

Heptacarpus igarashii sp. nov. from Northern Japan (Decapoda, Caridea, Hippolytidae)

Ken-Ichi Hayashi and Toshiro Chiba

Abstract. *Heptacarpus igarashii* sp. nov. is described from northern Japan. It belongs to the species-group with epipods on the first three pereopods and is distinguished from the other members of the group by the combination of a short rostrum unarmed ventrally, three pairs of telson spines, three to five marginal spinules on the first antennular segment and a long outer terminal spine of antennal scale.

Introduction

A small shrimp belonging to the hippolytid genus *Heptacarpus* was found in decapod samples from Toni Bay, Kamaishi City. It belongs to the species-group of the genus which bears epipods on the first three pereopods. It is rather easily distinguished from the Japanese members of that group so far known (Hayashi, 1979), but is closely related to three East Pacific species, especially to *H. brevirostris* (Dana, 1852). They, however, proved to have different characters in the rostral shape, the number of telson spines, and the shape of antennal scale, as well as the male-female size difference. We propose here the Japanese species as a new one, *H. igarashii* sp. nov., dedicated to the late Professor Takao Igarashi of Hokkaido University, who already considered that the present form was distinct from the other members.

Description

Heptacarpus igarashii sp. nov.

(Figs. 1-3)

Types. Toni Bay, Kamaishi City, Iwate Prefecture, April 24, 1984, T. Chiba leg.—1 ovig. ♀ (holotype), 1 ♂ (allotype), 1 ♂, 3 ovig. ♀, 1 ♀ (paratypes); June 21, 1984, T. Chiba leg.—7 ♂, 1 ovig. ♀ (paratypes); June 7, 1985, T. Chiba leg.—2 ovig. ♀, 2 ♀ (paratypes).

Description. Small size species (Fig. 1). Males larger than females. Rostrum short and spiniform, reaching slightly beyond end of eye (Fig. 2a), nearly straight and apically downward. Dorsal margin armed with four, sometimes five, teeth, arranged

equidistantly with rather wide space between rostral apex and foremost tooth; of these, two or three teeth on carapace; ventral margin unarmed. Carapace smooth, about three times as long as rostrum; suborbital margin rounded; antennal spine sharp and larger, continuous with suborbital angle; pterygostomial spine smaller than antennal spine but conspicuous (Fig. 2b).

Abdomen smooth. Pleura of fourth and fifth somites always pointed posteriorly, and spine of fourth somite small in some specimens. Telson shorter than uropod, armed with three pairs of dorsal spines; posterior margin ending in acute tip, with two pairs of unequal spines and about eight long plumose setae (Fig. 2c).

Eye moderate in size and cylindrical; cornea slightly shorter than stalk. Antennular peduncle reaching midpoint of antennal scale; first segment longer than distal two segments combined, with three to five marginal spinules; second and third segments subequal, each with single, rather large marginal spine. Stylocerite reaching slightly over distal margin of first segment. Outer antennular flagellum thickened and setose in proximal ten or more segments (Fig. 2a).

Antennal scale long, 3-3.5 times as long as wide; outer margin straight, ending in spine, distal margin of lamella as long as or slightly shorter than outer spine (Fig. 2d). Basicerite with one sharp spine lower and one blunt process upper corner of distal margin; carpocerite long, extending midpoint of scale; flagellum about as long as body length.

Mouthparts except for third maxilliped typical of genus. Mandibular palp two-jointed; incisor process with four small teeth; molar process large and massive with many marginal spinules and a

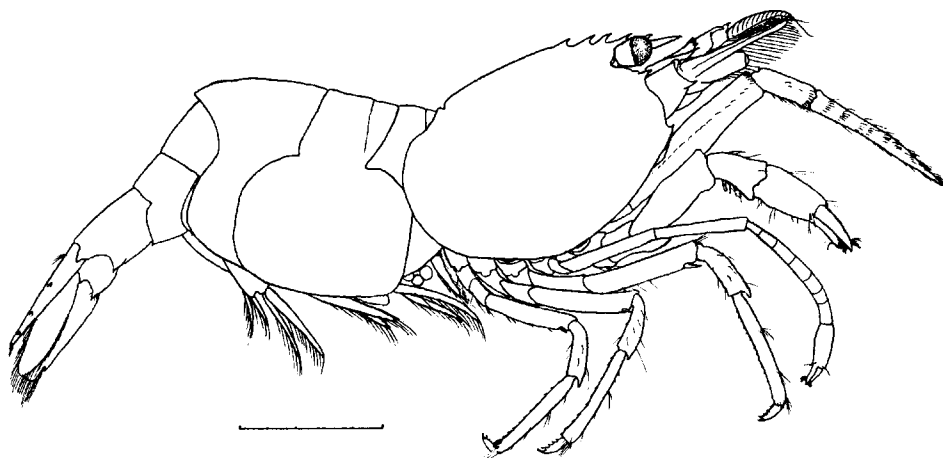


Fig. 1. *Heptacarpus igarashii* sp. nov., holotype, ovigerous female. Scale represents 5.0 mm.

