view; H, left maxilla 2, dorsal view; I, maxilliped, ventral view; I1, tip of right inner plate of maxilliped, ventral view. Scales: 0.1 mm.

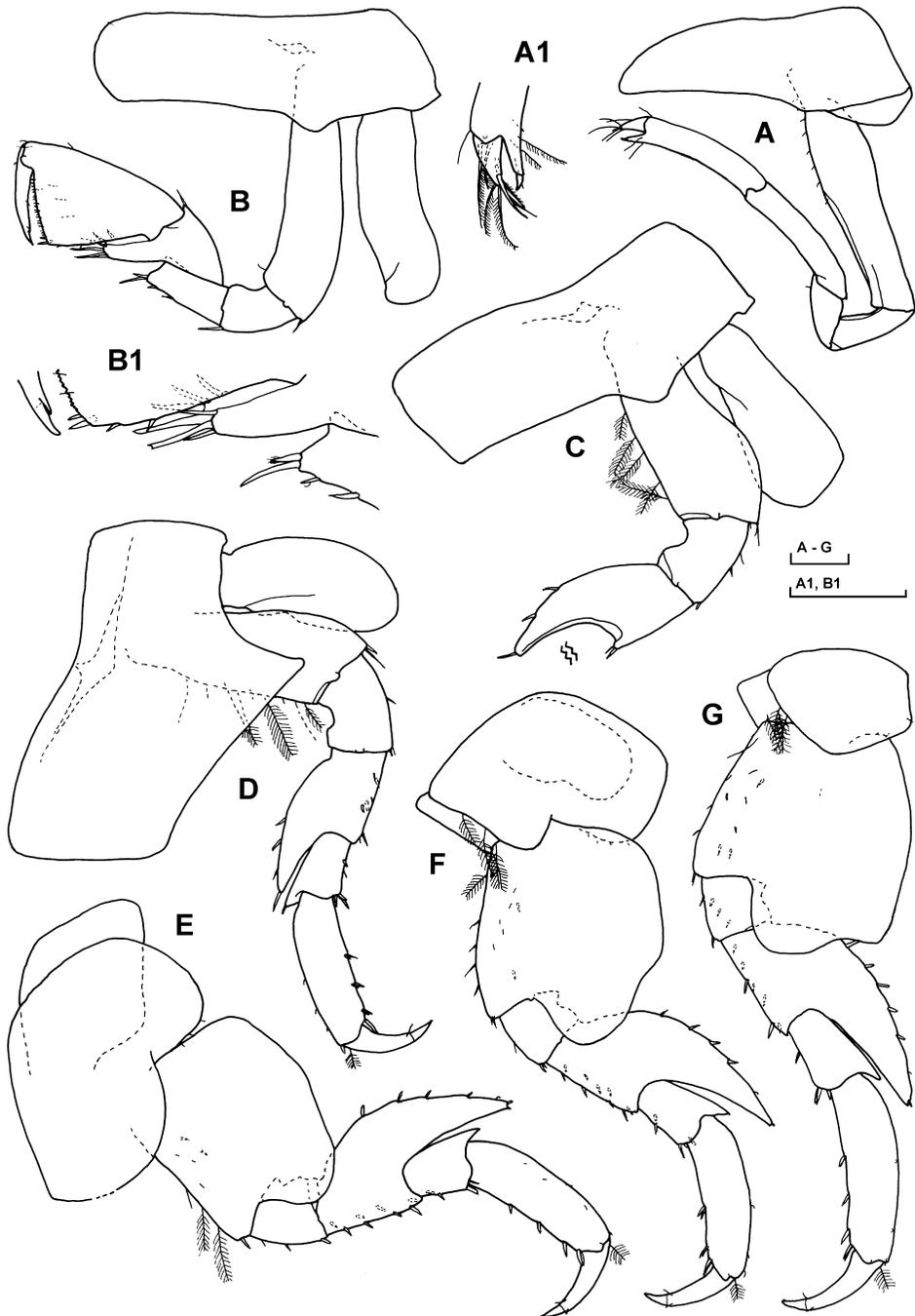


Fig. 11. *Postodius ornatus* sp. nov., holotype, male (4.0 mm), NSMT-Cr 21275. A, left gnathopod 1, lateral view; A1, tip of left gnathopod 1, lateral view; B, left gnathopod 2, lateral view; B1, posterior part of merus–dactylus of left gnathopod 2, lateral view; C–G, left pereopods 3–7, lateral views. Scales: 0.1 mm.

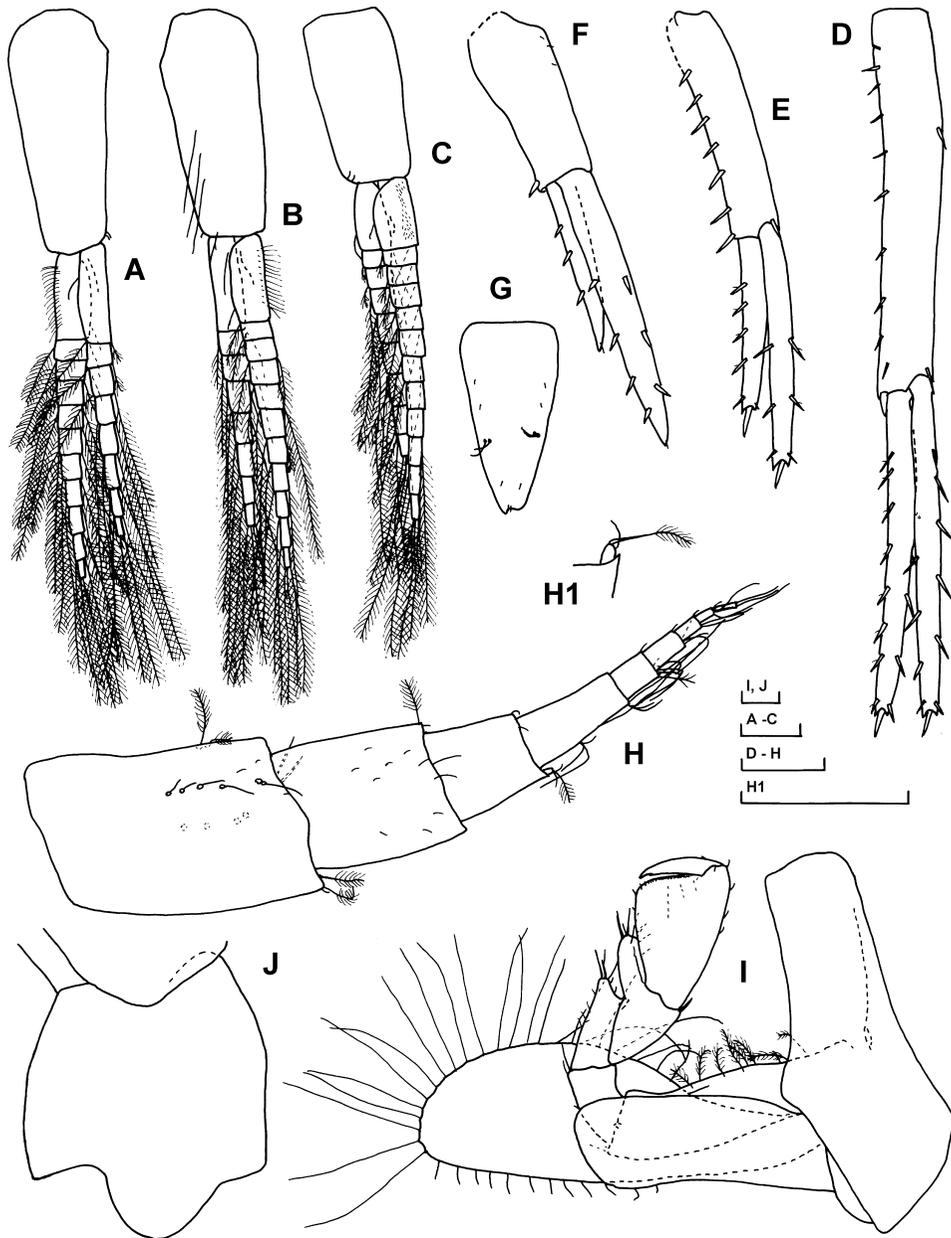


Fig. 12. *Postodius ornatus* sp. nov. A–G, holotype, male (4.0 mm), NSMT-Cr 21275; H–J, H1, paratype, female (6.9 mm), NSMT-Cr 21276. A, left pleopod 1, posterior view; B, left pleopod 2, anterior view; C, left pleopod 3, posterior view; D–F, left uropods 1–3, dorsal views; G, telson, dorsal view; H, left antenna 1, medial view; H1, left accessory flagellum, medial view; I, left gnathopod 2, lateral view; J, basis of left pereopod 7 (setae omitted), lateral view. Scales: 0.1 mm

with robust seta on posterodistal corner; merus with 2 robust setae each on posterior margin and posterodistal corner; carpus with 1 anterodistal and 7 posterodistal robust setae; propodus with 2

robust setae each on posterior margin and posterodistal corner; dactylus with accessory spine.

Pereopod 3 (Fig. 11C) large; coxal plate with blunt posterior projection, inner surface with

medium triangular process; basis with 5 plumose setae on anterior margin, bearing 3 robust setae on posterodistal corner; ischium with 2 and 1 robust setae on posterior margin and posterodistal corner, respectively; merus projected anterodistally, with 2 anterior, 1 anterodistal and 2 posterodistal robust setae. Pereopod 4 (Fig. 11D) probably subequal in length to pereopod 3; coxal plate wide, inner surface with large triangular process; basis with 6 plumose setae on anterior margin, bearing 2 robust setae on posterodistal corner; ischium with robust seta each on posterior margin and posterodistal corner; merus projected anterodistally, with 3 anterior, 1 anterodistal, 5 posterior and 2 posterodistal robust setae; carpus with 1 anterodistal, 2 posterior and 4 posterodistal robust setae; propodus with 4 couples of robust setae posteriorly; dactylus with plumose seta.

Pereopod 5 (Fig. 11E) about 1.1 times as long as pereopod 4; coxal plate lobate, anteroventral margin without setae; basis produced posterodistally, posterior margin weakly expanded at mid-length, anterior margin with 2 plumose setae distally, anterodistal corner bearing robust seta, anterolateral and anteromedial surfaces with 3 and 2 short robust setae, respectively; ischium with 3 robust setae on anterior margin; merus projected posterodistally, projection reaching about 0.25 length of propodus, margin with 4 anterior, 4 posterior and 1 posterodistal robust setae, anteromedial surface bearing 4 robust setae; carpus with 2 anterior and 3 anterodistal robust setae; propodus with 4 couples of robust setae anteriorly; dactylus with plumose seta. Pereopod 6 (Fig. 11F) subequal in length to pereopod 5; coxal plate lobate, anterior margin with 4 plumose setae; basis produced posterodistally, posterior margin weakly expanded at mid-length, anterior margin with 1 plumose and 4 robust setae, anterodistal corner bearing 2 robust setae, anterolateral and anteromedial surfaces with 5 and 2 short robust setae, respectively; ischium with 3 robust setae on anterior margin; merus projected posterodistally, projection reaching about 0.3 length of propodus, margin with 4 anterior, 4

posterior and 1 posterodistal robust setae, anteromedial surface bearing 5 robust setae; carpus with 2 anterior and 3 anterodistal robust setae; propodus with 3 couples of robust setae anteriorly; dactylus with plumose seta. Pereopod 7 (Fig. 11G) subequal in length to pereopod 6; coxal plate small, unlobed, anterior margin with 4 plumose setae; basis produced posterodistally, posterior margin expanded at 0.8 length, anterior margin with 3 robust setae, anterodistal corner bearing 2 robust setae, anterolateral and anteromedial surfaces with 4 and 3 short robust setae, respectively; ischium with 2 and 3 robust setae on anterior margin and anteromedial surface, respectively; merus projected posterodistally, projection reaching about 0.25 length of propodus, margin with 2 anterior, 5 posterior and 1 posterodistal robust setae, anteromedial surface with 5 robust setae; carpus with 1 anterior and 4 anterodistal robust setae; propodus with 4 couples of robust setae anteriorly; dactylus with plumose seta.

