

## Original Article

\*Present address: Faculty of Fisheries,  
Kagoshima University, 4-50-20 Shimoarata,  
Kagoshima 890-0056, Japan

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### Author for correspondence:

Masafumi Kodama,  
E-mail: [mkodama@fish.kagoshima-u.ac.jp](mailto:mkodama@fish.kagoshima-u.ac.jp)

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# Review of the subfamily Cleonardopsinae Lowry, 2006 (Crustacea: Amphipoda: Amathillopsidae) with description of a new genus and species from Japan

Masafumi Kodama\*  and Tomohiko Kawamura

International Coastal Research Center, Atmosphere and Ocean Research Institute, The University of Tokyo, 1-19-8  
Akahama, Otsuchi, Iwate 028-1102, Japan

## Abstract

The amathillopsid subfamily Cleonardopsinae Lowry, 2006 is reviewed. The only species of the subfamily, *Cleonardopsis carinata* K.H. Barnard, 1916, should be regarded as a species-complex. A new genus and species of the subfamily, *Carinocleonardopsis seisuia* gen. et sp. nov., is described from the Sea of Kumano, Japan as the second species of the subfamily Cleonardopsinae as well as the first record of the subfamily from the North Pacific. This new genus can be easily distinguished from *Cleonardopsis* by the presence of distinct large eyes and the dorsal carination on head, pereonites and pleonites.

## Introduction

The monotypic amphipod subfamily Cleonardopsinae Lowry, 2006 has a complex taxonomic history. The only current genus of the subfamily, *Cleonardopsis* Barnard, 1916 was originally established in the family Eusiridae, however, it has been frequently placed in other families such as Amathillopsidae or Pleustidae by various authors (e.g. Pirlot, 1936; Barnard & Karaman, 1991a, 1991b; Coleman, 1998; Lowry, 2006).

The only species of the genus, *Cleonardopsis carinata* Barnard, 1916, also has a complex taxonomic history. This species was originally described from off South Africa (Barnard, 1916). Since then, several authors have reported the species from various localities (e.g. Schellenberg, 1926; Pirlot, 1934, 1936; Stephensen, 1944). However, these reports sometimes lacked descriptions or illustrations, and moreover, sometimes showed different morphologies from each other. Lowry (2006) implied that the material of ‘*Cl. carinata*’ from different localities could be separate species.

During a survey of the deep-sea benthic fauna in the Sea of Kumano and off Tanabe Bay by TRV ‘Seisui-maru’, Mie University (research cruise no. 1803; Kimura *et al.*, 2019), an amphipod species attributed to the subfamily Cleonardopsinae was collected. The present study provides a review of the subfamily Cleonardopsinae and compares our material with the description of *Cleonardopsis carinata* in previous studies. As a result, our specimens clearly revealed distinct characters from the genus *Cleonardopsis*, and therefore, we herein describe and illustrate the present species as *Carinocleonardopsis seisuia* gen. et sp. nov.

## Materials and methods

Fresh specimens of *Carinocleonardopsis seisuia* gen. et sp. nov. were collected from sandy-muddy bottom in the Sea of Kumano, Japan (Figure 1). The body lengths of specimens examined were measured by tracing individuals’ mid-trunk lengths (tip of the rostrum to end of telson); measuring this curved length and then converting this to actual animal body length by correcting for magnification, following previous studies (e.g. Lörz *et al.*, 2007, 2009). The specimens were dissected under a binocular stereomicroscope, and the appendages were mounted in Euparal on glass slides. Observations and line drawings were made using a light microscope with the aid of a drawing tube (Y-IDT, Nikon, Tokyo, Japan). The specimens were deposited in the National Museum of Nature and Science, Tokyo (NSMT).

## Results

### Systematics

Order AMPHIPODA Latreille, 1816  
Family AMATHILLOPSIDAE Pirlot, 1934  
[New Japanese name: Ryukotsu-yokoebi-ka]  
Subfamily Cleonardopsinae Lowry, 2006  
Genus *Cleonardopsis* Barnard, 1916

*Cleonardopsis* Barnard, 1916: 175. —Schellenberg, 1926: 230. —Pirlot, 1936: 237. —Stephensen, 1944: 7. —Barnard, 1969: 223. —Griffiths, 1975: 118. —Ledoyer, 1986: 1052.

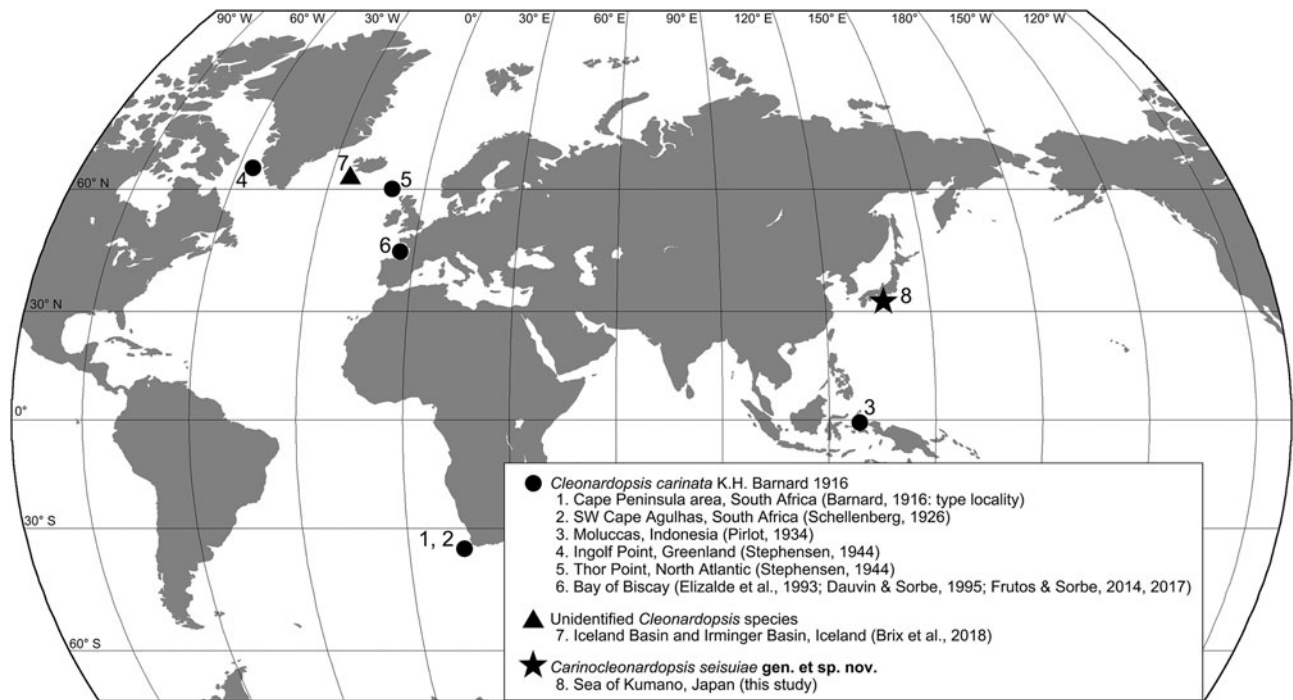


Fig. 1. Geographic distribution of the subfamily Cleonardopsinae Lowry, 2006.

—Barnard & Karaman, 1991a: 315. —Barnard & Karaman, 1991b: 646. —Elizalde *et al.*, 1993: 252. —Dauvin & Sorbe, 1995: 454. —Coleman, 1998: 31. —Lowry, 2006: 12. —Coleman, 2007: 20. —Frutos & Sorbe, 2014: 299, 304. —Frutos & Sorbe, 2017: 36. —Brix *et al.*, 2018: 7. —Jażdżewska *et al.*, 2018: 62.

