

First Record of a Hyalid Species, *Protohyale pumila* (Crustacea: Amphipoda: Hyalidae), from Korea

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ABSTRACT

A hyalid amphipod, *Protohyale pumila* (Hiwatari and Kajihara, 1981), collected from Jeju Island is reported for the first time in the Korean fauna. The species is characterized by the presence of a short apical spine on the palp article 4 of maxilliped, a distinctly large and blunt cusp on the propodus of male gnathopod 1, and a distal truncate process on the palm of male gnathopod 2. Herein, the present species is described and illustrated. Korean hyalid amphipods now are composed of four species belonging to three genera. Voucher specimens were deposited in the Marine Arthropod Depository Bank of Korea, Seoul National University.

Keywords: *Protohyale pumila*, Hyalidae, Amphipoda, marine, Korea

INTRODUCTION

Members of the family Hyalidae are part of the littoral marine amphipod group and mainly inhabit intertidal zones and shallow water. Most members of the group are found among algae living in warmer waters (Barnard and Karaman, 1991; Hiwatari, 2003). A few subgroups of the hyalid amphipods, including the genus *Protohyale* Bousfield and Hendrycks, 2002, are known for having a simple-form preamplexing notch of peraeon segment 2 in female. The dactylus of male gnathopod 1 meshes correctly with and is used to grasp the precopulatory notch of the female (Hendrycks and Bousfield, 2001).

Only one species, *P. rubra* (Thomson, 1879), has been found in Korea until now. In the present study, *Protohyale pumila* (Hiwatari and Kajihara, 1981) is reported for the first time as a member of the Korean amphipod fauna.

Specimens were collected among algae living in the intertidal zone at Jeju Island, Korea and preserved in 95% ethanol. A stereomicroscope (MZ8; Leica, Wetzlar, Germany) and a compound microscope (BX-50; Olympus, Tokyo, Japan) were used for the observation. Dissection and mounting were conducted following the methodology of Barnard and Karaman (1991). Illustrations were made by using a drawing tube or camera lucida. Body length was measured from the tip of

rostrum to the posterior end of urosomite 3. All specimens examined herein were deposited in the Marine Arthropod Depository Bank of Korea (MADBK, <http://madbk.org>) located at Seoul National University, Korea.

SYSTEMATIC ACCOUNTS

Order Amphipoda Latreille, 1816
Family Hyalidae Bulycheva, 1957
Genus *Protohyale* Bousfield and Hendrycks, 2002

Key to the species of the genus *Protohyale* from Korea

- Propodus of gnathopod 1 in male and female dissimilar to each other; palm of male gnathopod 2 with distinct truncate process
..... *P. pumila* (Hiwatari and Kajihara, 1981)
- Propodus of gnathopod 1 in male and female similar to each other; palm of male gnathopod 2 without process ...
..... *P. rubra* (Thomson, 1879)

¹*Protohyale pumila* (Hiwatari and Kajihara, 1981)

(Figs. 1–3)

Hyale dollfusi: Iwasa, 1939: 280, Pl. 18, text-fig. 18; Stephensen, 1944: 69, fig. 24 [not Chevreux, 1911].

