

# First Records of Two Pontoniid Shrimps (Crustacea: Decapoda: Caridea: Palaemonidae) from Korea

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## ABSTRACT

We describe and illustrate two pontoniine shrimps, *Cuapetes grandis* and *Periclimenes ornatus*, for the first time in Korea. *C. grandis* was collected in an artificial reef of Dadae, Geojedo Island by SCUBA diving in 15-20 m depth. This species was found in an oyster within an artificial reef and appeared to be free-living. *P. ornatus* was collected from Seongsanpo, Jeju Island by SCUBA diving in 10 m depth. This species had a symbiotic relationship with sea anemone. This record extends their previously known range from southern Japan to the Korean peninsula and the number of known pontoniine species in Korea to four.

**Keywords:** Caridea, Pontoniid shrimp, *Cuapetes grandis*, *Periclimenes ornatus*, Korea

## INTRODUCTION

The distribution of pontoniid shrimps extends from tropical to subtropical regions. These shrimps are usually in symbiotic relationships with a variety of other marine species, sponges, coelenterates, molluscs, echinoderms, and ascidians (Bruce, 1983). At present two species of Pontoniinae, *Periclimenaeus gorgonidarum* (Balss, 1913) and *Onycocaris callyspongiae* Fujino and Miyake, 1969, have been reported from Korean waters (see The Korean Society of Systematic Zoology, 1997; Koo and Kim, 2003).

Two species of pontoniine shrimps, collected by SCUBA from Geojedo Island and Jeju Island, were identified as *Cuapetes grandis* (Stimpson, 1860) and *Periclimenes ornatus* Bruce, 1969. These new additions to the shrimp fauna of Korea are briefly described and illustrated in the present study.

Postorbital carapace length is abbreviated as "CL". It is used as an indication of the size of the specimen and measured from the posterior margin of the orbit to the posterior mid-dorsal margin of the carapace. All specimens were preserved in 95% ethanol. Materials examined in this study are deposited in the second author's collection of Silla University, Busan.

## SYSTEMATIC ACCOUNTS

Order Decapoda Latreille, 1803

Family Palaemonidae Rafinesque, 1815

Subfamily Pontoniinae Kingsley, 1878

<sup>1</sup>\*Genus *Cuapetes* Clark, 1919

<sup>2</sup>\**Cuapetes grandis* (Stimpson, 1860) (Figs. 1-3)

*Anchistia grandis* Stimpson, 1860: 39.

*Periclimenes grandis*: Borradaile, 1898: 382; Bruce, 1976: 6, fig. 2; Chace and Bruce, 1993: 112.

*Kemponia grandis*: Bruce, 2004: 16; Li et al., 2004: 530.

*Cuapetes grandis*: Okuno, 2009: 68 (only list).

**Material examined.** 1 ♂ (CL 3.8 mm), 1 ♀ (CL 5.1 mm), Dadae (Geojedo Island), 22 Oct 2008, Lee SH, by SCUBA diving in 15-20 m depth.