*Amathillopleustes* Pirlot, 1934: 205 [synonymized with *Cleonardopsis* by Pirlot (1936)]

#### Diagnosis after Lowry (2006)

Head deeper than long; lateral cephalic lobe subquadrate, head truncated apically; anteroventral margin straight, anteroventral margin moderately recessed, anteroventral margin moderately excavate; rostrum short or moderate length; eyes absent. Body without setae; dorsally carinate. Antenna 1 subequal in length or longer than antenna 2; peduncle with sparse slender setae; peduncular article 1 longer than article 2; article 2 longer than article 3; article 3 shorter than article 1; accessory flagellum minute, 1-articulate; calceoli present. Antenna 2 medium length; peduncle with sparse slender setae or none; flagellum longer than peduncle.

Pereon. Coxae 1–4 longer than broad, overlapping, coxae not ventrally acute. Coxae 1–3 progressively larger. Gnathopod 1 subchelate; carpus shorter than propodus. Gnathopod 2 subchelate; coxa smaller than but not hidden by coxa 3; carpus short, shorter than propodus. Pereopods not prehensile. Pereopod 4 coxa not ventrally acute, with small posteroventral lobe. Pereopod 5 coxa without lobes; basis slightly expanded. Pereopod 6 basis slightly expanded. Pereopod 7 basis expanded, subrectangular.

Pleon. Urosomites not carinate. Uropods 1–2 apices of rami without robust setae. Telson weakly cleft; dorsal or lateral robust setae absent; apical robust setae absent.

#### Species composition

*Cleonardopsis carinata* Barnard, 1916 (monotypic)

#### Distribution

Some previous studies mentioned the distribution of the genus as ‘cosmopolitan’ (e.g. Barnard, 1969; Lowry, 2006). Detailed records of collecting localities are summarized in Figure 1 and shown as

follows: South Africa (Barnard, 1916; Schellenberg, 1926); Indonesia (Pirlot, 1934); Greenland (Stephensen, 1944); Bay of Biscay (Elizalde *et al.*, 1993; Dauvin & Sorbe, 1995; Frutos & Sorbe, 2014, 2017); Iceland (Brix *et al.*, 2018; Jażdżewska *et al.*, 2018).

#### Remarks

Detailed taxonomic history of the genus *Cleonardopsis* is reviewed below (see Review and discussion of the subfamily Cleonardopsinae).

#### *Cleonardopsis carinata* Barnard, 1916

(Figures 2–4)

*Cleonardopsis carinata* Barnard, 1916: 176. —Schellenberg, 1926: 230. —Pirlot, 1936: 237. —Stephensen, 1944: 7. —Griffiths, 1975: 118. —Ledoyer, 1986: 1052. —Barnard & Karaman, 1991a: 316. —Barnard & Karaman, 1991b: 646. —Elizalde *et al.*, 1993: 252. —Dauvin & Sorbe, 1995: 454. —Coleman, 1998: 31. —Lowry, 2006: 12. —Frutos & Sorbe, 2014: 299, 304. —Frutos & Sorbe, 2017: 36.

*Amathillopleustes alticoxa* Pirlot, 1934: 205. [Synonymized with *Cleonardopsis carinata* by Pirlot (1936)]

#### Distribution

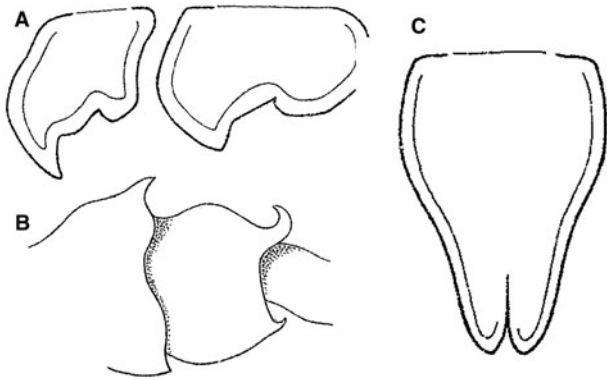
South Africa (Barnard, 1916; Schellenberg, 1926), Indonesia (Pirlot, 1934), Greenland (Stephensen, 1944), Bay of Biscay (Elizalde *et al.*, 1993; Dauvin & Sorbe, 1995; Frutos & Sorbe, 2014, 2017) (Figure 1).

#### Remarks

Several authors reported the occurrence of this species, however, only Barnard (1916) and Pirlot (1934) provided morphological description and illustration (Figures 2–4). Detailed taxonomic history of this species is reviewed below (see Review and discussion of the subfamily Cleonardopsinae).

Genus *Carinocleonardopsis* gen. nov.

[New Japanese name: Mino-yokoebi-zoku]



**Fig. 2.** *Cleonardopsis carinata* Barnard, 1916 from Cape Peninsula area of South Africa, modified from the original description by Barnard (1916). (A) coxae 5 and 6, lateral view; (B) pleosomites 2 and 3, lateral view; (C) telson, dorsal view. Scale bars were not provided in Barnard (1916).

**Diagnosis**

Head deeper than long, with rounded carination dorsally; lateral cephalic lobe subquadrate, head truncated apically; anteroventral margin straight, anteroventral margin moderately recessed, anteroventral

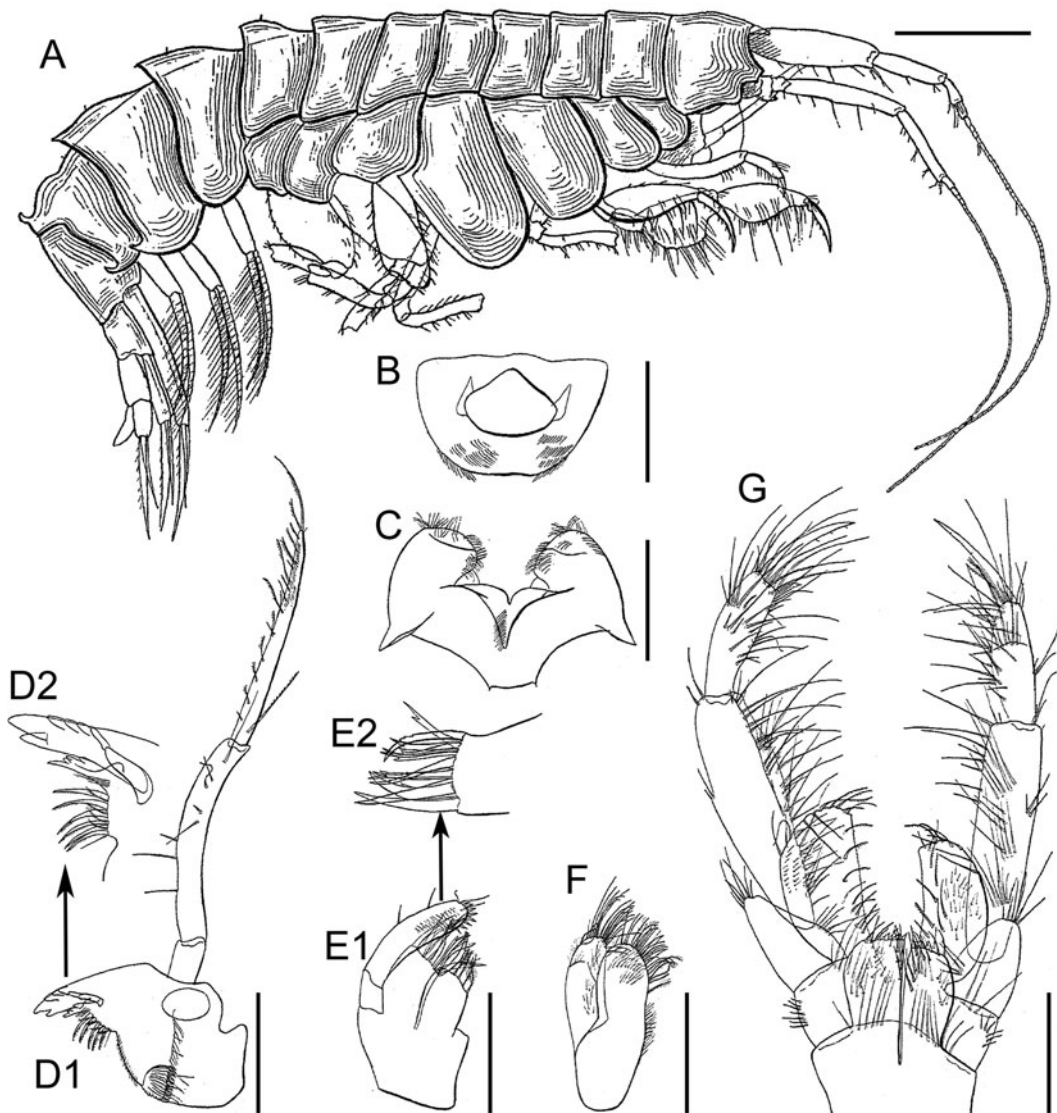
margin moderately excavate; rostrum short or moderate length; distinct eyes present. Body without setae; dorsal carination present on head, pereonites and pleonites. Antenna 1 subequal in length or longer than antenna 2; peduncle with sparse slender setae; peduncular article 1 longer than article 2; article 2 longer than article 3; article 3 shorter than article 1; accessory flagellum minute, 1-articulate; calceoli present. Antenna 2 medium length; peduncle with sparse slender setae or none; flagellum longer than peduncle.

