

A new record of *Pseudoleucon japonicus* (Crustacea: Cumacea: Leuconidae) from Korea

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Only four species of leuconids have been recorded in Korea, all belonging to the genera *Eudorella* Norman, 1867 and *Nippoleucon* Watling, 1991. In this study, *Pseudoleucon japonicus* Gamô, 1964 belonging to family Leuconidae Sars, 1878 is newly recorded for Korean cumacean fauna. Also, for the first time, the male of the species is fully described and illustrated. The specimens were collected from the exclusive economic zone (EEZ) in the western sea (Yellow Sea) of Korea, with a rectangular dredge during 2007–2008. This species is characterized by the following features: the carapace has strong serrations on the antero-lateral margin and a pair of short oblique ridges on the side surface; the ridges begin near the end of frontal lobe and merge with the dorsal median carina; the appendages, such as antenna 1, pereopod 2 and uropod have a lot of simple setae decorated with a bundle of hairs at the end. The present study represents the first record on the genus *Pseudoleucon* Zimmer, 1903 from Korea.

Keywords: Cumacea, Leuconidae, *Pseudoleucon*, new record, Korea

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INTRODUCTION

The family Leuconidae Sars, 1878, is composed of 20 genera with 171 species worldwide (WoRMS, 2021). Among them, four species belonging to genera *Eudorella* Norman, 1867 and *Nippoleucon* Watling, 1991 have been recorded in Korea: *Eudorella hwanghaensis* Hong & Park, 1999, *Eudorella pacifica* Hart, 1930, *Nippoleucon hinumensis* (Gamô, 1967), and *Nippoleucon projectus* Lee & Lee, 2006 (Hong & Park, 1999; Lee & Lee, 2003; 2006). The genus *Pseudoleucon* Zimmer, 1903 was established within the family Leuconidae to include *Pseudoleucon sorex* Zimmer, 1903 described originally from southern Japanese waters. After that, *Pseudoleucon japonicus* Gamô, 1964 was recorded from the same waters based on female specimens (Zimmer, 1903; Gamô, 1964). During the study on the cumacean specimens collected from the exclusive economic zone (EEZ) in the western sea (Yellow Sea) of Korea, we found *P. japonicus*, previously not recorded in Korean waters. In this study, *P. japonicus* is added to the Korean cumacean fauna, with the first description and illustrations of a male.

MATERIALS AND METHODS

The specimens were collected from the exclusive economic zone (EEZ) in the western sea of Korea, with a rectangular dredge from 13 August 2007 to 22 April 2008. The collected specimens were fixed in 70–80% ethanol, moved to the laboratory, and stored in 95% ethanol. The specimens were identified with a stereomicroscope (Model SZX12; Olympus, Japan). Drawing of the whole body was performed under a stereomicroscope (Model SZX12) with a drawing tube. Later, the samples were transferred to glycerin to be dissected under a stereomicroscope (Model SZX12). Drawing of the appendages was performed with a light microscope (Model BX51; Olympus, Japan). The body length was measured from the anterior tip of the carapace to the posterior end of the pleonite 6. Length of the appendages was measured along the mid-line of each appendage. The materials were deposited at the National Institute of Biological Resources (NIBR), Incheon, Korea and the Department of Biological Sciences, Dankook University (DKU), Cheonan, Korea.

SYSTEMATIC ACCOUNTS

Order Cumacea Kröyer, 1846
Family Leuconidae Sars, 1878

Genus *Pseudoleucon* Zimmer, 1903
유령올챙이새우속 (신칭)

Pseudoleucon Zimmer, 1903: 676; Calman, 1907: 31, 34;
Zimmer, 1908: 176; Stebbing, 1913: 85; Watling, 1991:
578.

Diagnosis. Pseudorostrum extending anterodorsally. Antenna 1 geniculate between articles 1 and 2. Female with exopods on pereopods 1–3 (on pereopods 1–4 in male). Pereopod 2 article 3 narrow. Uropod endopod biarticulate. Male with 2 pairs of pleopods.

Pseudoleucon japonicus Gamô, 1964 (Figs. 1, 2)

한줄유령올챙이새우 (신칭)

Pseudoleucon japonicus Gamô, 1964: 246, figs. 4, 5;
1967: 162; Watling, 1991: 578.