Korean name: ¹* 꼬마채찍해조슴이열새우

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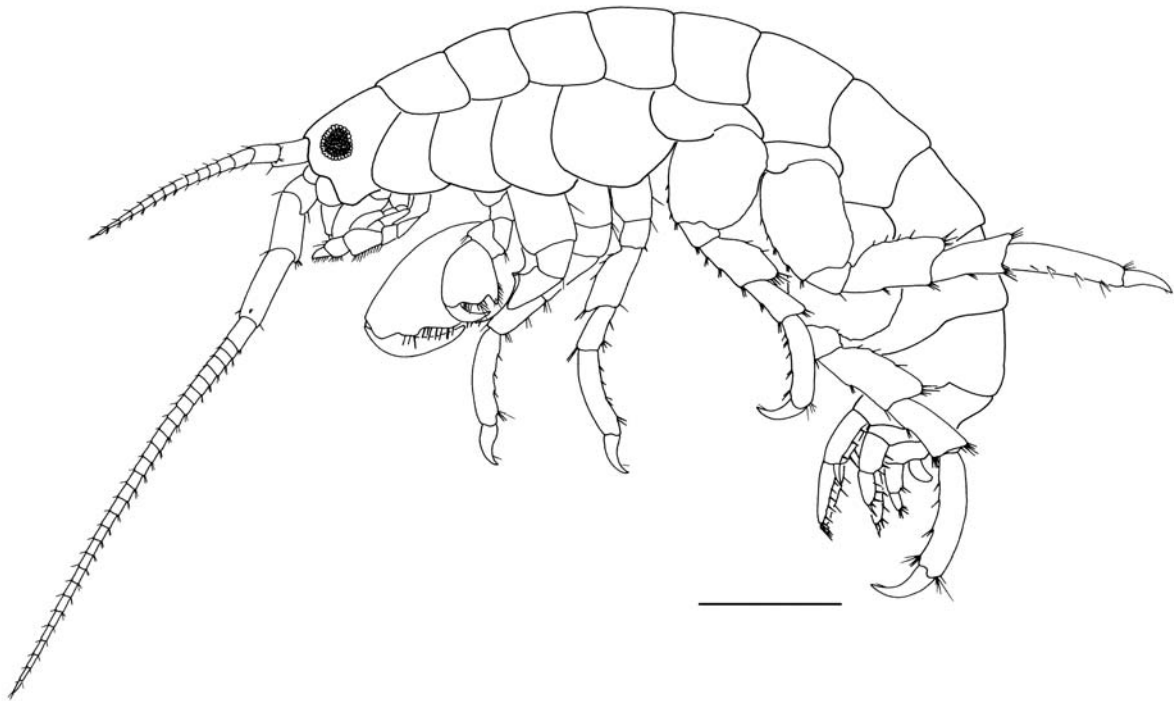


Fig. 1. *Protohyale pumila* (Hiwatari and Kajihara), male. Body. Scale bar=1 mm.

Hyale pumila Hiwatari and Kajihara, 1981: 35, figs. 1–4.

Protohyale (Boreohyale) pumila: Bousfield and Hendrycks, 2002: 77, fig. 36.

Material examined. Korea: 216 ♂♂, 21 ♀♀, Jeju-do, Jocheon-eup, Hamdeog-ri, Hamdeog Beach, 29 May 2007.

Description. Male: Body (Fig. 1) 6.98 mm long, compressed. Lateral cephalic lobe slightly convex, anteroventral cephalic excavation shallow. Eye black, large. Terminal part of antenna 1 reaching about one-fourth portion of antenna 2 flagellum. Antenna 2 about 0.5 times as long as body length, peduncle 5 slightly longer than peduncle 4. Palp article 4 of maxilliped slightly broad, bearing short apical spine and short marginal setae.

Coxa of gnathopod 1 (Fig. 2A) broad; basis without anterodistal lobe; carpus broad, bearing five spines on anterodistal margin, with expanded posterodistal lobe; propodus broadly expanded, anterior margin unarmed, with posterior marginal setae; palm convex, defined by large and blunt cusp, with one spine near defining corner; dactylus fitting palm.

Coxa of gnathopod 2 (Fig. 2B) subquadrate; basis bearing anterodistal lobe; ischium with subcircular lobe; merus slightly extended; propodus very large, anterior margin convex; palm oblique, subequal as long as posterior margin, with distal truncate process having one spine and several setae, whole of palm bearing spines; dactylus fitting palm.

Coxa of pereopod 2 (Figs. 2C, 3A) widest in middle, with posteroproximal excavation; propodus bearing pair of locking spines, locking spines subequal in size, heavily striated.

Basis of pereopods 3–5 (Figs. 2D–F, 3B) broad, subcircular, weakly serrate on posterior margin; merus and carpus slender; propodus having pair of locking spines, proximal locking spine larger than distal one, locking spines weakly striated.

Peduncle of uropod 1 (Fig. 3C) as long as rami, having large distolateral spine and marginal spines; inner and outer rami with three dorsal spines, respectively.

