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First record of two species of parthenopid crabs (Crustacea: Decapoda: Parthenopidae) from Korean waters

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Two species of parthenopid crabs, *Enoplolambrus laciniatus* (De Haan, 1839) and *Pseudolambrus lobatus* (Flipse, 1930), are recorded for the first time from Korean waters. *Enoplolambrus laciniatus* is similar to *E. validus* as the only known Korean species of the genus *Enoplolambrus*, however, it is characterized by having carinated ambulatory legs without teeth on the outer margins of carpi. *Pseudolambrus lobatus* is the first recorded species of the genus *Pseudolambrus* from Korean waters, characterized by having a rounded front, short chelipeds, and a carapace with produced angles posterolaterally. The morphologies of these two species are described and illustrated with color photographs herein.

Keywords: *Enoplolambrus laciniatus*, Korea, Parthenopidae, *Pseudolambrus lobatus*

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Introduction

Parthenopid crabs are usually called elbow crab because of having extremely long chelipeds that uncovered by carapace and short ambulatory legs.

They include more than 150 species in two subfamilies (Daldorfiinae Ng and Rodriguez, 1986 and Parthenopinae MacLeay, 1838) (Ng *et al*., 2008). Among them, only two species in the subfamily Parthenopinae, *Enoplolambrus validus* (De Haan, 1837) and *Rhinolambrus pelagicus* (Rüppell, 1830), have been recorded from Korean waters (Kim and Kim, 1997).

During a continuous taxonomic study on crabs, two parthenopid species were collected from the southern part of Korea and identified as *Enoplolambrus laciniatus* (De Haan, 1839) and *Pseudolambrus lobatus* (Flipse, 1930).

Therefore, we provide their descriptions and figures including color photographs.

Materials and Methods

Enoplolambrus laciniatus (De Haan, 1839) was collected from Jindo Island, Jellanamdo in about 10 m in depth by trap and *Pseudolambrus lobatus* (Flipse, 1930) was collected from Munsum, Jejudo Island in about 20 m in depth by SCUBA diving. The materials examined in this study were preserved in 95% ethanol and deposited at the corresponding author's collection at Silla University, Busan. They were observed under an EZ4D stereomicroscope and MZ8 stereomicroscope (Leica, Wetzlar, Germany). Drawings were made with the aid of a camera lucida. Color photographs were obtained using a digital camera (Olympus, Seoul, Korea). The abbreviations "cl" and "cw" refers to carapace length from the tip of the frontal margin to the posterior dorsal margin of the carapace and to the width of the carapace measured at the widest part.

Systematic Accounts

Order Decapoda Latreille, 1802
Superfamily Parthenopoidea MacLeay, 1838
Family Parthenopidae MacLeay, 1838
Genus *Enoplolambrus* A. Milne-Edwards, 1878

***Enoplolambrus laciniatus* (De Haan, 1839)**
긴다리자게 (신칭)
Parthenope (*Lambrus*) *laciniatus* De Haan, 1839: pl. 22, figs. 2, 3; 1839: 91.
Lambrus laciniatus: Ortmann, 1893: 415; Stimpson, 1907: 29.
Lambrus laciniatus enoshimanus: Parisi, 1915: 259.
Lambrus validus: Kamita, 1936: 31 (in part).
Lambrus (*Platylambrus*) *validus*: Kamita, 1941: 81 (in part).

