

## Occurrence of Pontoniine Shrimp, *Periclimenes brevicarpalis* (Decapoda: Caridea: Palaemonidae) in Korean Waters

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### ABSTRACT

Two specimens of pontoniine shrimp, *Periclimenes brevicarpalis* (Schenkel, 1902), having a symbiotic relationship with sea anemones are reported for the first time in Korea. The specimens were collected by SCUBA diving in Jejudo Island. It has a transparent body with a few large white spots on the carapace, abdomen, telson and uropods. Blue bands are on the cheliped and pereopods. Five brown eyespots with orange centers are on the telson and uropods. The morphology is described and illustrated with a color image of the living specimens. Two species of Korean *Periclimenes*, *P. ornatus*, and *P. brevicarpalis*, can be distinguished by the position of the anterior dorsolateral spine of the telson. This study extends its previously known range from Japan to Korea. Korean pontoniine now includes six species belonging to five genera of *Conchodytes*, *Cuapetes*, *Onycocaris*, *Periclimenaeus*, and *Periclimenes*.

**Keywords:** Pontoniine, shrimp, symbiotic relationship, *Periclimenes brevicarpalis*, Korea

### INTRODUCTION

Pontoniine shrimps are almost exclusively tropical and subtropical marine commensals. They are rarely found in temperate or fresh waters (Bruce, 1983). At present, five species belonging to five genera of pontoniine shrimps have been recorded in Korea (Lee and Ko, 2011, 2013): *Periclimenaeus gorgonidarum* (Balss, 1913), *Onycocaris callyspongiae* Fujino and Miyake, 1969, *Cuapetes grandis* (Stimpson, 1860), *Periclimenes ornatus* Bruce, 1969, and *Conchodytes nipponensis* (De Haan, 1844). Among them, only one species of *P. ornatus* is attributed to the genus *Periclimenes*. Two pontoniine specimens were collected in Seongsanpo, Jejudo Island, and identified as *Periclimenes brevicarpalis* (Schenkel, 1902). This species is new to the shrimp fauna of Korea. Therefore, its morphology is described and illustrated with color image of the living specimens.

Postorbital carapace length is abbreviated as “CL” measured from the posterior margin of the orbit to the posterior mid-dorsal margin of the carapace. Specimens were preserved in 95% ethanol. All materials examined in this study were de-

posited at the corresponding author's collection at Silla University, Busan.

### SYSTEMATIC ACCOUNTS

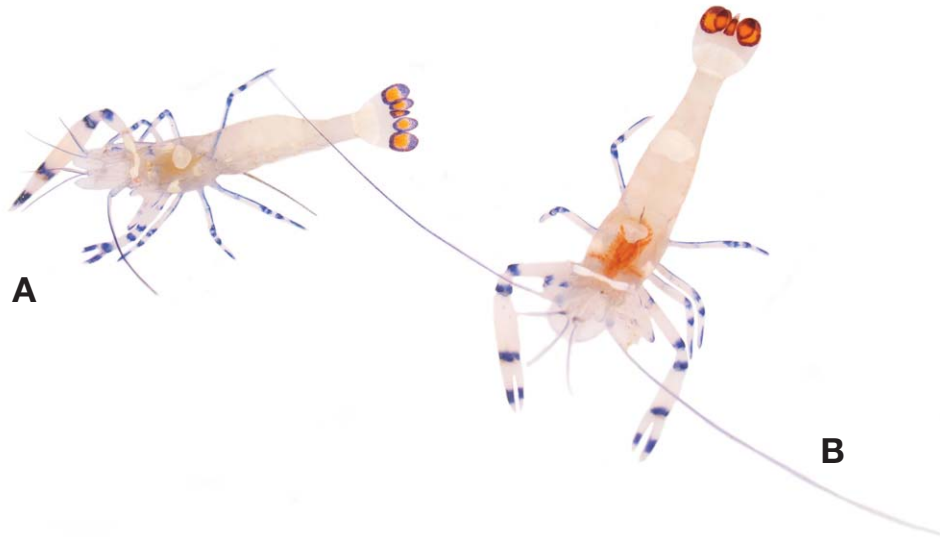
Order Decapoda Latreille, 1803  
Family Palaemonidae Rafinesque, 1815  
Subfamily Pontoniinae Kingsley, 1879  
Genus *Periclimenes* O.G. Costa, 1844