Pereon. Coxae 1–4 longer than broad, overlapping, coxae not ventrally acute. Coxae 1–3 progressively larger, coxae 3 and 4 enlarged. Gnathopods 1 and 2 similar, subchelate, typical amathillopsid-form; basis with row of short spine-like setae on posterior margin, carpus similar to propodus in length, with carpal lobe. Pereopods not prehensile. Pereopod 4 coxa not ventrally acute, with small posteroventral lobe. Pereopod 5 and 6 bases slightly expanded. Pereopod 7 basis expanded.

Pleon. Urosomites not carinate. Uropods 1–3 apices of rami without robust setae. Telson weakly cleft; dorsal or lateral robust setae absent; subapical robust setae present.

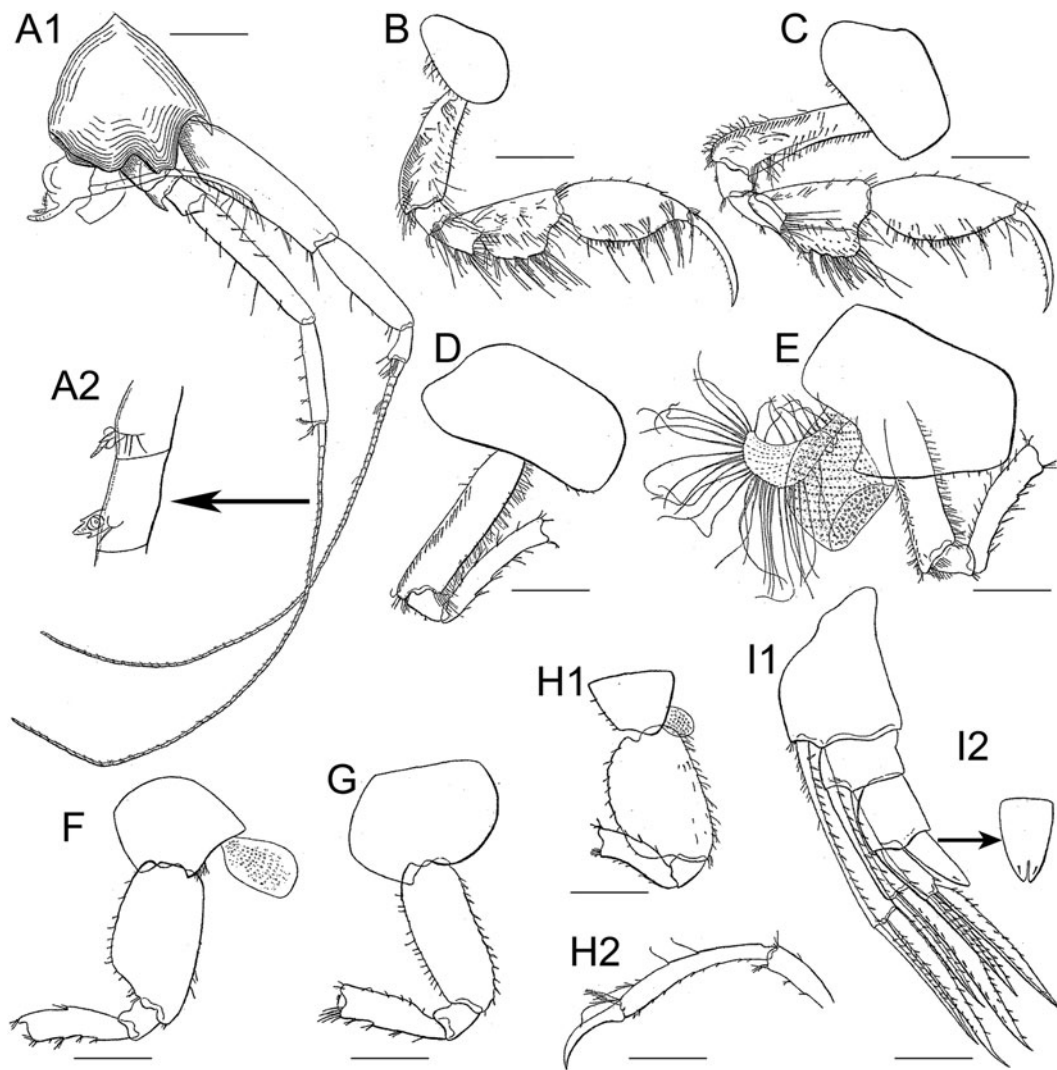
**Species composition**

*Carinocleonardopsis seisuia* gen. et sp. nov. (monotypic)



**Fig. 3.** *Cleonardopsis carinata* Barnard, 1916 from off Mollucas, eastern Indonesia, modified from Pirlot (1934). (A) habitus; (B) upper lip; (C) lower lip; (D1) mandible; (D2) incisor, laciniae mobilis and accessory setal row of mandible; (E1) maxilla 1; (E2) outer plate of maxilla 1; (F) maxilla 2; (G) maxilliped. Scale bars: (A) 1.0 mm; (B–G) 0.3 mm.





**Fig. 4.** *Cleonardopsis carinata* Barnard, 1916 from off Mollucas, eastern Indonesia, modified from Pirlot (1934). (A1) head; (A2) flagellar articles of antenna; (B) gnathopod 1; (C) gnathopod 2; (D–H1) coxa to merus of pereopods 3–7; (H2) propodus and dactylus of pereopod 7; (I1) urosome; (I2) telson. Scale bars: 0.5 mm.

#### Remarks

The present new genus is distinctively different from the genus *Cleonardopsis* in many morphological characters, especially in the (1) presence of large distinct eyes, (2) presence of a large dorsal carination on the head, pereonites and pleonites and (3) presence of a row of slender setae on the ventromedial margin of uropod 3 inner ramus.

#### Etymology

The generic name is derived from the combination of ‘Carino-’ after the large dorsal carination and ‘Cleonardopsis’ after the type genus of the subfamily Cleonardopsinae. The gender is feminine, as the generic name is ending in ‘-opsis’ (International Code of Zoological Nomenclature, Fourth Edition: Article 30.1.2).

*Carinocleonardopsis seisuia* gen. et sp. nov.

[New Japanese name: Seisui-mino-yokoebi]

(Figures 5–11)

cf. *Cleonardopsis* sp. – Kimura *et al.*, 2019: 30.

