

## New Record of Three Isopod Species (Crustacea: Malacostraca: Isopoda) from South Korea

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**Abstract** - Three marine isopods, *Symmius yamaguchiensis* Shimomura, 2008, *Colanthura pigmentata* Kensley, 1980 and *Synidotea nipponensis* Nunomura, 1985 are reported for the first time in South Korea. The family Chaetiliidae, and genera *Symmius* and *Colanthura* are new to South Korea. We provide descriptions of the diagnostic characteristics, illustrations of three species and their partial sequences of the mitochondrial cytochrome *c* oxidase subunit 1 (*COI*) for molecular characteristics.

**Keywords:** *Colanthura*, Chaetiliidae, *Symmius*, *Synidotea*, isopoda, South Korea

### INTRODUCTION

The genus *Symmius* Richardson, 1904, is one of among 12 genera belonging to the family Chaetiliidae Dana, 1849. Five species have been recorded in the genus *Symmius*: *S. azumi* Nunomura, 2008, *S. caudatus* Richardson, 1904, *S. philippinensis* Poore, 1991, *S. planus* Nunomura, 1984, *S. yamaguchiensis* Shimomura, 2008 (Poore and Schotte 2015c). The family Chaetiliidae and genus *Symmius* is new to South Korea.

The genus *Colanthura* Richardson, 1902 is one of seven genera belonging to the family Paranthuridae Menzies & Glynn, 1968 that is currently comprises of ten species (Poore and Schotte 2015a). This genus is also new to South Korea.

The genus *Synidotea* Harger, 1878, is one of 22 genera belonging to the family Idoteidae Samouelle, 1819. Currently, it comprises 61 species (Poore and Schotte 2015b). Two species of *Synidotea*: *S. laevidorsalis* (Miers, 1881) and *S. hikigawaensis* Nunomura, 1974 have previously been recorded in South Korea (Kwon 1986).

We provide descriptions of the diagnostic characteristics, illustrations, and partial sequences of the mitochondrial cytochrome *c* oxidase subunit 1 (*COI*) of three species.

### MATERIALS AND METHODS

#### 1. Sample collection

The specimens of *C. pigmentata* and *S. nipponensis* were collected with light traps from Yokjido Island and Sageunjin-beach in South Korea, respectively. The specimen of *S. yamaguchiensis* is collected with small dredge from Soyado Island in South Korea. 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

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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 Song and Min (2015) with two primers: jgLCO1490 5'-TITCIACIAAYCAYAARGAYATTGG-3' and jgHCO2198 5'-TAIACYTCIGGRTGICCRARAAYCA-3' (Geller et al. 2013).

## RESULTS AND DISCUSSION

Order Isopoda Latreille, 1817 등각목

Family Chaetiliidae Dana, 1849 두엽벌레과 (신칭)

Genus *Symmius* Richardson, 1904 창벌레속 (신칭)

### 1. *Symmius yamaguchiensis* Shimomura, 2008

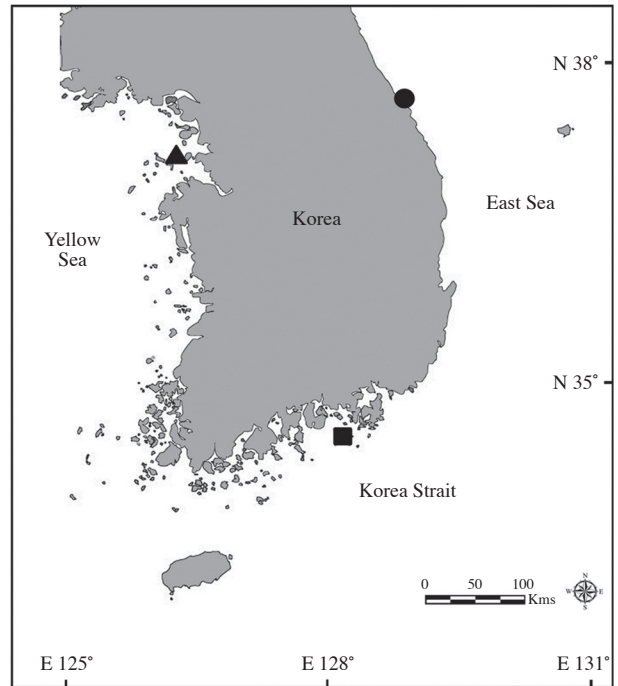
야마구치창벌레 (신칭) (Fig. 2)

**Synonyms:** *Symmius yamaguchiensis* Shimomura, 2008: 61, figs. 2-5.

**Material examined:** Korea: 2 females (NIBRIV0000316148, NIBRIV0000316149), Soyado Island, Incheon-si, 37° 12'N, 126° 10'E, Sep 21 2012, depth 0.5~1 m, collected with small dredge by Song JH (Fig. 1).