<sup>1</sup>\**Periclimenes brevicarpalis* (Schenkel, 1902) (Figs. 1, 2)  
*Ancylocaris brevicarpalis* Schenkel, 1902: 563, Pl. 13, fig. 21 (type locality: Makassar, Celebes, Indonesia).  
*Palaemonella aberrans* Nobili, 1904: 233.  
*Harpilius latirostris* Lenz, 1905: 380, Pl. 47, fig. 14.  
*Periclimenes potina* Nobili, 1905: 159.  
*Periclimenes hermitensis* Rathbun, 1914: 655, Pl. 1, figs. 1–3.  
*Periclimenes (Ancylocaris) brevicarpalis*: Kemp, 1922: 185, text-figs. 40–42, Pl. 6, fig. 8.  
*Periclimenes (Harpilius) brevicarpalis*: Holthuis, 1952: 69,

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**Fig. 1.** *Periclimenes brevicarpalis* (Schenkel, 1902). A, Male (postorbital carapace length 4.73 mm); B, Female (postorbital carapace length 5.25 mm).

fig. 27; Barnard, 1955: 48 (key); Johnson, 1961: 59, 75; Miyake and Fujino, 1968: 410, fig. 4; McNeill, 1968: 22. *Periclimenes brevicarpalis*: Bruce, 1971: 7; 1976: 145 (list); 1983: 879, fig. 7D, E; Suzuki and Hayashi, 1977: 196–197, Pl. 2, fig. 1; Chace and Bruce, 1993: 104; Li, 2000: 161, fig. 199 (see full synonymy); Minemizu, 2000: 51; Ravikumar and Vinoth, 2012: 105–108, fig. 2.

**Material examined.** 1 ♂ (CL 4.73 mm), 1 ♀ (CL 5.25 mm), Seongsanpo (Jejudo Island), 31 Mar 2011, Kim WK, by SCUBA diving in approximately 15 m depth.

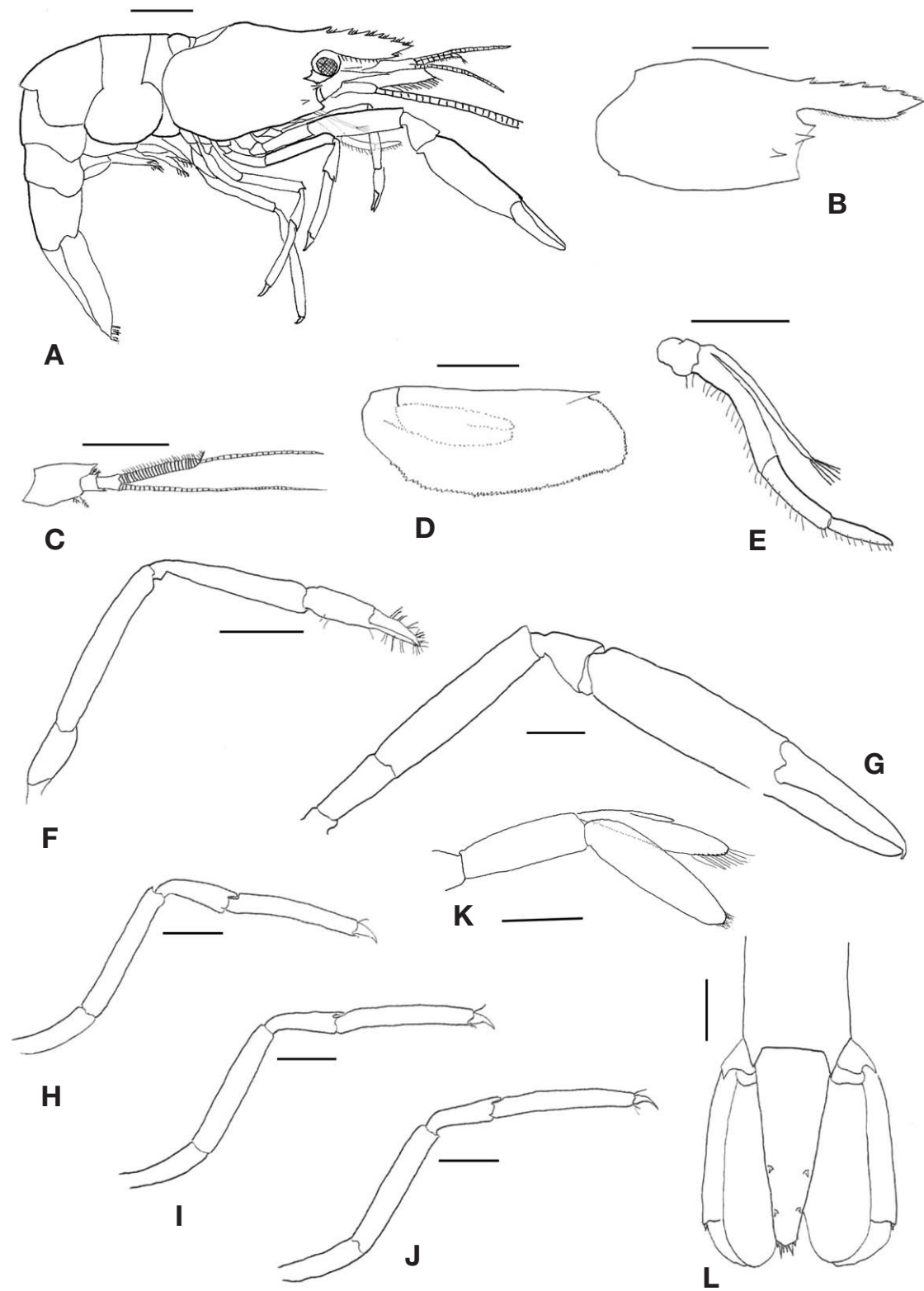
**Description.** Body (Figs. 1, 2A) small size, integument smooth. Rostrum (Fig. 2A, B) nearly straight, not overreaching antennal scale; dorsal margin armed with 6 teeth, ventral margin armed with 1 tooth. Carapace (Fig. 2A, B) with well developed hepatic and antennal spines. Abdomen (Fig. 2A) without compressed dorsal prominence on third somite; sixth somite more than 1.5 times of length of fifth somite. Telson (Fig. 2A, L) with 2 pairs of small dorsolateral spines, posterior margin with 3 pairs of small spines. Eye (Fig. 2A) with cornea hemispherical. Antennular peduncle (Fig. 2C) with 1 distolateral spine on basal segment; upper flagellum biramus. Antennal scale (Fig. 2D) approximately 2.1 times longer than broad; lateral margin slightly convex; distolateral tooth falling short of level of distal margin of blade. Third maxilliped (Fig. 2E) short, slender, with long setae on inner margin; exopod not reaching middle of penultimate segment of endopod, with long distal setae. First pereiopod (Fig. 2A, F) overreaching antennal scale; merus slightly longer than carpus; carpus distinctly longer than chela; fingers shorter than palm,