Pleopods (Fig. 12A–C) relatively long, pleopod 3 shortest; peduncles each with 2 coupling hooks, peduncle of pleopod 2 bearing 5 simple setae, peduncles of pleopods 1 and 3 bare; outer rami longer than inner, outer and inner rami with 11–12 and 8–9 articles, respectively, outer ramus articles 1 of pleopods 1–3 bearing many fine setae laterally. Uropod 1 (Fig. 12D) long; peduncle bearing 10, 1, 1 and 1 robust setae on lateral margin, medial margin, distolateral corner and distomedial corner, respectively; outer ramus with 7 lateral, 4 medial and 3 terminal robust setae, inner ramus with 3 lateral, 5 medial and 3 terminal robust setae. Uropod 2 (Fig. 12E) short, about 0.65 length of uropod 1; peduncle bearing 6, 1 and 1 robust setae on lateral margin, distolateral corner and distomedial corner, respectively; outer ramus with 4 lateral and 3 terminal robust setae, inner ramus with 2 lateral, 2 medial and 3 terminal robust setae. Uropod 3 (Fig. 12F) somewhat shorter than uropod 2; peduncle with distolateral robust seta; outer ramus about 0.6 length of inner ramus, with 3 lateral robust setae and terminal short seta, inner ramus with 3 lateral

and 3 medial robust setae and 1 terminal short seta. Telson (Fig. 12G) longish triangular, incised tip with short seta.

Paratype female (NSMT-Cr 21276). Eyes smaller than those of male holotype. Antenna 1 (Fig. 12H, H1) more slender than that of male holotype; ratio of lengths of peduncular articles 1–3 1:0.6:0.4; flagellum with 6 articles. Gnathopod 2 (Fig. 12I) subequal to that of male holotype except for oostegite, but basis with 8 plumose setae on anterior margin; anterior margins of gnathopod 1 and pereopods 3–7 also with plumose setae. Basis of pereopod 7 (Fig. 12J) subequal to that of male holotype, with expansion of posterior margin situated at 0.75 of length.

Coloration in life. Body and appendages orange, eyes red; pereonite 1 with U-shaped dark blue line, pereonites 2–7, pleonites 1 and 2 each with bent dark blue line, dorsal margins of pereonites 1–7 and pleonites 1–3 each with red band, ventral parts of cephalic lobe, pereonites 1–7 and pleonites 1–3 each with red spot; coxae 1–4 each with curved dark blue line and red spot, coxa 5 with curved dark blue line, coxae 6 and 7 each with red spot, bases of pereopods 5 and 6 each

with curved dark blue line and red spot. See Fig. 21C.

Remarks. This new species can be distinguished from the other *Postodius* species in the more distally located expansion on the basis of pereopod 7 and the coloration in life (Table 1).

Distribution. Shizuoka Prefecture: Nishi-izu, 18–22 m deep (present study).

Habitat. On rock or artificial structure.

Etymology. From the Latin *ornatus* (=adorned), referring to the body coloration.

***Postodius striatus* sp. nov.**

[New Japanese name: Aosuji-subeyokoebi]

(Figs. 13–16, 21D)

Material examined. Holotype: NSMT-Cr 21277, male (4.8 mm), off Aoshima Island, Shizugawa, Miyagi Prefecture, 38°39'N, 141°29'E, 6 m deep, on bryozoans, SCUBA, 16 July 2009, coll. N. Sato.

Paratypes: NSMT-Cr 21278, female (10.0 mm), same data as holotype; OMNH-Ar 8383–8385, 1 male (4.0 mm), 2 females (8.5, 8.1 mm), same data as holotype; CMNH-ZC 02403,

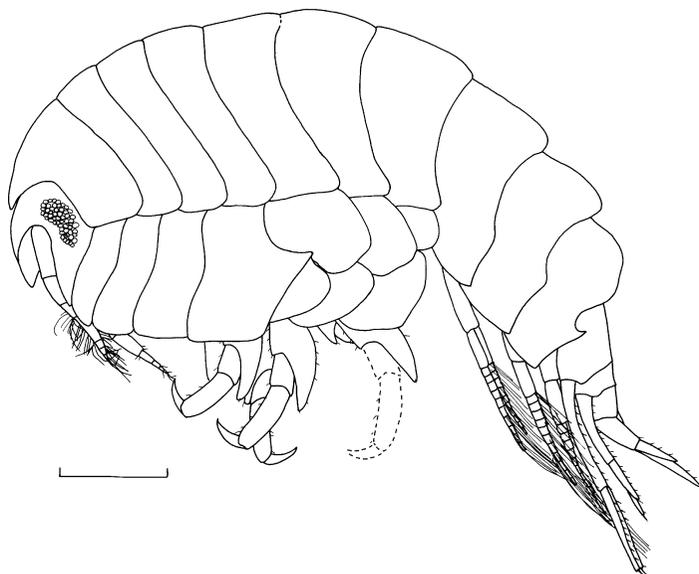


Fig. 13. *Postodius striatus* sp. nov., holotype, male (4.8 mm), NSMT-Cr 21277. Habitus, left lateral view. Scale: 0.5 mm.

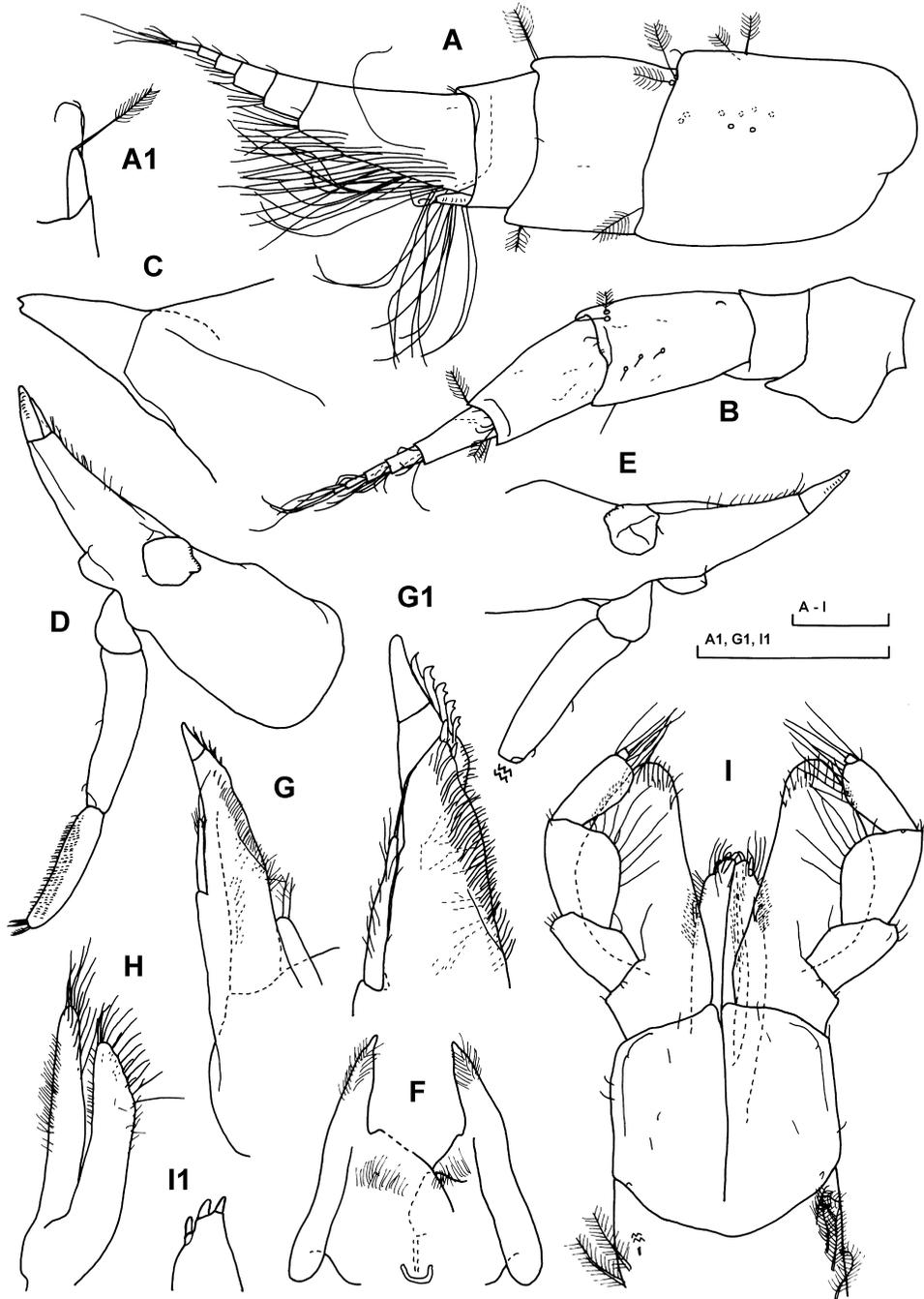


Fig. 14. *Postodius striatus* sp. nov., holotype, male (4.8 mm), NSMT-Cr 21277. A, left antenna 1, lateral view; A1, left accessory flagellum, medial view; B, left antenna 2, lateral view; C, upper lip, dorsolateral view; D, left mandible, medial view; E, right mandible, medial view; F, lower lip, ventral view; G, left maxilla 1, dorsal view; G1, tip of outer plate of left maxilla 1, dorsal view; H, left maxilla 2, dorsal view; I, maxilliped, ventral view; I1, tip of right inner plate of maxilliped, ventral view. Scales: 0.1 mm.