few teeth on molar surface (Fig. 3a). First maxilla with short palp (Fig. 3b). Second maxilla with broad scaphognathite; distal endite bilobed, palp short (Fig. 3c). First maxilliped with two jointed endopod; exopod long with medium caridean lobe; epipod large, bilobed; either endites not divided (Fig. 3d). Second maxilliped slightly larger than first maxilliped; exopod well developed; epipod single lobe with small podobranch (Fig. 3e). Third maxilliped with rod-like epipod (Fig. 3f), showing sexual dimorphism, as in *H. futilirostris* (Bate, 1888) (Miyake & Hayashi, 1968). In mature males third maxilliped extremely long and robust, reaching beyond antennal scale by distal two segments and one-fourth length of antepenultimate segment; distal segment slender, tapering with several corneous spines apically, longer than antepenultimate segment and more than 1.5 times as long as carapace (Fig. 2b). In ovigerous females third maxilliped longer comparable with other species, reaching beyond antennal scale by distal segment only or distal half of penultimate segment; distal segment also with several corneous spines, but shorter than antepenultimate segment and carapace length.

First pereopod also with sexual dimorphism like third maxilliped, more robust, reaching beyond antennal scale by distal three segments in males (Fig. 2b), and reaching beyond antennal scale by distal half of palm in females; chela more than twice as long as carpus in males; chela less than twice as long as carpus in females; merus shorter than chela, without subterminal spine in both

sexes. Second pereopod slender, reaching beyond antennal scale by half of carpus; ischium longer than merus. Third pereopod reaching beyond antennal scale by dactylus or distal half of propodus; merus with single subterminal spine; propodus as long as merus in female and shorter than merus in male, both with about ten pairs of spinules on posterior margin; dactylus biunguiculate, with four, rarely five, spinules on posterior margin. Epipod present on first three pereopods. Fourth pereopod falling short of end of antennal scale; merus with single subterminal spine; propodus as long as merus, both shorter than those of third pereopod. Fifth pereopod reaching end of antennular peduncle, merus with small subterminal spine, shorter than that of fourth pereopod; propodus longer than merus, and as long as that of fourth pereopod.

Endopod of male first pleopod with appendix interna bearing many retinacula near distal tip (Fig. 2e). Appendix masculina on male second pleopod short, as long as appendix interna with many long stiff setae (Fig. 2f). Exopod and endopod of uropod nearly same length; exopod ending in small spine with rather large spine just inside.

Size. Males larger than females. Holotype, ovigerous female: 28.0 mm in total length (TL); 6.5 mm in carapace length (CL); 2.4 mm in rostrum length; 4.7 mm in telson length; 15.0 mm in third maxilliped length; 12.0 mm in first pereopod length. Allotype, male: 35.0 mm in TL; 7.9 mm in CL; 2.0+ mm in rostrum length; 5.9 mm in telson length;

