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New Records of Hippolytid Shrimps (Crustacea: Decapoda: Caridea) from Korea

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ABSTRACT

Three hippolytid shrimps, *Hippolyte acuta, Latreutes acicularis*, and *Latreutes laminirostris* are reported from Korean waters. The former two species represent new records for the Korean marine fauna. *L. laminirostris*, previously known from Korea, is redescribed. A key to *Latreutes* species from Korean waters is given. The Korean Hippolytidae consists now of 19 species of nine genera.

Key words: new records, Hippolyte acuta, Latreutes acicularis, Latreutes laminirostris, Korea

INTRODUCTION

The Korean hippolytid shrimps have been reported as 17 species represented by eight genera (Kim and Kim, 1997; Park and Han, 2000; Cha et al., 2001): Birulia (1 species); Eualus (3 species); Heptacarpus (4 species); Latreutes (4 species); Lebbeus (2 species); Lysmata (1 species); Spirontocaris (1 species); and Tozeuma (1 species).

Ongoing studies on caridean shrimps from southern Korea, two other hippolytids, *Hippolyte acuta* (Stimpson, 1860) and *Latreutes acicularis* Ortmann, 1890 are collected from the eelgrass bed in Namhae, Sacheon, and Jeju-do. They are newly recorded from Korea.

Latreutes laminirostris Ortmann, 1890 is the first reported by Cha et al. (2001) from Namhae,

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Korea. Redescription on *L. laminirostris* is provided since the report of Cha et al. (2001) was limited to brief comments and description. A key to *Latreutes* species from Korean waters is also given.

Postorbital carapace length is abbreviated as cl. The material used in this study is deposited in the Laboratory of Zoology, Silla University (SUZ) and the Laboratory of Invertebrate Zoology, Pukyong National University (PUIZ).

SYSTEMATIC ACCOUNTS

Infraorder Caridea Dana, 1852 Family Hippolytidae Bate, 1888 Genus *Hippolyte Leach, 1814

**Hippolyte acuta (Stimpson, 1860) (Fig. 1)

Virbius acutus Stimpson, 1860, p. 35.

Hippolyte acuta: Yokoya, 1957: 537, figs. 1, 2 (larvae); d'Udekem d'Acoz, 1996: 112; Chace, 1997: 46 (list).

Hippolyte ventricosa: Hayashi and Miyake, 1968b: 140, fig. 10; Yanagawa and Watanabe, 1988: 616, fig. 4; Hayashi, 1994: 97, figs. 254, 255.

Material examined. 1σ (cl 2.0 mm), $1\uparrow$ (cl 3.0 mm), 2 ovig. \uparrow (cl 3.9, 4.0 mm), Hamdeok (Jeju-do), 10 Jun. 1994 (J. N. Kim), by beam trawl from eelgrass bed at 2-5 m in depth, PUIZ 155.

Description. Rostrum (Fig. 1A) slender, nearly straight, 1.03-1.36 times as long as carapace, with proximal dorsal tooth and 2 distal ventral teeth. Carapace (Fig. 1A) without tooth of dorsal rostral series arising from carapace posterior to orbital margin; supraorbital and antennal teeth present; suborbital angle (Fig. 1B-D) knob-like; suborbital knob variable from round to bluntly acute form; branchiostegal tooth articulated; branchiostegal margin not denticulate.

Eye (Fig. 1G) with eyestalk cylindrical, 1.10-2.20 times as long as cornea, without distodorsal spine and papilla; cornea as broad as eyestalk. Antennule (Fig. 1H) with stylocerite narrow, slender; first segment of peduncle with spine near midlength of ventral margin and dorsodistal tooth; upper extremity of third segment of peduncle broadly rounded; outer flagellum subequal to inner flagellum in length, about 1.64-2.60 times as broad as inner flagellum. Scaphocerite (Fig. 1I) 2.50-3.60 times as long as wide; distolateral tooth far from reaching distal margin of blade; distolateral tooth and blade separated by distinct notch. Mandible (Fig. 1J) with incisor process bearing 6 teeth. Third maxilliped (Fig. 1K) nearly reaching tip of first segment of antennular peduncle; distal segment with 8 teeth and several tufts of short setae. Third pereopod (Fig. 1L, M) prehensile in male, not prehensile in female; merus with 3 (rarely 4) spines; carpus with proximal spine; propodus with 6-7 pairs of ventral spines, without subdistal spine; dactylus with 9-10 small ventral spines.

