New Record of Two Xanthid Crabs (Crustacea: Decapoda: Xanthidae) from Korea

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ABSTRACT

Xanthid crabs, decapod crustacean, with the black coloured fingers, are easily found under rocks or stones in the intertidal or subtidal zones. Two xanthids, *Etisus laevimanus* Randall, 1840 and *Paraxanthias elegans* (Stimpson, 1858), were newly reported in Korean waters as part of continuous taxonomic studies on crabs. The genus *Paraxanthias* Odhner, 1925 was also reported for the first time in Korea. Of these, the examined specimen of *P. elegans* showed eight feathery hairs on the subdistal tip of the first gonopod, which differs from the description of Dai and Yang at 1991. Here, the descriptions and illustrations of these species are provided. Korean Xanthoidea currently consists of 30 species belonging to 25 genera.

Keywords: new report, *Paraxanthias elegans*, *Etisus laevimanus*, Decapoda, Korean fauna

INTRODUCTION

Many members of the family Xanthidae MacLeay, 1838, with the black coloured fingers, occur in the Indo-West Pacific. They are easily found around the intertidal or subtidal zones, and hide under the rocks or in the sponges and other sessile invertebrates, and graze on algae or on detritus.

Until now, 28 species of 24 genera belonging to the family Xanthidae have been recorded among Korean fauna (Lee et al., 2012). As a result of continuous taxonomic studies on Korean crabs, two xanthid crabs, *Etisus laevimanus* Randall, 1840 and *Paraxanthias elegans* (Stimpson, 1858), were newly reported from Korean waters. In Korea, *Etisus anaglyptus* H. Milne Edwards, 1834 was reported only in the genus *Etisus* H. Milne Edwards, 1834, and the genus *Paraxanthias* Odhner, 1925 was reported for the first time. With this report, Korean xanthoid crabs are now composed of 30 species in 25 genera. We provide their morphological descriptions are provided with illustration, in the current report.

MATERIALS AND METHODS

Materials examined in this study were preserved in 95% ethyl alcohol, and deposited in the Marine Arthropod Depository

Bank of Korea (MADBK), Seoul National University. The specimens were observed under a microscope (Model M165C; Leica, Wetzlar, Germany). Drawings were made with the aid of camera lucida. Images were recorded using Digital camera (Model Nikon D800; Nikon Imaging Korea Co., Ltd., Korea), and developed with the software (Model Helicon Focus; Helicon Soft Ltd., Kharkov, Ukraine).

The abbreviation “cl” and “cw” referred to the carapace length from the front to the posterior dorsal margin of the carapace and to the width of the carapace measured at the widest part, respectively. The zones of the carapace (1–3M, 1F, 2F, 1–4L, and 2P) were divided according to Dana (1853) and Serène (1984). The classification followed that of Ng et al. (2008).

SYSTEMATIC ACCOUNTS

Order Decapoda Latreille, 1802
Family Xanthidae MacLeay, 1838
Genus *Etisus* H. Milne Edwards, 1834

¹**Etisus laevimanus* Randall, 1840 (Figs. 1–3)

Etisus laevimanus Randall, 1840: 115; Forest and Guinot, 1961: 88; Sakai, 1976: 455, fig. 245, Pl. 161, fig. 1; Dai

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and Yang, 1991: 324, fig. 164B(5), Pl. 42(2).

Etisus convexus Stimpson, 1858: 31; 1907: 36, Pl. 5, fig. 2.

Etisus (Etisus) laevimanus: Holthuis, 1953: 21.

Material examined. Korea: 1 ♂ (cl 28.3 mm, cw 44.8 mm), 1 ♀ (cl 19 mm, cw 28.6 mm), Gyeongsangbuk-do, Uljin-gun, Jukbyeon-myeon, Hujeong-ri, 27 Sep 2012, SCUBA diving, Col. Rho HS.