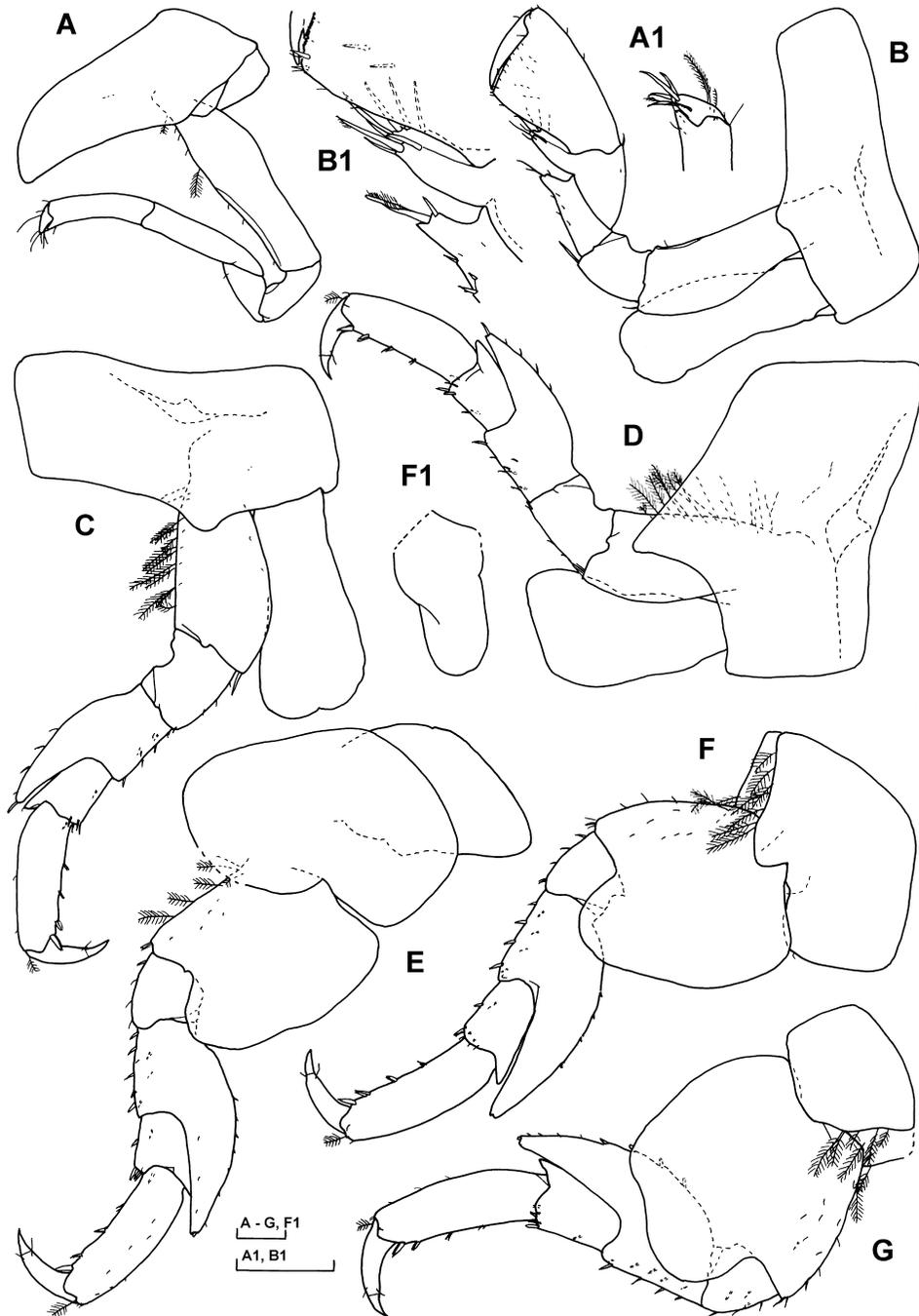


Fig. 15. *Postodius striatus* sp. nov., holotype, male (4.8 mm), NSMT-Cr 21277. A, left gnathopod 1, lateral view; A1, tip of left gnathopod 1, lateral view; B, left gnathopod 2, lateral view; B1, posterior part of merus-dactylus of left gnathopod 2, lateral view; C–F, left pereopods 3–6, lateral views; F1, gill of left pereopod 6, lateral view; G, right pereopod 7, lateral view. Scales: 0.1 mm.

3 females (8.5, 8.4, 8.2 mm, not dissected), same data as holotype.

Description. Holotype male. Body (Fig. 13) stout. Eyes medium. Pleonites 1 and 2 slightly produced posterodorsally, dorsal margin of pleonite 3 produced mid-posteriorly, posterolateral margin of pleonites 1 and 2 slightly projected at 0.65 of length.

Antenna 1 (Fig. 14A, A1) stout, short; ratio of lengths of peduncular articles 1–3 1:0.6:0.3; accessory flagellum slender, tip with 1 plumose and 2 simple setae; flagellum with 6 articles, article 1 long. Antenna 2 (Fig. 14B) about 0.8 length of antenna 1, with ratio of lengths of peduncular articles 3–5 1:2.4:2; flagellum with 5 articles.

Left mandible (Fig. 14D) with incisor relatively wide, denticulate; accessory blades indistinct, anterior margin distal to palp expanded; palp long, article 3 with many fine setae on lateral surface and 3 setae on tip. Right mandible (Fig. 14E) subequal to left except for lacinia mobilis. Maxilla 1 (Fig. 14G, G1) with outer plate bearing large spine and 6 serrated robust setae apically, distal half of dorsomedial surface with many short setae; palp setose. Maxilla 2 (Fig. 14H) with inner plate bearing distal setae, medial fine setae and lateral short setae, outer plate with distal setae and lateral fine setae. Maxilliped (Fig. 14I, I1) with inner plate bearing 3 distal robust setae, base with 7 (1 lost) plumose setae.

Gnathopod 1 (Fig. 15A, A1) small; coxal plate narrow; basis relatively wide, anterior margin with 2 plumose setae; propodus with 1 robust and 3 short setae posterodistally; dactylus with 2 needle-shaped, 5 plumose and 1 pectinate setae. Gnathopod 2 (Fig. 15B, B1) larger than gnathopod 1; coxal plate with blunt posterior projection, inner surface with tiny triangular process; basis without plumose setae on anterior margin, bearing robust seta on posterodistal corner; ischium with robust seta on posterodistal corner; merus with 3 robust setae each on posterior margin and posterodistal corner; carpus with 1 anterodistal and 8 posterodistal robust setae; propodus with 2 robust setae on posterodistal corner; dactylus with accessory spine.

Pereopod 3 (Fig. 15C) larger than gnathopod 2; coxal plate with blunt posterior projection, inner surface with medium triangular process; basis with 12 plumose setae on anterior margin, bearing 2 robust setae on posterodistal corner; ischium with 2 robust setae each on posterior margin and posterodistal corner; merus projected anterodistally, with 4 anterior, 1 anterodistal and 7 posterior robust setae. Pereopod 4 (Fig. 15D) subequal in length to pereopod 3; coxal plate wide, inner surface with large triangular process; basis with 13 plumose setae on anterior margin, bearing 3 robust setae on posterodistal corner; ischium with 2 robust setae each on posterior margin and posterodistal corner; merus projected anterodistally, with 4 anterior, 1 anterodistal and 8 posterior robust setae; carpus with 2 posterior and 6 posterodistal robust setae; propodus with 4 couples of robust setae posteriorly; dactylus with plumose seta.

Pereopod 5 (Fig. 15E) about 1.1 times as long as pereopod 4; coxal plate lobate, anteroventral margin without setae; basis produced posterodistally, posterior margin weakly expanded at mid-length, anterior margin with 6 plumose and 2 distal robust setae, anterolateral surface bearing 5 short robust setae; ischium with 4 robust setae on anterior margin; merus projected posterodistally, projection reaching about 0.3 length of propodus, margin with 6 anterior, 3 posterior and 1 posterodistal robust setae, anteromedial surface bearing 4 robust setae; carpus with 2 anterior and 5 anterodistal robust setae; propodus with 4 couples of robust setae anteriorly; dactylus with plumose seta. Pereopod 6 (Fig. 15F) subequal in length to pereopod 5; coxal plate lobate, anterior margin with 7 plumose setae; basis produced posterodistally, anterior margin with 2 plumose and 3 robust setae, anterodistal corner bearing 3 robust setae, anterolateral surface with 6 short robust setae; ischium with 4 robust setae on anterior margin; merus projected posterodistally, projection reaching about 0.25 length of propodus, margin with 4 anterior, 4 posterior and 1 posterodistal robust setae, anteromedial surface bearing 4 robust setae; carpus with 2 anterior and

6 anterodistal robust setae; propodus with 4 couples of robust setae anteriorly; dactylus with plumose seta. Pereopod 7 (Fig. 15G) about 0.9

times as long as pereopod 6; coxal plate small, unlobed, anterior margin with 8 plumose setae; basis broad, roundish, produced posterodistally,

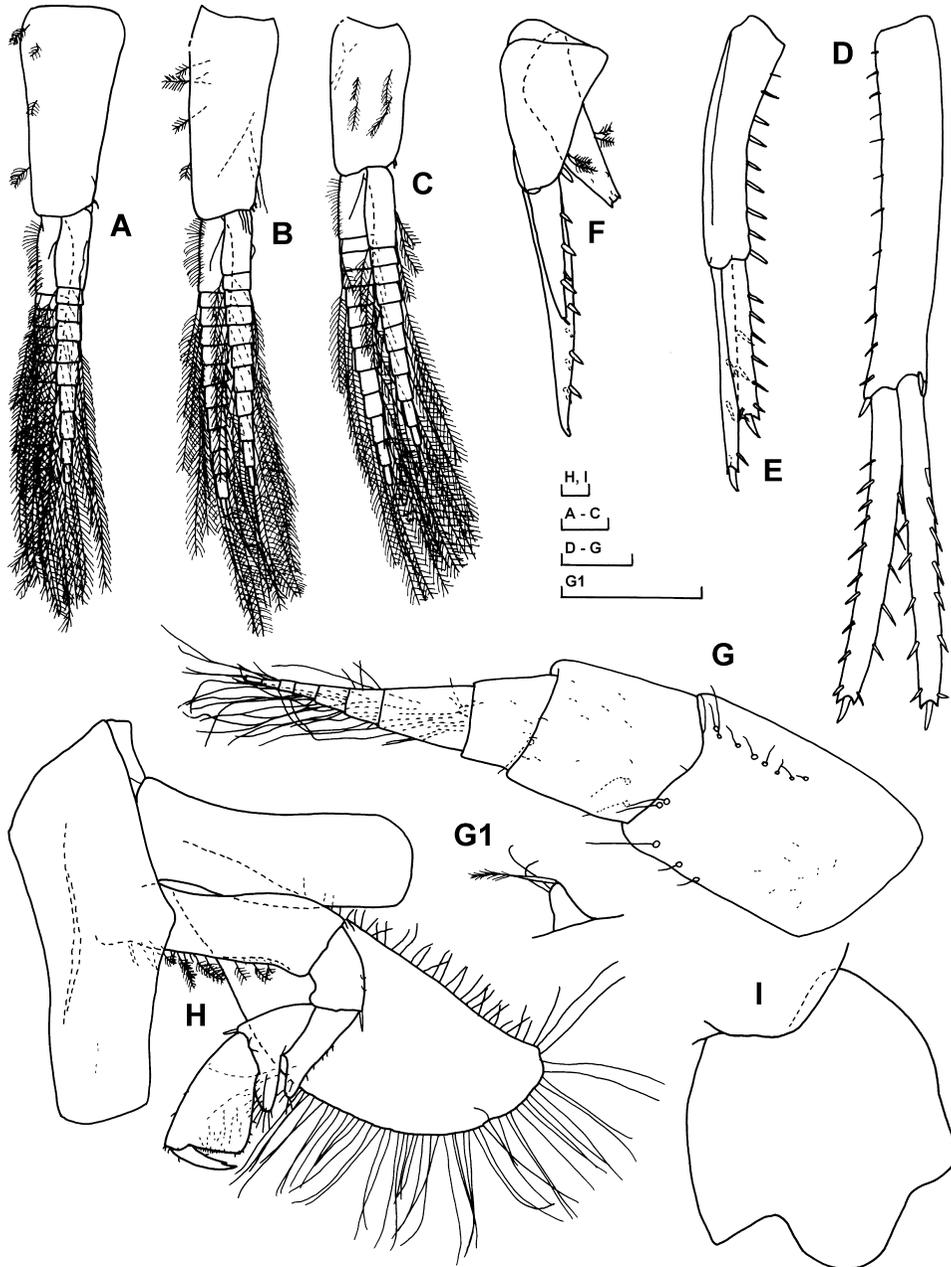


Fig. 16. *Postodius striatus* sp. nov. A–F, holotype, male (4.8 mm), NSMT-Cr 21277; G–I, G1, paratype, female (10.0 mm), NSMT-Cr 21278. A–C, left pleopods 1–3, posterior views; D, left uropod 1, dorsal view; E, left uropod 2, lateral view; F, left uropod 3 and telson, lateral view; G, left antenna 1, medial view; G1, left accessory flagellum, lateral view; H, left gnathopod 2, lateral view; I, basis of left pereopod 7 (setae omitted), lateral view. Scales: 0.1 mm.