Abdomen (Fig. 1E) smooth; second to fourth somites with tufts of plumose setae in female; third somite distinctly curved in lateral view; fifth somite without tooth above tergite-pleuron junction;

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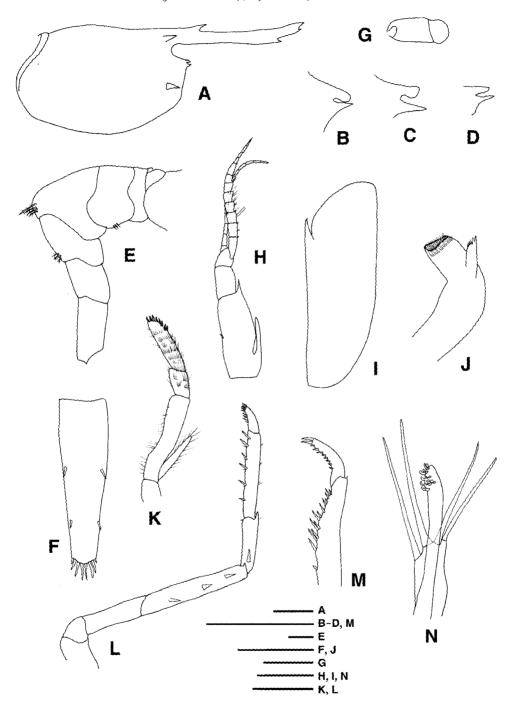


Fig. 1. Hippolyte acuta. A, carapace, lateral; B-D, suborbital angles, lateral; E, abdomen, lateral; F, telson, dorsal; G, eye, dorsal; H, antennule; I, scaphocerite; J, mandible; K, third maxilliped; L, third pereopod; M, dactyl and propodus of third pereopod; N, appendices masculina and interna. A-B, E, female (PUIZ 155, cl 3.0 mm); C, G, ovigerous female (PUIZ 155, cl 4.0 mm); D, F, M, N, male (PUIZ 155, cl 2.0 mm); H-L, ovigerous female (PUIZ 155, cl 3.9 mm). Scale bars = 1.0 mm (A-M), 0.1 mm (N).

sixth somite with triangular tooth on posterior margin, dorsal length about 2.00-2.21 times as long as height. Telson (Fig. 1F) with 2 pairs of dorsolateral spines; posterior margin rounded, with 4 pairs of spines.

Appendix masculina (Fig. 1N) about 0.50 times as long as appendix interna, with 4 setae.

Female fascigerous.

Eggs small, 0.30-0.34 mm in newly extruded ones.

Color. Green, gray or brownish black.

Remarks. Milne Edwards (1837) gave the type-locality of Hippolyte ventricosa as the seas of Asia. Subsequently, on the basis of specimens collected from southern Japan, Stimpson (1860) described H. acuta (as Virbius acutus). Although the descriptions provided by the two authors were too brief, some authors (Holthuis, 1947; Hayashi and Miyake, 1968b; Hayashi, 1994; Chace, 1997) regarded H. acuta as synonymous with H. ventricosa, since the difference of the shape of the rostrum between the two species is one of the most variable characters of Hippolyte species (Holthuis, 1947; d'Udekem d'Acoz, 1996). On the other hand, Hayashi (1981) proposed, until the specimens from southern Japan, the type locality of H. acuta, are examined, both species should not be considered as synonymous. Recently, d'Udekem d'Acoz (1996) separated H. ventricosa sensu lato into seven taxa: H. acuta from Japan, H. australiensis from Australia, H. ventricosa sensu stricto from Red Sea, Suez Canal and India, H. sp. A from Australia, H. sp. B from Hawaii, H. sp. C from Malay Archipelago, and H. sp. D from Madagascar. The specimens from Jeju-do have the following characteristics: rostrum with proximal dorsal tooth and two distal ventral teeth; sixth abdominal somite 2.00-2.21 times as long as wide; first segment of antennular peduncle with dorsodistal tooth; blade and distolateral tooth of scaphocerite separated by notch; third maxilliped nearly reaching tip of first segment of antennular peduncle; and third pereopod long, with propodus without subdistal spine. These characteristics agree with those of d'Udekem d'Acoz (1996)'s H. acuta. Therefore, the specimens from Jeju-do are assigned to H. acuta.