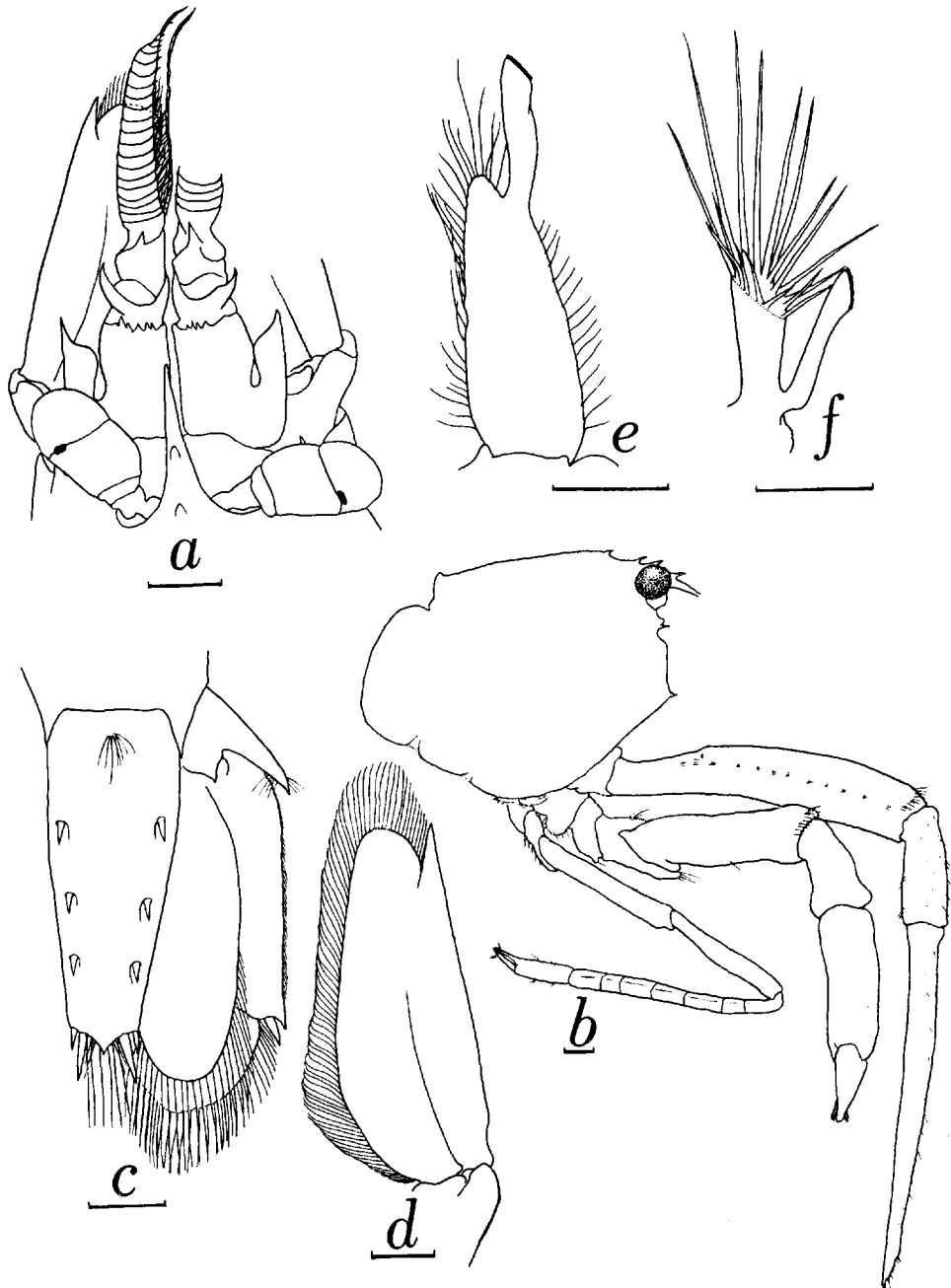


Fig. 2. *Heptacarpus igarashii* sp. nov., paratypes. *a*, Ovigerous female, 7.0 mm in CL; *b*, male, 8.1 mm in CL; *c*, female, 6.0 mm in CL; *d-f*, male, 7.9 mm in CL. *a*, Anterior part of body, dorsal view; *b*, anterior part of body with third maxilliped and first two pereopods; *c*, tail fan; *d*, antennal scale; *e*, endopod of first pleopod; *f*, appendices interna and masculina. Scales for *a-d* represent 1.0 mm, those for *e* and *f*, 0.5 mm.

