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## A new record of paramunnid isopod *Paramunna koreana* MALYUTINA & USHAKOVA, 2001 from Japan (Crustacea: Isopoda: Asellota)

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**ABSTRACT**—*Paramunna koreana* MALYUTINA & USHAKOVA, 2001 is reported from Japanese water for the first time. An adult male and juvenile female are described based on the Japanese material.

**KEY WORDS:** *Paramunna koreana*, Isopoda, Asellota, Paramunnidae, Kanagawa, Japan

### INTRODUCTION

Paramunnidae is a large family in the suborder Asellota, of seventeen genera of close to 100 species, all of which are benthic dwellers showing a global distribution (JUST & WILSON, 2004). Among them ten species and one subspecies of 4 genera, *Ascionana rhipis* (SHIMOMURA & MAWATARI, 1999), *Munnogonium armigerum*, SHIMOMURA & MAWATARI, 2000, *M. orientale* SHIMOMURA & MAWATARI, 2000, *Pleurogonium bifolium* SHIMOMURA & MAWATARI, 2001, *P. hispidum* SHIMOMURA & MAWATARI, 2001, *P. angustum* KUSSAKIN, 1972, *P. inerme orientale* KUSSAKIN, 1962, *Heterosignum mutsuensis* GAMÓ, 1976, *H. elegans* SHIMOMURA & MAWATARI, 2002, *H. ohtsukai* SHIMOMURA & MAWATARI, 2002, *H. otsuchiensis* SHIMOMURA & MAWATARI, 2002 have been so far reported from Japanese coast (GAMÓ, 1976; SHIMOMURA & MAWATARI, 1999, 2000, 2001, 2002).

Our survey of the invertebrate fauna on a granite stone slab for an abalone culture in the coast of Kanagawa Prefecture yielded *Paramunna koreana* MALYUTINA & USHAKOVA, 2001, originally described from Korea, as the first record of the species from Japan. The species are redescribed in detail based on the newly collected specimens. A juvenile female of the species is described for the first time.

### MATERIALS AND METHODS

Specimens were obtained by hand sorting from the surface of granite stone slab for an abalone culture. All the specimens obtained were fixed and preserved in 70% ethanol. Each individual was dissected appendage mounted on glass microslides and observed using a compound microscope equipped with differential interference contrast optics. Total length as indicated in "Material examined" was measured from

the tip of the head to the end of the pleotelson.

The specimens are deposited in the Kitakyushu Museum of Natural History & Human History (KMNH).

### TAXONOMY

#### *Paramunna koreana* MALYUTINA & USHAKOVA, 2001

*Paramunna koreana* MALYUTINA & USHAKOVA, 2001: 3-4, figs. 4, 5. – JUST & WILSON, 2004: 393-395, fig. 8.

(Figs. 1-2)

Material examined. Nagai, Yokosuka, Kanagawa Prefecture, Japan, 8 m deep, on a granite stone slab, 10 December 2003: 2 males, 0.64 mm (KMNH IvR 700,024), 0.64 mm (KMNH IvR 700,025); juvenile female, 0.44 mm (KMNH IvR 700,026).

#### Description of male (KMNH IvR 700,024)

Body (Fig. 1A) approximately 1.8 times as long as maximum width. Cephalon with expansion divided into 2 lobes by a shallow median concave; lobes of cephalon each with cuticular scale marginally; posterior margin convex between eyestalks. Eyes each with brown pigment. Pereonites each with few short setae laterally. Pereonite 1 robust, broader than cephalon; pereonites 2-7 subequal in width and length. Pereonites 1-6 laterally rounded; pereonite 7 with slightly pointed posterolateral corners. Coxae not dorsally visible on all pereonites. Pleonite sunken into pereonite 7. Pleotelson heptagonal, slightly wider than long, widest near anterior margin, with a few setae laterally and a pair of hooked teeth posterolaterally. Uropods biramous; endopod shorter than exopod, with 2 simple setae distally; exopod with 1 broom seta and 4 simple setae distally.