with setae laterally. Second pereiopod (Fig. 2A, G) long, stout, subequal; merus unarmed; carpus approximately 0.3 times as long as palm; palm slightly swollen, approximately 5 times as long as broad; fingers slightly shorter than palm. Third to fifth pereiopods (Fig. 2A, H–J) relatively slender, simple, not reaching distal end of antennal scale; each merus and carpus unarmed; each propodus with few setae on distal margin; each dactylus slightly curved, with pointed tip. First and second pleopods of female (Fig. 2K) with appendix interna.

**Color.** Transparent body with large white spots on carapace, abdomen, telson, and uropods. Blue bands on chelipeds and pereiopods. Five brown eyespots with orange centers on telson and uropods (Fig. 1).

**Distribution.** Indo-West Pacific region from the Red Sea and Mozambique to Palau, Santa Cruz, the Great Barrier Reef of Australia (Bruce, 1971), Japan (Suzuki and Hayashi, 1977; Minemizu, 2000), and now Korea.

**Remark.** This species has a symbiotic relationship with sea anemones (*Entacmaea actinostoloides*) like *Periclimenes ornatus*. In living shrimps these two species can be easily distinguished by the color pattern. In case of the preserved specimens without the color pattern, they are very similar to each other, therefore, can be separated by the position of the anterior dorsolateral spine of the telson, which is on the proximal half of the telson length in *P. brevicarpalis* (vs. on the one-third of the telson length in *P. ornatus*). Korean pontoninae now consists of six species belonging to five genera. *Periclimenaeus gorgonidarum*, *Onycocaris callyspongiae*, *Cua-petes grandis*, *Conchodytes nipponensis*, *Periclimenes ornatus*, and *P. brevicarpalis*.



**Fig. 2.** *Periclimenes brevicarpalis* (Schenkel, 1902), female (postorbital carapace length 5.25 mm). A, Habitus, lateral; B, Carapace, lateral; C, Left antennule, dorsal; D, Left antennal scale, dorsal; E, Right third maxilliped, lateral; F, Right first pereiopod, lateral; G, Right second pereiopod, lateral; H, Right third pereiopod, lateral; I, Right fourth pereiopod, lateral; J, Right fifth pereiopod, lateral; K, Right first pleopod, dorsal; L, Telson and uropod, dorsal. Scale bars: A–C=2 mm, D–L=1 mm.