Description. Carapace (Fig. 1A) outline distinctly rounded, subcircular; surface convex, smooth and punctuated; regions recognizable, grooves separating regions shallow, but those surrounding gastric regions deeper; 5L with a deep depression on its anterior border; gastric-cardiac region H-shaped, and deep groove. Front (Figs. 1A, B, 2B) produced, subquadrate, distinctly truncate, anterior margins bearing strong granules, divided into 2 lobes; each lobe with anterior margin slightly slanting, concave and separated from orbit by wide V-shaped notch. Dorsal margin of orbit (Figs. 1A, B, 2B) with one fissure. Anterolateral border (Figs. 1A, 2B) bearing 5 distinct teeth, including triangular postorbital angle as first; first 2 teeth flat and obtuse; last 2 dentiform but claw-shaped. Antennules folded obliquely. Basal article of antenna not reaching margin of carapace front, strong lateral flange greatly exceeding articulation with flagellum, abutting inner sub-orbital lobe blocking orbital hiatus, flagellum centered on broad antennal sulcus, excluded from orbit. Third maxillipeds (Fig. 3A) with merus produced at outer-distal angle.

Chelipeds (Figs. 1A, 2A, C, D) massive, robust, unequal. Chelipeds about 2.5 times as long as carapace length. Carpus with an obtuse tooth at the inner angle. Propodus depressed, subequal to finger in length; immovable finger with 1 obtuse tooth at sub tip. Dactylus of major chela depressed, with 2 obtuse teeth on inner margin. Fingers dark brown and pigment extended into propodes.

Ambulatory legs (Fig. 1A) short, heavy, moderately setose, shorter than carapace length; upper and lower border with hairs; anterior and posterior surfaces naked. Dactylus proximally bearing small, slightly elevated condyle abutting locking arch on distal margin of propodus, distally terminating in elongated corneous tip.

Male abdomen (Fig. 3B) narrow, elongated; third to fifth somites fused, lateral lobes of fused third somite weakly sculptured, granular, somite suture limited to slight indentations in lateral margin; sixth segment subrectangular; telson triangular and shorter than the sixth segment. Female abdomen (Fig. 3C) naked, covered sternum; all segment separated.

First pleopod of the male (Fig. 3D, E) curved ventrally and serrated along the margins. Second gonopod small, short, ex-

Fig. 1. *Etisus laevimanus* Randall, 1840, male (cl 28.3 mm, cw 44.8 mm). A, Whole animal, dorsal view; B, Anterior view; C, Ventral view. cl, carapace length from the front to the posterior dorsal margin of the carapace; cw, width of the carapace measured at the widest part.

tending about 1/4 length of first gonopod, slightly swollen terminal bulb narrowing to sharp spine.

Habitat. Crevices of rocks or under stones, intertidal zone.

Distribution. China, Hawaii, India, Japan, Singapore, Tai-

Fig. 2. *Etisus laevimanus*, male (cl 28.3 mm, cw 44.8 mm). A, Left cheliped, dorsal view; B, Anterolateral border, dorsal view; C, Right cheliped, outer view; D, Left cheliped, outer view. cl, carapace length from the front to the posterior dorsal margin of the carapace; cw, with of the carapace measured at the widest part.

wan, east-southern coast of Africa, and Korea (the present study).

Remarks. In Korea, *Etisus anaglyptus* H. Milne Edwards, 1834 was only reported in genus *Etisus* H. Milne Edwards, 1834, and was collected from Uljin, Korea. *Etisus anaglyptus* bears four or five tubercles on the upper surface of propodi of chelipeds, 4 tubercles on anterolateral border, and the narrow frontal width. However, *E. laevimanus*, the second species reported in the genus from Korea, has smooth upper surface of propodi of chelipeds, 4 broad and triangular teeth on the anterolateral border, and relatively broader frontal width. The Korean specimens agreed with the description of *E. laevimanus* by Dai and Yang (1991), and they were collected from same habitat of *E. anaglyptus* collected previously in Korea.

Etisus laevimanus occurs in Hainan Island and Paracel Island of China, Taiwan, and from Okinawa to Sagami bay

of Japan. In Korea, this species only appears in Uljin of the East Sea. Two species of the genus *Etisus*, *E. anaglyptus* and *E. laevimanus*, have only occurred from Uljin in Korea. It means that Korean two species of *Etisus* has not appeared in the Yellow sea.

¹*Genus *Paraxanthias* Odhner, 1925

²**Paraxanthias elegans* (Stimpson, 1858) (Figs. 4, 5)

Xanthodes elegans Stimpson, 1858: 33; 1907: 47, Pl. 5, fig. 3.

Xanthias atromanus Haswell, 1882: 49.