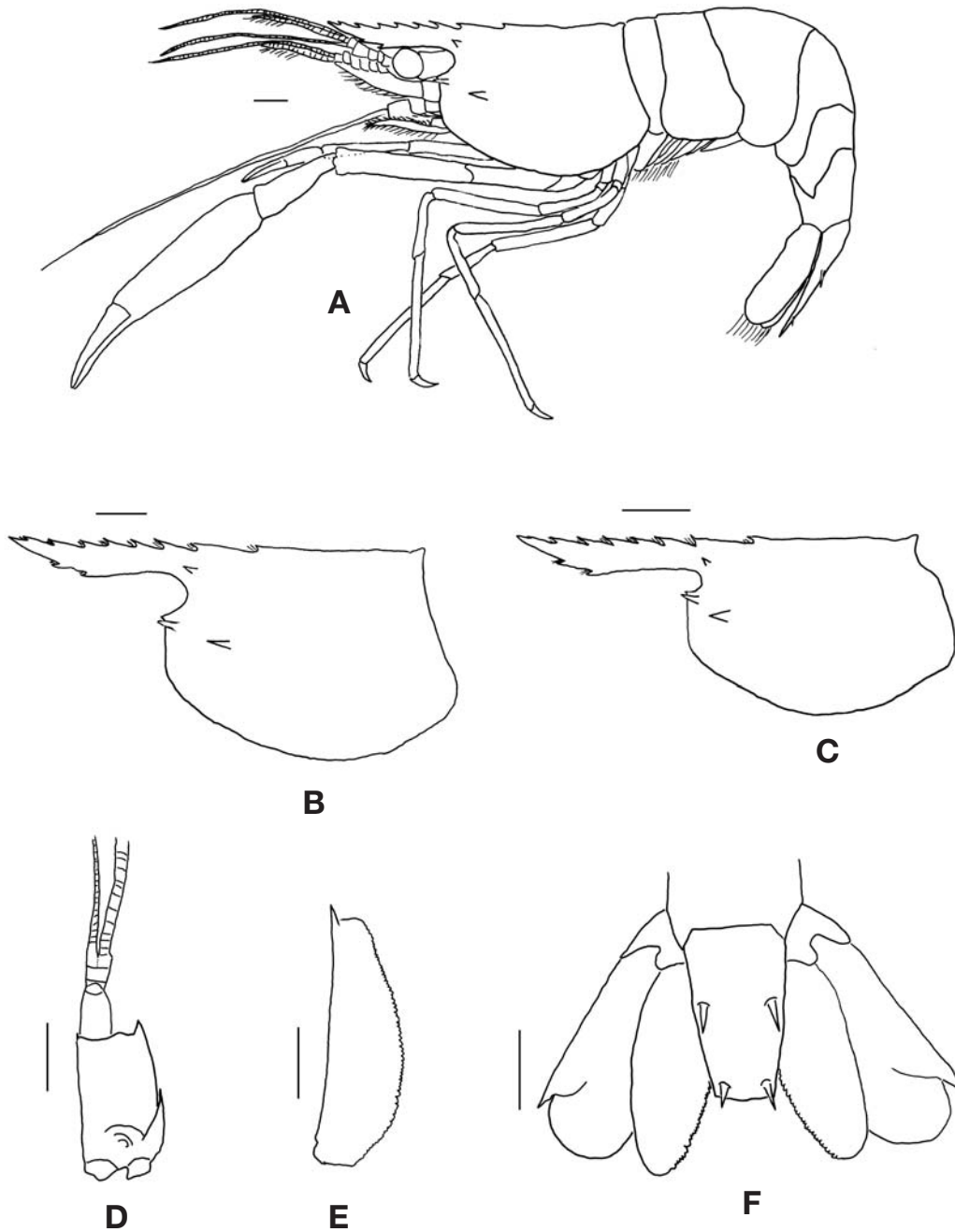
**Description.** Integument smooth on lateral areas of carapace and abdomen. Rostrum (Fig. 1A-C) reaching slightly beyond level of distal end of antennal scale, rostral formula 2+6/2; dorsal teeth rather subequally spaced, posteriormost tooth somewhat separated from remainder of dorsal rostral series, situated posterior to level of hepatic spine. Carapace (Fig. 1A-