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## REFERENCES

- Barnard KH, 1955. Additions to the fauna-list of South African Crustacea and Pycnogonida. *Annals of the South African Museum*, 43:1-107.
- Bruce AJ, 1971. Pontoniid shrimps from the ninth cruise of R/V Anton Bruun, IIOE, 1964: I. *Palaemonella* Dana and *Periclimenes* Costa. *Smithsonian Contributions to Zoology*, 82:1-13.
- Bruce AJ, 1976. A report on some pontoniid shrimps collected from the Seychelle Islands by the F.R.V. Manihine, 1972, with a review of the Seychelles pontoniid shrimp fauna. *Zoological Journal of the Linnean Society*, 59:89-153.
- Bruce AJ, 1983. Expédition Rumphius II (1975). Crustacés parasites, commensaux, etc. (Th. Monod éd.) IX. Crustacés Décapodes (1ere partie: Natantia Pontoniinae). *Bulletin du Muséum National d'Histoire Naturelle, Section A, Zoologie, Biologie et Écologie animales*, 5:871-902.
- Chace FA Jr, Bruce AJ, 1993. The caridean shrimps (Crustacea: Decapoda) of the Albatross Philippine Expedition 1907-1910, Part 6: Superfamily Palaemonoidea). *Smithsonian Contributions to Zoology*, 543:1-152.
- Holthuis LB, 1952. The Decapoda of the Siboga Expedition. Part XI. The Palaemonidae collected by the Siboga and Snellius Expeditions with remarks on other species. II. Subfamily Pontoniinae. *Siboga Expédition*, 39:1-253.
- Johnson DS, 1961. A synopsis of the Decapoda Caridea and Stenopodidea of Singapore, with notes on their distribution and a key to the genera of Caridea occurring in Malayan waters. *Bulletin of the National Museum, State of Singapore*, 30:44-79.
- Kemp S, 1922. Notes on Crustacea Decapoda in the Indian Museum. XV. Pontoniinae. *Records of the Indian Museum*, 24: 113-288.
- Lee KH, Ko HS, 2011. First records of two pontoniid shrimps (Crustacea: Decapoda: Caridea: Palaemonidae) from Korea. *Korean Journal of Systematic Zoology*, 27:239-245.
- Lee SH, Ko HS, 2013. The first record of *Conchodytes nipponensis* (De Haan, 1844) (Crustacea: Decapoda: Palaemonidae) associated with pen shell *Atrina pectinata* (Linnaeus, 1767) (Mollusca: Bivalvia) from Korea. *Journal of Species Research*, 2:1-6.
- Lenz H, 1905. Ostafrikanische Dekapoden und Stomatopoden. *Abhandlungen Herausgegeben von der Senckenbergischen Naturforschenden Gesellschaft*, 27:341-392.
- Li X, 2000. Catalogue of the genera and species of Pontoniinae Kingsley, 1878 (Decapoda, Palaemonidae). Xueyuan Press, Beijing, pp. 1-319.
- McNeill FA, 1968. Crustacea, Decapoda & Stomatopoda. Great Barrier Reef Expedition 1928-29 Scientific Reports, 7:1-98.
- Minemizu R, 2000. Marine Decapod and Stomatopod Crustaceans mainly from Japan. Bun-ichi Sogo Publishing Co., Tokyo, pp. 1-344.
- Miyake S, Fujino T, 1968. Pontoniid shrimps from the Palau Islands (Crustacea, Decapoda, Palaemonidae). *Journal of the Faculty of Agriculture, Kyushu University*, 14:399-431.
- Nobili G, 1904. Diagnoses préliminaires de vingt-huit espèces nouvelles de Stomatopodes et Décapodes Macroures de la Mer Rouge. *Bulletin du Muséum National d'Histoire Naturelle, Paris*, 10:228-238.
- Nobili G, 1905. Décapodes nouveaux des Côtes d'Arabie et du Golfe Persique (diagnoses préliminaires). *Bulletin du Muséum National d'Histoire Naturelle, Paris*, 11:158-164.
- Rathbun MJ, 1914. Stalk-eyed crustaceans collected at the Monte Bello Islands. *Proceedings of the Zoological Society of London*, 1914:653-664.
- Ravikumar S, Vinoth R, 2012. First report of *Periclimenes brevicarpalis* in Palk Strait of southeast coast of India. *European Journal of Biological Sciences*, 4:105-108.
- Schenkel E, 1902. Beitrag zur Kenntnis der Dekapodenfauna von Celebes. *Verhandlungen der Naturforschenden Gesellschaft in Basel*, 13:485-585.
- Suzuki K, Hayashi KI, 1977. Five caridean shrimps associated with sea anemones in central Japan. *Publications of the Seto Marine Biological Laboratory*, 24:193-208.

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