Paraxanthias elegans: Sakai, 1976: 430, fig. 226, Pl. 155, fig. 2; Dai and Yang, 1991: 300, fig. 156B(3), Pl. 38(5).

Xanthias elegans: Serène, 1984: 191 (key), 194 (key).

Material examined. Korea: 1 ♂ (cl 8.8 mm, cw 13 mm), Gyeongsangbuk-do, Uljin-gun, Jukbyeon-myeon, Hujeong-

Korean name: ¹*에쁜부채게 속(신칭), ²*에쁜부채게(신칭)

Fig. 3. *Etisus laevimanus*. A, Left third maxilliped; B, Male abdomen; C, Female abdomen; D, Left male first gonopod, ventral view; E, Tip of left male first gonopod, ventral view. Scale bars: A–D=5 mm, E=0.5 mm.

Fig. 4. *Paraxanthias elegans* Stimpson, 1858, male (cl 8.8 mm, cw 13 mm). A, Whole animal, dorsal view; B, Anterior view; C, Ventral view; D, Chelipeds, outer view. cl, carapace length from the front to the posterior dorsal margin of the carapace; cw, with of the carapace measured at the widest part.

ri, 27 Sep 2012, SCUBA diving, Col. Rho HS.

Description. Carapace (Fig. 4A) transversely oval, being weakly convex anteriorly; dorsal surface naked, and well divided into areolae by shallow, with short ridge on each of 1M, 2M, 3L, and 4L lobes; covered with thick microscopical granules, being not convex. Front (Fig. 4A–C) deflected downwards, convex near median notch but concave near outer side, separated from inner orbital angle by notch. Antennal basal segment rather wide but short; its inner angle just touched with the short ventral prolongation of the front; outer angle raised to level of inner infraorbital angle; antennal flagellum rather stout and only slightly longer than the major diameter of the orbit, being provided with microscopical secondary. Anterolateral border (Fig. 4A) with 4 obtuse teeth beside outer orbital tooth, last two later and more produced. Posterolateral border somewhat, directed downwards, and as wide as front. Ischium of third maxilliped (Figs. 4B, C, 5A) bearing angle at anterior-lateral region.

Chelipeds (Fig. 4A, D) stout, asymmetrical. Merus smooth with its outer surface; inner surface concave; anterior margin granulate. Carpus sculpturesque with outer surface; upper surface dentiform, and with 2 teeth at inner-distal angle. Propodus smooth on surface except for dorsal surface; dorsal surface situated longitudinal groove along outer border; upper-outer surface furnished with large tubercles arranged in rows, forming irregular crests; dactylus stout, with teeth on cutting edges; immovable finger of minor chelipeds with distinct longitudinal groove along the middle of the outer surface.

Ambulatory legs (Fig. 4A) comparatively stout. Merus naked on both surface, with hairs and row of conical granules on upper border. Carpus, propodus and dactylus are densely covered with several long hairs. Upper borders and surfaces carpus and propodus armed with rather sparse conical granules. Upper surface of the carpus with longitudinal row. Dactylus much narrower than propodus, armed also with several sharp, more or less elongate granules on upper surface and with thick yellow, semitransparent spinules on upper border near terminal claw.

Male abdomen (Figs. 4C, 5B) with third to fifth segments fused; sixth segment square, broader than long; telson with distal margin coniform.

First gonopod (Fig. 5C–E) with distal portion curved laterally, finger-shaped at tip and armed with long feathery hairs on inner side.

Habitat. Rocky or pebbly beach, under stones or in crevices of rocks.

Distribution. Australia, China, Japan, Taiwan, and Korea (the present study).

Remarks. The characteristics of the examined specimen agreed well with the description of Dai and Yang (1991) ex-

Fig. 5. *Paraxanthias elegans*. A, Left third maxilliped; B, Male abdomen; C, Left male first gonopod, ventral view; D, Tip of left male first gonopod, ventral view; E, Tip of left male first gonopod, dorsal view. Scale bars: A–C=1 mm, D, E=0.3 mm.

cept for the male first gonopod. The examined specimen showed 8 feathery hairs on the tip of the first gonopod while the description of *Paraxanthias elegans* of Dai and Yang

(1991) referred to 5 feathery hairs (see Dai and Yang, 1991: fig. 156B).

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