Material examined. Korea: 1 sub♂ (NIBRIV0000299463) 1 sub♀ (DKUCUM 202001), EEZ st. D6, 35°19'31.0"N, 124°58'08.5"E, 22 April 2008, collected by Song SJ; 1 sub♀ (DKUCUM 202002), EEZ st. 1, 35°47'40.2"N, 125°05'43.3"E, 13 August 2007, collected by Song SJ; 1 sub♀ (DKUCUM 202003), EEZ st. N2, 35°41'31.0"N, 125°28'37.7"E, 30 January 2008, collected by Song SJ; 1 sub♀ (DKUCUM 202004), EEZ st. 14, 35°02'43.6"N, 124°46'26.7"E, 22 April 2008, collected by Song SJ.

Description. Subadult male (NIBRIV0000299463). Body length (Fig. 1A) 2.6 mm, excluding uropods. Carapace (Fig. 1A, B) slightly longer than 1/3 of body length, 1.7 times as long as its depth, 1.6 times as long as its width; shape nearly rectangular in dorsal view, with 1 pair of short oblique ridges, ridges beginning near end of frontal lobe and merging with dorsal median carina. Antennal notch and antero-lateral angle indistinct. Antero-lateral margin with strong serrations. Pseudorostral lobes (Fig. 1A, B) extending anterodorsally, truncated, and serrated. Ocular lobe (Fig. 1A, B) very small, without lens and pigment. Pereon (Fig. 1A, B) 0.7 times carapace length, shorter than 1/3 of body length. Pleon (Figs. 1A, 2F) 0.6 times as long as carapace and pereon together, with 2 pairs of pleopods; pleonite 5 longest, 0.7 times as long as pleonites 3 and 4 together; pleonite 6 0.5 times as long as pleonite 5, with 3 pairs of simple setae near distal margin.

Antenna 1 (Fig. 1C), peduncle 3-articulated; article 1 subequal in length to remaining articles combined, with 1 short plumose and 6 plumose setae; article 2 0.5 times as long as article 1, with 2 simple setae bearing a bundle of hairs laterally, 10 simple setae bearing a bundle of hairs distally; article 3 subequal in length to article 2, with 5

simple setae bearing a bundle of hairs on medial corner. Main flagellum 3-articulated, subequal in length to article 3 of peduncle; article 1 longest, with 1 simple seta bearing a bundle of hairs distally; article 2 0.4 times as long as article 1, with 1 aesthetasc and 2 simple setae bearing a bundle of hairs distally; article 3 small, with 1 aesthetasc and 2 simple setae bearing a bundle of hairs distally. Accessory flagellum not articulated, with 5 simple setae bearing a bundle of hairs distally.

Antenna 2 (Fig. 1D), peduncle composed of 4 articles; article 2 with 2 plumose setae anterior margin; article 3 with 1 plumose seta anterior margin; article 4 without seta; flagellum underdeveloped.

Maxilliped 3 (Fig. 1E), basis 1.2 times as long as remaining articles combined, with numerous hair-like and 4 plumose setae medially, 4 plumose setae on lateral face, 1 plumose and 3 long plumose setae on lateral corner; ischium short, unarmed; merus 2.6 times as long as ischium, with 2 plumose setae medially, 1 long plumose seta laterodistally; carpus 1.2 times as long as merus, with 3 plumose setae medially; propodus 0.8 times as long as carpus, unarmed; dactylus 0.9 times as long as propodus, with 4 short simple setae on lateral face, 5 simple setae terminally.

Pereopod 1 (Fig. 1F), basis 0.9 times as long as remaining articles combined, with 5 plumose setae medially, 4 plumose setae on lateral face, 1 plumose seta and 3 simple setae bearing a bundle of hairs distally; ischium very short, with 1 plumose seta medially; merus 2.9 times as long as ischium, with 1 short simple and 1 plumose setae medially, 2 short simple and 3 long plumose setae laterally; carpus 1.4 times as long as propodus, with 2 short simple setae, 1 complex pedunculate seta, and 4 simple setae bearing a bundle of hairs medially, 4 short simple and 4 long plumose setae laterally, 2 short simple and 3 long plumose setae laterodistally; propodus 0.8 times as long as carpus, with 4 short simple setae and 1 simple seta bearing a bundle of hairs medially, 4 short simple and 3 long plumose setae laterally; dactylus 0.8 times as long as propodus, with 2 short simple and 1 simple setae laterally, 1 short simple and 3 simple setae terminally.