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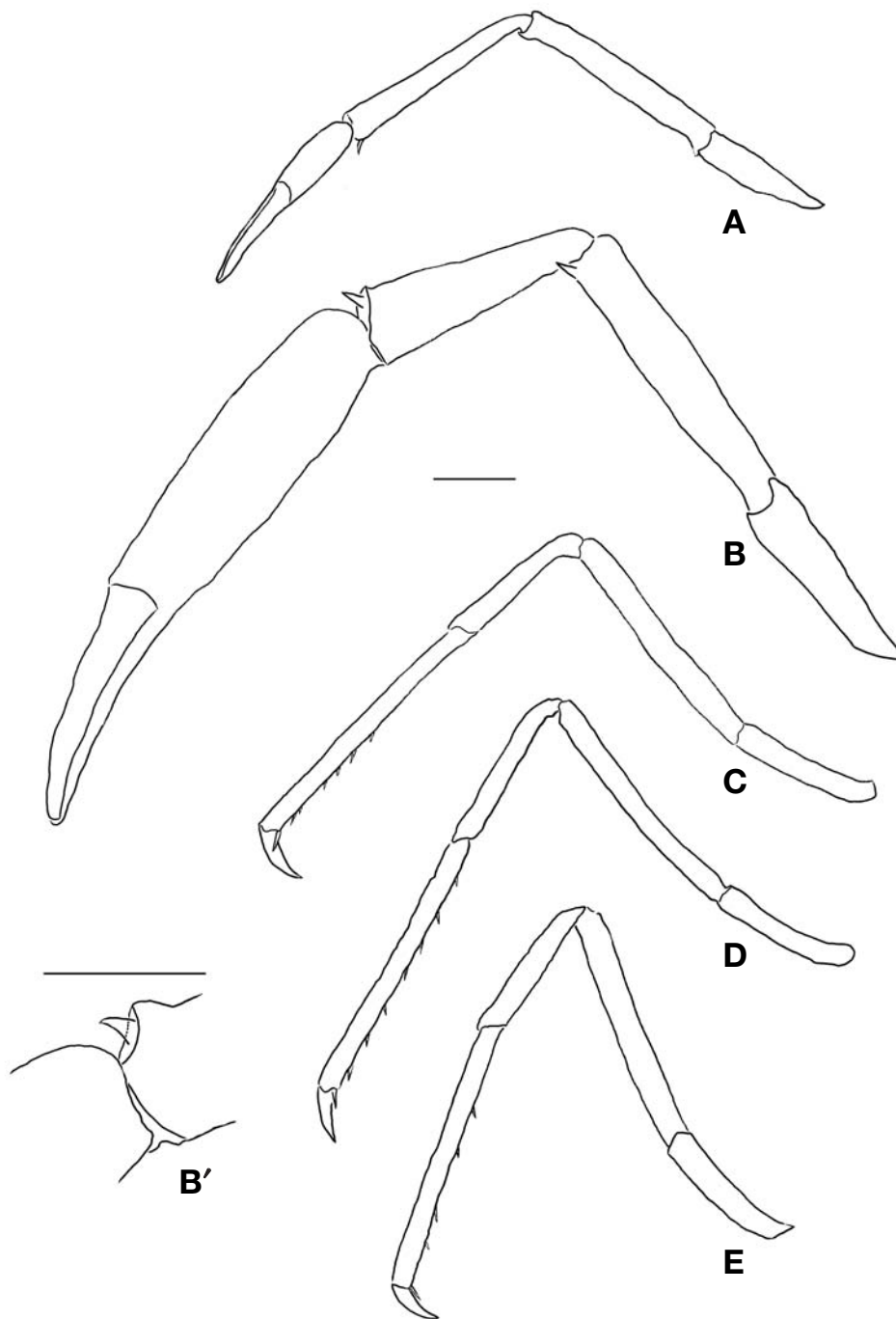
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**Fig. 1.** *Cuapetes grandis*, ovigerous female (postorbital carapace length 5.1 mm, eggs omitted). A, Habitus, lateral; B, Carapace, lateral; C, Male (postorbital carapace length 3.8 mm) carapace, lateral; D, Left antennule, ventral; E, Left scaphocerite, dorsal; F, Telson, dorsal. Scale bars: A-F=1 mm.

C) with supraorbital spine, hepatic spine not noticeably larger than antennal spine, not extending beyond anterior margin of carapace, orbital angle triangular. Abdomen (Fig. 1A) without compressed dorsal prominence on 3rd somite, 5th somite pointed, 6th somite approximately 1.5 times as long as 5th. Telson (Fig. 1F) with 2 pairs of dorsolateral spines. Eye (Fig.

1A) moderately small, cornea well-developed. Antennular peduncle (Fig. 1D) with 1 distolateral spine on basal segment. Scaphocerite (Fig. 1E) approximately 4 times as long as width, distolateral tooth distinctly overreaching distal margin of blade. 1st pereopod (Fig. 2A) overreaching scaphocerite by length of fingers. 2nd pereopod (Fig. 2B, B') with fingers



**Fig. 2.** *Cuapetes grandis*, ovigerous female (postorbital carapace length 5.1 mm, eggs omitted). A, Left 1st pereopod, lateral; B, Left 2nd pereopod, lateral; B', 2nd pereopod's distal spine of carpus; C, Left 3rd pereopod, lateral; D, Left 4th pereopod, lateral; E, Left 5th pereopod, lateral. Scale bars: A-E, B'=1 mm.