#### Material examined

**Holotype:** NSMT-Cr 29000, female, 12.6 mm, Sea of Kumano, 190–195 m deep, sandy-muddy bottom, 24 April 2018, TRV

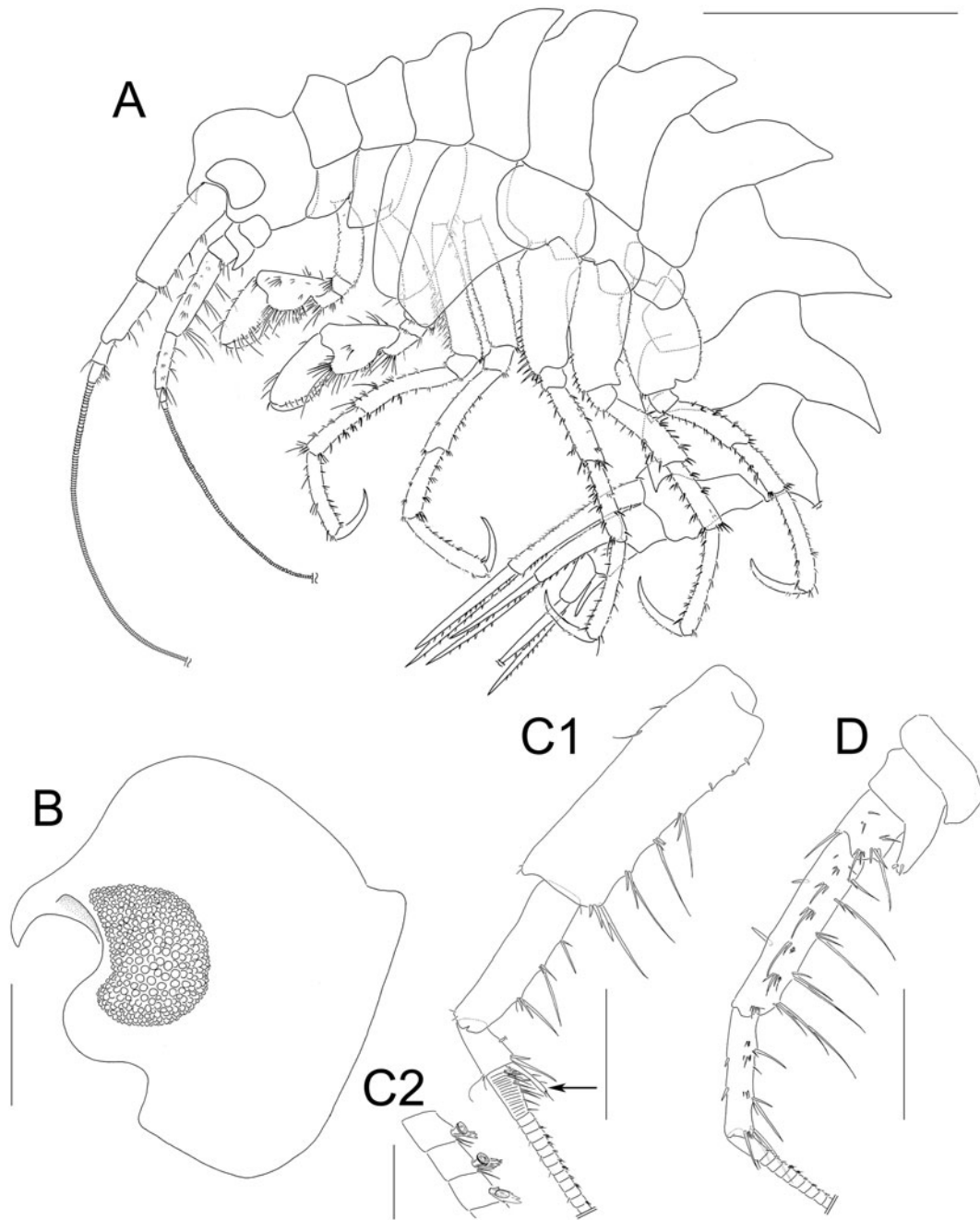
‘Seisui-maru’, beam trawl, towed from 34°9.868’N 136°35.624’E to 34°9.738’N 136°35.171’E (Station 1B in Kimura *et al.*, 2019). **Paratype:** NSMT-Cr 29001, male(?), 7.3 mm, same data as holotype.

#### Description

Based on holotype, except for maxilla 1 inner plate being based on paratype (both left and right maxilla 1 inner plates unfortunately broken in holotype).

**BODY** (Figure 5A) with distinct carination on head, pereonites, pleonites, but not on urosomites, each carina located on mid-dorsal part of each segment.

**HEAD** (Figure 5A, B) about as long as pereonites 1–2 combined; carina on head rounded, larger than that on pereonite 1; eyes distinct, large, reniform, located along antennal sinus of antenna 1; lateral cephalic lobes small, not beyond apex of rostrum, rounded distally; antennal sinus of antenna 2 present, small, deep; rostrum short, curved downward, pointed apically, reaching proximal 0.1–0.2 of peduncular article 1 of antenna 1. **Antenna 1** (Figure 5C1) slender, setose ventrally; length ratio of peduncular articles 1–3 about 5:3:1; flagellum much longer than peduncle, consisting of numerous short articles, first flagellar article longer than others with callynophore, with endosomatic transverse-stripe pattern (?vestige of fused articles); accessory flagellum slender, consisting of 1 article, shorter than first flagellar

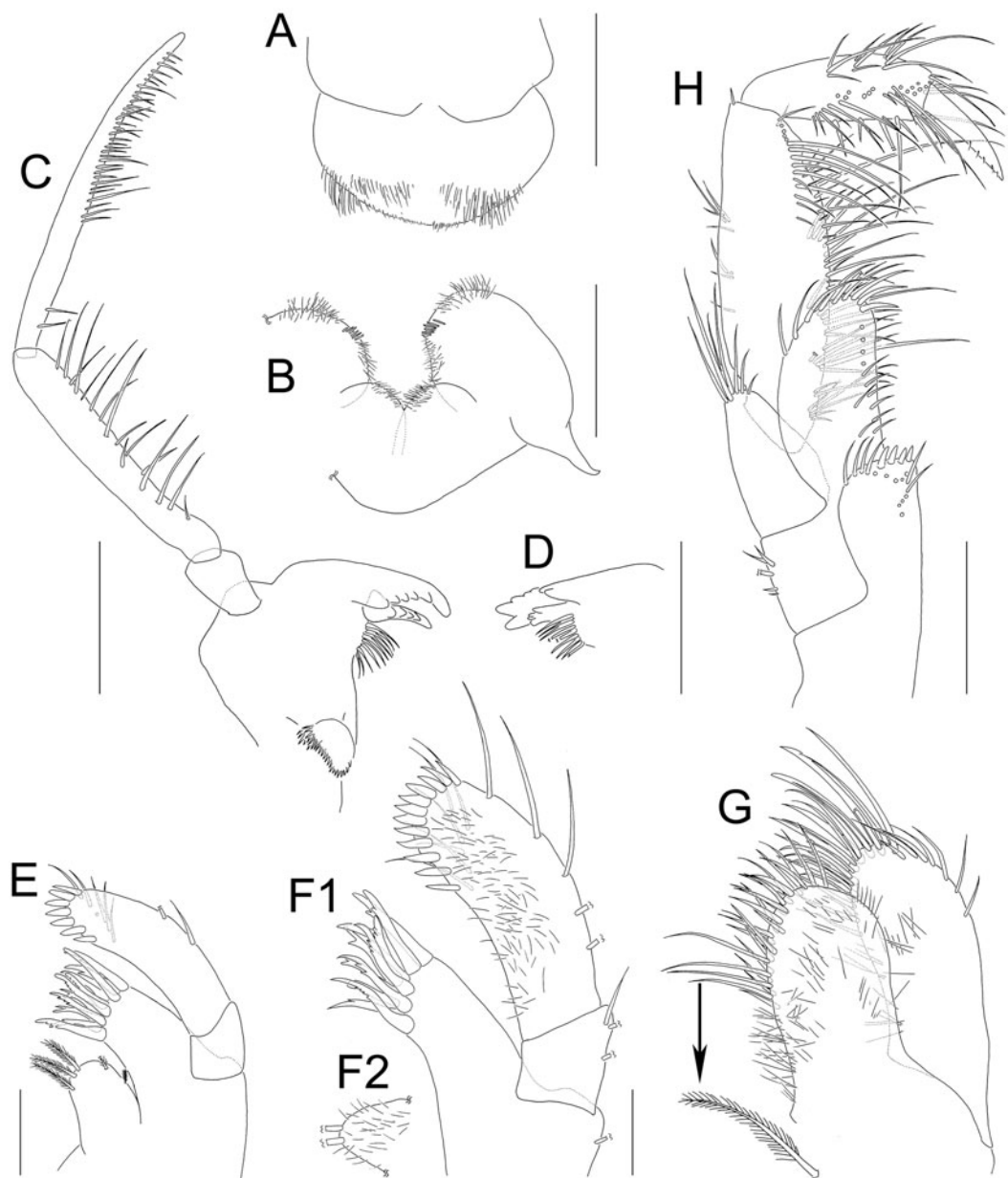


**Fig. 5.** *Carinocleonardopsis seisuiae* gen. et sp. nov., holotype female, 12.6 mm (NSMT-Cr 29000). (A) habitus (coxal gills, oositegites and pleopods omitted; setae partly omitted), lateral view; (B) head, lateral view; (C1) right antenna 1 (distal part of flagellum omitted; arrow indicating accessory flagellum), medial view; (C2) flagellar articles and calceoli of right antenna 1, medial view; (d) left antenna 2 (distal part of flagellum omitted), lateral view. Scale bars: (A) 3.0 mm; (B) 0.5 mm; (C1, D) 1.0 mm; (C2) 0.1 mm.