**Diagnosis:** Body elongate, 2.4 times as long as wide, dorsoventrally flattened, length 12.35 mm. Eyes small, situated ocular lobes. Head, pereonites and pleonite 2 with middorsal projections. Coxal plates large and distinctly visible dorsally on pereonites 5~7. Pleon 0.42 of total length, composed of 2 segments and pleotelson, pleonite 1 without mid-dorsal projection. Pleotelson triangular, tapering to sharply rounded apex.

**Remarks:** *Symmius yamaguchiensis* was described by Shimomura (2008) based on the specimens collected from the off Yamaguchi Prefecture, Japan. This species has been previously reported from type locality only. *Symmius yamaguchiensis* has a similar external appearance as *Symmius caudatus* Richardson, 1904. However, *S. yamaguchiensis* differs from *S. caudatus* in having wider body (2.5 times as long as



**Fig. 1.** The collection locality of three isopod species in this study: *Symmius yamaguchiensis*, Soyado Island, Incheon-si (▲); *Colanthura pigmentata*, Yokjido Island, Tongyeong-si, Gyeongsangnam-do (■); *Synidotea nipponensis*, Sageunjin-beach, Gangneung-si, Gangwon-do (●).

wide in *S. yamaguchiensis* versus 3.1 times as long as wide in *S. caudatus*) and pereonites 1~7 with mid-dorsal projection (pereonites without mid-dorsal projection in *S. caudatus*).

In general, *S. yamaguchiensis* from the South Korea is well agreed with the original descriptions and illustrations of Shimomura (2008). However, Korean specimen has some variation from those of type locality in the following characteristics: (1) anterior angle of ocular lobe slightly projecting anteriorly; (2) maxillipedal endite with two coupling hooks. As a result of this study, distribution of *S. yamaguchiensis* is more widened, and provides information of genus *Symmius* from South Korea for the first time.

**Habitat:** There is no information on habitat at the type locality. This species collected from the South Korea on sandy bottom with sea grass community at 0.5~1 m depth.

