

## A New Record of Iphiculid Crab, *Pariphiculus coronatus* (Decapoda: Iphiculidae), in Korea

Sang-Hui Lee<sup>1</sup>, Jae Mook Jeong<sup>2</sup>, Sang-kyu Lee<sup>3,\*</sup>

<sup>1</sup>National Marine Biodiversity Institute of Korea, Seocheon 33662, Korea

<sup>2</sup>Fisheries Resources Research Center, National Institute of Fisheries Science, Tongyong 53064, Korea

<sup>3</sup>School of Earth and Environmental Sciences & Research Institute of Oceanography, Seoul National University, Seoul 08826, Korea

### ABSTRACT

During a survey for the southern sea of Korea, an iphiculid crab, *Pariphiculus coronatus*, was newly recorded from Korea. Specimens were obtained at a depth of 109–120 m near Jeju Island. *Pariphiculus coronatus* can be distinguished from congeners by the following characters: the carapace length and the carapace width subequal, the surface of carapace covered with round granules, the medial tubercles of the intestinal and cardiac region of the carapace, and the first gonopod curved in the half region and straight in the distal portion. The Korean leucosoids have 16 genera and 20 species so far. Here we provide the diagnosis and illustration of *Pariphiculus coronatus*.

**Keywords:** Crustacea, crabs, Korean fauna, Leucosioidea, Iphiculidae

### INTRODUCTION

Leucosioidea Samouelle, 1819, is known as a nut crab or pebble crab. It is commonly found from the intertidal shore to shelf and slope depths. Leucosoids live partially buried in sediment during the daytime. They forage for preys at night (Poore, 2004). Currently, two families, seventy-nine genera, and 505 species of leucosoid crabs have been recorded worldwide (WoRMS Editorial Board, 2022). Of these, the genus *Pariphiculus* Alcock, 1896 consists of four species: *P. agariciferus* Ihle, 1918, *P. coronatus* (Alcock and Anderson, 1894), *P. mariannae* (Herklot, 1852), and *P. stellatus* Ng & Jeng, 2017.

In Korea, 253 crab species have been reported (Ko, 2003; Ng and Richer de Forges, 2015; Kim et al., 2021, 2022; Lee et al., 2021, 2022). Fifteen genera and 19 species of leucosoid crabs have been reported, including 11 species recorded from Jeju Island (Kim et al., 2021, 2022; Lee et al., 2021). During faunal studies of Korean crabs, two specimens of *Pariphiculus coronatus* (Alcock and Anderson, 1894) were collected using an otter trawl from off the coast of Jeju Island

in Korea.

Specimens were observed under a stereomicroscope (Leica, Germany). Drawings were made using a Camera Lucida (Leica). Images were recorded using a D7000 digital camera (Nikon, Japan). They were developed using a Helicon Focus software (Helicon Soft, Ukraine). Statistical tests were performed with IBM SPSS Statistics package (ver. 26; IBM Corp., Armonk, NY, USA). Measurements provided were maximum carapace length (CL) and carapace width (CW), including spines. All characteristics were measured using metric dial callipers (Wiha, USA). Classification followed that described by Ng et al. (2008). The present material was deposited in the National Marine Biodiversity Institute of Korea (MABIK).

