

# First report of *Pagurus erythrogrammus* (Crustacea: Decapoda: Anomura) from Korea

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A pagurid crab, *Pagurus erythrogrammus* is described and illustrated for the first time from Korean waters. It was collected by SCUBA diving in Seogwipo (Jeju Island) on 30 May 2013. Its morphology is similar to those of known Korean species of the family Paguridae: *Boninpagurus pilosipes*, *Pagurus nigrivittatus*, and *Pagurus quinquelineatus*. This species, however, it is distinguished by having a developed rostrum, seven rows of spines on dorsal surface of the right palm in male, a row of spines on the medial surface of the dactylus of the third pereopod, 12 long ventral spines of dactylus of the third pereopod, six small spines on the concaved distal margin of telson, and three reddish brown lines on lateral surfaces of propodi of the second and third pereopods.

Keywords: Anomura, Decapoda, Korea, Paguridae, *Pagurus erythrogrammus*

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## INTRODUCTION

Pagurid crabs are commonly called right-handed crabs because they have a larger right cheliped than the left. The family Paguridae Latreille, 1802 is the largest family in the superfamily Paguroidea Latreille, 1802 and includes over 75 genera and 542 species (McLaughlin *et al.*, 2010). In Korea, only 12 genera and 42 species have been reported in this family (Hong *et al.*, 2015; Jung and Kim, 2016; 2017). The genus *Pagurus* (Fabricius, 1775) consists of 173 species in the world (McLaughlin *et al.*, 2010) and is distinguished from other hermit crabs by having much larger right cheliped than left, semichelated fourth pereopods, a spirally twisted abdomen, and asymmetrical uropods (McLaughlin, 2003). During a taxonomical study on hermit crab from Korean waters, a specimen of *Pagurus erythrogrammus* Komai, 2003 was collected by SCUBA diving from Jeju Island. Therefore, the morphology of this species is described and illustrated with a color image.

The drawing was made using a dissecting microscope MZ8 (Leica, Wetzlar, Germany) with a camera lucida. Image was obtained using a digital camera (Model D200; Nikon, Tokyo, Japan). The abbreviation “sl” refers to shield length from the tip of the rostrum to the midpoint of the posterior margin of the shield, and was taken using a digital vernier caliper (CD-15 APX; Mi-

tutoyo, Kawasaki, Japan). The specimen was preserved in 95% Ethanol. The morphological terminology used in this study generally follows that of McLaughlin *et al.* (2007). The anomuran classification follows that of McLaughlin *et al.* (2010). The specimen examined in this study was deposited at National Institute of Biological Resources (NIBR), Incheon.

## SYSTEMATIC ACCOUNTS

Superfamily Paguroidea Latreille, 1802  
Family Paguridae Latreille, 1802  
Genus *Pagurus* Fabricius, 1775

### *Pagurus erythrogrammus* Komai, 2003

붉은줄무늬참집게 (신칭) (Figs. 1, 2)

*Pagurus erythrogrammus* Komai, 2003: 133-141, figs. 12-15, 24C, 25A; McLaughlin *et al.*, 2010: 33 (list), fig. 15F.

*Pagurus pilosipes*: Miyake, 1978: 91 (part), fig. 34a (not *Pagurus pilosipes*).

**Material examined.** 1♂ (sl 3.8 mm), Korea: Seogwipo, Jeju Is., 30 May 2013, Lee SH, SCUBA at 5 m depth.

**Description.** Shield (Figs. 1, 2A) slightly longer than broad, about 1.1 times broader than long, dorsal surface



**Fig. 1.** Color photo of *Pagurus erythrogrammus* ("sl 3.8 mm").

with turf of setae; rostrum triangular, well developed, overreaching lateral projections; lateral margin sloped; posterior margin roundly truncated.

Ocular peduncles (Figs. 1, 2A) shorter than sl, dorso-medial surface with 2 rows of setae; Ocular acicles (Figs. 1, 2A) subovoid, terminal margin with submarginal spine.