There are several descriptions on *H. ventricosa* from Japanese waters (Hayashi and Miyake, 1968b; Yanagawa and Watanabe, 1988; Hayashi, 1994). All these specimens are probably identical with *H. acuta* as pointed out by d'Udekem d'Acoz (1996). In specimens from the Amakusa Islands (cf. Hayashi, 1994), the rostrum has one or two ventral teeth, the eyestalk is long, about three times as long as cornea, the incisor process of the mandible has five teeth, and the dactylus of the third pereopod has ten or more ventral spines. However, in specimens from Jeju-do, the rostrum has two ventral teeth, the length of the eyestalk is variable, 1.06-2.20 times as long as cornea, the incisor process of the mandible has six teeth, and the dactylus of the third pereopod has nine or ten ventral spines.

Distribution. Southern Japan and herewith reported from Jeju-do in Korea.

Genus Latreutes Stimpson, 1860

*Latreutes acicularis Ortmann, 1890 (Fig. 2)

Latreutes acicularis Ortmann, 1890: 506, pl. 37, fig. 6, 6d-k, 6n; Doflein, 1902: 638; De Man, 1907: 421; Kemp, 1914: 125 (list); Holthuis, 1947: 16; Hayashi and Miyake, 1968b: 144,

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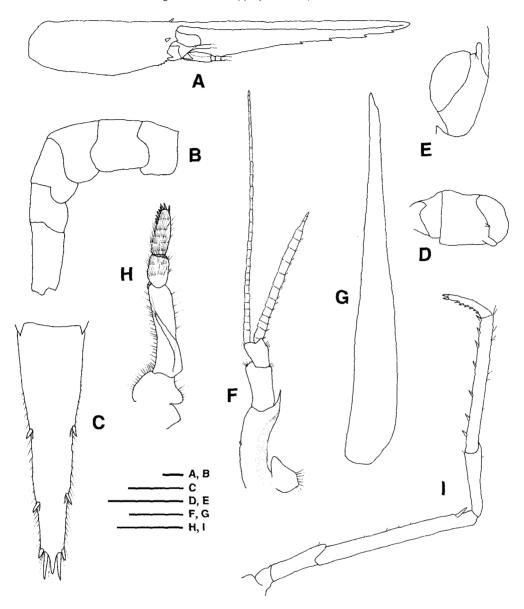


Fig. 2. Latreutes acicularis. A, carapace, lateral; B, abdomen, lateral; C, telson, dorsal; D, eye, anterior; E, eye, dorsal; F, antennule; G, scaphocerite; H, third maxilliped; I, third pereopod. A-D, F, H, ovigerous female (SUZ 10114, cl 7.0 mm); E, G, I, ovigerous female (PUIZ 154, cl 6.5 mm). Scale bars = 1.0 mm.

fig. 11; Holthuis, 1980: 127; Chace, 1997: 50 (list), 69 (in key).

Material examined. $1 \stackrel{?}{+}$ (cl 6.5 mm), 1 ovig. $\stackrel{?}{+}$ (cl 7.1 mm), Hamdeok (Jeju-do), 10 Jun. 1994 (J. N. Kim), by beam trawl from eelgrass bed at 2-5 m in depth, PUIZ 153; 1 ovig. $\stackrel{?}{+}$ (cl 6.5 mm), Seopo (Sacheon), 8 May 1997 (C. B. Kang), by beam trawl at 2-4 m in depth, PUIZ 154; 1 ovig. $\stackrel{?}{+}$ (cl 7.0 mm), Gumpyeong (Namhae), 20 Jul. 1997 (H. J. Yang), by hand net from eelgrass bed,

SUZ 10114.

Description. Rostrum (Fig. 2A) elongate, straight, 1.56-1.85 times as long as carapace, with 0-2 distal dorsal teeth and 3-5 ventral teeth. Carapace (Fig. 2A) with tooth of dorsal rostral series arising from carapace posterior to orbital margin; supraorbital and hepatic teeth absent; suborbital angle not knob-like; branchiostegal tooth articulated; branchiostegal margin with 5-6 denticles.

Eye (Fig. 2D, E) with eyestalk nearly as long as cornea, with dorsodistal spine and long papilla; cornea less broad than eyestalk. Antennule (Fig. 2F) with stylocerite subtriangular, rounded distally; first segment of peduncle with spine near midlength of ventral surface and dorsodistal tooth; upper extremity of third segment of peduncle broadly acute; outer flagellum shorter than inner flagellum, 2.00-3.00 times as broad as inner flagellum. Scaphocerite (Fig. 2G) slender, 7.20-9.20 times as long as wide, with distolateral tooth overreaching distal margin of blade; distolateral tooth and blade not separated by distinct notch. Mandible without incisor process. Third maxilliped (Fig. 2H) with distal segment with several tufts of short setae proximally and 8-10 teeth distally. Third pereopod (Fig. 2I) with merus bearing distal spine; carpus without spine; propodus with 5-7 ventral spines and subdistal spine; dactylus biunguiculate, with 4-7 ventral spines.