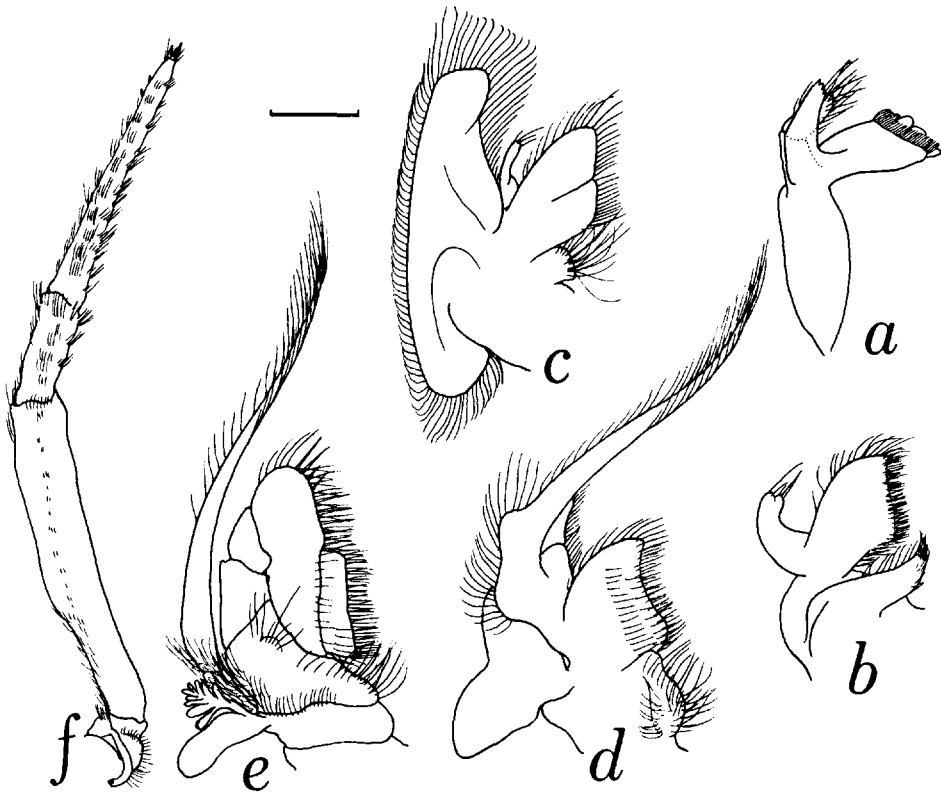


Fig. 3. *Heptacarpus igarashii* sp. nov., paratype, ovigerous female, 7.1 mm in CL. a, Mandible; b, first maxilla; c, second maxilla; d, first maxilliped; e, second maxilliped; f, third maxilliped. Scale represents 2.0 mm for a-e, 1.0 mm for f.

30.0 mm in third maxilliped length; 21.0 mm in first pereopod length.

Male with extremely long third maxilliped and first pereopod, 6.8–8.0 (mean 7.5, $n=6$) mm in CL, and smaller male with normal appendages, 3.1–4.6 mm in CL; ovigerous females 6.3–7.6 (mean 6.8, $n=7$) mm in CL. Field observation revealed that males more than 6.1 mm in CL with these long appendages.

Remarks. The morphological variations were not observed in this species unlike *H. jordani* (Rathbun, 1902) (Hayashi & Chiba, 1987). The dorsal rostral teeth were four in 16 specimens of 19 type series, and the remaining three specimens beared five dorsal teeth. Ventral margin was unarmed in all specimens. The pterygostomial spine was present in both sides of all types except one small male, 3.2 mm in CL, absent from either side. The pleural spine on the fourth abdominal somite was present in both sides of all specimens

without exception. The meral subterminal spine was usually one in each leg of the last three pereopods, except for one specimen which beared two spines on the right side of third pereopod. There were three pairs of telson spines in all specimens except one with abnormal shape. The spinules on the first antennular segment were rather variable, four or five pairs or unequally present on one side, or rarely two, three or six spinules on one side.

Color. In an ovigerous female abdomen dark brown; carapace, basal parts of third maxilliped and first pereopod slightly lighter; rostrum, tail fan, antennal flagellum, antennule, distal segment of third maxilliped and chela of first pereopod and second to fifth pereopods light brown; antennular flagellum reddish brown. Other patterns such as transparent with brownish or yellowish patches on carapace and abdomen or yellowish transverse bands on abdomen were observed in

field. Live specimens probably may vary their color pattern with environment.

Distribution. The present type materials were all collected from Toni Bay, Kamaishi City, a bay opened directly to the North Pacific Ocean. According to Mr. Komai, this species was already known to distribute in Miyako Bay, Iwate Prefecture, near the type locality and Volcano Bay, Hokkaido.

Discussion

The present new species is referred to the species-group with epipods on the first three pereopods, which character is shared with six Asian species (Hayashi, 1979). This species is readily distinguished from these Pacific species by the very short rostrum with smooth ventral margin. All Asian species have the comparatively long rostrum armed both dorsal and ventral margins (Hayashi, 1979; Hayashi & Chiba, 1987). Moreover, *H. rectirostris* (Stimpson), *H. grebnitzkii* (Rathbun) and *H. jordani* have the subterminal spine on the merus of first pereopod (Hayashi & Chiba, 1987), which is entirely absent in the new species. There is a single marginal spinule on the first antennular segment in *H. rectirostris*, *H. futilirostris* (Bate) and *H. commensalis* Hayashi (Hayashi, 1979; Hayashi & Chiba, 1987), while the new species bears usually more than four spinules.