**World distribution:** Japan (Shimomura 2008), Korea.

**Deposition:** NIBR No. NIBRIV0000316148, NIBRIV0000316149 (2 females).

**Molecular characteristic:** GenBank accession number:

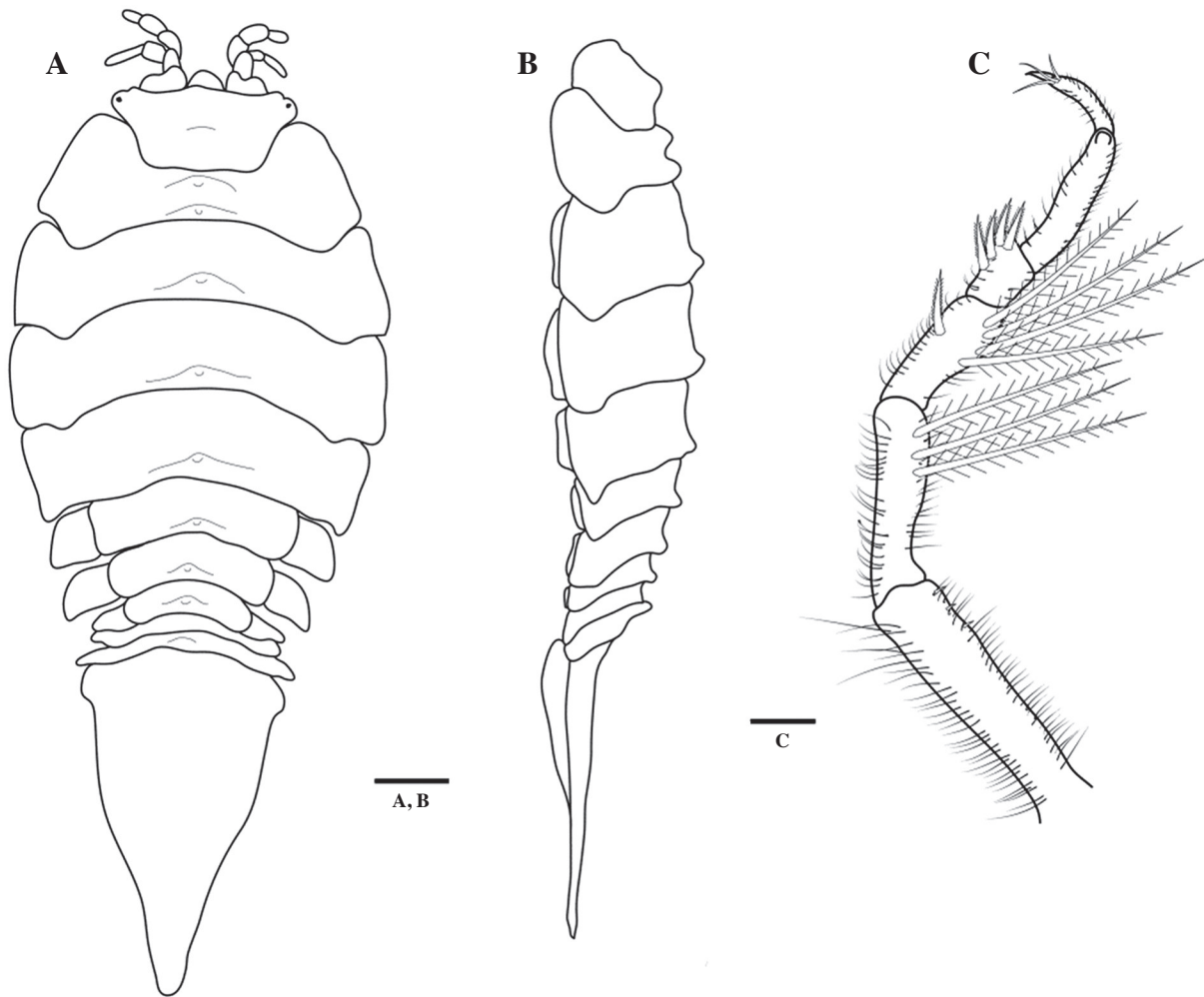


Fig. 2. *Symmius yamaguchiensis*, female. A, body, dorsal view; B, body, lateral view; C, pereopod 7. Scale bars: A, B = 1 mm, C = 0.2 mm.

KR493001, KR493002 (2 females).

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

**2. *Symmius azumai* Nunomura, 2008**

**Synonyms:** *Symmius yamaguchiensis* Shimomura, 2008: 15, figs. 2, 3.

**3. *Symmius caudatus* Richardson, 1904**

**Synonyms:** *Symmius caudatus* Richardson, 1904: 39, figs. 11-15.

**4. *Symmius philippinensis* Poore, 1991**

**Synonyms:** *Symmius philippinensis* Poore, 1991: 149, figs. 7, 8.

**5. *Symmius planus* Nunomura, 1984**

**Synonyms:** *Symmius planus* Nunomura, 1984: 60, figs. 3, 4.

Family Paranthuridae Menzies & Glynn, 1968

오목꼬리마디벌레과

Genus *Colanthura* Richardson, 1902 배마디벌레속 (신칭)

**6. *Colanthura pigmentata* Kensley, 1980**

깜장배마디벌레 (신칭) (Fig. 3)