Antennula (Fig. 1C) composed of 6 articles. Article 1 broadest, with 1 large cuticular scale and 1 simple seta medially;

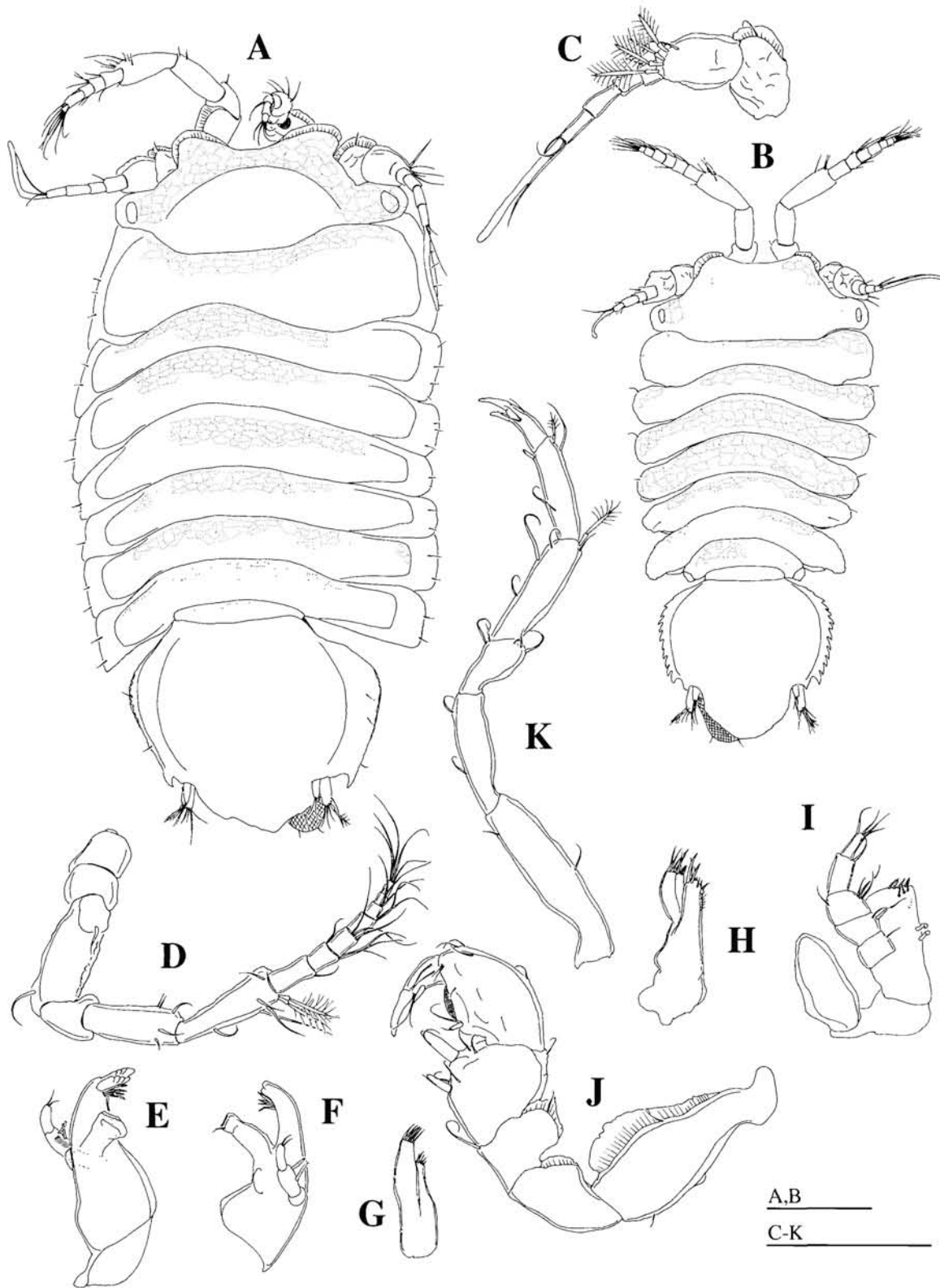


Fig. 1. *Paramunna koreana* MALYUTINA & USHAKOVA, 2001, A, C-K, male (KMNH IvR 700,024), B, juvenile female (KMNH IvR 700,026): A, B, habitus, dorsal; C, right antennula, ventral; D, right antenna, ventral; E, left mandible, medial; F, right mandible, dorsal; G, right maxillula, ventral; H, right maxilla, ventral; I, right maxilliped, ventral; J, right pereopod 1, medial; K, right pereopod 2. Scales = 100  $\mu$ m.