Peduncle of uropod 2 (Fig. 3D) almost as long as rami, having marginal spines; inner and outer rami each with two dorsal spines.

Peduncle of uropod 3 (Fig. 3E) about 1.5 times as long as ramus, bearing five inner marginal setae and two apicodorsal spines; ramus with six apical spines.

Telson (Fig. 3F) completely cleft, both lobes having four small setae on lateral margin.

Female: Body 6.12 mm long, slightly smaller than that of male.

Basis of gnathopod 1 (Fig. 3G) weakly swollen anterodistally; propodus slender, subrectangular, middle part of posterior margin concave; palm oblique, simple; dactylus fitting palm.

Gnathopod 2 (Fig. 3H) similar to gnathopod 1, rather lar-

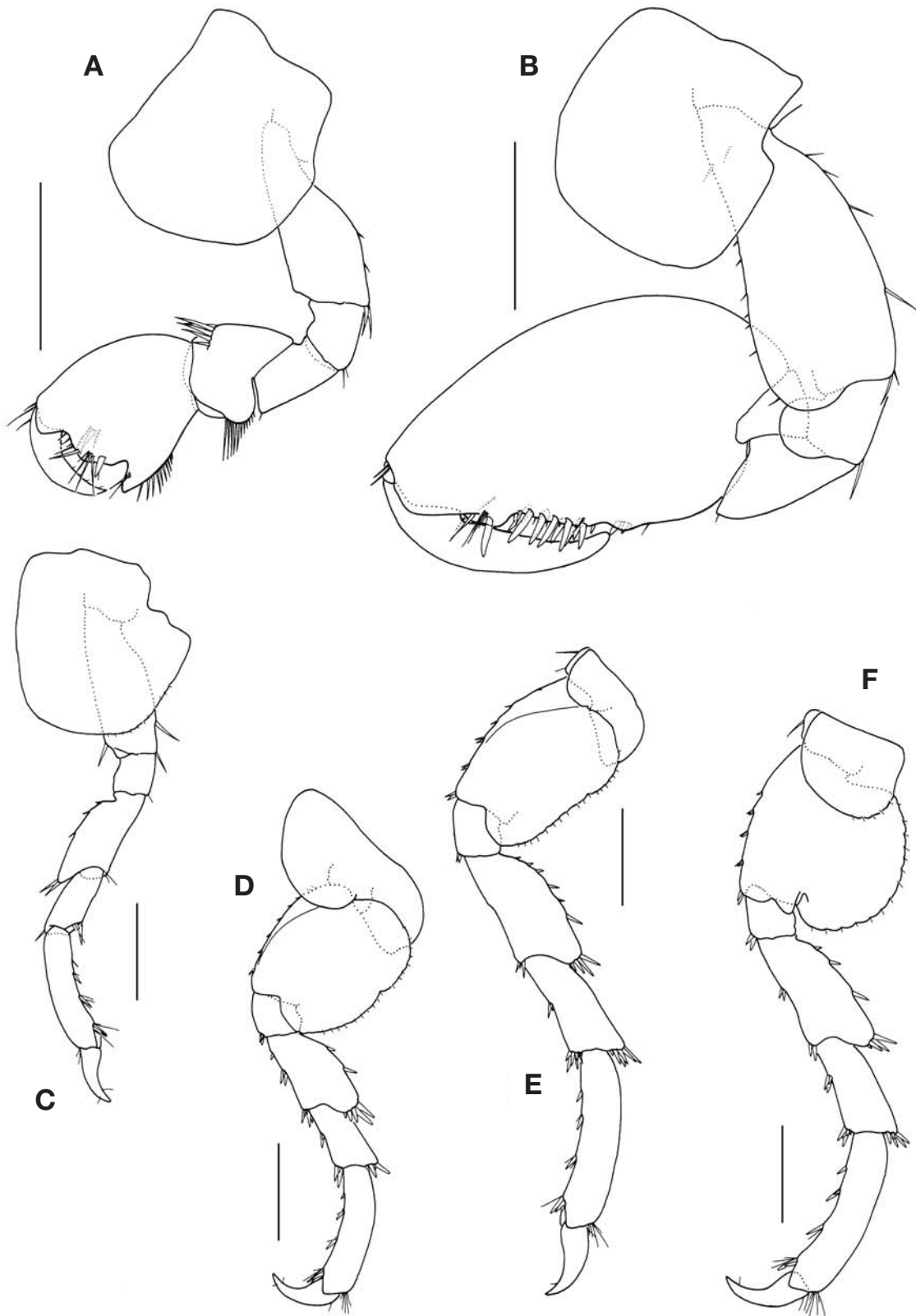


Fig. 2. *Protohyale pumila* (Hiwatari and Kajihara), male. A, Gnathopod 1; B, Gnathopod 2; C, Pereopod 2; D, Pereopod 3; E, Pereopod 4; F, Pereopod 5. Scale bars: A–F=0.5 mm.