Antennular peduncles (Figs. 1, 2A) overreaching corneas by length of 0.1 of ultimate segment. Antennal peduncles (Figs. 1, 2A) overreaching corneas.

Left third maxilliped (Fig. 2D) moderately stout; ischium subrectangular, about 1.6 times longer than broad, inner margin denticulate, inner and outer margins with setae; merus with setae on inner margin, distal surface, and medial and distal part of outer margin; carpus and propodus with setae on inner margin and distal angle of outer margin; dactylus setose; exopod with setae on inner margin, approaching middle part of carpus.

Right cheliped (Figs. 1, 2C) larger than left cheliped; chela subovoid, about 1.8 times longer than broad, covered with setae; dactylus slightly shorter than palm, middle line of dorsal surface with 2 rows of small spines, dorsomedial margin with small spines, cutting edge with row of calcareous teeth, terminating in small calcareous claw; palm slightly shorter than carpus, surface with 7 rows of small spines, dorsomedial and dorsolateral margins with row of small spines, cutting edge of fixed finger with teeth on proximal and distal parts, prominent tooth on medial part; carpus subequal in length to merus, broadened distally, dorsomedial and distal parts of dorsal surface with spinules and setae.

Left cheliped (Figs. 1, 2B) shorter than right cheliped, approached to middle part of palm of right cheliped;

chela subovoid, about twice longer than broad, covered with setae; dactylus longer than palm; dorsal surface with small spines; cutting edge with small corneous teeth; palm shorter than carpus, surface with 2 rows of spines, dorsolateral margin with row of small spines, cutting edge of fixed finger with row of calcareous teeth, 7 teeth on medial to distal part; carpus compressed laterally, dorsal surface with row of spines and setae.

Left second pereopod (Figs. 1, 2E, E') slender, long; dactylus as long as propodus, slightly curved, dorsal and ventral margins with setae, distal angle of dorsal margin with corneous spine, ventral margin with 11 long corneous spines; propodus about 1.8 times longer than carpus, dorsal and ventral margins with setae, medial to distal part of ventral margin with 4 long corneous spines; carpus with distal angle spine on dorsal margin; merus with spines on medial part of ventral margin.

Left third pereopod (Figs. 1, 2F, F') slender, longest; dactylus as long as propodus, slightly curved, dorsal and ventral margins with setae, distal angle of dorsal margin with corneous spine, ventral margin with 12 long corneous spines, medial surface with row of 5 spines; propodus about 1.6 times longer than carpus, dorsal and ventral margins with setae, medial to distal part of ventral margin with 6 long corneous spines; carpus with distal angle spine on dorsal margin; merus with setae on dorsal and ventral margins.

Abdomen (Fig. 1) twisted to rightward, with 3 unpaired pleopods in male and asymmetrical uropods.