### SYSTEMATIC ACCOUNTS

Superfamily Leucosioidea Samouelle, 1819

Family Iphiculidae Alcock, 1896

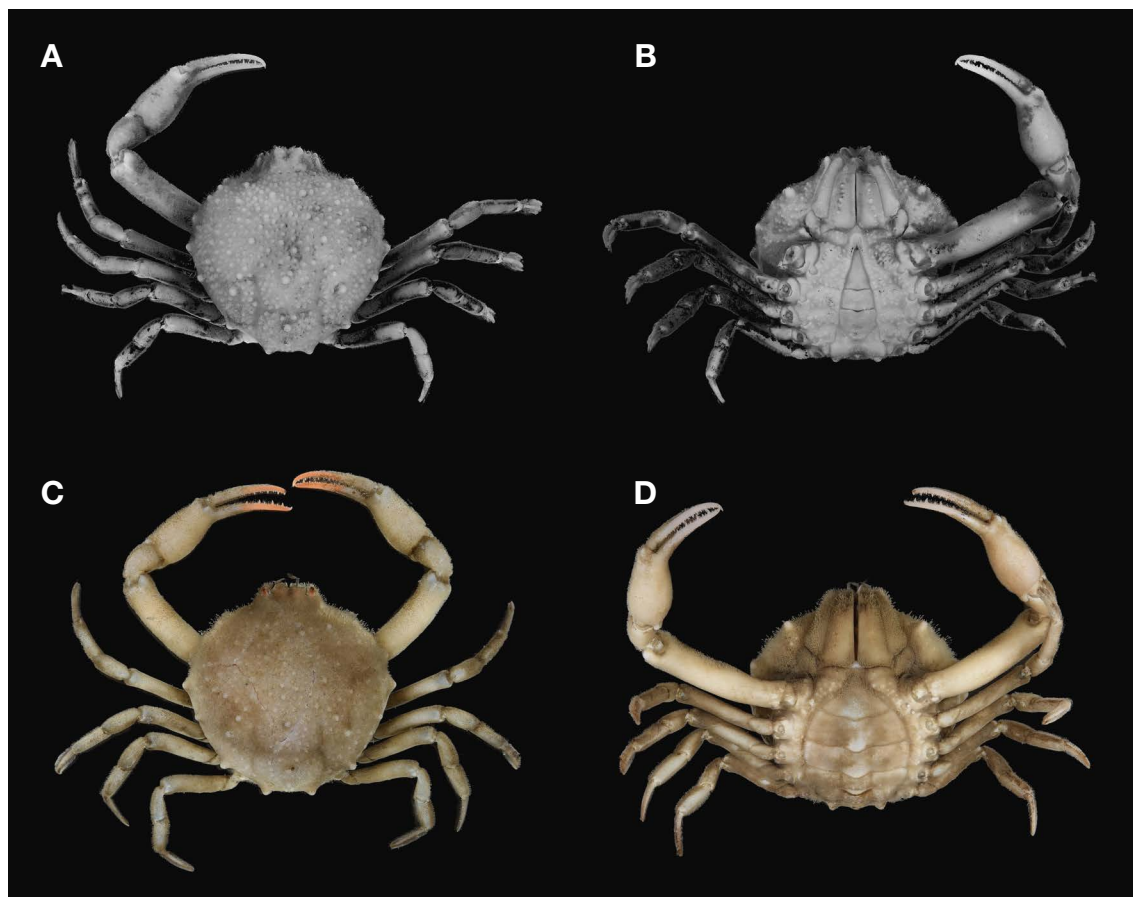
<sup>1</sup>\*Genus *Pariphiculus* Alcock, 1896

Korean name: <sup>1</sup>\*왕관밤게속 (신칭)

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\*To whom correspondence should be addressed

Tel: 82-2-872-6750, Fax: 82-2-6935-1295  
E-mail: bio249@snu.ac.kr



**Fig. 1.** *Pariphiculus coronatus* (Alcock and Anderson, 1894). A, B, Male (CL 23.5 mm, CW 23.4 mm) (MABIK CR00014462); C, D, Female (CL 21.8 mm, CW 22.6 mm) (MABIK CR00252506). A, C, Habitus, dorsal view; B, D, Habitus, ventral view.

<sup>1</sup>*Pariphiculus coronatus* (Alcock and Anderson, 1894)  
(Figs. 1, 2)

*Randallia coronatus* Alcock and Anderson, 1894: 177.

*Randallia coronata*: Alcock and Anderson, 1896: Pl. 24, fig. 2.

