

## New Report of Two Species of Genus *Pentias* (Crustacea: Malacostraca: Isopoda) from South Korea

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**Abstract** - Two marine isopods, *Pentias hayi* Richardson, 1904 and *P. thompsoni* Collinge, 1916 were verified as unrecorded species in South Korea. The genus *Pentias* is reported for the first time in South Korea. These two isopods were collected from Heuksan-do Island and Ulleung-do Island from South Korea, respectively. We provide descriptions of the diagnostic characteristics, illustrations of two species and their partial sequences of the mitochondrial cytochrome *c* oxidase subunit 1 (*COI*) for molecular characteristics.

**Key words:** isopods, new records, *Pentias*, South Korea

### INTRODUCTION

The genus *Pentias* Richardson, 1904 is one of 22 genera belonging to the family Idoteidae Samouelle, 1819 that currently comprises four species (Poore and Schotte 2015). The genus *Pentias* is reported for the first time in South Korea.

We provide detailed descriptions of the diagnostic characteristics, illustrations and partial sequences of the mitochondrial cytochrome *c* oxidase subunit 1 (*COI*) of the two species: *Pentias hayi* Richardson, 1904 and *Pentias thompsoni* Collinge, 1916. Additionally, a key to the worldwide species of *Pentias* is provided.

### MATERIALS AND METHODS

#### 1. Sample collection

The specimens of *Pentias hayi* and *P. thompsoni* were collected with light traps from Heuksan-do Island and Ulleung-do Island in South Korea, respectively. They were

preserved directly in 95% ethyl alcohol after collection. All examined specimens were deposited in the National Institute of Biological Resources (NIBR) and Inha University, South Korea.

#### 2. Morphological analysis

Specimens were observed and dissected under a stereomicroscope (Model SZX-7; Olympus, Tokyo, Japan). Illustrations of appendages were made with a drawing tube connected to a light microscope (Model DM 2500; Leica, X50-630, Wetzlar, Germany). Drawings of whole bodies were made using a drawing tube attached to a stereomicroscope (Olympus SZX-12). Measurements of appendages and whole body lengths were taken using a stage micrometer (Leica, Germany) and an ocular micrometer.

#### 3. DNA sequencing

The *COI* sequences were determined according to the method used in the paper by Song and Min (2015) with two primers: jgLCO1490 5'-TITCIACIAAYCAYAARGAYATTGG-3' and jgHCO2198 5'-TAIACYTCIGGRTGICC RAA RAAAYCA-3' (Geller *et al.* 2013).

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## RESULTS AND DISCUSSION

Order Isopoda Latreille, 1817 등각목  
 Suborder Valvifera Sars, 1882 유변아목  
 Family Idoteidae Samouelle, 1819 주걱벌레과  
 Genus *Pentias* Richardson, 1904  
 거친다리주걱벌레속 (신칭)

### 1. *Pentias hayi* Richardson, 1904

길쭉거친다리주걱벌레 (신칭) (Fig. 2)

**Synonyms:** *Pentias hayi* Richardson, 1904: 47, figs. 24, 25.

**Material examined:** Korea: 1 female (NIBRIV0000307757), Heuksan-do Island, Sinan-gun, Jeollanam-do, 34°40'N, 125°26'E, Apr 3 2012, depth 3~4 m, collected with light traps by Song JH (Fig. 1).

**Diagnosis:** Body elongated, about 5 times longer than wide, 17.1 mm; coxae 6~7 occupy whole lateral margin. Maxillipedal palp with five articles. Pleotelson very long, with 3 incomplete sutures, almost equal in length to last five pere-

onites (3~7). All pereopods robust and short, with distinct bi-unguiculate dactylus. Coxal plates well visible dorsally on pereonites 2~7.

**Remarks:** In general, the material of *Pentias hayi* collected from South Korea is well agreed with the original description of Richardson (1904). *Pentias hayi* is very similar to *P. namikawai* Nunomura (2006) in external features. However, *P. hayi* differs from *P. namikawai* in the ratio between length and width in body; coxal plates on pereonites 2~7. Body almost 5 times longer than wide; coxal plates well visible dorsally on pereonites 2~7 in *P. hayi*. But, body almost 7.8 times longer than wide; coxal plates hardly visible dorsally on pereonites 2~7 in *P. namikawai*.