0.7 times as long as palm; carpus 0.7 times as long as palm, 3.2 times as long as distal width, with distal spine; merus with distinct distal tooth on flexor margin. 3rd-5th pereopods (Fig. 2C-E) with simple dactyli; flexor margin of propodus with 7 spinules on 3rd pereopod, 8 spinules on 4th pereopod,

5 spinules on 5th pereopod; 5th pereopod not overreaching scaphocerite. Uropod (Fig. 1F) overreaching extended telson.

**Remarks.** The two specimens agree closely with the previous description. Chace and Bruce (1993) described the carpus of the 2nd pereopod was 4 to 5 times longer than the distal width,



**Fig. 3.** *Cuapetes grandis*, ovigerous female (postorbital carapace length 5.1 mm).

but in our specimens it was approximately 3.2 times longer. It is generally accepted that the difference falls within the range of variation for this species. This species was found in an oyster within an artificial reef and appeared to be free-living. It is now the only species within the genus *Cuapetes* in Korea.

**Color in life (Fig. 3).** Yellowish brown bands are on distal parts of the carpus and the propodus and proximal and distal parts of the fingers on the 2nd pereopod.

**Distribution.** Red Sea to Mozambique, Japan, Indonesia, Australia (Li and Liu, 2004), and now in Korea.

<sup>1</sup>\*Genus *Periclimenes* Costa, 1844

<sup>2</sup>\**Periclimenes ornatus* Bruce, 1969 (Figs. 4-6)

*Periclimenes ornatus* Bruce, 1969: 266, 1983: 209; Chace and Bruce, 1993: 119; Debelius, 2000: 187; Minemizu, 2000: 56; Marin et al., 2005: 212.

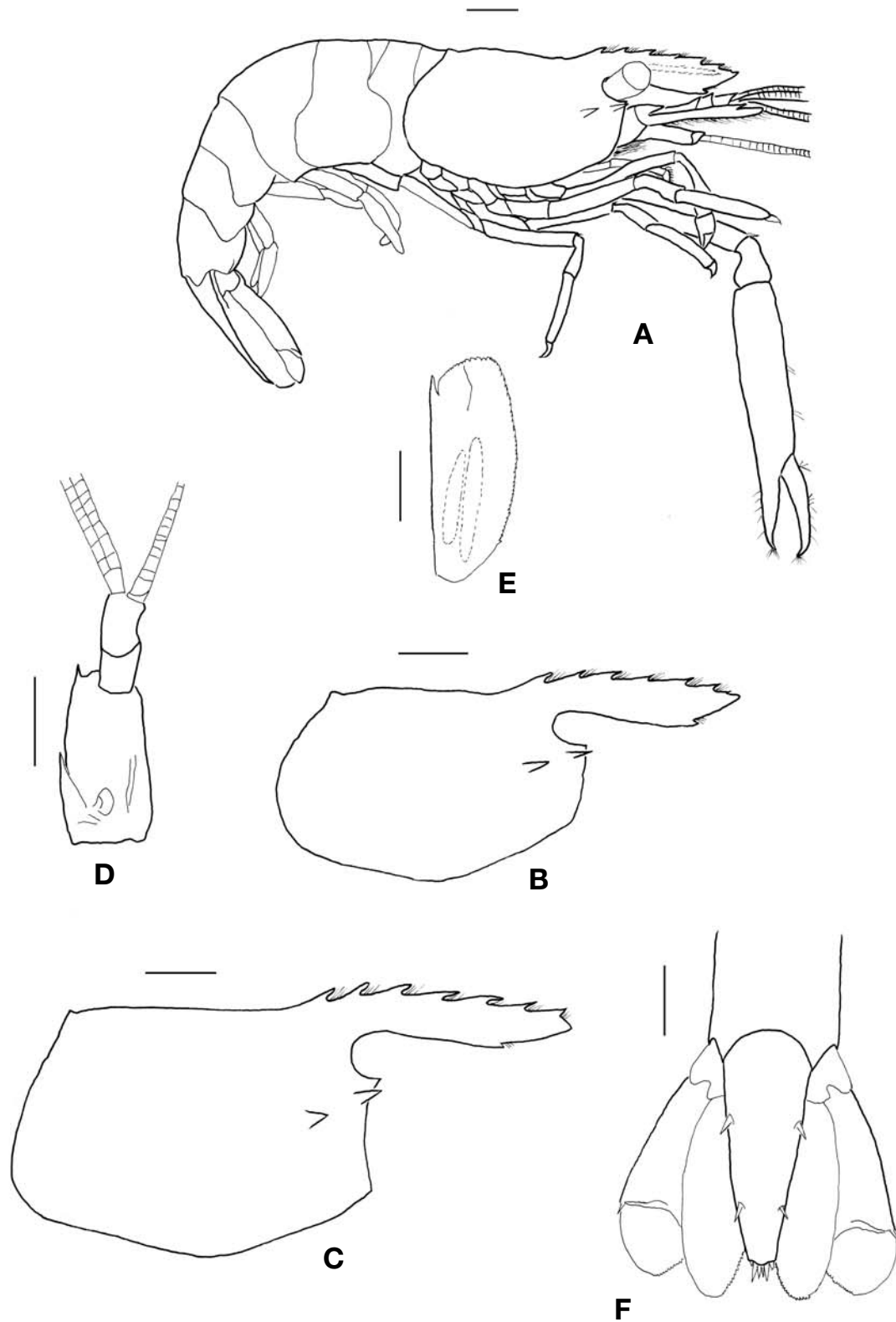
**Material examined.** 1♂ (CL 4.1 mm), 2♀♀ (CL 4.8, 4.9 mm), Seongsanpo (Jejudo Island), 18 Oct 2008, Ko HS, by SCUBA diving in 10 m depth.