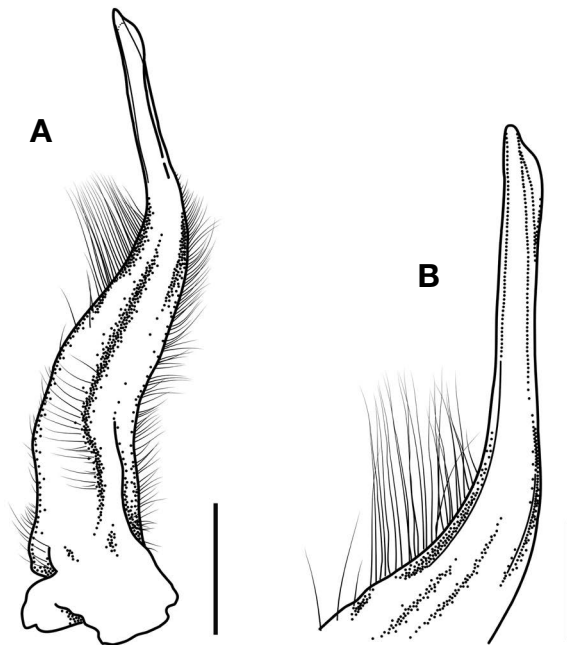
*Pariphiculus coronatus*: Alcock, 1896: 258; 1899: 30; Doflein, 1904: 41, Pl. 14, fig. 7; Ihle, 1918: 249, 312 (list), figs. 98, 99, 110, 114; Balss, 1922: 131; Yokoya, 1933: 129, fig. 45; Sakai, 1935: 64; 1936: 56, fig. 17; 1937: 129, fig. 20, Pl. 14, fig. 6; 1965: 43, Pl. 17, fig. 5; 1976: 104, fig. 57, Pl. 29, fig. 5; Takeda and Miyake, 1970: 227; Serène and Lohavanijaya, 1973: 37, Pl. 5A; Serène and Vadon, 1981: 118, 124; Miyake, 1983: 68; Türkay, 1986: 149; Chen, 1989: 229, fig. 22, Pl. 1, fig. 3, Pl. 3, fig. 5; Tan, 1996: 1023, 1048; Muraoka, 1998: 19; Komatsu et al., 2005: 106; Galil and Ng, 2007: 87; Shih et al., 2017: 1367, fig. 1A, B.

**Material examined.** Korea: 1♂ (CL 23.5 mm, CW 23.4

mm), Jeju Island, Jeju-si, 33°44'30.42"N, 126°13'29.28"E, 109 m, 22 Oct 2012 (MABIK CR00014462); 1♀ (CL 21.8 mm, CW 22.6 mm), Jeju Island, Seogwipo-si, 33°11'57.38"N, 127°11'44.83"E, 120 m, otter trawl, R/V "Tamgu 22", 1 May 2019 (MABIK CR00252506).

**Diagnosis.** Carapace (Fig. 1A, C) circular, CL and CW subequal; dorsal surface thickly covered with varying sizes of rounded granules and tomentum; middle-line of carapace with three distinct tubercles: one cardiac, two intestinal; mesobranchial region with each one distinct tubercle; lateral margins with five distinct tubercles; posterior margin with two tubercles; branchial, posterior cardiac, intestinal regions clearly separated by grooves; rostrum bilobed. Abdomen of male (Fig. 1B) consisting of five segments; abdomen of female (Fig. 1D) consisting of seven distinct segments, none swollen. Chelipeds (Fig. 1A–D) symmetrical, slightly stout, covered with tomentum; palm swollen; fingers slender, with cutting edges denticulate. Ambulatory legs (Fig. 1A–D) sub-

Korean name: <sup>1</sup>\*왕관밤게 (신칭)



**Fig. 2.** *Pariphiculus coronatus* (Alcock and Anderson, 1894). Male (CL 23.5 mm, CW 23.4 mm) (MABIK CR00014462). A, Left first gonopod, ventral view; B, Tip of left first gonopod, ventral view. Scale bars: A=2 mm, B=1 mm.

cylindrical, covered with tomentum. First gonopod of male (Fig. 2A, B) curved in half region and straight in distal portion.