**Habitat:** This species collected from the South Korea on sandy and gravel bottom with some algae at 3~4 m depth.

**World distribution:** Japan (Richardson 1904), Korea.

**Deposition:** NIBR No. NIBRIV0000307757.

**Molecular characteristic:** GenBank accession number: KR261927.

**Identifiers:** Ji-Hun Song, Gi-Sik Min.

### 2. *Pentias thompsoni* Collinge, 1916

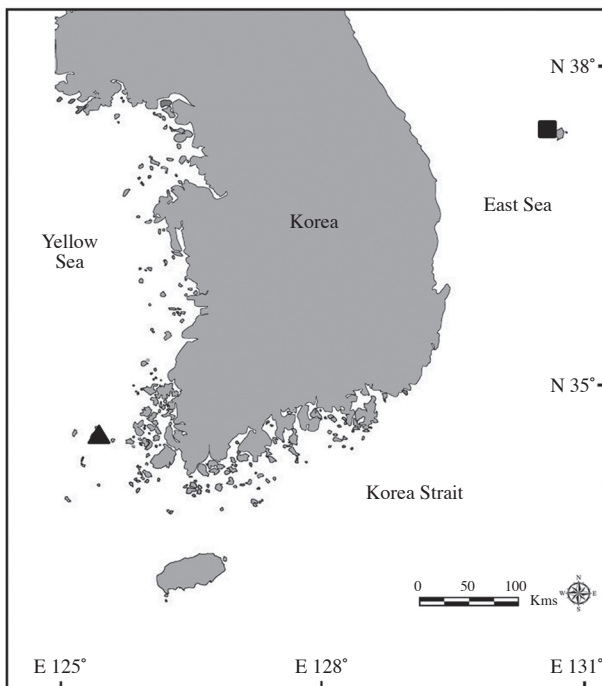
넓적거친다리주걱벌레 (신칭) (Fig. 3)

**Synonyms:** *Pentias thompsoni* Collinge, 1916: 1, pl. 3, figs. 1-10.

**Material examined:** Korea: 1 female (NIBRIV0000314409), Ulleung-do Island, Ulleung-gun, Gyeongsangbuk-do, 37°28'N, 130°54'E, Jul 20 2013, depth 3~4 m, collected with light traps by Song JH (Fig. 1).

**Diagnosis:** Body oblong ovate, about 3.5 times longer than wide, convex dorsally, 9.3 mm. Pleotelson narrower than pereonites 2~7, with 1 complete suture and 2 incomplete sutures. All pereopods robust and short, with distinct bi-unguiculate dactylus. Pleotelson have 1 complete suture and 2 incomplete sutures.

**Remarks:** In general, the material of *Pentias thompsoni* collected from South Korea is well agreed with the original description by Collinge (1916). *Pentias thompsoni* is distinctly different from all other species of *Pentias*: (1) pleotelson have 1 complete suture and 2 incomplete sutures (other species have 3 incomplete sutures) and (2) relative wider body, about 3.5 times longer than wide (more than 5 times longer than wide in other species).



**Fig. 1.** The collection locality of two species of genus *Pentias* in this study: *Pentias hayi*, Heuksan-do Island, Sinan-gun, Jeollanam-do (▲); *Pentias thompsoni*, Ulleung-do Island, Ulleung-gun, Gyeongsangbuk-do (■).