**Description.** Integument smooth on lateral areas of carapace and abdomen. Rostrum (Fig. 4A-C) not overreaching scaphocerite, horizontal, rostral formula 0+6-7/1, posteriormost tooth not isolated from remainder of dorsal rostral series, situated slightly posterior to level of orbital margin, anterior

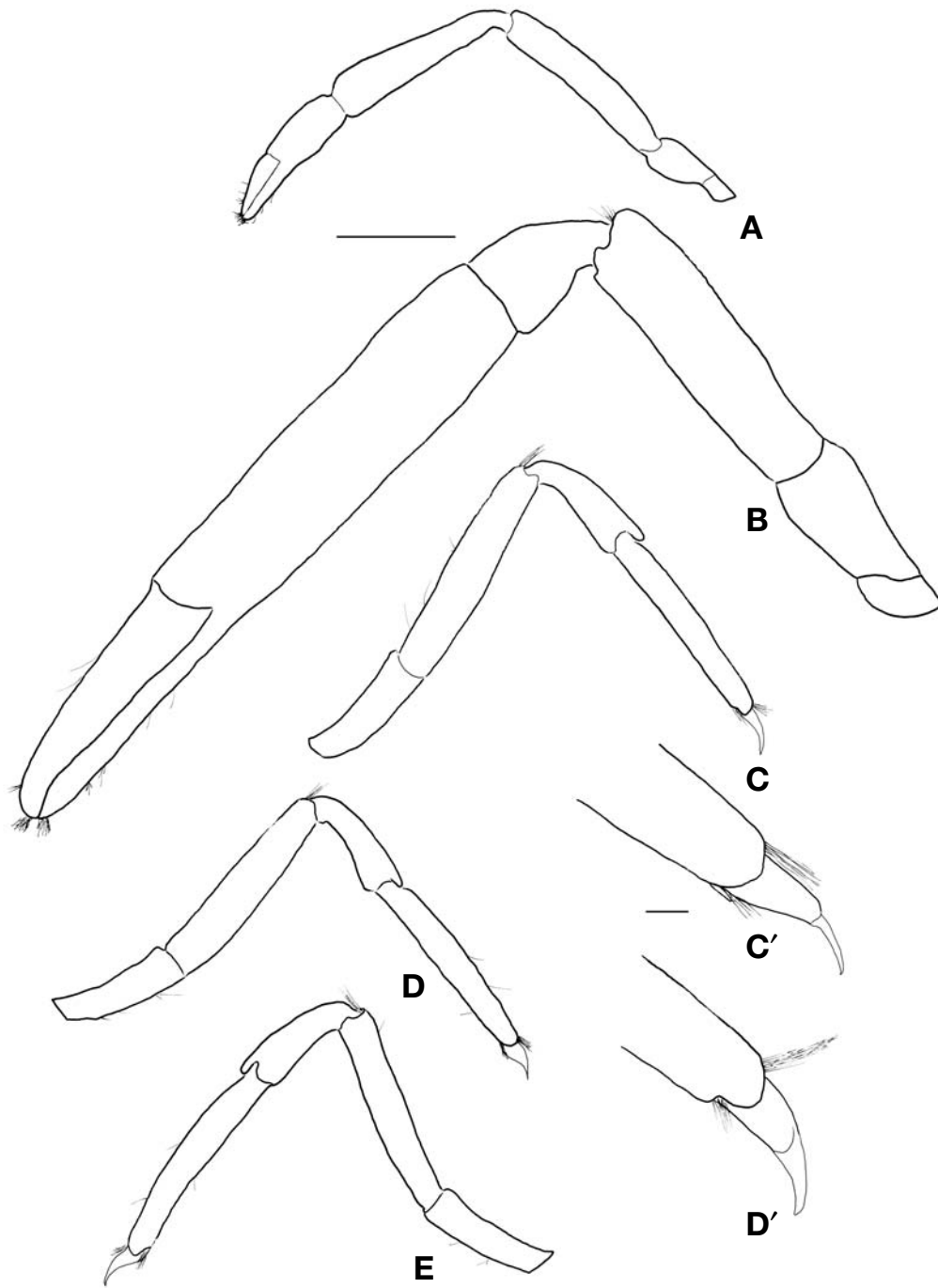
to hepatic spine. Carapace (Fig. 4A-C) without supraorbital or postorbital tooth, hepatic spine not noticeably larger than antennal spine, arising posteriorly and slightly ventrally to level of latter, not extending beyond anterior margin of carapace, orbital angle acute. Abdomen (Fig. 4A) without compressed dorsal prominence on 3rd somite, 6th somite approximately 1.5 times as long as 5th. Telson (Fig. 4F) with 2 pairs of well-developed dorsal spines anterior to posterior margin, at approximately 0.3 and 0.6 of length. Eye (Fig. 4A) with cornea hemispherical. Antennular peduncle (Fig. 4D) with 1 distolateral tooth on basal segment. Scaphocerite (Fig. 4E) approximately 2.5 times as long as width, lateral margin straight, distolateral tooth not exceeding distal margin of blade. 1st pereopod (Fig. 5A) with fingers subspatulate, cutting edges entire. 2nd pereopods (Fig. 5B) similar, subequal, with fingers approximately 0.5 times as long as palm, carpus approximately 0.3 times as long as palm, approximately 1.7 times longer than width, without distal spines, merus without distal tooth on flexor margin. 