article, with several slender setae distally; calceoli present (Figure 5C2). *Antenna 2* (Figure 5D) slender; peduncle setose, article 2 with produced gland cone; flagellum much longer than peduncle, consisting of numerous short articles; calceoli present.

**Mouthparts.** *Upper lip* (Figure 6A) rounded, setulose. *Lower lip* (Figure 6B) setulose, outer plate with 6 robust setae distomedially, with mandibular process; inner plate indistinct, fused. *Mandible* (Figure 6C, D): palp with 3 articles, article 1 short, without setae, article 2 elongated with long setae medially; article 3 longer and more slender than article 2, slightly tapering distally, rounded apically, with several setae proximomedially, medial margin with dense setae on distal 0.6; left, right incisors 6-, 7-dentate, respectively; left, right laciniae mobiles with 5, 4 teeth, respectively; left, right accessory setal raw including 10, 9 setae, respectively; molar well developed. *Maxilla 1* (Figure 6E, F1): palp with 2 articles,

article 1 with or without several setae laterally (present in holotype, absent in paratype), article 2 gently curved inward, with several long slender setae laterally, several robust setae (12 in holotype, 7 in paratype) distally, 6 ventrofacial slender setae on ventral surface, setulose on dorsal and ventral surface; outer plate shorter than palp, truncate distally, with 11 teathed robust setae distally; inner plate unfortunately broken in holotype (Figure 6F2), setulose, with at least 2 setae; inner plate of paratype (Figure 6E) smaller than outer plate, rounded distally, setulose, with 3 long and 2 short plumose setae. *Maxilla 2* (Figure 6G): dorsal surface setulose in both plates; outer plate extending beyond inner plate with dense setae distolaterally, distally, distomedially; inner plate with dense setae medially to distally, some setae on inner plate plumose. *Maxilliped* (Figure 6H): palp with 4 articles, article 1 subtriangular with group of long setae

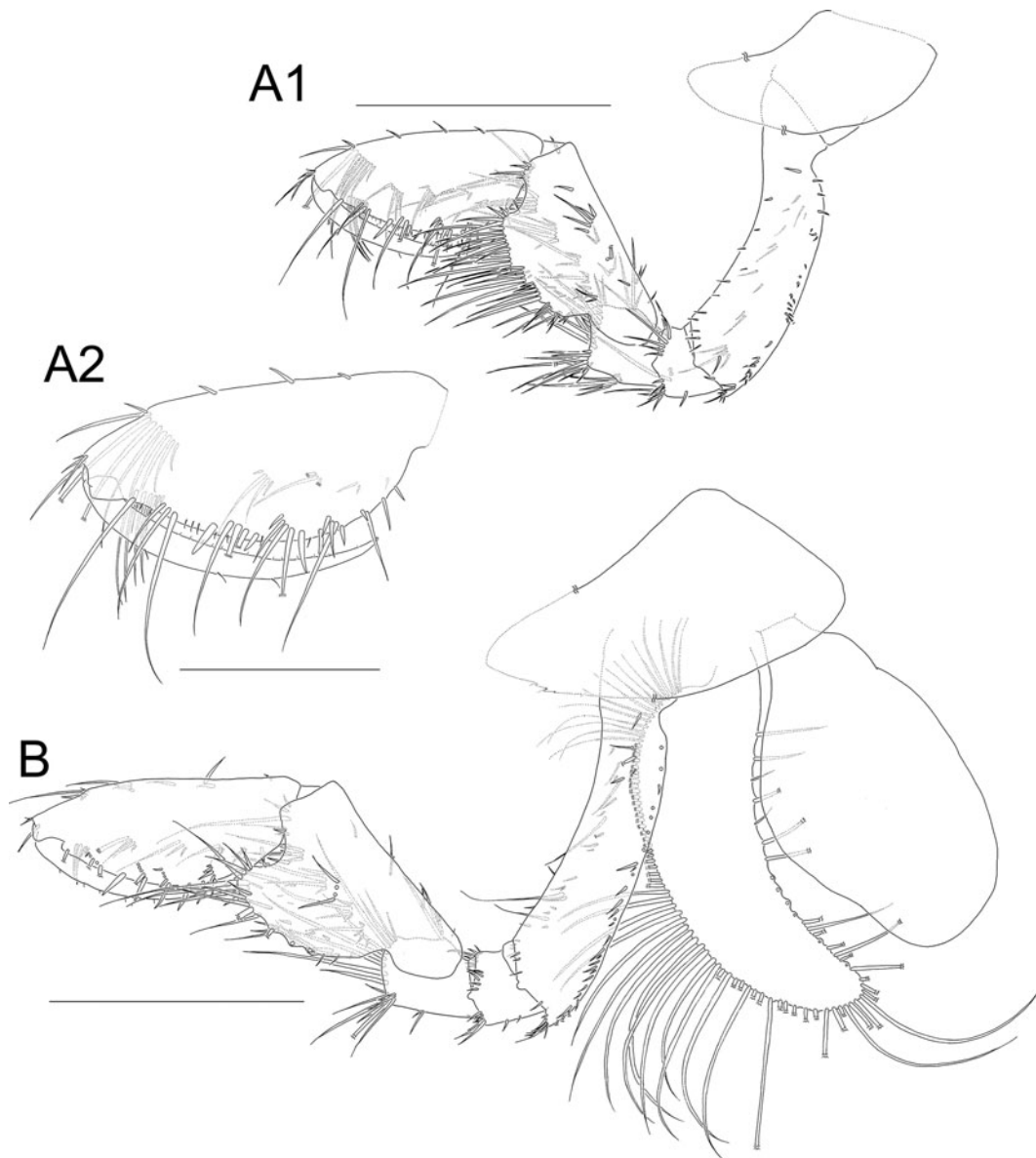


**Fig. 6.** *Carinocleonardopsis seisuiae* gen. et sp. nov., all but E, holotype female, 12.6 mm (NSMT-Cr 29000); E, paratype male(?), 7.3 mm (NSMT-Cr 29001). (A) upper lip, posterior view (setules partly omitted); (B) lower lip (setules partly omitted, right half omitted), ventral view; (C) left mandible, medial view; (D) incisor, laciniae mobilis and accessory setal row of right mandible, medial view; (E) right maxilla 1 of paratype (setules omitted), dorsal view; (F1) right maxilla 1 of holotype (inner plate damaged and detached during the dissection processing; setules omitted), dorsal view; (F2) inner plate of right maxilla 1 of holotype (damaged; only distal part remained), ?dorsal view; (G) right maxilla 2 (setules partly omitted), dorsal view; (H) left maxilliped (setae partly omitted), dorsal view. Scale bars: (A–D) 0.5 mm; (E–H) 0.1 mm.

distolaterally, article 2 long, beyond distal end of outer plate, with several groups of setae laterally, dense setae medially, with additional row of setae on distal 0.3 of dorsomedial area, article 3 about 0.6 times as long as article 2 with dense setae, article 4 falcate, about 0.6 times as long as article 3, with several short setae on distal half of medial margin; outer plate, roundly convex laterally, straight to slightly concave medially, with row of setae medially, distally to distolaterally, setae on distal area slightly robust; inner plate convex laterally, medial margin straight, with several setae distolaterally to medially, 4 nodular setae mediolaterally.