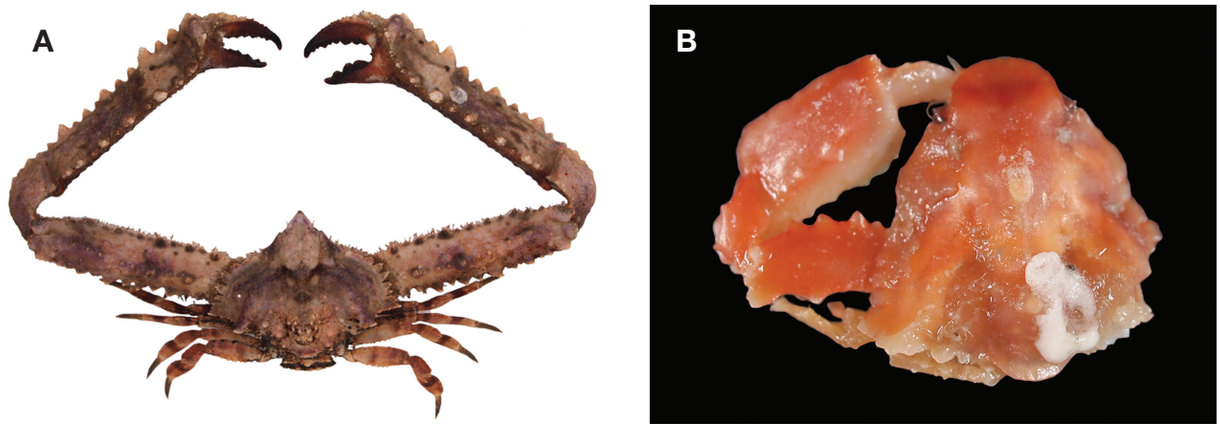

Fig. 1. Color photographs of two parthenopid crabs. A, *Enoplolambrus laciniatus* (De Haan, 1839), male (cl 38 mm, cw 38 mm): B, *Pseudolambrus lobatus* (Flipse, 1930), male (cl 7.2 mm, cw 7.3 mm).

Parthenope (*Platylambrus*) *laciniata*: Yamaguchi and Baba, 1993: 370, fig. 125A, B.
Parthenope (*Platylambrus*) *valdius* forma *laciniatus*: Sakai, 1976: 269, pl. 92, fig. 1.
Lambrus intermedius: Miers, 1879: 29.
Enoplolambrus laciniatus: Ng *et al*., 2008: 130 (list).

Material examined. 1♂ (cl 38 mm, cw 38 mm), Korea: Jindo Is, 27 Jul 2012, Lee SH, trap in about 10 m in depth.
Description. Carapace (Figs. 1A, 2A) subpentagonal, as long as broad; anterior half of dorsal surface relatively smooth; regions convex; mesogastric and cardiac regions convex and large tubercle; epi- and meso-branchial regions with ridge; exorbital tooth developed; hepatic margin defined, not fused with epibranchial margin; epibranchial margin enlarged, convex, with 4 granulated, lamella teeth; lateral posterior margin with 3 triangular teeth; posterior margin produced. Front prominent, triangular, concaved medially frontal and protogastric regions.

Chelipeds (Figs. 1A, 2B) symmetrical, extremely long, robust, tuberculated; merus as long as propodus, with medial ridge, outer margin with 13 unequal sized tubercles; propodus prismatic, 10-13 tubercles on angles; movable finger curved, upper margin with tubercles on decreased in size distally.

Ambulatory legs (Fig. 2C-F) short, flattened; posterior margins of meri and propodi of first to fourth ambulatory legs with acute tubercles; anterior margins of merus, carpus and propodus of fourth ambulatory leg carinated; distal margin of propodi and dactyli covered with setae.

Male abdomen (Fig. 2G) 5-segmented; third and fourth segments with transverse ridge; fifth segment with triangular tubercle. Telson triangular.

First gonopod (Fig. 2H) stout, prismatic, tapering distally; with truncated tip, with surrounded setae. Second gonopod (Fig. 2I) slender, slightly shorter than first gonopod, segmented 1/3 of proximal part, with pointed tip.
Color. Generally brown, dactyli of chelipeds and ambulatory legs black.
Habitat. Muddy sand bottom covered with broken shells at intertidal region.
Distribution. Australia, China, Japan and now Korea.
Remarks. *Enoplolambrus laciniatus* (De Haan, 1839) is very similar to *E. valdius* (De Haan, 1837) by having tuberculated carapace and chelipeds, however, they can be easily distinguished by the following characteristics. The protogastric and epibranchial regions of the carapace are relatively smooth in the former (*vs*. granulated in the latter), the meri of chelipeds are long in the former (*vs*. relatively short in the latter), and the anterior margin of the carpi and propodi of the fourth ambulatory leg are carinated in the former (*vs*. not carinated and with tubercles in the latter). *E. laciniatus* is the second recorded species in the genus *Enoplolambrus* in Korea.

Genus *Pseudolambrus* Paul'son, 1875
둥근이마자게속 (신칭)

***Pseudolambrus lobatus* (Flipse, 1930)**
둥근이마자게 (신칭)
Lambrus (*Pseudolambrus*) *lobatus* Flipse, 1930: 48, 53, fig. 37.
Parthenope (*Pseudolambrus*) *ozakii*: Sakai, 1969: 257, fig. 6; 1976: 277, pl. 94, fig. 2.
Pseudolambrus lobatus: Ng *et al*., 2008: 131 (list).