posterior margin expanded at 0.65 of length, anterior margin with 3 robust setae, anterodistal corner bearing 2 robust setae, anterolateral and anteromedial surfaces with 7 and 1 short robust setae, respectively; ischium with 3 robust setae each on anterior margin and anteromedial surface; merus projected posterodistally, projection reaching about 0.25 length of propodus, margin with 4 anterior, 4 posterior and 1 posterodistal robust setae, anteromedial surface bearing 5 robust setae; carpus with 1 anterior and 6 anterodistal robust setae; propodus with 4 couples of robust setae anteriorly; dactylus with plumose seta.

Pleopods (Fig. 16A–C) relatively long, pleopod 3 shortest; peduncles each with 2 coupling hooks, peduncle of pleopod 1 with 4 plumose setae, peduncle of pleopod 2 with 5 plumose and 6 simple setae, peduncle of pleopod 3 with 8 plumose setae; outer rami longer than inner, outer and inner rami with 12–13 and 10–11 articles, respectively, outer ramus articles 1 of pleopods 1–3 bearing many fine setae laterally. Uropod 1 (Fig. 16D) long; peduncle bearing 12, 1 and 1 robust setae on lateral margin, distolateral corner and distomedial corner, respectively; outer ramus with 9 lateral, 5 medial and 5 terminal robust setae, inner ramus with 4 lateral, 6 medial and 3 terminal robust setae. Uropod 2 (Fig. 16E) short, about 0.7 length of uropod 1; peduncle bearing 8 and 1 robust setae on lateral margin and distolateral corner, respectively; outer ramus with 5 lateral and 3 terminal robust setae, inner ramus with 3 lateral, 2 medial and 3 terminal robust setae. Uropod 3 (Fig. 16F) shorter than uropod 2; peduncle with distolateral robust seta; outer ramus about 0.55 length of inner ramus, with 3 lateral robust setae and terminal short seta, inner ramus with 4 lateral and 3 medial robust setae and 1 terminal short seta. Telson (Fig. 16F) triangular, incised tip with 2 minute setae.

Paratype female (NSMT-Cr 21278). Eyes smaller than those of male holotype. Antenna 1 (Fig. 16G, G1) more slender than that of male holotype; ratio of lengths of peduncular articles 1–3 1:0.6:0.3; accessory flagellum short, tip

with 1 plumose and 2 simple setae; flagellum with 7 articles. Gnathopod 2 (Fig. 16H) subequal to that of male holotype except for oostegite, but basis with many (ca. 18) plumose setae on anterior margin; anterior margins of gnathopod 1 and pereopods 3–7 also with plumose setae. Basis of pereopod 7 (Fig. 16I) subequal to that of male holotype, with expansion of posterior margin situated at 0.7 of length.

Coloration in life. Body and appendages reddish orange, eyes red, tips of antennae white, propodi and dactyli of pereopods 3–7 light orange; pereonite 1 with U-shaped light blue line, pereonites 2–7 each with bent light blue line, pleonites 1–3 each with straight light blue line, anterodorsal corners of pereonites 2–7 and pleonites 1–3 each with small white mark; coxae 1–5 each with curved light blue line. See Fig. 21D.

Remarks. This new species is distinguishable from the other *Postodius* species by the combination of the short projections on the meri of pereopods 5–7 and the more proximally located expansion on the basis of pereopod 7, and the body coloration in life (Table 1).

Distribution and habitat. So far known only from the type locality, Shizugawa, Miyagi Prefecture, 6–8 m deep. Found on bryozoans or on rock.

Etymology. From the Latin *striatus* (= striated), referring to the body coloration.

***Gordonodius* gen. nov.**

[New Japanese name: Gōdon-subeyokoebi-zoku]

Diagnosis. Anterodorsal corner of pereonite 1 strongly produced. Dorsal projections of pereonites present, those of pleonites distinct. Posterolateral margin of pleonite 3 without projection. Eyes reniform. Antenna 1 peduncle with article 2 shorter than article 1; accessory flagellum present, 1-articulated; flagellum heavily setose in male. Mandible long; incisor relatively wide; lacinia mobilis present on left side, broad; palp somewhat proximal to molar. Lower lip with outer lobes long, weakly notched inside. Maxilla

1 with inner plate bearing 2 apical setae, outer plate styliform, with several toothed robust setae on tip; palp 1-articulated, short, with long apical seta. Maxillipedal palp 3-articulated. Coxae 1–4 progressively becoming wider, equally long; coxae 2–4 each with holder structure on inner surface. Gnathopod 1 propodus projected posterodistally, projection with short robust seta; dactylus small, triangular, with several long thick setae. Gnathopod 2 propodus wide, palm transverse, distal margin serrated, with 2 robust setae on posterodistal corner. Gills present on pereopods 2–6. Dactyli of pereopods 3–7 each with nail. Uropods spinous, inner ramus of uropod 3 relatively wide. Telson entire, lateral margin with pair of 2 penicillate setae. Female similar to male, but antenna 1 less setose, oostegites present on pereopods 2–5.

Type species. *Postodius zelleri* Berge, Vader and Coleman, 1999.

Remarks. Berge *et al.* (1999) described *Postodius zelleri* as the second species of *Postodius*. However, I have confirmed that this species is distinct from the four species here assigned to *Postodius* in the following characters: prominent dorsal projections are present on the pereonites and pleonites; the maxillipedal palp is three-articulated; and the telson is entire. In *Postodius*, dorsal projections on the pereonites and pleonites are indistinct; the maxillipedal palp is four-articulated;

and the telson is minutely cleft. These characters are generically diagnostic, and consequently I propose to establish a new genus, *Gordonodius*, to accommodate *P. zelleri*.

Distribution. Japan.

Etymology. Derivative of *Odius*, alluding to the collector (Richard Gordon Smith) of the type species (Berge *et al.*, 1999).

Gordonodius zelleri (Berge, Vader and Coleman, 1999) comb. nov.

[New Japanese name: Gôdon-subeyokoebi]

(Figs. 17–20, 21E)

Postodius zelleri Berge, Vader and Coleman, 1999: 246, figs. 3–7.

Material examined. NSMT-Cr 21279–21283, 2 male (2.7, 3.2 mm), 3 female (5.1, 4.6, 3.2 mm), Kodomari, Takahama, Fukui Prefecture, 35°32'N, 135°31'E, 10 m deep, among bush of brown alga *Sargassum macrocarpum*, SCUBA, 25 April 1980, coll. H. Ariyama and H. Nakahara; OMNH-Ar 8386, 1 male (2.1 mm), Himajima Island, Aichi Prefecture (34°42'N, 137°00'E), 2 m deep, among colony of red alga *Gelidium elegans*, snorkeling, 5 August 2001, coll. H. Ariyama; OMNH-Ar 8387, 1 male and 1 female (2.7, 3.9 mm, not dissected), Kamishima Island, Mie Prefecture (34°33'N, 136°59'E), among algae, snorkeling, 6–7 August 1983, coll.

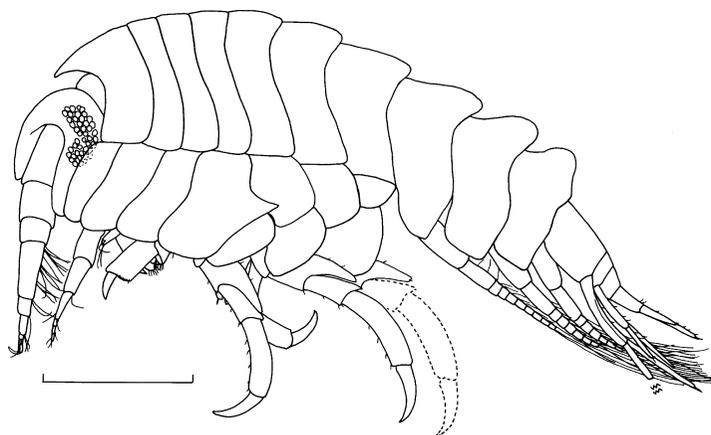


Fig. 17. *Gordonodius zelleri* (Berge, Vader and Coleman, 1999), male (2.7 mm), NSMT-Cr 21279. Habitus, left lateral view. Scale: 0.5 mm.