**PEREON.** *Pereonites* with distinct mid-dorsal carination (Figure 5A); carina on pereonite 1 isosceles-triangular, larger than that on pereonite 2; carinae on pereonites 2–5 increasing in size; carinae on pereonites 5–7 similar to each other, producing posterodorsally, pointing apically.

*Gnathopod 1* (Figure 7A1, 2) subchelate; coxa produced anteroventrally, anterior margin concave, proximal to distal margin rounded; basis, medial face with row of short setae, posterior margin with row of short robust (or sometimes slender) setae, posterodistal lobe weak having short robust setae; carpus broad, subequal or slightly broader than propodus, with strongly dense setae posteriorly and medially, posterior margin convex with subdistal excavation; propodus, medial face setose, palm convex with dense slender setae and robust setae; dactylus, posterior margin without teeth, with several short simple setae. *Gnathopod 2* (Figure 7B) similar to gnathopod 2 in shape, but larger than gnathopod 1; coxa produced anteroventrally, rounded ventrally to distally, ventral margin with 2 or 3 very small teeth, each tooth with short simple setae; carpus broader than that of gnathopod 1, posterodistal excavation on carpus deeper than that on gnathopod 1; propodus slightly more slender than that of gnathopod 1.



**Fig. 7.** *Carinocleonardopsis seisiae* gen. et sp. nov., holotype female, 12.6 mm (NSMT-Cr 29000). (A1) left gnathopod 1, lateral view; (A2) propodus and dactylus of left gnathopod 1, lateral view; (B) left gnathopod 2 (setae partly omitted), lateral view. Distal areas of both the coxae were damaged during the dissection processing, and thus, line drawings were based on the right coxae (shown by broken line). Scale bars: (A1, B) 1.0 mm; (A2) 0.5 mm.

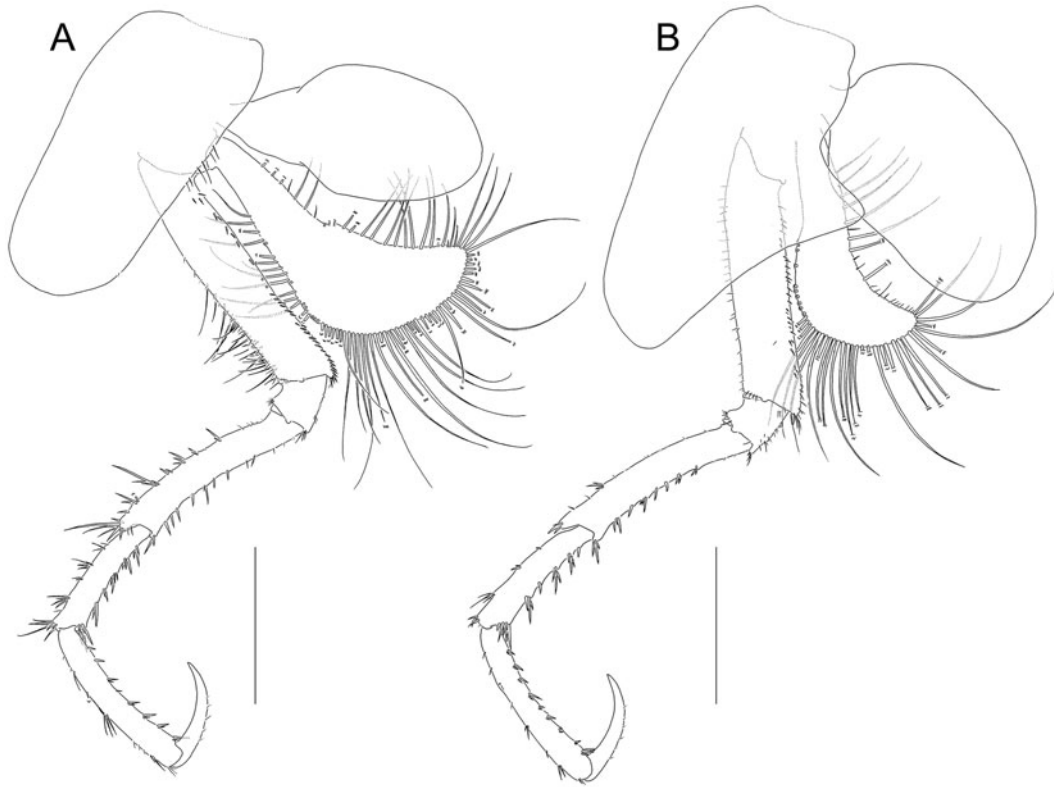
*Pereopods 3* (Figure 8A) simple, longer than gnathopod 2; coxa subrectangular, slightly tapering distally, rounded ventrally; basis with row of short robust setae posteriorly, anterior margin with dense long and short setae on distal half; merus expanded posterodistally; merus–propodus, weakly curved posteriorly, with several groups of robust setae anteriorly, posteriorly; dactylus falcate, distally acute, with several short setae anteriorly. *Pereopods 4* (Figure 8B) simple, slightly longer than pereopod 3; coxa enlarged, deeper than coxa 3, anterior margin slightly convex, posterior margin with triangular projection, posterior margin from posteroproximal corner to the projection excavated almost fitting anterior margin of coxa 5, posterior margin from the projection to distal end slightly concave, distal area subrounded, not acute or pointed; basis–dactylus similar to those of pereopod 3, but slightly longer than those of pereopod 3.

*Pereopod 5* (Figure 9A) similar to pereopod 6 in length; coxa bilobate, anterior lobe rounded; basis subrectangular, anterior margin with row of long robust setae on distal half; ischium short with several robust setae anteriorly, unarmed posteriorly; merus expanded posterodistally, with groups of robust setae

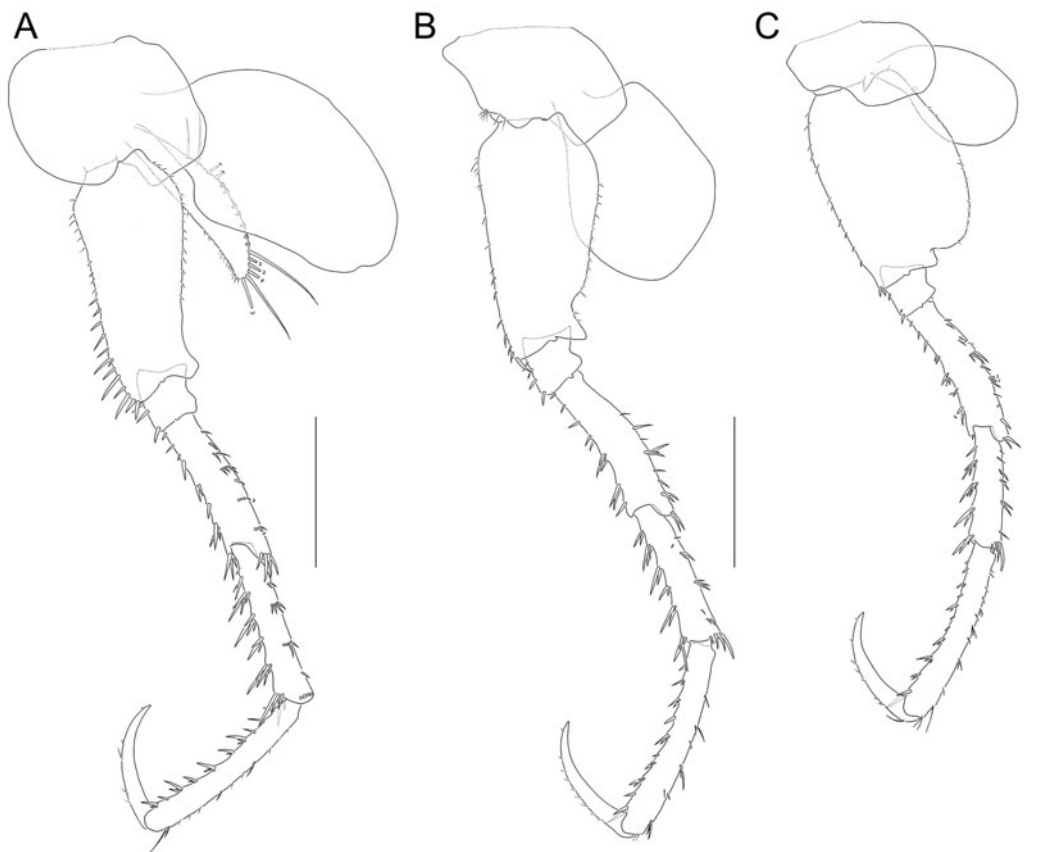
anteriorly, posteriorly; carpus slightly shorter than merus, with several groups of robust setae anteriorly, posteriorly; propodus slightly longer than merus, with several groups of robust setae anteriorly, with slender setae posteriorly; dactylus slender, falcate, with several slender setae posteriorly. *Pereopod 6* (Figure 9B) similar to pereopod 5, but coxa smaller, anterior lobe of coxa angular, basis more expanded posteriorly, anterior margin of basis with shorter robust setae than those in pereopod 5. *Pereopod 7* (Figure 9C) similar to but shorter than pereopod 5 or 6, coxae smaller with posterior lobe rounded, basis more expanded posteriorly. *Coxal gills* present on gnathopod 2, pereopods 3–7; oostegites present on gnathopod 2, pereopods 3–5, each oostegite bearing dense long marginal setae.