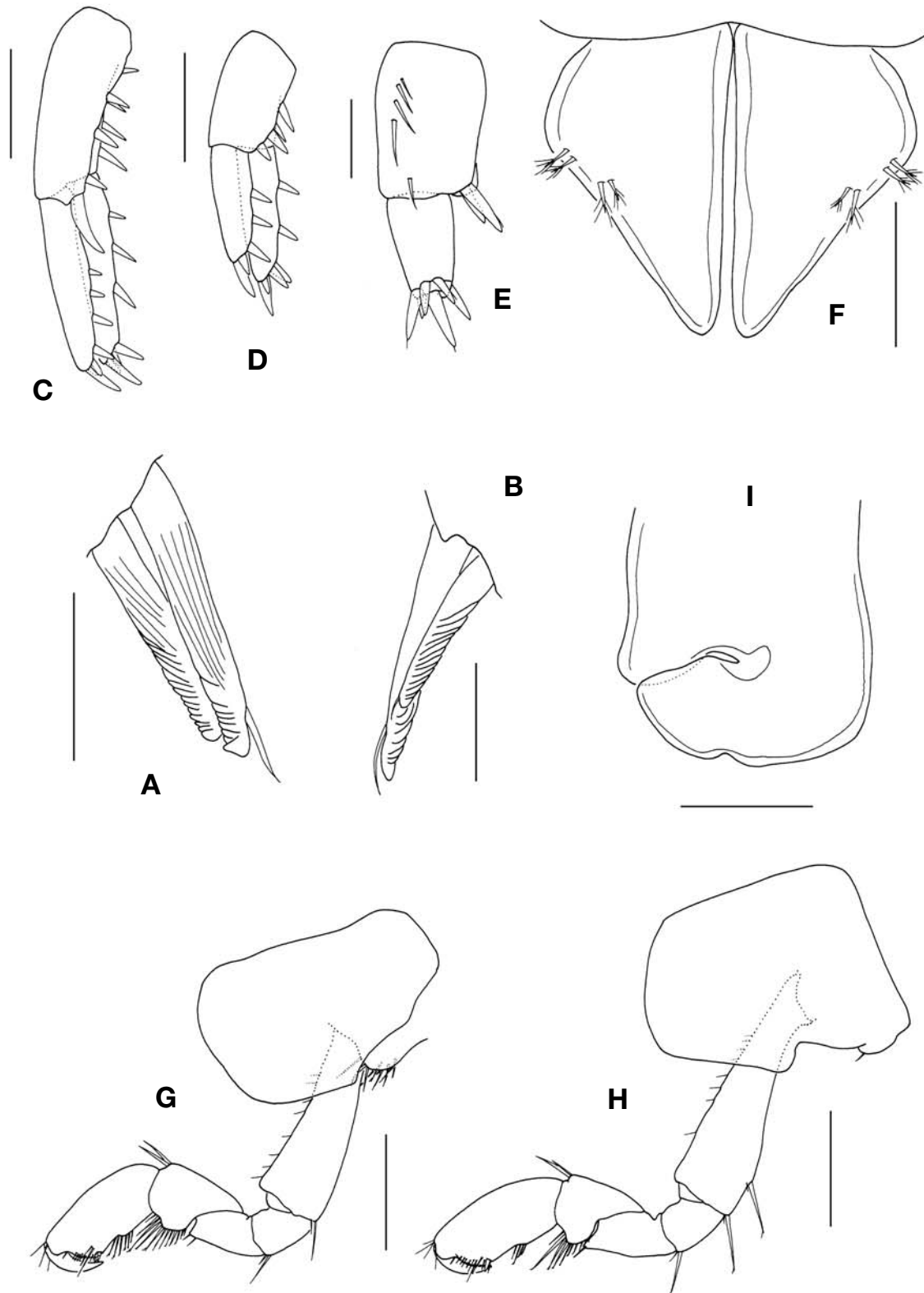


Fig. 3. *Protohyale pumila* (Hiwatari and Kajihara), male. A, Locking spines of pereopod 2 propodus; B, Locking spines of pereopod 5 propodus; C, Uropod 1; D, Uropod 2; E, Uropod 3; F, Telson. Female. G, Gnathopod 1; H, Gnathopod 2; I, Preamplifying notch of pereon 2. Scale bars: A, B=0.05 mm, C, D, G, H=0.3 mm, E, F=0.1 mm, I=0.2 mm.

ger.

Pereon segment 2 (Fig. 3I) bearing split-like preamplifying notch; posterior lobe strongly expanded forward, and overlapping with anterior lobe; without locking slit on surface.

Distribution. Korea (Jeju Island), Japan.

Remarks. *Protohyale pumila* (Hiwatari and Kajihara, 1981) is similar to *P. laie* (Barnard, 1970) and *Hyale latimana* Hiwatari, 2003. Each of the three species has a defining large and blunt cusp on the palm of male gnathopod 1, and one spine on the defining corner. However, the case of *P. laie* and *H. latimana*, the anterodistal margin of the propodus of male gnathopod 1 is tumid in shape, whereas that of *P. pumila* is not. In *P. laie* and *H. latimana*, there is no process on the palm of the male gnathopod 2, whereas there is a distinct truncate process in *P. pumila*. In *P. laie*, the palm of male gnathopod 2 is much longer than the posterior margin, whereas that of each of *P. pumila* and *H. latimana* is almost as long as the margin.

The characteristics of our specimens coincide with those shown in Hiwatari and Kajihara's original description based on specimens from Japan. Minor differences were observed in the shape of the carpus of gnathopod 1 and the ischium of gnathopod 2. The shape of male specimens was more rounded compared to that of the original description.