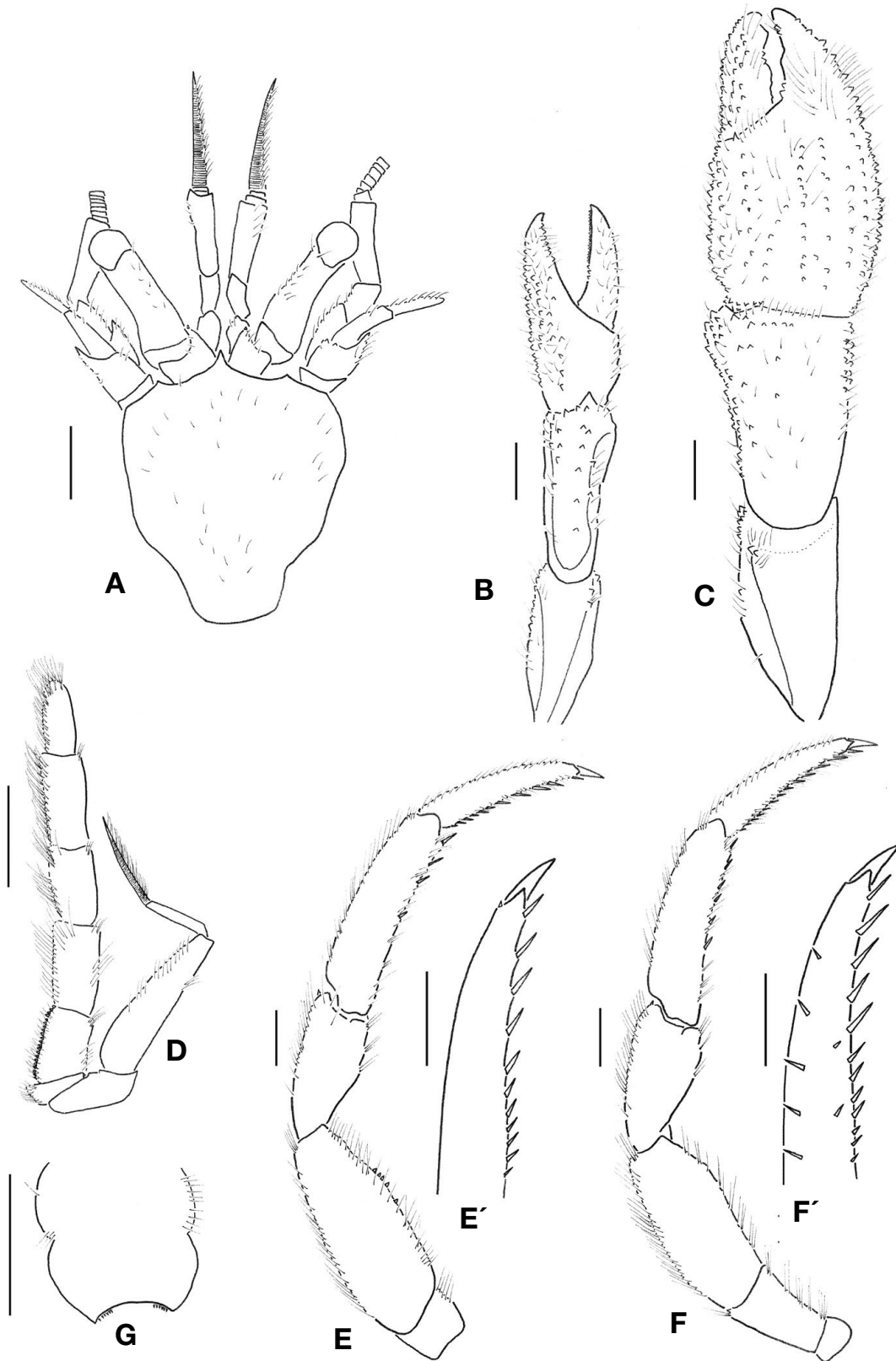
Telson (Fig. 2G) with long bristles on lateral surface, medial cleft indistinct; distal margin slightly concaved, with 6 small spines on each lobes.

**Color in life** (Fig. 1). Shield reddish brown. Ocular peduncles with 2 longitudinal lines on dorsal surface. Chelipeds generally reddish brown, dactylus whitish yellow. Second and third pereopods generally whitish yellow, meri with 2 reddish brown lines on medial surfaces, carpi, propodi, and dactyli with 3 reddish brown lines on medial surfaces.