**PLEON.** Distinct mid-dorsal carination present on pleonites, but absent on urosomites (Figure 5A); carinae on pleonites 1–2 similar to those on pereonites 5–7 in size and shape, carina on pleonite 3 similar but slightly smaller than those on pleonites 1–2. *Epimeral plate 1*, posterior margin convex, posteroventral angle obtuse; *epimeral plate 2*, posterior margin sinuous with shallow excavation, posteroventral angle acute; *epimeral plate 3*,



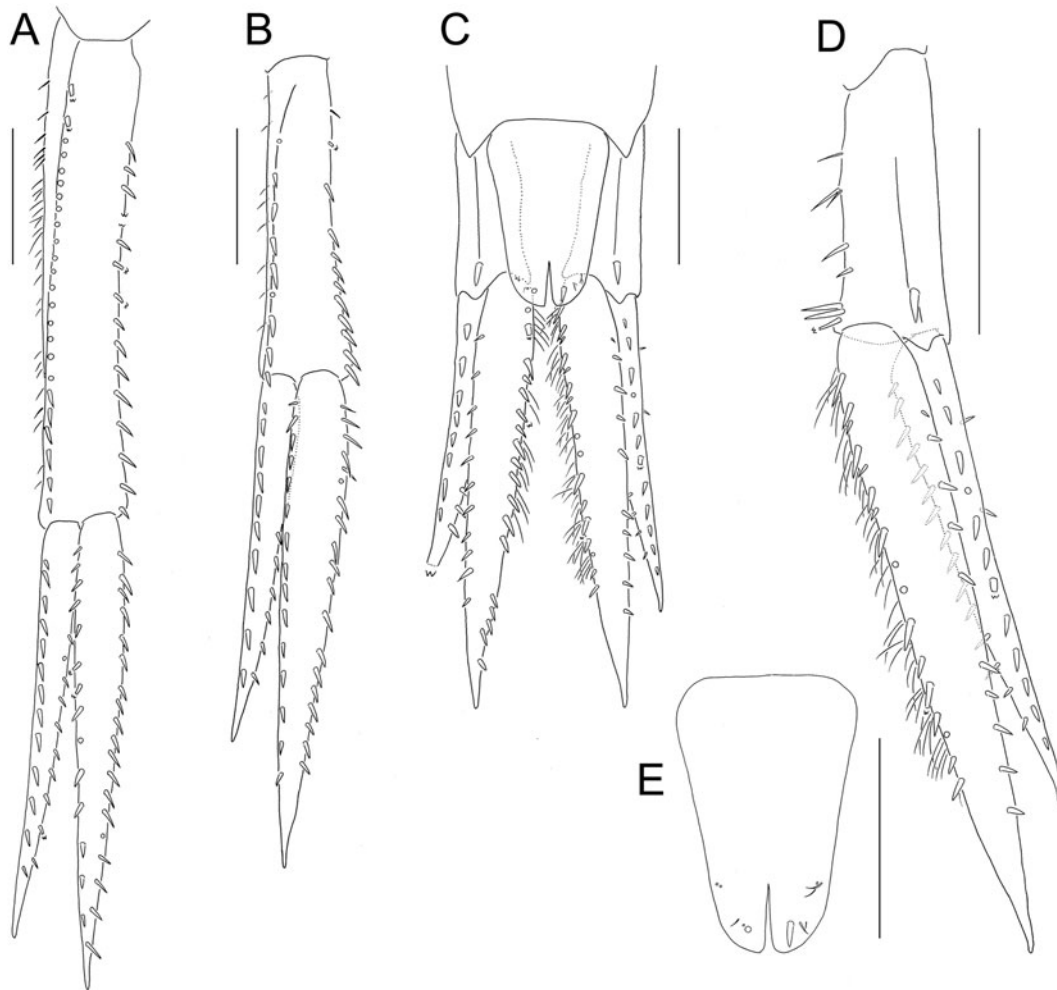


**Fig. 8.** *Carinocleonardopsis seisuiae* gen. et sp. nov., holotype female, 12.6 mm (NSMT-Cr 29000). (A) left pereopod 3, lateral view; (B) left pereopod 4, lateral view. Scale bars: 1.0 mm.



**Fig. 9.** *Carinocleonardopsis seisuiae* gen. et sp. nov., holotype female, 12.6 mm (NSMT-Cr 29000). (A–C) left pereopods 5–7, lateral views. Scale bars: 1.0 mm.





**Fig. 10.** *Carinocleopardopsis seisuiiae* gen. et sp. nov., holotype female, 12.6 mm (NSMT-Cr 29000). (A, B) left uropod 1, 2, dorsal view; (C) urosomite 3 and telson, dorsal view; (D) right uropod 3, dorsal view; (E) telson, dorsal view. Scale bars: 0.5 mm.

posterior margin sinuous with deep excavation, posteroventral angle acute, more produced than in plate 2.

*Urosomite 1* longer than urosomites 2–3 combined, with shallow dorsal keel; *urosomite 2* shortest, dorsal margin weakly concave; *urosomite 3* slightly longer than urosomite 2, but shorter than telson, without keel. *Uropod 1* (Figure 10A): peduncle subequal length of inner ramus, with rows of robust setae dorsolaterally, dorsomedially, with row of slender setae ventrolaterally; both rami tapering distally, with rows of robust setae dorsolaterally and dorsomedially, without slender setae, without apical robust setae, inner ramus longer than outer ramus. *Uropod 2* (Figure 10B) shorter than uropod 1; peduncle 0.6–0.7 times as long as inner ramus, with rows of robust setae dorsolaterally and dorsomedially, with sparse row of slender setae ventrolaterally; both rami tapering distally, with rows of robust setae dorsolaterally, dorsomedially, without slender setae, without apical robust setae, inner ramus longer than outer ramus. *Uropod 3* (Figure 10C, D): peduncle 0.4–0.5 times as long as inner ramus, with robust seta disto-dorsolaterally; both rami tapering distally, with rows of robust setae dorsolaterally, dorsomedially, without apical robust setae, inner ramus longer than outer ramus, with dense slender setae ventromedially. *Telson* (Figure 10C, E) longer than wide, reaching distal end of uropod 3 peduncle, slightly cleft distally, with subapical robust setae.

#### Colouration in life

Body generally reddish orange (Figure 11A); appendages and urosomites partly whitish to colourless; eyes red. These colours on

body faded in preservation over time; eyes changed to white (Figure 11B, C).

#### Distribution

Known only from Sea of Kumano, Japan (Figure 1).