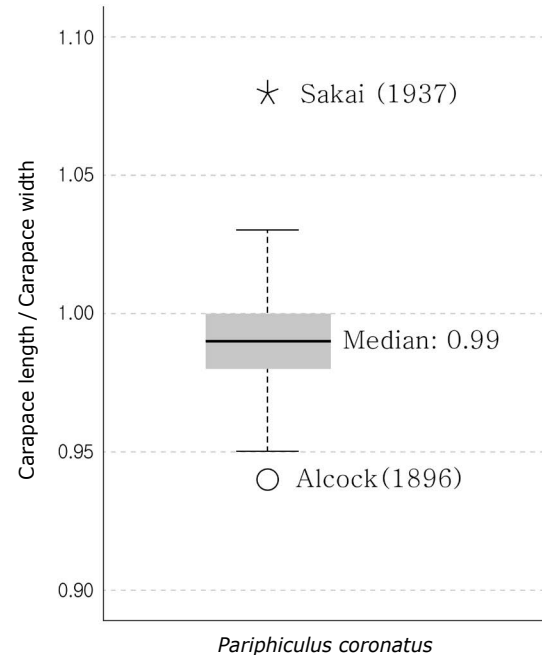
**Coloration.** The carapace and ambulatory legs are ivory, and the distal half of fingers are pale orange.

**Habitat.** Mud or sandy mud.

**Distribution.** Bay of Bengal (type locality), Indonesia, Japan, Persian Gulf, the Philippines, Red Sea, South China Sea, Taiwan, Vietnam, and Korea (present study).

## RESULTS AND DISCUSSION

The ratio of CL and CW has been considered one of the characteristics of *Pariphiculus coronatus*. However, the previous records about the ratio of CL and CW of *P. coronatus* differed among studies. Some authors (Alcock, 1896; Serène and Lohavanijaya, 1973; Tan, 1996; Shih et al., 2017) referred to it as “broader than long”. Chen (1989) referred to it as “broader than long or as long as broad”. Sakai (1937) referred to it as “very slightly longer than broad (in male)”. We obtained the CL and CW records from previous papers of *P. coronatus* (Alcock and Anderson, 1894; Sakai, 1937; Serène and Vandon, 1981; Chen, 1989; Shih et al., 2017), and examined the ratio of CL and CW based on the morphometric analysis ( $n=26$ ,



**Fig. 3.** Result of morphometric analysis of *Pariphiculus coronatus* (Alcock and Anderson, 1894) ( $n=26$ ). Box plots depicting maxima, minima, median, and quartile values for ratio of carapace length and carapace width.

including Korean specimens) (Fig. 3). The result showed that the carapace is slightly broader than long, slightly longer than broad, or as long as broad. Therefore, we propose to describe this species that CL and CW are subequal because the difference between them are less than 1.5 mm. In addition, the specimens of Sakai (1937) and Alcock and Anderson (1894), the outlier, would be rechecked based on the morphology.

Tan (1996) noted that *Pariphiculus coronatus* and *P. mariannae* differed in the morphology of the first gonopod of the male: The first gonopod of the male of *P. coronatus* has rather a straight structure of the distal portion, while that of *P. mariannae* is bent at an angle in the distal portion. Regarding the first gonopod of the male in previous papers, that of *P. coronatus* is curved in the half region and straight in the distal portion (Chen, 1989: fig. 22E, F; present fig. 2A, B) while *P. mariannae* is bent in the distal portion (Chen, 1989: fig. 23e, f; Dai and Yang, 1991: fig. 37B (1); Serène and Lohavanijaya, 1973: fig. 61). According to Ng and Jeng (2017: fig. 13A–C, E–G), the first gonopods of *P. agaricifeus* and *P. stellatus* were not bent. Therefore, the morphology of the first gonopod can be an essential characteristic that distinguishes *P. coronatus* in the genus *Pariphiculus*.

Accordingly, the characteristics of *Pariphiculus coronatus* can be summarized as follows: (1) the CL and the CW are subequal, (2) the carapace surface is covered with round

granules, (3) the carapace has median tubercles in the cardiac and intestinal regions, (4) the first gonopod is curved in the half region and straight in the distal portion. The present male and female specimens from Korea also had these characteristics.

## ORCID

Sang-Hui Lee: <https://orcid.org/0000-0002-8724-9292>

Jae Mook Jeong: <https://orcid.org/0000-0003-1876-3455>

Sang-kyu Lee: <https://orcid.org/0000-0003-3450-3389>

## CONFLICTS OF INTEREST

No potential conflict of interest relevant to this article was reported.

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