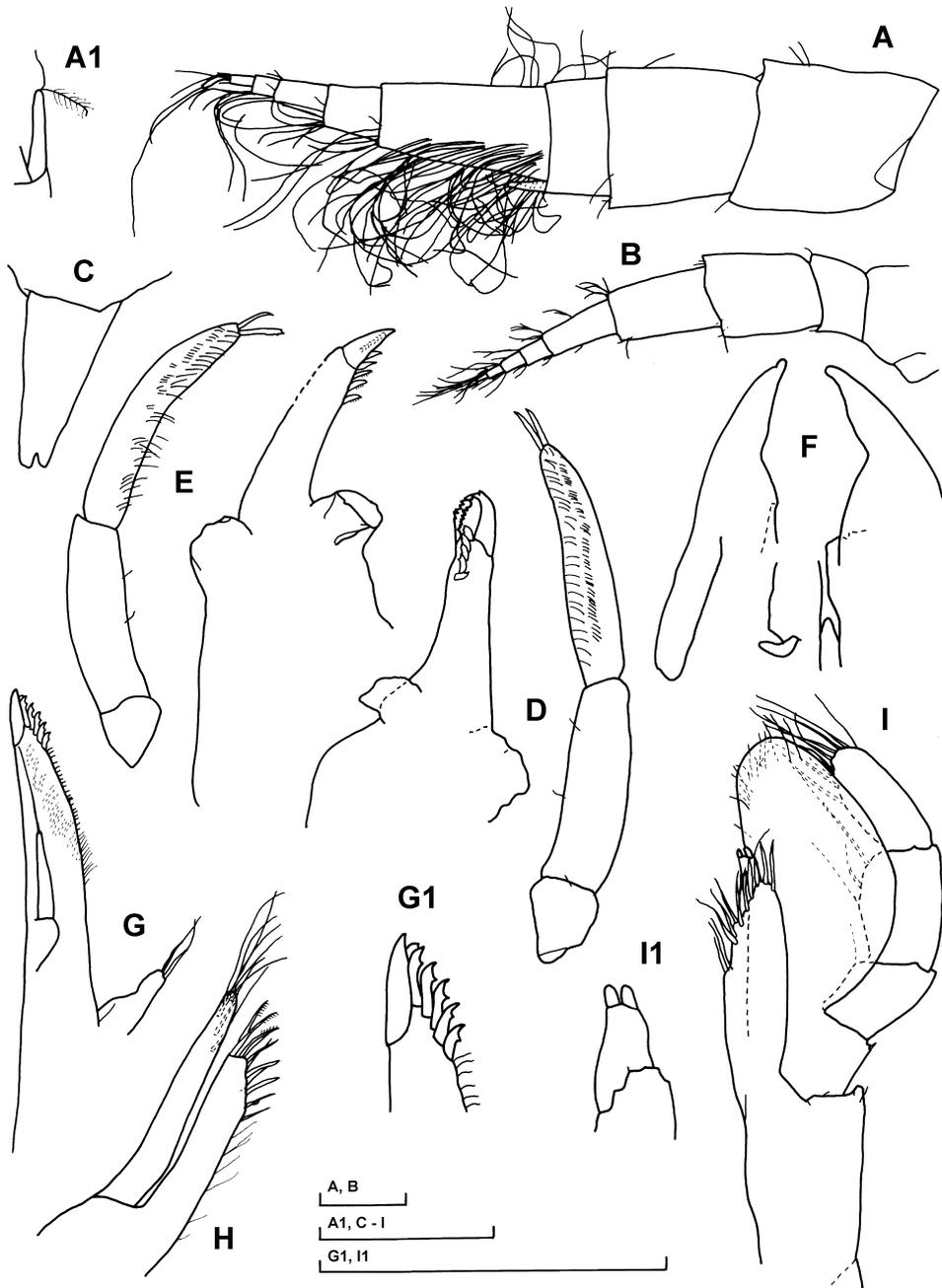


Fig. 18. *Gordonodius zelleri* (Berge, Vader and Coleman, 1999), male (2.7 mm), NSMT-Cr 21279. A, left antenna 1, lateral view; A1, left accessory flagellum, medial view; B, left antenna 2, lateral view; C, upper lip, dorso-lateral view; D, left mandible (palp removed), lateral view; E, right mandible (palp removed), lateral view; F, lower lip (split), ventral view; G, right maxilla 1, ventral view; G1, tip of outer plate of right maxilla 1, ventral view; H, left maxilla 2, dorsal view; I, right maxilliped, dorsal view; I1, tip of inner plate of right maxilliped, dorsal view. Scales: 0.1 mm.

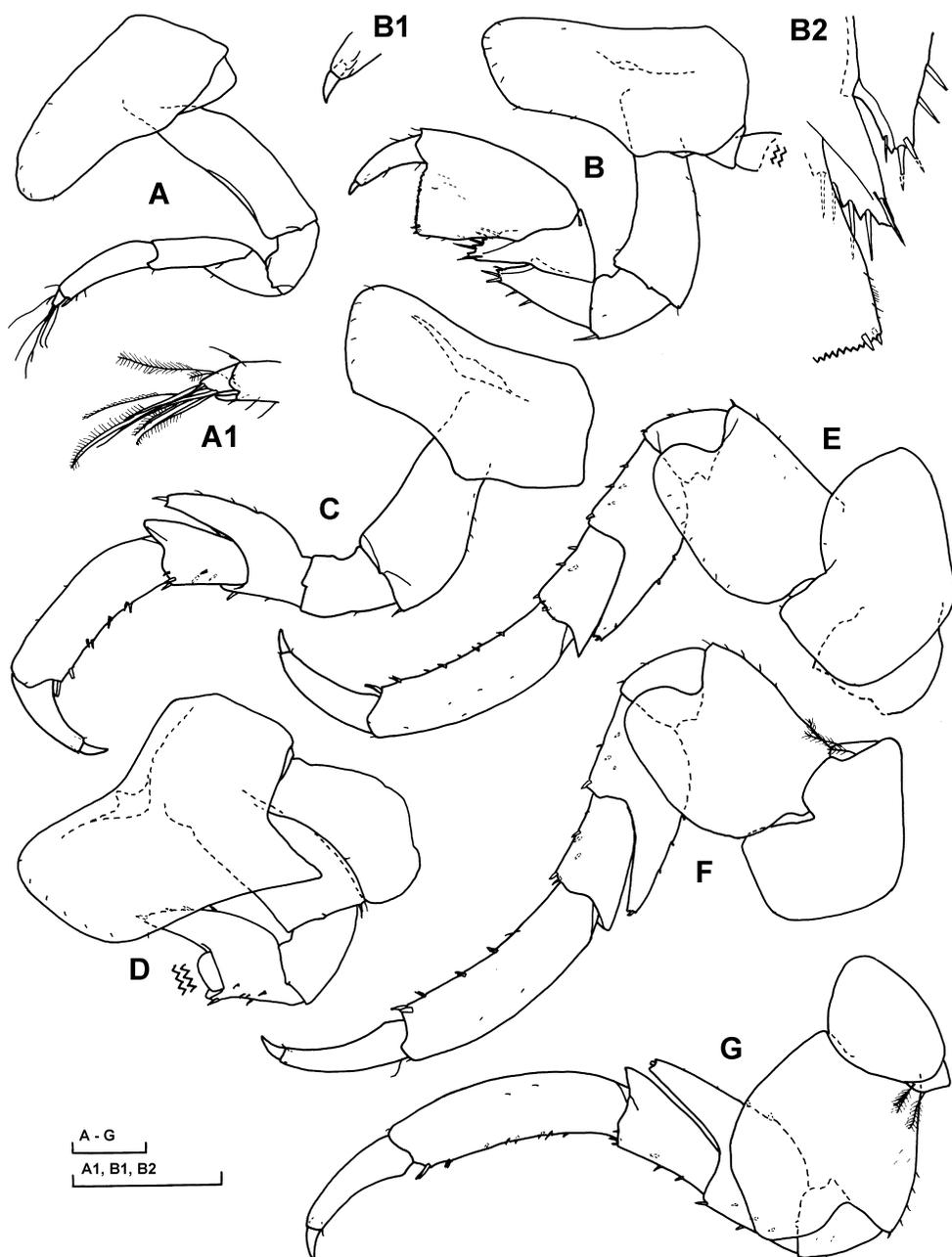


Fig. 19. *Gordonodius zelleri* (Berge, Vader and Coleman, 1999), male (2.7 mm), NSMT-Cr 21279. A, left gnathopod 1, lateral view; A1, tip of left gnathopod 1, lateral view; B, left gnathopod 2, lateral view; B1, tip of dactylus of left gnathopod 2, lateral view; B2, posterior part of merus-propodus of left gnathopod 2, lateral view; C-F, left pereopods 3-6 (gill of pereopod 6 lost), lateral views; G, right pereopod 7, lateral view. Scales: 0.1 mm.

H. Ariyama; OMNH-Ar 8388, 8389, 1 male (3.1 mm) and 1 female (3.8 mm), Jogasaki coast in Wakayama, Wakayama Prefecture, 34°17'N,

135°04'E, lower intertidal zone, among colony of red alga *Gelidium japonicum*, 8 June 1997, coll. H. Ariyama; NSMT-Cr 21284, 1 ovigerous fe-

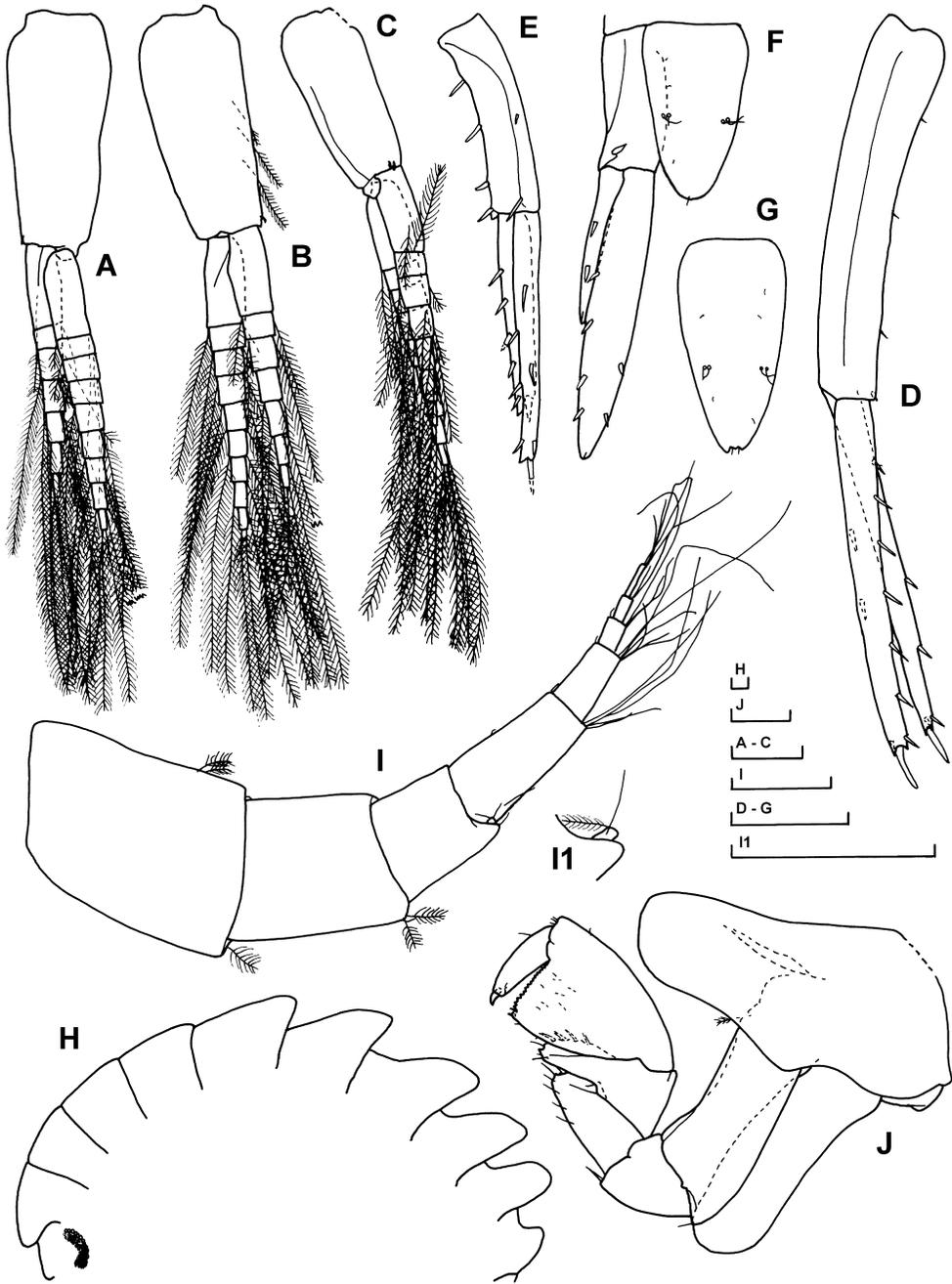


Fig. 20. *Gordonodius zelleri* (Berge, Vader and Coleman, 1999). A–C, E, F, male (2.7 mm), NSMT-Cr 21279; D, G, male (3.2 mm), NSMT-Cr 21280; H, female (5.1 mm), NSMT-Cr 21281; I, II, J, female (4.6 mm), NSMT-Cr 21282. A, left pleopod 1, anterior view; B, left pleopod 2, posterior view; C, left pleopod 3, posteromedial view; D, left uropod 1, lateral view; E, left uropod 2, medial view; F, left uropod 3 and telson, dorsal view; G, telson, dorsal view; H, dorsal outline of body, lateral view; I, left antenna 1, medial view; II, left accessory flagellum, medial view; J, left gnathopod 2 (oostegite lost), lateral view. Scales: 0.1 mm.

male (4.5 mm, not dissected), Jogasaki coast in Wakayama, Wakayama Prefecture, lower intertidal zone, among colony of red alga *Gelidium japonicum*, 3 April 2010, coll. H. Ariyama.