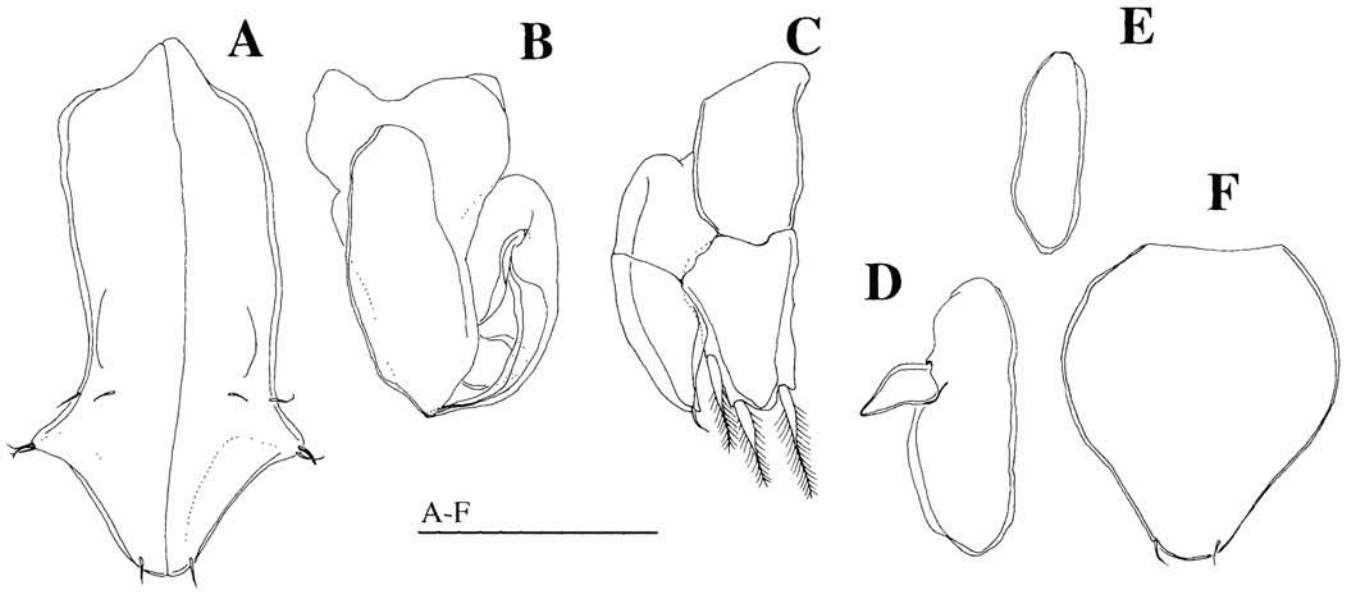


Fig. 2. *Paramunna koreana* MALYUTINA & USHAKOVA, 2001, A-E, male (KMNH IvR 700,024), F, juvenile female (KMNH IvR 700,026): A, pleopod 1, ventral; B, right pleopod 2, ventral; C, right pleopod 3, ventral; D, right pleopod 4, ventral; E, right pleopod 5, ventral; F, operculum, ventral. Scale = 100  $\mu$ m.

article 2 longer than article 1, with 1 simple and 4 broom setae distally; article 3 shortest, with 1 distal-medial simple seta; article 4 slightly longer than article 3; article 5 longer than article 4; article 6 as long as article 5, apically with 1 aesthetasc and 2 short, 1 long setae.

Antenna (Fig. 1D) composed of 6 stout articles and 7 thin flagellar articles. Article 1 short, without setae; article 2 as long as article 1, article 3 proximolaterally with 1 protrusion, with single seta, distomedially with 1 simple seta; article 4 approximately 1/3 as long as article 3; article 5 approximately twice as long as article 4, distally with 5 simple, short setae; article 6 slightly longer than article 5, medially with 2 broom and 3 simple setae, distolaterally with 1 simple seta. Flagellum approximately 1.6 times as long as article 6, each with some simple setae.

Left mandible (Fig. 1E) consisting of palp, incisor and molar process, lacinia mobilis and setal row. Article 1 of palp without setae; article 2 as long as article 1, with 2 setulated setae and some scales; article 3 narrowest, apically with 2 simple setae. Incisor with 4 cusps; lacinia mobilis with 4 teeth; setal row with 4 setae; molar process without setae.

Right mandible (Fig. 1F) lacking lacinia mobilis; molar process with short seta apically.

Maxillula (Fig. 1G) inner lobe apically with 5 setae; outer lobe apically with 6 setae.

Maxilla (Fig. 1H) with inner lobe with 6 apical setae and some medial setae; outer 2 lobes each with 4 apical setae.

Maxilliped (Fig. 1I): article 1 broader than long, with 1

medial seta; article 2 trapezoidal, as long as article 1, with 2 medial setae; article 3 longer than article 2, as broad as article 2, with 3 medial and 1 lateral setae; article 4 as long as article 3, approximately half as broad as article 3, with 2 mediolateral setae; article 5 shorter and narrower than article 4, apically with 4 setae; endite quadrate, with 1 dorsal, 3 subdistal simple setae, and with 4 pectinate setae distally and two coupling hooks medially; epipod ovate, approximately 2.3 times as long as broad.