3rd pereopod (Fig. 5C, C') with dactyl not subdistally truncate, without denticulate lobe on flexor margin, simple, not biunguiculate, flexor margin concave, propodus with small distoventral spine only, not segmented. 4th-5th pereopods (Fig. 5D, D', E) similar to 3rd pereopod, propodus without small distoventral spine. Uropod (Fig. 4F) broad, exceeding tip of telson.

**Remarks.** Chace and Bruce (1993) described the scaphocerite was 2.5 times longer than the width, but in these specimens

Korean name: <sup>1</sup>\*유령새우속 (신칭), <sup>2</sup>\*예쁜점유령새우 (신칭)



**Fig. 4.** *Periclimes ornatus*, male (postorbital carapace length 4.1 mm). A, Habitus, lateral; B, Male carapace, lateral; C, Female (postorbital carapace length 4.8 mm) carapace, lateral; D, Right antennule, ventral; E, Right scaphocerite, dorsal; F, Telson, dorsal. Scale bars: A-F=1 mm.



**Fig. 5.** *Periclimenes ornatus*, male (postorbital carapace length 4.1 mm). A, Left 1st pereopod, lateral; B, Left 2nd pereopod, lateral; C, Right 3rd pereopod, lateral; C', Dactyl of 3rd pereopod, lateral; D, Right 4th pereopod, lateral; D', Dactyl of 4th pereopod, lateral; E, Left 5th pereopod, lateral. Scale bars: A-E=1 mm, C', D'=0.1 mm.

it was 2.7 times longer. It is generally accepted that the difference falls within the range of variation for this species. Omori et al. (1994) reported that this species had a symbiotic relationship with sea anemone such as *Parasicyonis* sp., however, our specimens were associated with the sea anemone

*Entacmaea actinostoloides*. It is now the only species within the genus *Periclimenes* in Korea.