#### Habitat

Found on sandy-muddy bottom, 190–195 m deep.

#### Etymology

The new species is named after TRV ‘Seisui-maru’. The specific name is a noun in the genitive case.

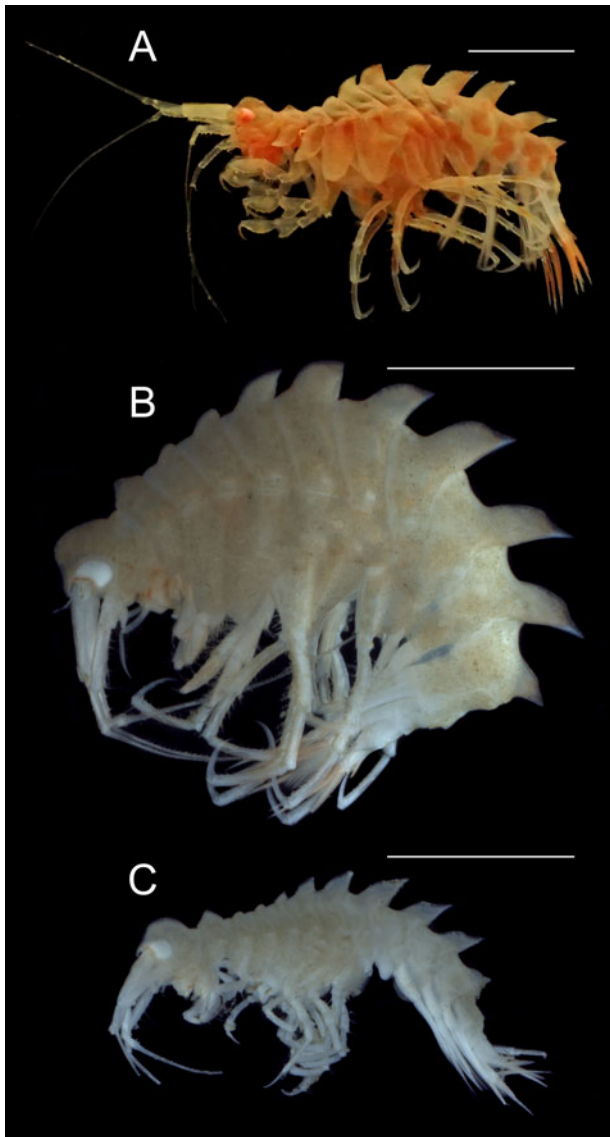
#### Remarks

See the Remarks section of the genus and Review and discussion of the subfamily Cleonardopsinae.

#### Discussion

##### Review and discussion of the subfamily Cleonardopsinae

The subfamily Cleonardopsinae has a complex taxonomic history. The hitherto only genus of the subfamily, *Cleonardopsis*, was originally established in the family Eusiridae by Barnard (1916). Soon after that, Schellenberg (1926) reported *Cl. carinata* near the type locality, treating it in the family Eusiridae. Pirlot (1934) established the new family Amathillopsidae and the new genus *Amathillopleustes*, however, Pirlot (1936) subsequently



**Fig. 11.** *Carinocleonardopsis seisiae* gen. et sp. nov. (A) colouration in life; (B, C) specimens fixed and preserved with 70% ethanol. (A, B) holotype female, 12.6 mm (NSMT-Cr 29000), lateral view (B, left antenna 1 detached during preservation); (C) paratype male(?) 7.3 mm (NSMT-Cr 29001). Scale bars: 3.0 mm.

synonymized *Amathillopleustes* with *Cleonardopsis*, and placed the genus in the family Amathillopsidae. Stephensen (1944) reported *Cl. carinata* from off Greenland, treating it as the family Amathillopsidae. After that, however, Barnard (1969), Griffiths (1975) and Ledoyer (1986) placed *Cleonardopsis* in the family Eusiridae. The biggest monograph of marine gammaridean amphipods by Barnard & Karaman (1991a, 1991b) placed *Cleonardopsis* in the two families, Eusiridae and Pleustidae. Coleman (1998) again transferred *Cleonardopsis* to the family Amathillopsidae based on several characters such as dorsal carination and outline of gnathopod morphology. Lowry (2006) recently revised the family Amathillopsidae. He established a new subfamily Cleonardopsinae in the family Amathillopsidae and placed *Cleonardopsis* in this subfamily. The genus *Cleonardopsis* is, therefore, currently treated as a member of the Amathillopsidae. The genus is distinguished from the other amathillopsids by the ventrally rounded coxae 3 and 4 and the slightly cleft telson.

The hitherto only species of the subfamily, *Cl. carinata*, also has a complex taxonomic history. This species was originally described from the Cape Peninsula area of South Africa

(Barnard, 1916). However, in the original description, Barnard (1916) only illustrated the coxae 5–6, pleosomites 2–3 and telson (Figure 2). Soon after the original description, Schellenberg (1926) reported *Cl. carinata* near the type locality, however, no illustrations or descriptions were provided. Pirlot (1934) described *Amathillopleustes alticoxa* from off the Moluccas in eastern Indonesia with detailed description and illustrations (Figures 3, 4), and subsequently synonymized *A. alticoxa* with *Cl. carinata* (see Pirlot, 1936). Stephensen (1944) reported *Cl. carinata* from ‘Ingolf’ station 27 off western coast of Greenland and ‘Thor’ station 78 in North Atlantic without any illustrations or descriptions. Lowry (2006) recently mentioned the synonymization of *A. alticoxa* with *Cl. carinata* made by Stephensen (it seems he possibly overlooked Pirlot (1936)) as ‘risky business based on unsubstantiated evidence’. Lowry (2006) also mentioned that it is difficult to accept that the material reported by Stephensen (1944) from eastern Greenland is synonymous with either of these species. We basically agree with his opinion. Indeed, illustrations in Barnard’s (1916) original description (Figure 2) show a clearly different morphology from those of Pirlot’s (1934) material (Figure 4F, G, I2); the anterior lobe of coxae 5 and 6 of Barnard’s material are more acutely falcate than that of Pirlot’s material; the lateral margins of the telson are sinuous in Barnard’s material (proximally convex and distally concave), whereas those in Pirlot’s material are rather rounded (entirely convex). Therefore, we concluded that *Cl. carinata* should be regarded as a species-complex. More material, especially topotype material, would need to be examined in future studies to solve the *Cl. carinata* species-complex problem.

The recent IceAGE expeditions (Icelandic marine Animals: Genetics and Ecology) reported 46 specimens of *Cleonardopsis* around Iceland (Iceland Basin and Irminger Basin; Brix *et al.*, 2018). Five individuals of these were subsequently DNA-barcoded (Jazdzewska *et al.*, 2018). These specimens from Iceland were identified to the genus-level pending further investigation.

In this study, we described *Carinocleonardopsis seisiae* gen. et sp. nov. This is the second genus and species of the subfamily as well as the first record of the subfamily from the North Pacific. We have placed the present new genus and species in the subfamily Cleonardopsinae based on the enlarged and ventrally rounded coxae 3 and 4, the short flagellar articles 2 and 3 of antenna 1 (both of them are distinctively shorter than the article 1), the subchelate gnathopods 1 and 2, and the cleft telson. This new genus is also somewhat similar in habitus with the family Pleustidae, especially the carinate pleustid genus *Neopleustes*. However, pleustids have an entire telson (or weakly notched telson in some species), whereas the present new genus has the distinctively cleft telson. Moreover, the outline of the gnathopods clearly shows amathillopsid characters (see Coleman, 1998): row of short spine-like setae on posterior margin of basis, carpal lobes, almond-shaped propodi, slender dactyli with microtrichs in inner curvature. Therefore, we concluded that this new genus should be placed in the amathillopsid subfamily Cleonardopsinae. In the Cleonardopsinae, the present new genus is also distinctively different from the genus *Cleonardopsis* in many characters such as (1) presence of large distinct eyes, (2) presence of a large dorsal carination on the head, pereonites and pleonites and (3) presence of a row of dense slender setae on the ventromedial margin of uropod 3 inner ramus.

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