Abdomen (Fig. 2B) smooth, without tufts of setae; sixth somite with round process on posterior margin, dorsal length 2.08-2.23 times as long as height. Telson (Fig. 2C) with 2 pairs of dorsolateral spines; posterior margin not rounded, with 2 spines on each side of median tooth.

No male specimen collected.

Female not fascigerous.

Eggs small, 0.28-0.32 mm in newly extruded ones.

Color. Green or greenish brown interspersed with small white spots.

Remarks. The Korean specimens agree well with Ortmann (1890)'s original description except that our specimens have the rostrum 1.56-1.86 times as long as carapace, with zero to two distal dorsal teeth.

Hayashi and Miyake (1968b) made no mention of the presence of the dorsodistal papilla of the eyestalk in the specimens from the Amakusa Islands, of which the rostrum has three to six ventral teeth, and the branchiostegal margin of the carapace has four to eight (usually five) denticles. However, in Korean specimens, the rostrum has three to five ventral teeth, the branchiostegal margin of the carapace has five or six denticles, and the eyestalk has the dorsodistal papilla. *Latreutes acicularis* is an important food for the fishes in eelgrass bed (Yasuda, 1957).

Distribution. From Hakodate to the Amakusa Islands in Japan, and herewith reported from Jejudo and southern Korea.

*Latreutes laminirostris Ortmann, 1890 (Fig. 3)

Latreutes laminirostris Ortmann, 1890: 506, pl. 37, fig. 5; De Man, 1907: 422; Kemp, 1914: 126 (list); Yokoya, 1930: 528; Yu, 1935: 42 (in key), 49; Holthuis, 1947: 16; Liu, 1955: 45, pl. 16, figs. 1, 2; Holthuis, 1980: 128; Hayashi, 1994: 95, fig. 253a; Chace, 1997: 50 (list), 69 (in key); Cha et al., 2001: 100, unnumbered fig.

Material examined. $2\mathcal{F}$ (cl 7.0, 7.2 mm), $1 \stackrel{\wedge}{\cdot}$ (cl 10.1 mm), 5 ovig. $\stackrel{\wedge}{\cdot}$ (cl 10.2-12.1 mm),

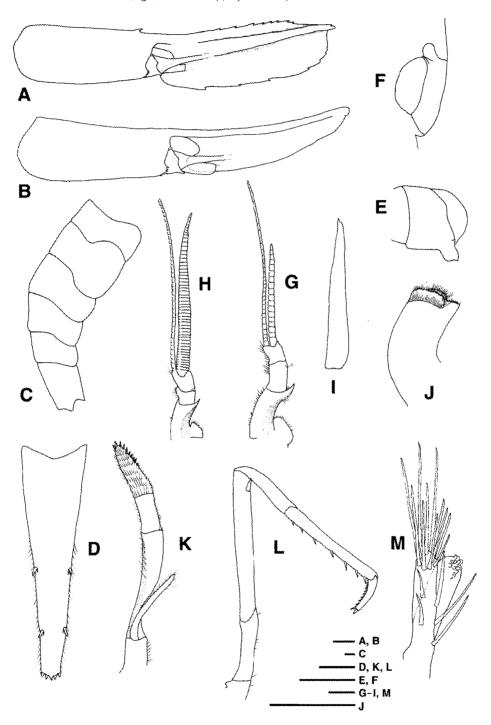


Fig. 3. Latreutes laminirostris. A, B, carapaces, lateral; C, abdomen, lateral; D, telson, dorsal; E, eye, anterior; F, eye, dorsal; G, H, antennules; I, scaphocerite; J, mandible; K, third maxilliped; L, third pereopod; M, appendices masculina and interna. A, C-G, I-L, ovigerous female (SUZ 10117, cl 11. 2 mm); B, H, M, male (SUZ 10117, cl. 7.2 mm). Scale bars = 1.0 mm (A-L), 0.1 mm (M).

Gumpyeong (Namhae), 20 July 1997 (H. J. Yang), by hand net from eelgrass bed, SUZ 10117.