Material examined. 1♂ (cl 7.2 mm, cw 7.3 mm), Korea: Munsum in Jeju Island, 28 Oct 2014, Park JH, SCUBA diving in about 20 m in depth.
Description. Carapace (Figs. 1B, 3A, B) partly broken,

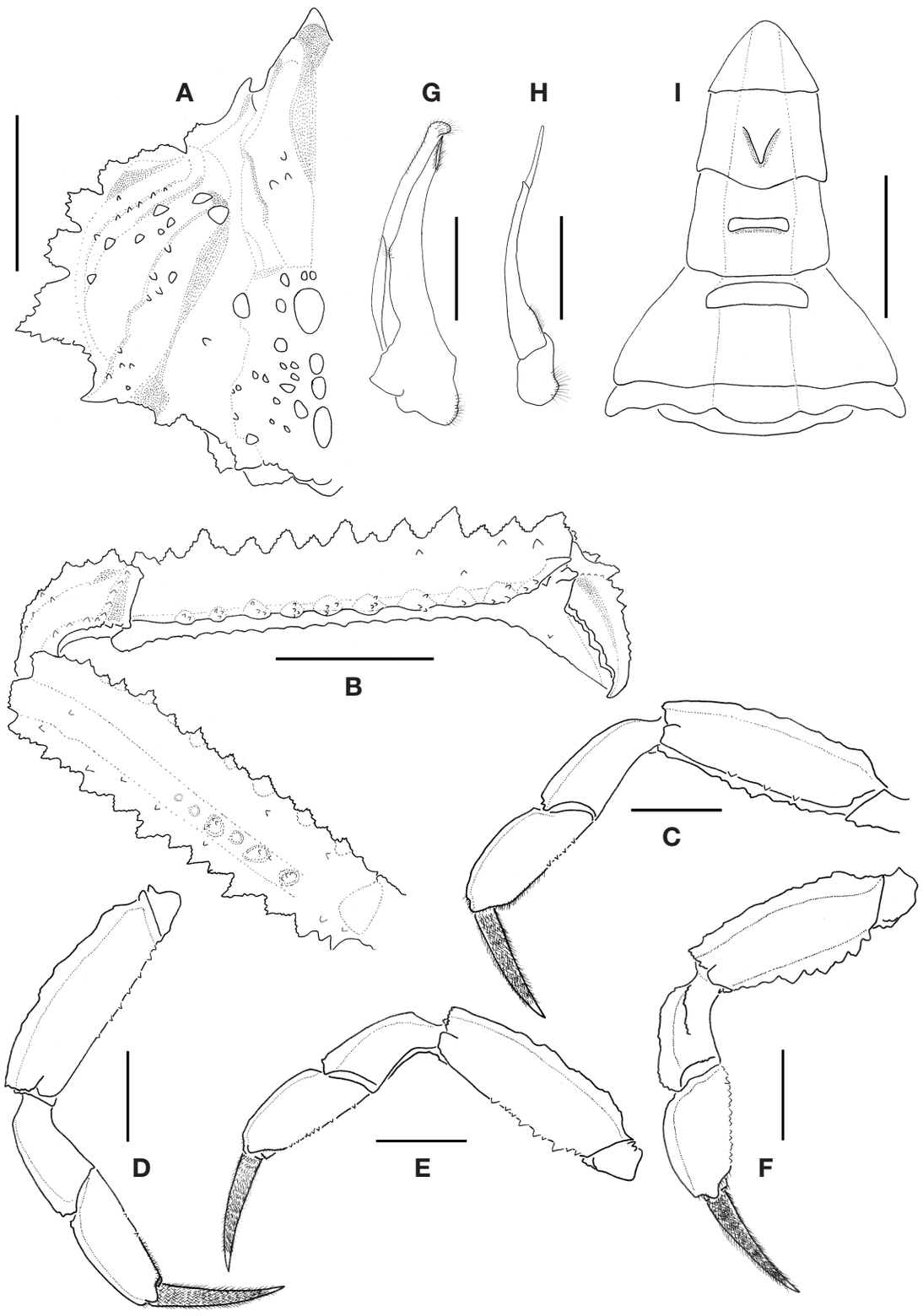

Fig. 2. *Enoplolambrus laciniatus* (De Haan, 1839), male (cl 38 mm, cw 38 mm). A, Left half of carapace; B, Left cheliped; C-F, First to fourth left ambulatory legs; G, First gonopod; H, Second gonopod; I, Male abdomen. Scale bars: A = 1 cm, B = 2 cm, G, H = 3 mm, C-F, I = 5 mm.