Pereopod 2 (Fig. 2A), basis 1.3 times as long as remaining articles combined, with 12 plumose setae and 3 simple setae bearing a bundle of hairs medially, 1 plumose seta on lateral face, 1 short simple and 1 plumose setae laterally; ischium very short, with 1 long plumose seta mediodistally; merus 7.3 times as long as ischium, with 1 simple seta bearing a bundle of hairs mediodistally, 3 simple setae bearing a bundle of hairs laterally, 1 plumose seta distally; carpus 1.4 times as long as merus, with 2 simple setae bearing a bundle of hairs medially, 2 simple setae bearing a bundle of hairs laterally, 1 plumose seta and 2 simple setae bearing a bundle of hairs distally; propodus 0.3 times as long as carpus, with 1 simple seta

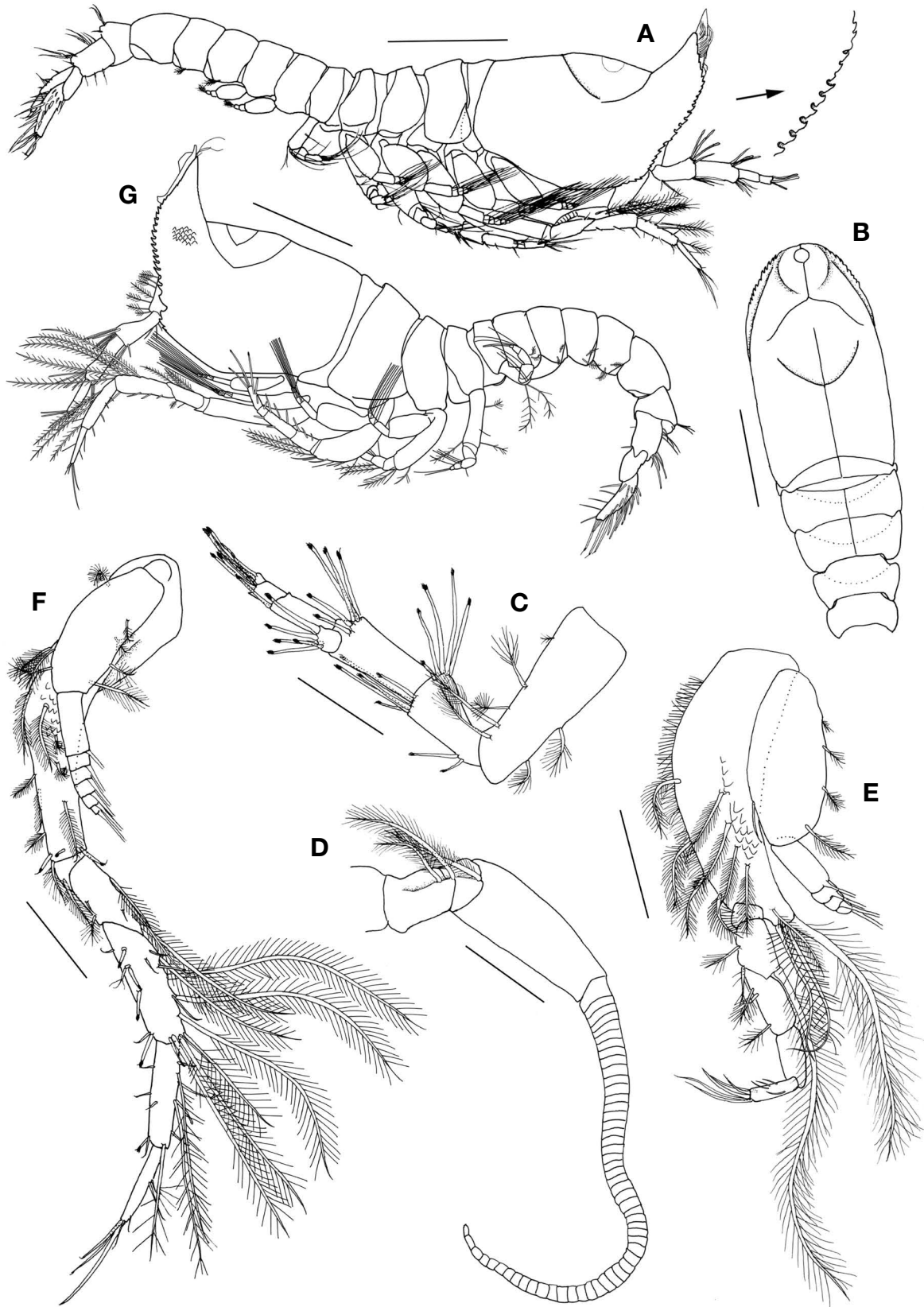


Fig. 1. *Pseudoleucon japonicus* Gamô, 1964, subadult male, 2.6 mm. A, habitus, lateral view; B, carapace and pereon, dorsal view; C, antenna 1; D, antenna 2; E, maxilliped 3; F, pereopod 1; G, habitus of subadult female, lateral view, 2.7 mm. Scale bars: A, B, G=0.5 mm, C-F=0.2 mm.