On the other hand, five species of this species-group have been known from the American side of the Pacific (Holmes, 1900; Rathbun, 1904; Schmitt, 1921; Butler, 1980). Of these *H. breviostris* (Dana, 1852), *H. palpator* (Owen, 1839) and *H. taylori* (Stimpson, 1857) are more closely related to the present new species in these characters concerned. However, they are readily separated from each other as follows.

1) In *H. igarashii* the rostrum is spiniform, usually with four teeth on the dorsal margin, and rather long interval is present between the foremost tooth and rostral apex. In *H. breviostris* five or six teeth are present on the dorsal margin and the foremost tooth is situated near the rostral apex, but rarely makes bifid apex (Holmes, 1900; Schmitt, 1921; Butler, 1980). In *H. palpator* the rostrum is slender like the present new species, and with six teeth on the dorsal margin, but the apex is sometimes bifid or trifid appearance

(Holmes, 1900; Schmitt, 1921). In *H. taylori* the rostrum is much shorter, and is armed with five or six closely set teeth on the dorsal margin, of which distal two teeth are above rather than behind the rostral apex (Holmes, 1900; Schmitt, 1921).

2) In *H. igarashii* the dorsal spines on the telson is three pairs, instead of four pairs in these American species (Holmes, 1900; Schmitt, 1921; Butler, 1980).

3) In *H. igarashii* there are three to five marginal spinules on the first antennular segment as in *H. breviostris* (Butler, 1980) and *H. palpator* (Holmes, 1900). While only one marginal spinule is present in *H. taylori* (Holmes, 1900; Schmitt, 1921).

4) The outer terminal spine of the antennal scale is longer than or as long as lamella in *H. igarashii*, while it is apparently shorter in the American species (Holmes, 1900, Schmitt, 1921; Butler, 1980).

5) The merus of the third pereopod is provided with a single subterminal spine in *H. igarashii* and *H. breviostris* (Butler, 1980). While *H. palpator* and *H. taylori* bear two or three similar spines on the merus of third pereopod (Holmes, 1900; Schmitt, 1921).

6) *H. taylori* is 28 mm in total length and apparently smaller than the other species (Schmitt, 1921).

Judging from these relationship, the new species is more closely related to *H. breviostris* than to the other two species. The males are usually larger than females in the new species, while in *H. breviostris* the size is reverse (Butler, 1980), which character is probably worth mentioning.

The elongation of a part of thoracic appendages in mature males is also reported in *H. palpator* and *H. taylori* (Bauer, 1977).

H. pugettensis Jensen, 1983, recently described from Puget Sound and the San Juan Archipelago, has the short rostrum like the present new species. The difference between them are clear. In the American species the epipod is present on the first and second pereopods only, the first antennular peduncle has a single marginal spinule and the telson bears four pairs of spines.

Acknowledgments

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(Hayashi, K.: Shimonoseki University of Fisheries. 2-7-1 Nagatahonmachi, Shimonoseki, Yamaguchi, 759-65 Japan. Chiba, T.: Kesenuma Municipal Office. Kesenuma, Miyagi, 988 Japan)

日本の北部から採集されたトゲツノモエビ属の1新種 *Heptacarpus igarashii* sp. nov.

林 健一・千葉敏朗

岩手県釜石市唐丹湾から採集されたトゲツノモエビ属の1新種を記載する。これは、第1から第3歩脚にかけて副肢を持ち、額角が短く、下縁には歯がないこと、尾節の上縁に3対の棘があること、第1触角柄部の第1節には3~5本の小棘があること、触角鱗の外側末端棘が長いことなどにより、他の種類から区別される。学名は、この種類の存在を生前すでに指摘しておられた、故五十嵐孝夫北海道大学教授に捧げて、*Heptacarpus igarashii* sp. nov. とする。基産地のほか、宮古湾と噴火湾からも知られている。

(林 健一: 759-65 山口県下関市永田本町 2-7-1 水産大学校. 千葉敏朗: 988 宮城県気仙沼市八日町 1-1-1 気仙沼市役所)