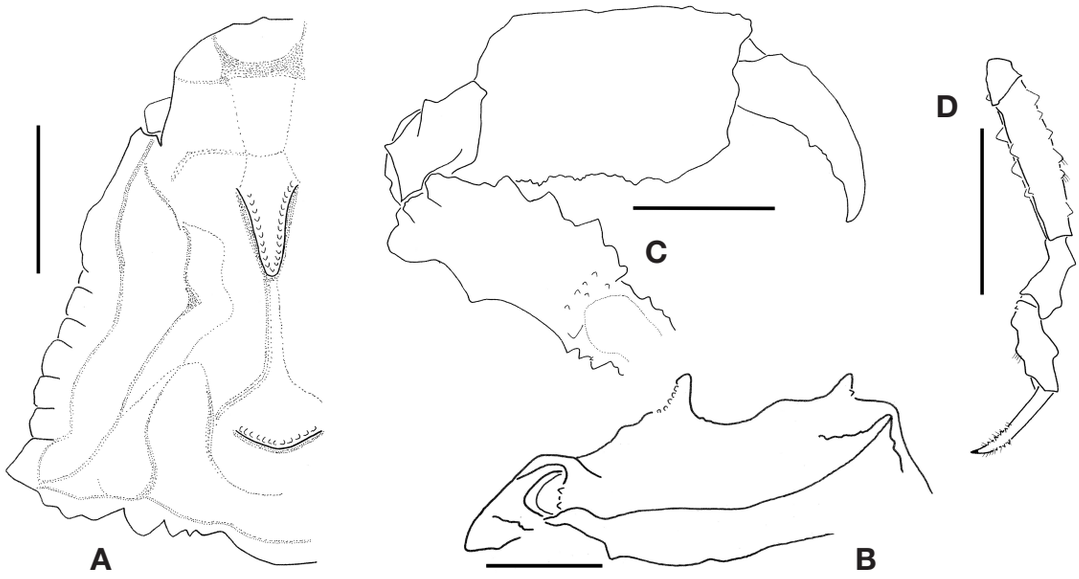

Fig. 3. *Pseudolambrus lobatus* (Flipse, 1930), male (cl 7.2 mm, cw 7.3 mm). A, Left half of carapace; B, Lateral view of carapace; C, Left cheliped; D, Third left ambulatory leg. Scale bars: A-D = 2 mm.

missing right branchial region, subtriangular, depressed, as long as broad; regions indistinct; gastric and cardiac regions each with conical tubercle, gastric and cardiac regions connected saddle like ridge; branchial region flattened, depressed; hepatic margin rounded as lobe; epibranchial margin expanded, convex, divided into 6 rectangular teeth by narrow fissures; lateral posterior margin with 7 triangular unequal sized teeth; posterior margin produced. Front rounded triangular, directed obliquely downward, concaved and depressed medially.

Left cheliped (Fig. 3C) robust; merus subrectangular, with 4-5 lamelliform teeth on outer and inner margins; propodus subrectangular, 1.5 times longer than broad, inner margin tuberculated; movable finger curved, 2 small triangular teeth on cutting margin; fixed finger missing.

Third ambulatory leg (Fig. 3D) short, slender; merus with 6 triangular teeth on anterior margin and 3 teeth on posterior margin; carpus with 2 lamelliform teeth on anterior margin; propodus with tooth on anterior and 2 larmelliform teeth on posterior margins; dactylus with spinules distally.

Color. Generally reddish orange.

Habitat. Broken shelly and sandy bottom at intertidal region.

Distribution. Indonesia, Philippines, Japan and now Korea.

Remarks. *Pseudolambrus lobatus* (Flipse, 1930) is the first species in the genus *Pseudolambrus* Paul'son, 1875 from Korean waters. The genus *Pseudolambrus* is composed of 15 species (Ng *et al*., 2008) and distinguished from other partheonpid genera by having entirely fused hepatic region and a postobital tooth on the carapace, not constricted hepatic and branchial regions, and short chelipeds (Sakai, 1976). *Pseudolambrus lobatus* is different from other congeneric species by having a carapace with produced hepatic lobe, an enormous sized with a large lobe on proximal part of right cheliped, and a left cheliped with crossed dactyli (Sakai, 1976). Althought the present specimen does not have a right cheliped and a fixed finger of the left cheliped, characteristics of the carapace and the left cheliped agree with Sakai (1976)'s description of this species.

Acknowledgements

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