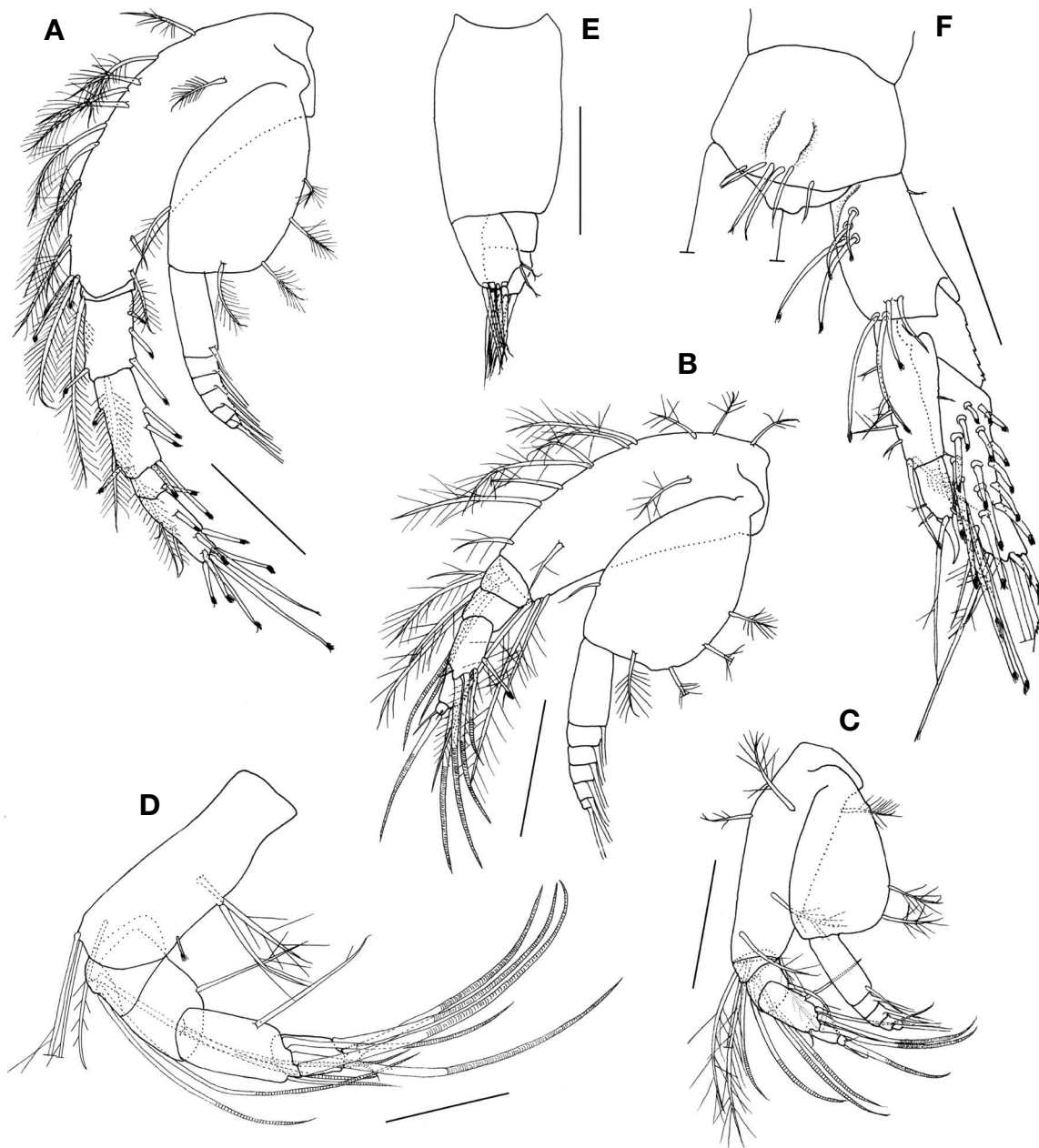


Fig. 2. *Pseudoleucon japonicus* Gamô, 1964, subadult male, 2.6 mm. A, pereopod 2; B, pereopod 3; C, pereopod 4; D, pereopod 5; E, pleopod 1; F, uropods and last pleonite. Scale bars: A–C, F=0.2 mm, D, E=0.1 mm.

bearing a bundle of hairs laterodistally; dactylus 2.9 times as long as propodus, with 1 short simple and 1 plumose setae medially, 2 simple setae bearing a bundle of hairs on lateral face, 1 simple seta bearing a bundle of hairs laterally, 1 simple seta and 5 simple setae bearing a bundle of hairs terminally.