Description. Rostrum (Fig. 3A, B) straight, slightly upwards, 1.56-1.85 times as long as carapace; subrectangular, with 7-10 dorsal teeth and 6-8 ventral teeth in female; triangular, without dorsal or ventral teeth in male. Carapace (Fig. 3A, B) with tooth of dorsal rostral series arising from carapace posterior to orbital margin in female, ridge arising from carapace posterior to orbital margin in male; supraorbital and hepatic teeth absent; suborbital angle without knob-like process; branchiostegal tooth articulated; branchiostegal margin with 7-10 denticles.

Eye (Fig. 3E, F) with eyestalk, longer than comea, with dorsodistal spine and long papilla; cornea less broad than eyestalk. Antennule (Fig. 3G, H) with stylocerite small, rounded, not acute distally; first segment of peduncle with median ventral spine and distal tooth; upper extremity of third segment of peduncle broadly acute; outer flagellum shorter than inner flagellum, 2.00-2.25 times as broad as inner flagellum in female; 3.84-4.00 times as broad as inner flagellum in male. Scaphocerite (Fig. 3I) 5.92-7.88 times as long as wide; distolateral tooth overreaching distal margin of blade; distolateral tooth and blade not separated by distinct notch. Mandible (Fig. 3J) with molar process, without incisor process. Third maxilliped (Fig. 3K) overreaching eye; distal segment with short setae and 8-10 teeth. Third pereopod (Fig. 3L) with merus bearing distal spine; carpus without proximal spine; propodus with 5-7 ventral spines and subdistal spine; dactylus biunguiculate, with 6-9 ventral spines.

Abdomen (Fig. 3C) smooth, without tufts of plumose setae; sixth somite with round process on posterior margin, dorsal length 1.46–1.89 times as long as height. Telson (Fig. 3D) with 2 pairs of dorsolateral spines; posterior margin subtruncate, small median tooth and 2 pairs of small spines.

Appendix masculina (Fig. 3M) 1.08-1.30 times as long as appendix interna, with 16 setae.

Female not fascigerous.

Eggs small, 0.52-0.60 mm in newly extruded ones.

Color. Green or white and banded with dorsomedian white stripe.

Remarks. Ortmann (1890) first described *Latreutes laminirostris* based on one female collected from Tanagawa, Japan. The female specimens from Namhae agree well with Ortmann (1890)'s original description. However, the rostrum in female specimens from Namhae is variable, and has seven to ten dorsal and six to eight ventral teeth.

The rostrum in *L. laminirostris* had been known to be of the same shape in both sexes (Liu, 1955). However, in specimens from Namhae, the shape of the rostrum is sexually dimorphic. In male, the rostrum is devoid of dorsal and ventral teeth, and the carapace has no tooth of dorsal rostral series arising from the carapace posterior to the orbital margin. However, in female, the rostrum has seven to ten dorsal and six to eight ventral teeth, and the carapace has tooth of dorsal rostral series arising from the carapace posterior to the orbital margin. The sexual dimorphism in the rostrum can be also seen in *Latreutes anoplonyx* Kemp, 1914, *Latreutes mucronatus* (Stimpson, 1860), and *Latreutes planirostris* (De Haan, 1844) (Hayashi and Miyake, 1968a; Kim and Park, 1972; Hayashi, 1994).

Distribution. China, Japan, and herewith reported from southern Korea.

Key to Latreutes species from Korean waters

Carapace without unarmed dorsal concavity above eye	3
2. Carapace with blunt median elaboration on cardiac region	L. planirostris
- Carapace without blunt median elaboration on cardiac region	·· L. mucronatus
3. Rostrum slender, long	····· L. acicularis
- Rostrum stout, leaf-like	4
4. Dactylus of third pereopod uniunguiculate	···· L. anoplonyx
- Dactylus of third pereopod biunguiculate	L. laminirostris

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한국미기록 꼬마새우류(갑각강: 십각목: 생이하목)

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요 약

한국 남부지역에서 채집된 꼬마새우류 2종, 꼬마새우(Hippolyte acuta)와 날 씬넓적뿔꼬마새우(Latreutes acicularis)가 한국 미기록종으로 판명되어 재기재하고 보고하였다. 이미 보고된 넓적뿔꼬마새우속의 긴넓적뿔꼬마새우(L. laminirostris)를 재기재하고 한국산 넓적뿔꼬마새우속 종에 대한 검색표를 제시하였다. 지금까지 보고된 한국산 꼬마새우과는 모두 9속 19종이 된다.