Description. Male [based on NSMT-Cr 21279 and NSMT-Cr 21280 (uropod 1 and telson)]. Body (Fig. 17) somewhat stout. Eyes large. Pereonites 6 and 7 slightly produced posterodorsally, pleonites 1 and 2 strongly projected posterodorsally, pleonite 3 strongly produced middorsally, posterolateral margins of pleonites 1 and 2 weakly expanded at 0.65 of length, posterolateral margin of pleonite 3 slightly expanded.

Antenna 1 (Fig. 18A, A1) stout; ratio of lengths of peduncular articles 1–3 1 : 0.9 : 0.3; accessory flagellum slender, tip with 1 plumose and 1 simple setae; flagellum with 6 articles, article 1 long. Antenna 2 (Fig. 18B) about 0.7 length of antenna 1, with ratio of lengths of peduncular articles 3–5 1 : 1.7 : 1.6; flagellum with 5 articles.

Left mandible (Fig. 18D) with incisor denticulate; accessory blades 5 in number; palp long, article 3 with many fine setae on lateral surface and 2 thick setae on tip. Right mandible (Fig. 18E) subequal to left except for lacinia mobilis. Maxilla 1 (Fig. 18G, G1) with outer plate bearing large spine and 6 serrated robust setae apically, distal half of dorsomedial surface with many short setae. Maxilla 2 (Fig. 18H) with inner plate bearing distal thick setae and medial fine setae, outer plate with distal setae. Maxilliped (Fig. 18I, I1) with inner plate bearing 2 distal robust setae.

Gnathopod 1 (Fig. 19A, A1) small; coxal plate narrow; basis relatively wide, anterior margin without plumose setae; propodus with 1 robust and 3 short setae posterodistally; dactylus with 2 simple and 5 plumose long setae and 1 plumose short seta. Gnathopod 2 (Fig. 19B, B1, B2) larger than gnathopod 1; coxal plate with blunt posterior projection, inner surface with tiny triangular process; basis without plumose setae on anterior margin, bearing robust seta on posterodistal corner; ischium with robust seta on posterodistal corner; merus with 2 and 3 robust setae on posterior margin and posterodistal corner, respectively; carpus with 1 anterodistal and 6 posterodistal

robust setae; propodus with 2 robust setae on posterodistal corner; dactylus with nail.

Pereopod 3 (Fig. 19C) larger than gnathopod 2; coxal plate with blunt posterior projection, inner surface with wide triangular process; basis without plumose setae on anterior margin, bearing robust seta on posterodistal corner; ischium with short robust seta on posterior margin; merus projected anterodistally, projection not reaching distal end of carpus, margin with 3 anterior, 1 anterodistal, 1 posterior and 1 posterodistal robust setae; carpus with 3 posterior and 3 posterodistal robust setae; propodus with 5 couples of robust setae posteriorly. Pereopod 4 (Fig. 19D) with coxal plate wide, inner surface with large triangular process; basis without plumose setae on anterior margin, bearing 2 robust setae on posterodistal corner; ischium without robust setae; merus projected anterodistally, margin with 3 anterior, 1 anterodistal, 5 posterior and 1 posterodistal robust setae.

Pereopod 5 (Fig. 19E) with coxal plate lobate, anteroventral margin without setae; basis produced posterodistally, anterior margin with 3 robust setae, anterolateral surface bearing 3 short robust setae; ischium with 3 robust setae on anterior margin; merus projected posterodistally, projection not reaching distal end of carpus, margin with 3 anterior, 3 posterior and 1 posterodistal robust setae, anteromedial surface bearing 2 robust setae; carpus with 3 anterior and 4 anterodistal robust setae; propodus long, with 6 single and 2 couples of robust setae anteriorly. Pereopod 6 (Fig. 19F) subequal in length to pereopod 5; coxal plate lobate, anterior margin with 2 plumose setae; basis produced posterodistally, anterior margin with short plumose seta and 4 robust setae, anterodistal corner bearing robust seta; ischium with 2 robust setae on anterior margin; merus projected posterodistally, projection not reaching distal end of carpus, margin with 2 anterior, 3 posterior and 1 posterodistal robust setae, anteromedial surface bearing 3 robust setae; carpus with 2 robust setae each on anterior margin, anteromedial corner and anterodistal corner; propodus long, with 5 couples of robust

setae anteriorly. Pereopod 7 (Fig. 19G) somewhat shorter than pereopod 6; coxal plate small, unlobed, anterior margin with 3 plumose setae; basis broad, produced posterodistally, posterior margin roundish, anterior margin with 4 robust

setae, anterodistal corner bearing robust seta, anterolateral surface with 3 short setae; ischium with 2 robust setae each on anterior margin and anteromedial surface; merus projected posterodistally, projection not reaching distal end of

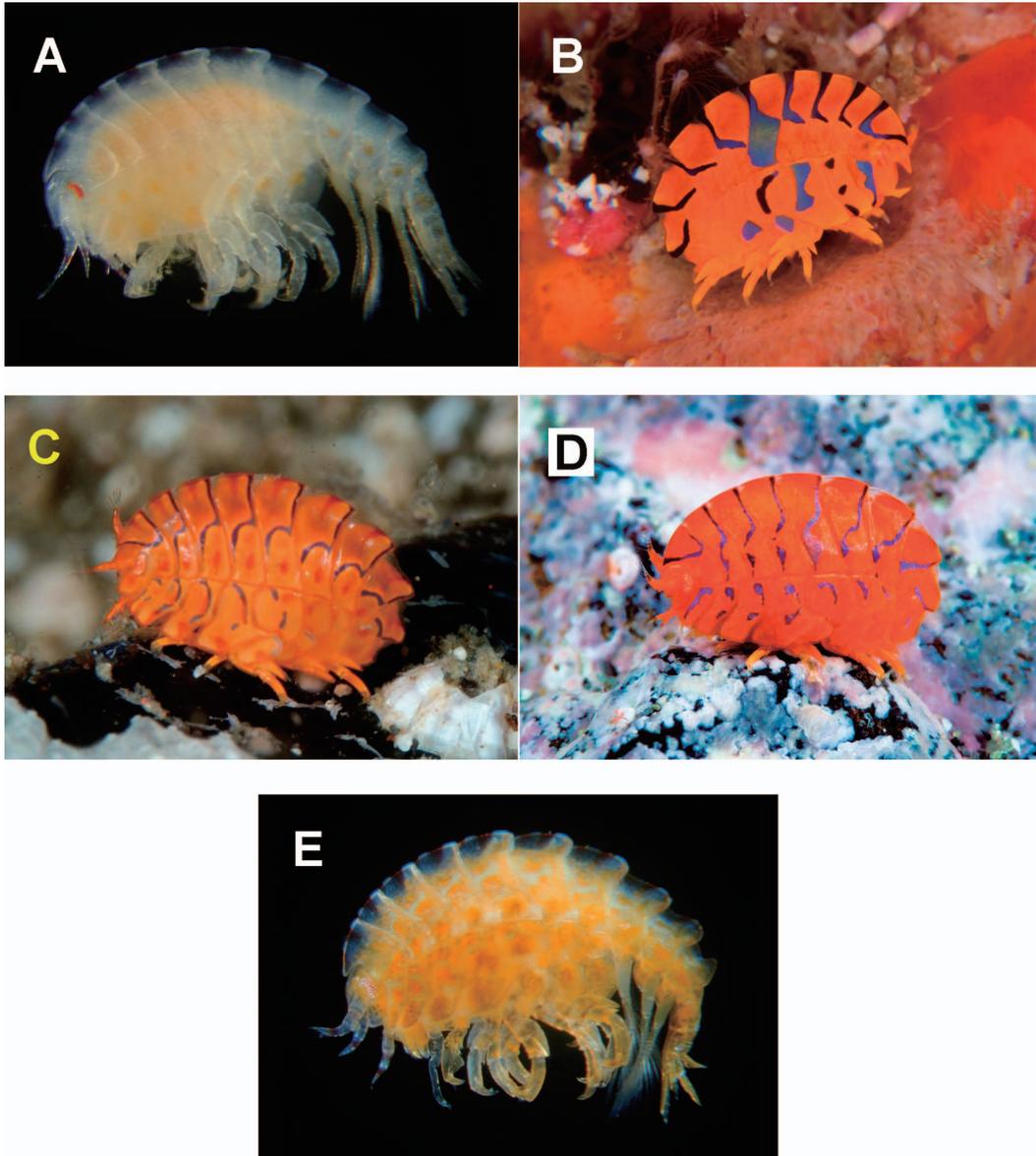


Fig. 21. A, *Postodius imperfectus* Hirayama, 1983, female (4.4 mm), NSMT-Cr 21269; B, *Postodius igneus* sp. nov., paratype female (7.4 mm), NSMT-Cr 21274, photography by K. Tanaka; C, *Postodius ornatus* sp. nov., female (not preserved), Osezaki, Nishi-izu, Shizuoka Prefecture, 20 m deep, sandy bottom, 26 April 2009, photography by S. Yamamoto; D, *Postodius striatus* sp. nov., female (not preserved), northwest of Aoshima Island, Shizugawa, Miyagi Prefecture, 8 m deep, on rock, 10 January 2005, photography by N. Sato; E, *Gordonodius zelleri* (Berge, Vader and Coleman, 1999), female (4.5 mm), NSMT-Cr 21284.

carpus, margin with 2 anterior, 2 posterior and 1 posterodistal robust setae, anteromedial surface bearing 3 robust setae; carpus with 3 robust setae each on anterior margin and anterodistal corner; propodus long, with 6 single and 2 couples of robust setae anteriorly.

Pleopods (Fig. 20A–C) relatively long, pleopod 3 shortest; peduncles each with 2 coupling hooks, peduncle of pleopod 2 bearing 3 plumose setae, peduncles of pleopods 1 and 3 bare; outer rami longer than inner, outer and inner rami with 9 and 7 articles, respectively. Uropod 1 (Fig. 20D) long; peduncle bearing 3 and 1 robust setae on lateral margin and distolateral corner, respectively; outer ramus with 5 lateral, 2 medial and 3 terminal robust setae, inner ramus with 3 lateral and 3 terminal robust setae. Uropod 2 (Fig. 20E) short, about 0.7 length of uropod 1; peduncle bearing 3 lateral, 1 medial, 1 distolateral and 1 mediodistal robust setae; outer ramus with 4 lateral and 2 terminal robust setae, inner ramus with 2 lateral, 2 medial and 3 terminal robust setae. Uropod 3 (Fig. 20F) shorter than uropod 2; peduncle with distolateral robust seta; outer ramus about 0.55 length of inner ramus, with 2 lateral robust setae and terminal short seta, inner ramus with 4 lateral and 2 medial robust setae and terminal short seta. Telson (Fig. 20F, G) roundish triangular, tip with single short seta or pair of minute notches bearing short seta.