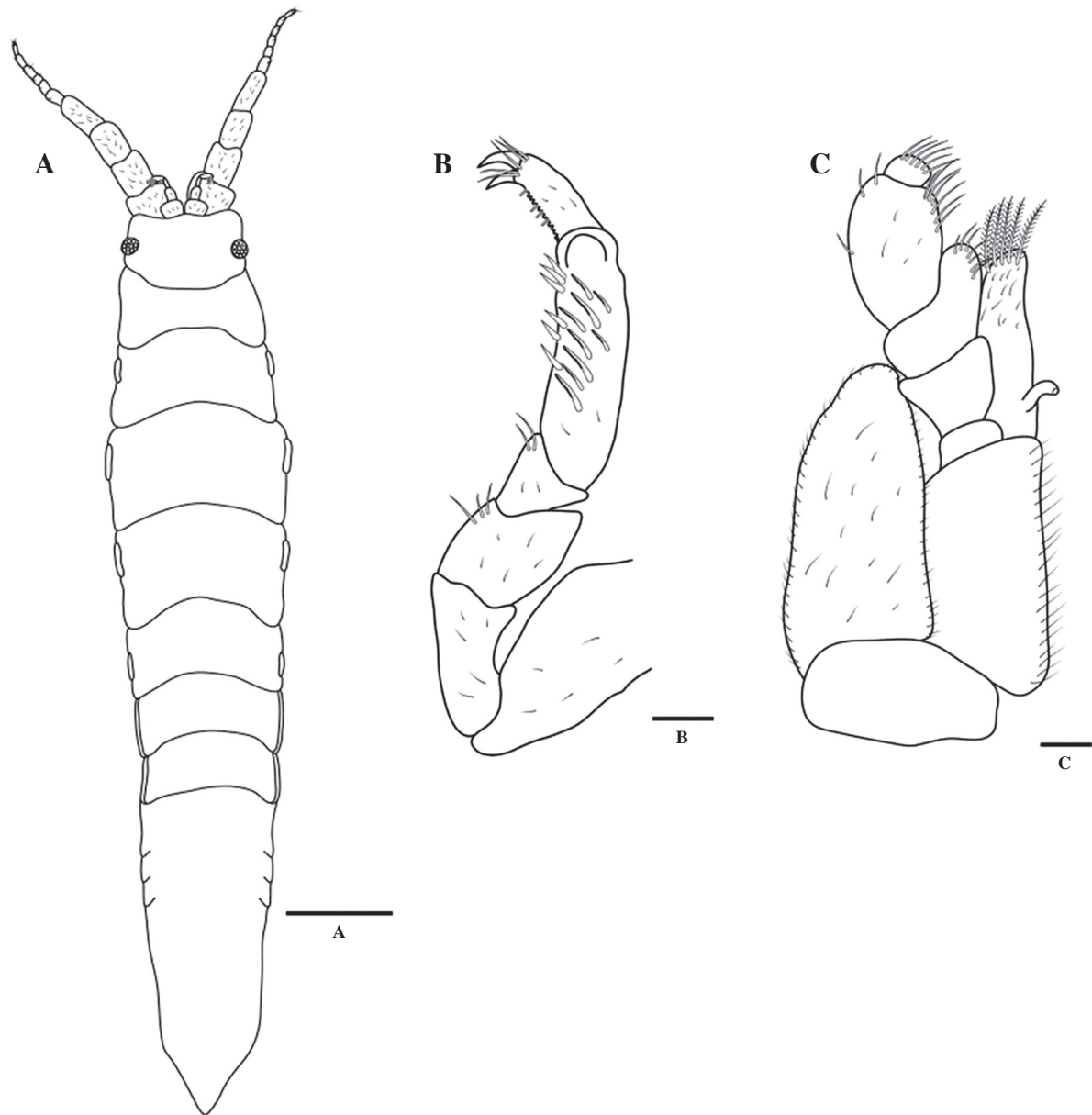


Fig. 2. *Pentias hayi*, female. A, body, dorsal view; B, pereopod 1; C, maxilliped. Scale bars: A=2 mm, B=0.2 mm, C=0.1 mm.