**Synonyms:** *Colanthura pigmentata* Kensley, 1980: 5, figs. 2, 3; Poore, 1981: 70; Poore, 1984: 708.

**Material examined:** Korea: 3 males, 5 females, Yokjido Island, Tongyeong-si, Gyeongsangnam-do, 34°38'N, 128°

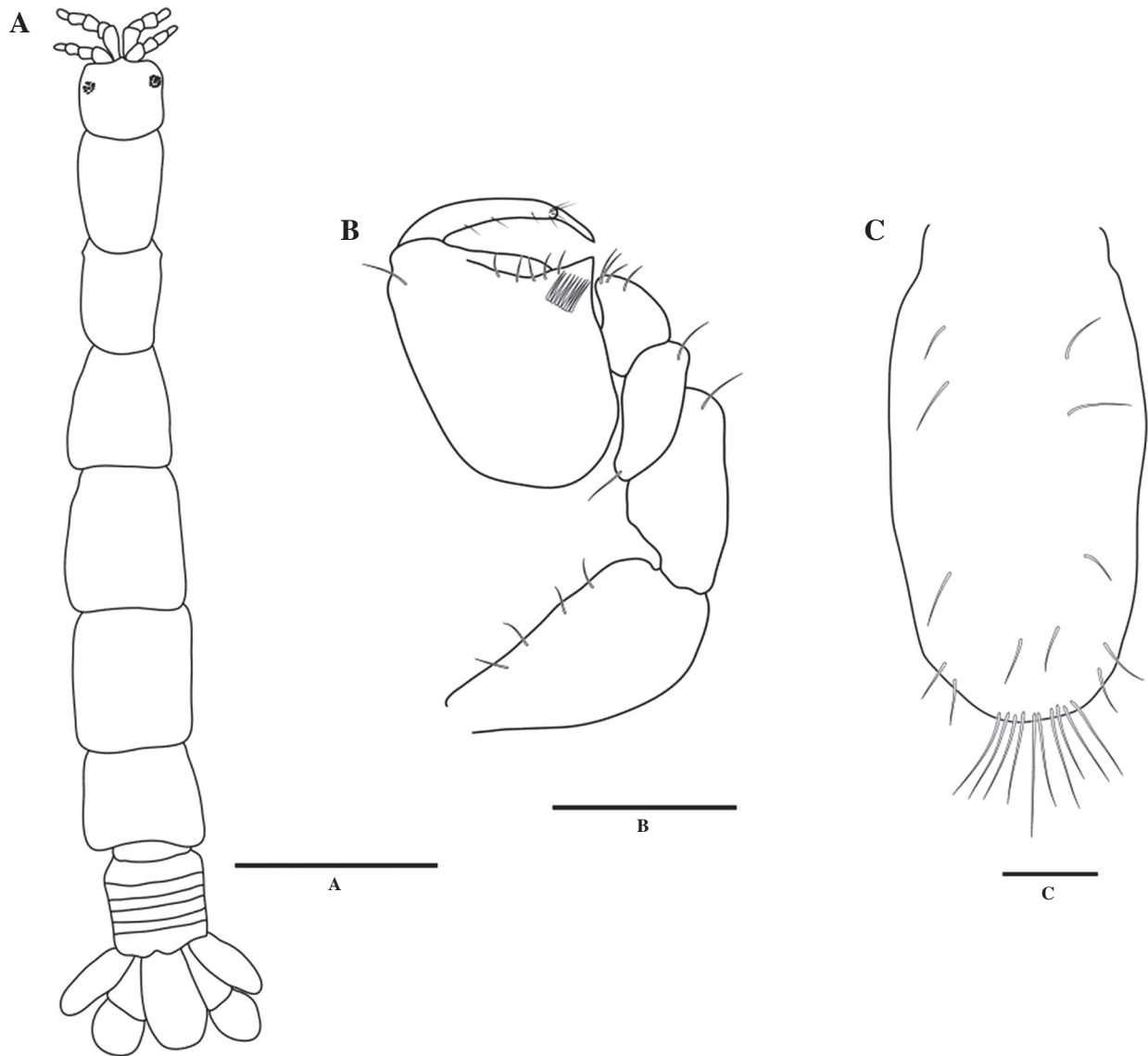


Fig. 3. *Colanthuria pigmentata*, female. A, body, dorsal view; B, pereopod 1; C, pleotelson. Scale bars: A = 1 mm, B = 0.2 mm, C = 0.1 mm.

14'E, September 10, 2012, depth 2~3 m, collected with light traps by Song JH (Fig. 1).

**Diagnosis:** Body with dark brown pigmentation, almost 8 times longer than greatest width, 4.8 mm. Pereonite 7 very short and seventh pair of pereopod absent. Pleonites 1~6 free, pleonite 1 about twice length of pleonite 2; pleonites 2~5 subequal; pleonite 6 longer, with a middorsal cleft on posterior margin. Palm of pereopod 1 with proximal triangular process. Pleotelson with no serration.