**Habitat.** Gastropod shell, intertidal to 75 m (Komai, 2003).

**Distribution.** Japan (Komai, 2003) and Korea.

**Remarks.** *Pagurus erythrogrammus* has similar characteristics to *Boninpagurus pilosipes*, *Pagurus nigrivittatus*, and *Pagurus quinquelineatus* as the known Korean species of the family Paguridae. However, *P. erythrogrammus* is distinguished by having a developed rostrum (vs. undeveloped in *B. pilosipes*, variable in *P. nigrivittatus*, undeveloped in *P. quinquelineatus*), seven rows of spines on the dorsal surface of the right palm in male (vs. five rows in *B. pilosipes*, scattered *P. nigrivittatus*, six to seven rows *P. quinquelineatus*), a row of spines on the medial surface of dactyli of the third pereopod, 12 long ventral spines of dactyli of the third pereopod (vs. five to seven



**Fig. 2.** *Pagurus erythrogrammus* Komai, 2003, male ("sl 3.8 mm"). A, Shield; B, Left cheliped; C, Right cheliped; D, Left third maxilliped; E, Left second pereopod; E', Dactylus of left second pereopod; F, Left third pereopod; F', Dactylus left third pereopod; G, Telson. Scale bars: 1 mm.

in *B. pilosipes*, five to seven *P. nigrivittatus*, eight to 14 *P. quinquelineatus*), a minute medial cleft on the lateral margin of telson, and small spines on concaved distal margin of the telson (vs. a slightly minute medial cleft, oblique, and larger spines in *B. pilosipes*, a minute medial cleft *P. nigrivittatus*, slightly oblique, and larger spines, a wide medial cleft, slightly oblique, and small spines *P. quinquelineatus*), and three reddish brown lines on lateral surfaces of propodi of the second and third pereopods (vs. four reddish brown in *B. pilosipes*, three dark brown *P. nigrivittatus*, five brick red of reddish brown *P. quinquelineatus*) (Komai, 2003). The present specimen agrees well with the description of the species by Komai (2003).

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### REFERENCES

- Hong, J.S., G.Y. Im, C.K. Jo, S.G. Jo, H.K. Jung, C.B. Kim, S.W. Kim, W.R. Kim, H.S. Ko, J.R. Lee, G.S. Min, B.J. No, H.S. No, S.Y. Seo, U.M. Son, J.H. Song, J.I. Song, K.S. Um, J.H. Won and S.M. Yun. 2015. National list of species of Korea, Invertebrate-VII. National Institute of Biological Resources, pp. 1-546.
- Jung, J.B. and W. Kim. 2016. Two species of the genus *Discorsopagurus* (Malacostraca: Decapoda: Paguridae) new to Korea. *Animal Systematics, Evolution and Diversity* 32:141-147.
- Jung, J.B. and W. Kim. 2017. First record of two species of hermit crabs (Decapoda, Paguridae) from South Korea, with remarks on the associated hydrozoan, *Hydrissa sodalists*. *Crustaceana* 90:659-672.
- Komai, T. 2003. Reassessment of *Pagurus pilosipes* (Stimpson), supplemental description of *P. insulae* Asakura, and descriptions of three new species of *Pagurus* from east Asian waters (Crustacea: Decapoda: Anomura: Paguridae). *Natural History Research* 7:115-166.
- McLaughlin, P.A. 2003. Illustrated keys to families and genera of the superfamily Paguroidea (Crustacea: Decapoda: Anomura), with diagnoses of genera of Paguridae. *Memiors of Museum Victoria*, 60:111-144.
- McLaughlin, P.A., T. Komai, R. Lemaitre and D.L. Rahayu. 2010. Annotated checklist of anomuran decapod crustaceans of the world (exclusive of the Kiwaoidea and families Chirostylidae and Galatheidae of the Galatheoidea), part I. Lithodoidea, Lomisoidea and Paguroidea. *The Raffles Bulletin of Zoology* 23:5-107.
- McLaughlin, P.A., R. Lemaitre, T. Komai and T.Y. Chan. 2007. A catalog of the hermit crabs (Paguroidea) of Taiwan. National Taiwan Ocean University, Keelung. pp. 1-376.
- Miyake, S. 1978. The Crustacean Anomura of Sagami Bay. Biological Laboratory, Imperial Household, Tokyo. ix+200 pp. (in English), 161 pp. (in Japanese).

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