Recently, the large genus *Hyale* in the family Hyalidae was revised by Bousfield and Hendrycks (2002) based on North Pacific fauna. They proposed five new genera from the genus *Hyale*. Now, six genera, *Hyale* Rathke, 1837, *Apothyale* Bousfield and Hendrycks, 2002, *Protohyale* Bousfield and Hendrycks, 2002, *Ptilohyale* Bousfield and Hendrycks, 2002, *Ruffohyale* Bousfield and Hendrycks, 2002, and *Serejohyale* Bousfield and Hendrycks, 2002, are valid (Serejo, 2004). Of these, the genus *Protohyale* was split into four subgenera: *Boreohyale*, *Diplohyale*, *Leptohyale* and *Protohyale*. In the revision by Bousfield and Hendrycks (2002), *Hyale pumila* was transferred as *Protohyale (Boreohyale) pumila*. However, Hughes and Lowry (2006) did not follow the subgeneric status of Bousfield and Hendrycks (2002), because the subgeneric taxonomy of *Protohyale* does not completely cover the Australian species. Therefore, they combined four subgenera into the genus *Protohyale*. In this study, we placed our species *pumila* in the genus *Protohyale* following the scheme of Hughes and Lowry.

ACKNOWLEDGMENTS

The authors thank Prof. Wim Vader (Tromsø Museum, University of Tromsø, Norway) for helpful comments. This study was supported by a grant from the Marine Biotechnology Programme, funded by Ministry of Land, Transport and Maritime Affairs of the Korean Government.

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Received July 17, 2012
 Revised September 4, 2012
 Accepted September 9, 2012