Pereopod 3 (Fig. 2B) basis 1.7 times as long as remaining articles combined, with 10 plumose setae medially, 2 plumose setae on lateral face, 1 plumose and 2 long plumose setae laterodistally, 1 plumose and 1 long

plumose setae distally; ischium 0.1 times as long as basis, with 1 plumose seta medially, 1 plumose and 1 annulate setae distally; merus subequal in length to ischium, with 1 annulate seta distally; carpus 1.9 times as long as merus, with 1 simple seta bearing a bundle of hairs laterally, 1 short simple and 3 annulate setae distally; propodus 0.6 times as long as carpus, with 1 annulate seta laterodistally; dactylus 0.3 times as long as propodus, with 2 short simple and 1 annulate setae terminally.

Pereopod 4 (Fig. 2C), basis 1.7 times as long as remain-

ing articles combined, with 1 plumose seta medially, 3 plumose setae on lateral face, 1 plumose seta laterally, 1 plumose and 2 long plumose setae distally; ischium 0.1 times as long as basis, with 4 annulate setae distally; merus 1.6 times as long as ischium, with 1 plumose and 1 annulate setae distally; carpus 1.7 times as long as merus, with 1 annulate seta laterally, 1 short simple and 3 annulate setae distally; propodus 0.5 times as long as carpus, unarmed; dactylus 0.2 times as long as propodus, with 2 short simple and 1 annulate setae terminally.

Pereopod 5 (Fig. 2D), basis 0.8 times as long as remaining articles combined, with 3 plumose setae mediodistally, 2 plumose setae and 1 simple seta bearing a bundle of hairs laterally; ischium 0.3 times as long as basis, with 3 annulate setae medially; merus 1.9 times as long as ischium, with 1 plumose seta laterally, 1 annulate seta distally; carpus subequal in length to merus, with 1 plumose seta laterally, 4 annulate setae distally; propodus 0.5 times as long as carpus, with 1 annulate seta laterodistally; dactylus 0.2 times as long as propodus, with 1 short simple seta medially, 1 annulate seta terminally.

Pleopod 1 (Fig. 2E), basis 2.5 times as long as inner ramus, unarmed; outer ramus 2-articulated, with 4 simple setae terminally; inner ramus unarticulated, with 2 complex pedunculate setae laterally, 4 simple setae terminally.

Uropod (Fig. 2F), peduncle subequal in length to last pleonite, with 1 simple seta and 7 simple setae bearing a bundle of hairs medially, 1 short simple seta laterally. Uropod endopod 2-articulated, 1.4 times as long as peduncle, 0.7 times as long as exopod; article 1 with 4 plumose setae and 1 simple seta with single subterminal setule medially, 1 plumose seta and 1 simple seta bearing a bundle of hairs mediodistally, 1 short simple seta laterally; article 2 0.4 times as long as article 1, with 1 short simple seta and 1 simple seta with single subterminal setule mediodistally, 1 short simple seta laterodistally, 1 long plumose and 1 stout simple setae terminally. Uropod exopod 2-articulated, 1.9 times as long as peduncle; article 1 unarmed, article 2 with 3 plumose setae, 1 broken seta, and 21 simple seta bearing a bundle of hairs.

Subadult female (DKUCUM 202001). Body length (Fig. 1G) 2.7 mm, excluding uropods. Carapace slightly longer than 1/3 of body length, 1.5 times as long as its depth; shape and sculpture of carapace similar to subadult male. Pereon 0.7 times as long as carapace, shorter than 1/3 of body length; pereopods 4 and 5 without exopod. Pleon 0.6 times as long as carapace and pereon together, without pleopod.

Distribution. Korea (Yellow Sea), Japan.

Remarks. *Pseudoleucon japonicus* Gamô, 1964 is easily distinguished from *Pseudoleucon sorex* Zimmer, 1903 by having a pair of short oblique ridges on the carapace. In the original description, only the female of *P. japonicus* was described (Gamô, 1964). Fortunately, the specimens of

both sexes were collected in the present study. There is no doubt that these specimens are *P. japonicus* due to the following characters: 1) the carapace has strong serrations on antero-lateral margin and a pair of short oblique ridges on the side surface; 2) the short oblique ridges begin near the end of frontal lobe and merge with dorsal median carina; 3) the antenna 1, pereopod 2 and uropod have a lot of simple setae decorated with a bundle of hairs at the end. Also, the setal type and pattern of appendages, such as antenna 1, maxilliped 3, pereopods 1–5 and uropod, are almost the same as Gamô's specimen. There is, however, a slight difference in the length ratio of the pereopods and uropods, between the collected specimens and the original description (Gamô, 1964), which is assumed to be due to sexual dimorphism and developmental variation.

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