**Remarks:** *Colanthuria pigmentata* is distinguished from other species of *Colanthuria* by several characteristics: (1)

distinct projection on pereonites 1~5 lateral margin in male specimens; (2) body with dark brown pigmentation; (3) uropodal exopod and endopod with serrate margin; (4) rostrum equal in extent to anterolateral angles of cephalon. *Colanthuria pigmentata* is very similar to *C. nigra* Nunomura, 1975 in external features. However, the serrate margin on pleotelson is absent in *C. pigmentata*, while present in *C. nigra*. Additionally, *C. pigmentata* has a strong triangular proximal process on pereopod 1, while no proximal process on pereopod 1 in *C. nigra* (Nunomura and Nishimura 1975; Kensley 1980). In general, *C. pigmentata* specimens from

South Korea are well agreed with the illustrations and original description of Kensley (1980).

**Habitat:** Habitat information is not available for the type locality. Korean specimens were collected on sandy and gravel bottom with some green algae at 2~3 m depth.

**World distribution:** Madagascar (Kensley 1980), Korea.

**Deposition:** NIBR No. NIBRIV0000307755 (1 female).

**Molecular characteristic:** GenBank accession number: KR095339 (1 female).

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

Family Idoteidae Samouelle, 1819 주걱벌레과

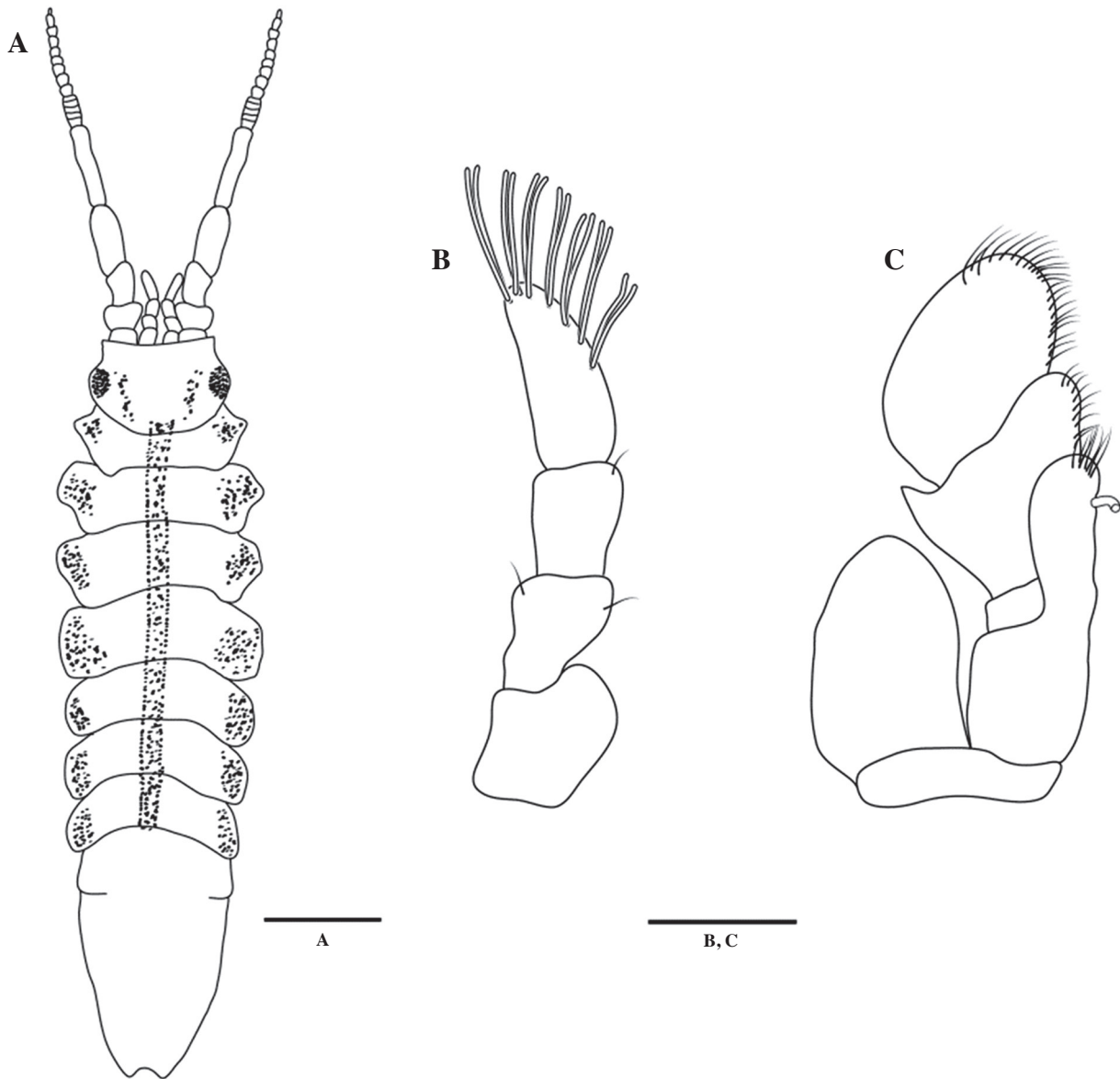
Genus *Synidotea* Harger, 1878 둥근주걱벌레속

**7. *Synidotea nipponensis* Nunomura, 1985**

일본둥근주걱벌레 (신칭) (Fig. 4)

**Synonyms:** *Synidotea nipponensis* Nunomura, 1985: 127, figs. 5, 6.

**Material examined:** Korea: 5 females, Sageunjin-beach, Gangneung-si, Gangwon-do, 37°48'N, 128°53'E, July 4, 2014, depth 2~3 m, collected with light traps by Song JH



**Fig. 4.** *Synidotea nipponensis*, female. A, body, dorsal view; B, antennule; C, maxilliped. Scale bars: A = 1 mm, B, C = 0.2 mm.

(Fig. 1).