**Color in life (Fig. 6).** Body is transparent. Scaphocerite, pereopods and uropods are violet spotted.

**Distribution.** Red Sea, Kenya, Japan, Hong Kong, Indonesia



**Fig. 6.** *Periclimenes ornatus*. A, Live shrimp; B, Shrimp associated with sea anemone *Entacmaea actinostoloides*.

(Marin et al., 2005), and now in Korea.

## ACKNOWLEDGEMENTS

This work was supported by “The Survey of Korean Indigenous Species” from National Institute of Biological Resources (NIBR) of Ministry of Environment of Korea.

## REFERENCES

- Borradaile LA, 1898. A revision of the Pontoniidae. The Annals and Magazine of Natural History, Series 7, 2:376-391.
- Bruce AJ, 1969. Preliminary descriptions of sixteen new species of the genus *Periclimenes* Costa, 1844 (Crustacea, Decapoda, Natantia, Pontoniinae). Zoologische Mededelingen, 43:253-278.
- Bruce AJ, 1976. A report on a small collection of shrimps from the Kenya National Marine Parks at Malindi, with notes on selected species. Zoologische Verhandelingen Uitgegeven

- door het Rijksmuseum van Natuurlijke Historiete Leiden, 145:1-72.
- Bruce AJ, 1983. The pontoniine shrimp fauna of Australia. Memoirs of the Australia Museum, 18:195-218.
- Bruce AJ, 2004. A partial revision of the genus *Periclimenes* Costa, 1884 (Crustacea: Decapoda: Palaemonidae). Zootaxa, 582:1-26.
- 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.
- Debelius H, 2000. Crustacea guide of the world: shrimps, crabs, lobsters, mantis shrimps, amphipods. IKAN Unterwasserarchiv, Frankfurt, pp. 1-321.
- Koo HY, Kim W, 2003. First report of palaemonid shrimp *Oncocaris callyspongiae* (Decapoda: Caridea: Palaemonidae) from Korea. Korean Journal of Systematic Zoology, 19:251-255.
- Li X, Bruce AJ, Manning RB, 2004. Some palaemonid shrimps (Crustacea: Decapoda) from northern South China Sea, with descriptions of two new species. The Raffles Bulletin of Zoology, 52:513-553.
- Li X, Liu JY, 2004. Report of pontoniinae shrimps (Crustacea: Decapoda) collected by the Joint Chinese-German marine biology expeditions to Hainan Island, South China Sea. III. *Periclimenes*. Chinese Journal of Oceanology and Limnology, 22:89-100.
- Marin IN, Britayev TA, Anker A, 2005. Pontoniine shrimps associated with cnidarians: new records and list of species from coastal waters of Viet Nam. Arthropoda Selecta, 13: 199-218.
- Minemizu R, 2000. Marine decapod and stomatopod crustaceans mainly from Japan. Bun'ichi Sogo Publishing Co., Tokyo, pp. 1-344.
- Okuno J, 2009. *Cuapetes* Clark, 1919, a senior synonym of *Kemponia* Bruce, 2004 (Crustacea: Decapoda: Palaemonidae). Zootaxa, 2028:67-68.
- Omori K, Yanagisawa Y, Hori N, 1994. Life history of the caridean shrimp *Periclimenes ornatus* Bruce associated with a sea anemone in Southwest Japan. Journal of Crustacean Biology, 14:132-145.
- Stimpson W, 1860. Prodromus descriptionis animalium evertibratorum, quae in Expeditione ad Oceanum Pacificum Septentrionalem, a Republica Federata missa, Cadwaladaro Ringgold et Johanne Rodgers Ducibus, observavit et descripsit. Pars VIII. Crustacea Macrura. Proceedings of the Academy of Natural Sciences of Philadelphia, 12:22-47.
- The Korean Society of Systematic Zoology, 1997. List of animals in Korea (excluding insects). Academy Publishing Co., Seoul, pp. 1-489.

Received June 27, 2011  
Revised September 9, 2011  
Accepted October 30, 2011