Female [NSMT-Cr 21281 (body) and NSMT-Cr 21282 (antenna 1 and gnathopod 2)]. Body (Fig. 20H), eyes smaller than those of male; pereonites 5–7, and pleonites 1 and 2 strongly produced posterodorsally, pleonite 3 strongly projected middorsally. Antenna 1 (Fig. 20I, I1) more slender than that of male; ratio of lengths of peduncular articles 1–3 1:0.6:0.4; accessory flagellum vestigial, tip with 1 plumose and 1 simple setae; flagellum with 5 articles. Gnathopod 2 (Fig. 20J) similar to that of male, but all articles wider than those of male and anterior margin of basis with plumose seta.

Coloration in life (female, NSMT-Cr 21284; Fig. 21E). Body and appendages mottled orange and white, coxae 1–7 and bases–meri of pere-

opods 5–7 brownish; eyes red; antennae white, but flagellar articles 1 of both antennae red; dorsal margins of pereonites 1–7 and pleonites 1–3 each with 2 red marks.

Remarks. The present specimens generally agree with the original description by Berge *et al.* (1999) except for the following points: (1) the accessory flagellum is present, although in the original description, it is not mentioned; (2) the flagella of antennae are relatively long, and (3) the posterodistal corner of the propodus of gnathopod 1 is less produced than in the original description. The latter two discrepancies are minor and could be within intraspecific variation.

The type locality of this species was indicated as “Joshi Island, close to Kobe” by Berge *et al.* (1999), but this island could not be located. According to Smith (1993), Richard Gordon Smith, the collector of the type specimens, dwelled mainly in Kobe, Hyogo Prefecture and visited twice Toshi Island, Mie Prefecture in October 1905 and July 1906. Thus it is highly likely that the type locality was misjudged to be close to Kobe and that “Toshi” was incorrectly spelled as “Joshi” on the original label. In addition, this species was collected from Himagajima and Kamishima Islands near Toshi Island.

Distribution. Japan, Aichi Prefecture to Wakayama Prefecture in the Pacific coast, Fukui Prefecture in the Japan Sea coast; lower intertidal to 10 m (present study).

Habitat. Among algae.

Genus *Antarctodius* Berge, Vader and Coleman, 1999

[New Japanese name: Mukashi-subeyokoebi-zoku]

Antarctodius Berge *et al.*, 1999: 244; Labay, 2010: 35.

Emended diagnosis. Anterodorsal margin of pereonite 1 not produced. Dorsal projections of pereonites absent, those of pleonites present or absent. Posterolateral margin of pleonite 3 with or without projection. Eyes variable. Antenna 1 peduncle with article 2 shorter than article 1; accessory flagellum absent. Mandible relatively

short; incisor narrow; lacinia mobilis present on left side; palp somewhat distal to molar. Lower lip with outer lobes long, strongly notched inside. Maxilla 1 with inner plate bearing 3 apical plumose setae, outer plate relatively short, styli-form, with many robust setae on tip; palp 2-articulated, wide, exceeding outer plate, with several apical setae. Maxillipedal palp 4-articulated. Coxa 1 almost as large as coxa 2, coxae 2–4 progressively becoming wider, equally long. Gnathopod 1 propodus not projected posterodistally, posterodistal corner with long robust seta; dactylus small, triangular, with several thick setae. Gnathopod 2 propodus narrow, palm weakly transverse, distal margin serrated, dactylus with accessory spine. Gills present on pereopods 2–6. Uropods spinous, inner ramus of uropod 3 relatively wide. Telson cleft or entire.

Species included. *Antarctodius antarcticus* (Watling and Holman, 1981) (type species); *A. rauscherti* Coleman and Kauffeldt, 2001; *A. noncarinatus* Labay, 2010; and *A. japonicus* sp. nov.

Remarks. The diagnosis of the genus is emended because the previous diagnoses were too simple and contain some errors. The genus is unique in having the two-articulated palp of maxilla 1 in the family Odiidae. Berge *et al.* (1999)

stated that this genus is most plesiomorphic within the family Ochlesidae *sensu lato*.

Distribution. Antarctic Ocean, Okhotsk Sea, and Japan.

***Antarctodius japonicus* sp. nov.**

[New Japanese name: Mukashi-subeyokoebi]

(Figs. 22–25)

Postodius sp. A: Matsuo *et al.*, 2007: 22.

Material examined. Holotype: NSMT-Cr 21285, male (2.9 mm), St. 84 (Matsuo *et al.*, 2007), midway between Kuchinotsu and Ohyano, Ariake Sound, 32°34'N, 130°15'E, 47 m deep, sandy gravel bottom, Smith–McIntyre grab, 5 June 1997, coll. M. Azuma.

Description. Holotype male. Body (Fig. 22) relatively slender. Eyes very large; posterolateral margins of pleonites 1 and 2 slightly projected at 0.65 length, posterolateral margin of pleonite 3 notched at 0.25 of length, with small projection on ventral corner.

Antenna 1 (Fig. 23A) stout, short; ratio of lengths of peduncular articles 1–3 1:0.5:0.2; flagellum with 4 articles, article 1 long. Antenna 2 (Fig. 23B) about 0.9 length of antenna 1, with ratio of lengths of peduncular articles 3–5 1:2.1:

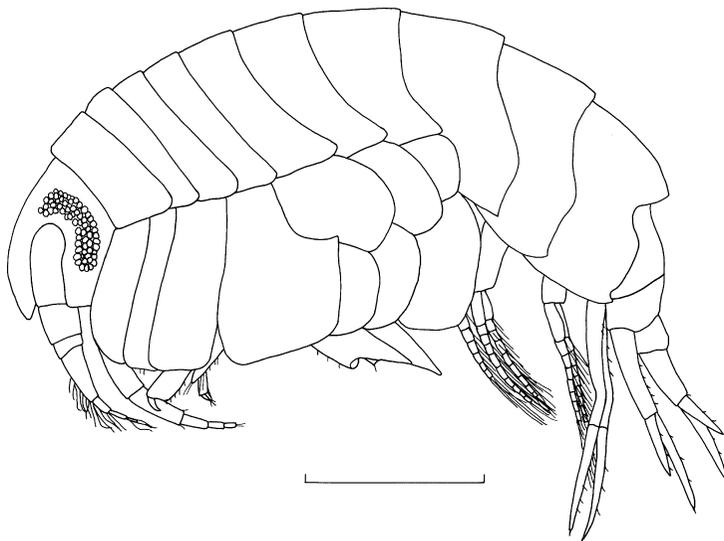


Fig. 22. *Antarctodius japonicus* sp. nov., holotype, male (2.9 mm), NSMT-Cr 21285. Habitus, left lateral view. Scale: 0.5 mm.

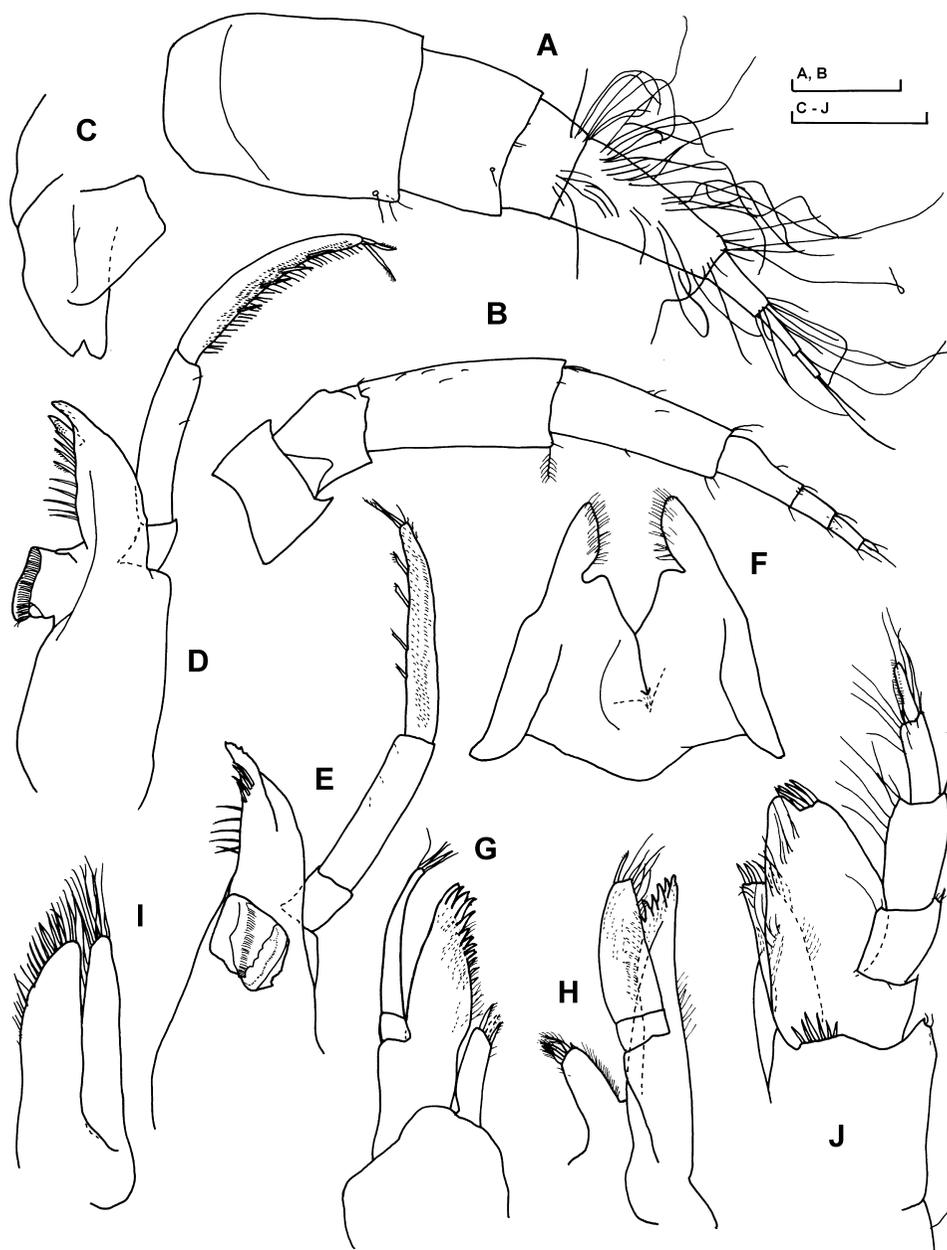


Fig. 23. *Antarctodius japonicus* sp. nov., holotype, male (2.9 mm), NSMT-Cr 21285. A, left antenna 1, medial view; B, left antenna 2, medial view; C, upper lip, dorsolateral view; D, left mandible, medial view; E, right mandible, medial view; F, lower lip, ventral view; G, right maxilla 1, ventral view; H, left maxilla 1, dorsolateral view; I, right maxilla 2, dorsal view; J, left maxilliped, ventral view. Scales: 0.1 mm.

1.9; flagellum with 3 articles.