Pereopod 1 (Fig. 1J) shorter than pereopods 2-7; basis longest, dorsally with 1 broad cuticular scale and 1 seta, and with 1 ventral seta; ischium approximately 1.9 times as long as basis, dorsally with 1 cuticular scale; merus trapezoidal, approximately half as long as ischium, dorsally with 1 broad cuticular scale and 1 seta, and with 1 seta distal-ventrally; carpus broadest, ventrally with 2 robust sensory setae and 1 simple seta, with 3 medial and 1 distodorsal simple setae; propodus slightly longer than carpus, ventrally with 1 fringe and 1 robust sensory and 1 simple setae, medially with 3 simple setae and 4 simple scales, and with 3 simple setae dorsally; dactylus with 2 medial and 2 distal simple setae, and slightly curved and short claws.

Pereopod 2 (Fig. 1K) as long as pereopods 3-7; basis longest article, with 1 ventral and 1 dorsal simple setae; ischium approximately 1.6 times as long as basis, ventrally with 2 simple setae; merus trapezoidal, with 2 ventral and 3 dorsal simple setae; carpus slightly longer than ischium, with 3 ventral simple setae, dorsally with 1 broom and 1 simple setae; propodus shorter than carpus, ventrally with 1 robust sensory and 1 simple setae, dorsally with 1 broom and 1 simple setae, and with 1 medial

simple seta; dactylus narrowest article, with 1 ventral and 2 medial simple setae, and 1 curved and 1 minute claws.

Pereopods 3-7 similar to pereopod 2 in shape and chaetotaxy.

Pleopod 1 (Fig. 2A) with triangular lateral expansion at 3/4 length, approximately 1.9 times as long as width, bearing 3 setae on each lateral tip, and with 2 pairs of simple setae ventrally and pair of simple setae apically.

Pleopod 2 (Fig. 2B) protopod broad, without setae; endopod reaching to tip of protopod, with slender curved appendix masculina; exopod stout.

Pleopod 3 (Fig. 2C) endopod with 3 stout plumose setae distally; exopod slightly narrower than endopod, apically with 1 short simple seta.

Pleopod 4 (Fig. 2D) endopod ovate, approximately 2.6 times as long as width; exopod minute.

Pleopod 5 (Fig. 2E) ovate, approximately 3.3 times as long as width.

#### Description of juvenile female (KMNH IvR 700,026)

Body (Fig. 1B) approximately twice as long as maximum width. Cephalon with rudimentary expansion divided into 2 lobes by a shallow median concave; posterior margin convex between eyestalks. Pereonites 2-5, laterally rounded, each with few short setae laterally. Pereonite 1 slightly, broader than cephalon; pereonites 2 to 5 decreasing in width gradually; pereonite 6 as broad as pereonite 5, posterior-laterally projected; pereonite 7 laterally bilobed. Coxae dorsally visible on pereonites 4-7. Pleotelson wider than long, with 11 pairs of acute teeth.

Operculum (Fig. 2F) approximately 1.1 times as long as width, apically rounded, subapically with 2 short setae.

**Remarks.** The present specimens were identified with *Paramunna koreana* MALYUTINA & USHAKOVA, 2001, known from the East coast of South Korea (type locality), by the following characters: (1) the cephalon divided into two lobes by a shallow median concave; (2) heptagonal shaped pleotelson; (3) ventrally convex palm of propodus of pereopod 1; (4) moderately narrow maxilliped palp; (5) pleopod 1 with triangular lateral expansion at 3/4 length. Some minor differences between Japanese and the original materials are follows: the former has a well-developed cuticular scale on basis of pereopod 1, and short exopod of

pleopod 4, while the latter has a rudimentary scale on basis of pereopod 1, and moderately long exopod of pleopod 4.

The small female specimen (KMNH IvR 700,026) collected simultaneously with the adult male are assigned to the species for the following reasons: (1) two lobes on anterior margin of the cephalon; (2) ovate operculum with 2 short setae subapically. The specimen is probably juvenile of the species, because its pereonite 7 is rudimentary. Some differences of habitus between the juvenile and mature female of the original description are as follows: the former has laterally rounded pereonites 1-6, dorsally visible coxae of pereonites 4-7, and the pleotelson with 11 pairs of acute teeth laterally.

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