**Habitat:** This species collected from the South Korea on sandy and gravel bottom with some algae at 3~4 m depth.

**World distribution:** Japan (Collinge 1916), Korea.

**Deposition:** NIBR No. NIBRIV0000314409.

**Molecular characteristic:** GenBank accession number: KR261928.

**Identifiers:** Ji-Hun Song, Gi-Sik Min.

### 3. *Pentias arimotoi* Rafi, 1973

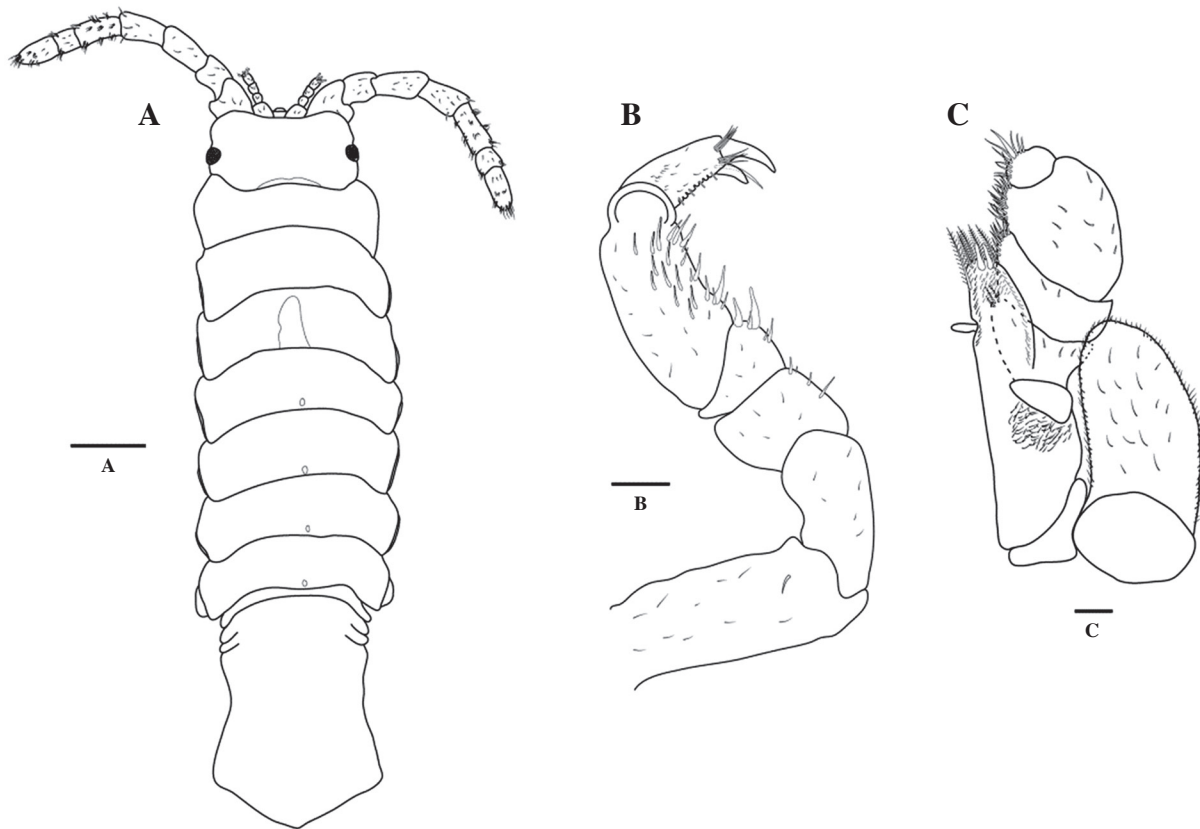
**Synonyms:** *Pentias arimotoi* Rafi, 1973: 1041, figs. 1, 2.

### 4. *Pentias namikawai* Nunomura, 2006

**Synonyms:** *Pentias namikawai* Nunomura, 2006: 27, fig. 9.

### Key to the worldwide species of the genus *Pentias*

1. The pleotelson with 1 complete suture and 2 incomplete



**Fig. 3.** *Pentias thompsoni*, female. A, body, dorsal view; B, pereopod 1; C, maxilliped. Scale bars: A = 1 mm, B = 0.2 mm, C = 0.1 mm.

- sutures (1 + 2)..... *P. thompsoni*  
 – The pleotelson with 3 incomplete sutures (0 + 3).....2  
 2. Pereonites 5~7 with dorsally invisible coxal plates.....  
 ..... *P. arimotoi*  
 – Pereonites 5~7 with dorsally visible coxal plates.....3  
 3. Body almost 5 times longer than greatest width; coxal  
 plates well visible dorsally on pereonites 2~7..... *P. hayi*  
 – Body almost 7.7 times longer than greatest width; coxal  
 plates hardly visible dorsally on pereonites 2~7.....  
 ..... *P. namikawai*

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turbance and Harmful Effects, funded by KIMST/MOF.

#### REFERENCES

- Collinge W. 1916. Description of a new species of Marine Isopoda of the genus *Pentias*, Richardson. *Int. J. Zool. R.* 1:33-35.
- Geller J, C Meyer, M Parker and H Hawk. 2013. Redesign of PCR primers for mitochondrial cytochrome *c* oxidase subunit I for marine invertebrates and application in all-taxa biotic surveys. *Mol. Ecol. Resour.* 13:851-861.
- Numomura N. 2006. Marine Isopod Crustaceans in the Sagami Sea, Central Japan. *Memoir. Natl. Sci. Mus.* 41:7-42.
- Poore GCB and M Schotte. 2015. *Pentias* Richardson, 1904. In: Schotte M., C.B Boyko, N.L. Bruce, G.C.B. Poore, S. Taiti & G.D.F. Wilson (eds.) (2015) *World Marine, Freshwater and Terrestrial Isopod Crustaceans database*. Accessed through: World Register of Marine Species at <http://www.marinespecies.org/aphia.php?p=taxdetails&id=249156> on 2015-03-30.

- Rafi F. 1973. A new species of the genus *Pentias* Richardson (Isopoda, Valvifera) from the Sea of Japan. *Can. J. Zool.* 51:1041-1045.
- Richardson H. 1904. Contributions to the natural history of the Isopoda. *Proc. Unit. States. Natl. Mus.* 27:1-89.
- Song JH and GS Min. 2015. Two new species, *Caenanthura koreana* sp. nov. and *Apanthura koreaensis* sp. nov. (Crustacea: Isopoda: Anthuridae) from South Korea. *Zootaxa* 3937:362-376.

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