Left mandible (Fig. 23D) with incisor denticulate; accessory blades developed, 9 in number; palp long, article 3 with 4 thick setae on ventral margin and many fine setae on lateral surface, tip

with 3 thick setae. Right mandible (Fig. 23E) with 10 accessory blades, palp article 3 bearing 2 apical thick setae. Maxilla 1 (Fig. 23G, H) with outer plate bearing large spine and 10–11 robust setae mediolaterally; palp with plumose seta and

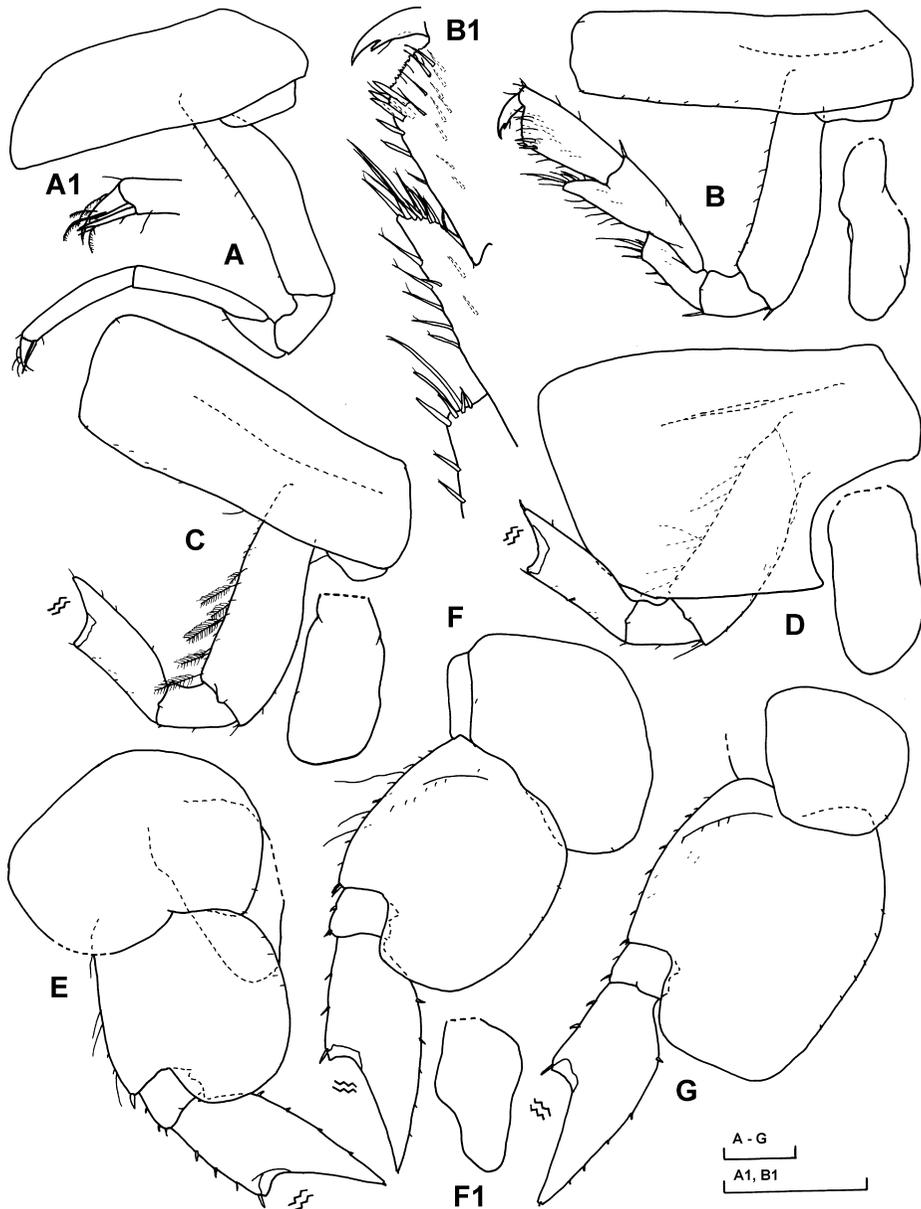


Fig. 24. *Antarctodius japonicus* sp. nov., holotype, male (2.9 mm), NSMT-Cr 21285. A, left gnathopod 1, lateral view; A1, tip of left gnathopod 1, lateral view; B, left gnathopod 2, lateral view; B1, posterior part of merus-dactylus of left gnathopod 2, lateral view; C-G, left pereopods 3-7, lateral views; F1, gill of pereopod 6, lateral view. Scales: 0.1 mm.

several normal setae on tip. Maxilla 2 (Fig. 23I) with inner and outer plates bearing many distal and medial setae. Maxilliped (Fig. 23J) with inner plate bearing 2 distal and 6 median robust setae, outer plate with 4 robust setae laterodistally; palp article 4 slender.

Gnathopod 1 (Fig. 24A, A1) small; coxal plate narrow; basis relatively wide, anterior margin without plumose setae; propodus with 1 long robust and 2 short setae posterodistally; dactylus with 1 needle-shaped and 5 plumose setae. Gnathopod 2 (Fig. 24B, B1) slightly larger than

gnathopod 1; coxal plate almost straight; basis without anterior plumose setae, bearing robust seta on posterodistal corner; ischium with robust seta on posterodistal corner; merus with 2 and 6 robust setae on posterior margin and posterodistal corner, respectively; carpus with 1 anterodistal, 6 posterior, 10 posterodistal and 2 posteromedial robust setae; propodus with 4 robust setae on posterodistal corner.

Pereopod 3 (Fig. 24C) with coxal plate almost straight; basis with 8 plumose setae on anterior margin, bearing 2 robust setae on posterodistal corner; ischium with robust seta each on posterior margin and posterodistal corner; merus projected anterodistally, margin with 3 anterior, 1 anterodistal, 4 posterior and 1 posterodistal robust setae. Pereopod 4 (Fig. 24D) with coxal plate wide, ventral margin long; basis with 7 plumose setae on anterior margin, bearing 2 robust setae on posterodistal corner; ischium with robust seta each on posterior margin and pos-

terodistal corner; merus projected anterodistally, with 1 anterior, 1 anterodistal, 4 posterior and 1 posterodistal robust setae.

Pereopod 5 (Fig. 24E) with coxal plate lobate, anteroventral margin without setae; basis roundish, produced posterodistally, anterior margin with several simple setae and distal robust seta; ischium with 3 robust setae on anterior margin; merus projected posterodistally, margin with 3 anterior, 1 anterodistal, 4 posterior and 5 posterodistal robust setae. Pereopod 6 (Fig. 24F) with coxal plate slightly lobate, anterior margin without plumose setae; basis roundish, produced posterodistally, anterior margin with 3 long simple setae and 4 short robust setae, anterodistal corner bearing robust seta, anterolateral surface with 6 short robust setae; ischium with 2 robust setae on anterior margin; merus projected posterodistally, margin with 2 anterior, 1 anterodistal, 5 posterior and 1 posterodistal robust setae. Pereopod 7 (Fig. 24G) with coxal plate small, un-

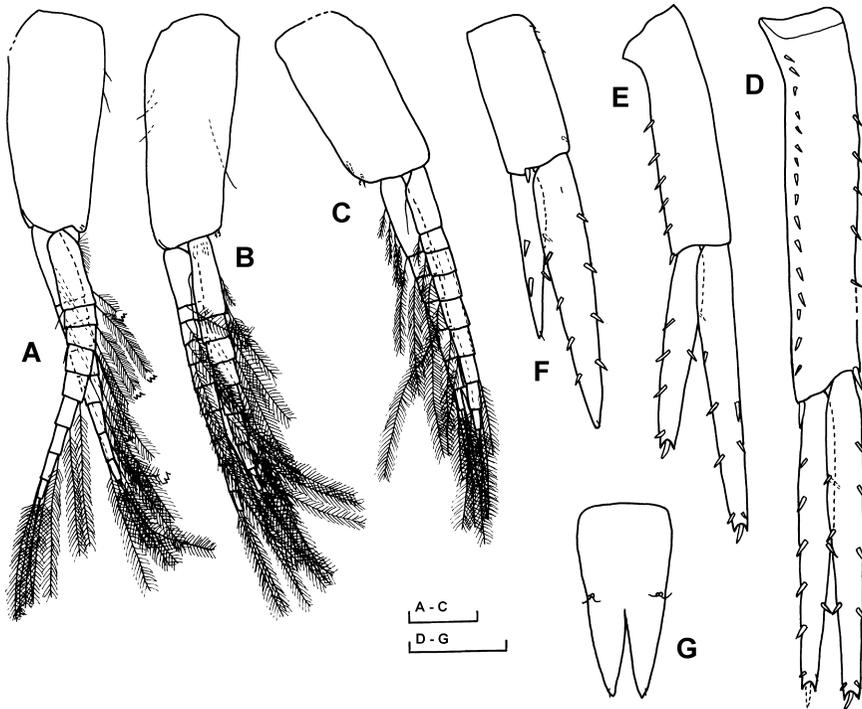


Fig. 25. *Antarctodius japonicus* sp. nov., holotype, male (2.9 mm), NSMT-Cr 21285. A, B, left pleopods 1, 2, posterior views; C, left pleopod 3, anterior view; D–F, left uropods 1–3, dorsal views; G, telson, dorsal view. Scales: 0.1 mm.

lobed, anterior margin without plumose setae; basis broad, quadrate, produced posterodistally, anterior margin with 8 robust setae, anterodistal corner bearing 2 robust setae, anterolateral surface with 4 short robust setae; ischium with 3 robust setae on anterior margin; merus projected posterodistally, margin with 2 anterior, 1 anterodistal, 5 posterior and 1 posterodistal robust setae.

Pleopods (Fig. 25A–C) relatively long, pleopod 3 shortest; peduncles each with 2 coupling hooks, peduncles of pleopod 1–3 bearing 2 simple setae, 4 simple setae and 2 robust setae, respectively; outer rami longer than inner, outer and inner rami with 8–10 and 7–9 articles, respectively. Uropod 1 (Fig. 25D) long; peduncle bearing 16, 5, 1 and 1 robust setae on lateral margin, medial margin, distolateral corner and distomedial corner, respectively; outer ramus with 5 lateral, 3 medial and 3 (1 lost) terminal robust setae, inner ramus with 3 lateral, 4 medial and 3 terminal robust setae. Uropod 2 (Fig. 25E) short, about 0.75 length of uropod 1; peduncle bearing 5 and 1 robust setae on lateral margin and distolateral corner, respectively; outer ramus with 3 lateral, 2 medial and 2 terminal robust setae, inner ramus with 3 lateral, 2 medial and 3 terminal robust setae. Uropod 3 (Fig. 25F) shorter than uropod 2; peduncle with 1 distolateral and 1 distomedial robust setae; outer ramus about 0.6 length of inner ramus, with 2 lateral and 2 medial robust setae and terminal short seta, inner ramus with 4 lateral and 4 medial robust setae and terminal short seta. Telson (Fig. 25G) deeply cleft, both tips each with minute seta.

Coloration in preservative. Eyes pale orange, other parts white.

Remarks. *Antarctodius japonicus* sp. nov. differs from the three congeneric species in the relatively wider bases of pereopods 5–7 and the absence of a triangular projection on the posterolateral margin of pleonite 3. This new species is the first representative of the genus from Japanese waters.

Distribution and habitat. Ariake Sound, 47 m deep (present study). Sandy gravel bottom.

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