**Diagnosis:** Body flattened, about 3.4 times as long as wide. Anterior margin of cephalon straight. Pereonites 1~3 with emarginated margin, but 4~7 with parallel margin. Pleotelson with an incomplete suture. Color dull yellow or grey. Posterior margin of pereonite 1 is hardly emarginated and lateral margins of pereonites 4~7 are rounded.

**Remarks:** *Synidotea nipponensis* is very similar to *S. hikigawaensis* Nunomura, 1974 in external features. However, *S. nipponensis* differs from *S. hikigawaensis* in the relative length of pereopods and the shape of pereonites. Pereopods 2~7 are long, especially pereopod 7; posterior margin of pereonite 1 is hardly emarginated; lateral margins of pereonites 4~7 are rounded (*S. nipponensis*). Pereopods are short; posterior margin of pereonite 1 is very emarginated; lateral margins of pereonites 4~7 are angulated (*S. hikigawaensis*).

In general, *S. nipponensis* specimens from South Korea are well agreed with the illustrations and original description of Nunomura (1985).

**Habitat:** Habitat information is not available for the type locality. South Korean specimens were collected from a sandy bottom with numerous algae at 1~2 m depth.

**World distribution:** Japan (Nunomura 1985), Korea.

**Deposition:** NIBR No. NIBRIV0000307759 (1 female).

**Molecular characteristic:** GenBank accession number: KR095340 (1 female).

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

#### 8. *Synidotea hikigawaensis* Nunomura, 1974

히키가와등근주걱벌레

**Synonyms:** *Synidotea hikigawaensis* Nunomura, 1974: 9, figs. 6, 7.

#### 9. *Synidotea laevidorsalis* (Miers, 1881) 등근주걱벌레

**Synonyms:** *Edotia hirtipes* var. *laevidorsalis* Miers, 1881: 69, pl. III, figs. 1, 2.

*Synidotea laevidorsalis* (Miers, 1881): Benedict, 1897: 404; Kwon, 1986: 117, fig. 8A.

#### Key to the Korean species of the genus *Synidotea*

1. Pleotelson shorter than one and a quarter times the proximal width ..... *S. laevidorsalis*

- Pleotelson longer than one and a half times the proximal width ..... 2
- 2. Pereonite 1 with very emarginated margin; pereonites 4~7 with angulated margin ..... *S. hikigawaensis*
- Pereonite 1 with hardly emarginated margin; pereonites 4~7 with rounded margin ..... *S. nipponensis*

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