# Studies on the hippolytid shrimps from Japan, IV. : Two allied species, Heptacarpus rectirostis (Stimpson) and H. futilirostis (Bate), from Japan

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# Studies on the hippolytid shrimps from Japan, IV.

## Two allied species, *Heptacarpus rectirostis* (Stimpson) and *H. futilirostis* (Bate), from Japan[1)]

Sadayoshi MIYAKE and Ken-Ichi HAYASHI

## Introduction

In 1860 Stimpson described *Hippolyte rectirostris* in deep water from Hakodate, Hokkaido. Since then this species, which is now referred to the genus *Heptacarpus*, has attracted the taxonomical and ecological attention, and it has been well known to be very common in the weed-belts near the shore in Japan and its adjacent water. However, after the examination of many specimens catalogued as *Heptacarpus rectirostris* from northern and southern Japan, we came to the conclusion that under the name *H. rectirostris* is included another distinct species.

This neglected species differs from the true *H. rectirostris* in the rostral characters, the formula of the meral spines of the pereiopods and the geographical distribution. Through the courtesy of Dr. L. B. Holthuis, Dr. I. Gordon and Dr. A. L. Rice, the species proved to be identical with *Heptacarpus futilirostris* (Bate) which was originally described by Bate (1888) as *Nauticaris futilirostris* from the Akashi Strait. Unfortunately for long time, *N. futilirostris* has been ranged under the species incertae, because nothing was known about the exopod of the third maxilliped (Holthuis, 1947).

In order to correct such a confusion, in this paper we attempt to redefine the status of *H. rectirostris* and also to redescribe *H. futilirostris* as a valid species.

We are thankful to Dr. Fenner A. Chace, Jr. of the U. S. National Museum, Washington, D. C. and Dr. Lipke B. Holthuis of the Rijksmuseum van Natuurlijke Historie, Leiden, for confirming the specific status of these two species and reading our original manuscript. Further we wish to express our thanks to Dr. Isabella Gordon and Dr. A. L.

1) Contributions from the Zoological Laboratory, Faculty of Agriculture, Kyushu University, No. 374.

Rice of the British Museum (Natural History) for kind re-examination and illustration of Bate's type and de Man's specimens, and correcting the manuscript. We are also greatful to Drs. Taiji Kikuchi, Hiroshi Kurata, Minoru Imajima and Itsuo Kubo, Jisaburo Yasuda and Messrs. Hitoshi Sando and Hiroshi Mukai and the staffs of the Marine Ecological Researching Society of Kagoshima University, for sending the valuable material at our disposal.

The material examined unless stated otherwise is deposited at the Zoological Laboratory, Kyushu University (ZLKU).

## Description

### *Heptacarpus rectirostris* (Stimpson, 1860)

(Figs. 1, 2 and 7, a-d)

*Hippolyte rectirostris* Stimpson, 1860, 102 [34] — Hakodate (Type locality).
*Hippolyte rectirostris*, Doflein, 1902, 637, pl. 3 fig. 7—Hakodate.
*Spirontocaris rectirostris*, Rathbun, 1902, 44 — Hakodate, Korea.
*Spirontocaris rectirostris*, de Man, 1907, 411, pl. 32 figs. 31, 32 (in part) — Inland Sea of Japan.
*Spirontocaris rectirostris*, Balss, 1914, 43—Nagasaki, Sagami Bay, and Aomori.
*Spirontocaris rectirostris*, Yokoya, 1930, 531 — Mutsu Bay.
*Eualus rectirostris*,? Derjugin and Kobjakova, 1935, 142 — Continental side of Sea of Japan.
*Heptacarpus rectirostris*, Holthuis, 1947, 13 — No new locality.
*Heptacarpus rectirostris*, Sando, 1964, 32 — Aomori Bay.

*Material examined.*

Asamushi, Aomori Bay, 2 juv., ZLKU No. 9283, *Sargassum* or *Zostera* belt, Summer, 1959 or 1960, H. Sando leg.
Off Yushima, Aomori Bay, 1 ovig. ♀, ZLKU No. 10220, 10 m deep, muddy sand, June 19, 1963, H. Sando leg.
Miyako Bay, Iwate Pref., 1 ovig. ♀, 1 ♀, ZLKU No. 10805, 9 m deep, Dredge, July 5, 1967, M. Imajima leg.
Yamada Bay, Iwate Pref., 1 ovig. ♀, ZLKU No. 10807, 14 m deep, Dredge, July 9, 1967, M. Imajima leg.
Matsushima Bay, Miyagi Pref., 2 ovig. ♀ ♀, ZLKU No. 9285, Date uncertain, H. Sando leg.
Off Akashi, Inland Sea of Japan, 2 ovig. ♀ ♀, Mar. 15, 1958, J. Yasuda leg. (Dr. Yasuda's collection).
Togi-jima I., Inland Sea of Japan, 2 ovig. ♀ ♀, May 12, 1935, Collector uncertain (one specimen deposited at the Mukaishima Marine Biological Laboratory).

Buzen-sea, west part of Inland Sea of Japan, 3 ovig. ♀♀, 1 ♀, ZLKU No. 8175, Small trawl net, Mar. 1962, Oita Prefectural Fisheries Experimental Station leg. (One ovigerous female, ZLKU No. 8175, is now deposited at the U. S. National Museum).
Off Oita Pref., 1 ♀, ZLKU No. 1434, Aug. 1956, Collector unknown.
Off Tsuyazaki, Fukuoka Pref., 4 juv., ZLKU No. 9556, Small Danish seine, *Sargassum* belt, June 23, 1967, S. Matsuura and T. Fujino leg.
Off Magarizaki, Tomioka, Amakusa Is., 1 ovig. ♀, ZLKU No. 8174, Dredge, Aug. 2, 1958, T. Kikuchi leg.
Locality unknown, 1 ovig. ♀, ZLKU No. 10808, Mar. 1963, I. Kubo leg.

The rostrum is narrow and almost straight, reaching slightly beyond the tip of the antennular peduncle. The upper border is armed with five or six teeth, of which the first two or three are placed on the carapace behind the orbit. There are three or four teeth on the lower border near the apex. The low postrostral carina reaches backward about the half distance to the posterior border of the carapace. The antennal spine is developed and acute, separated from the round suborbital angle by a notch. The pterygostomian spine is small but distinct.

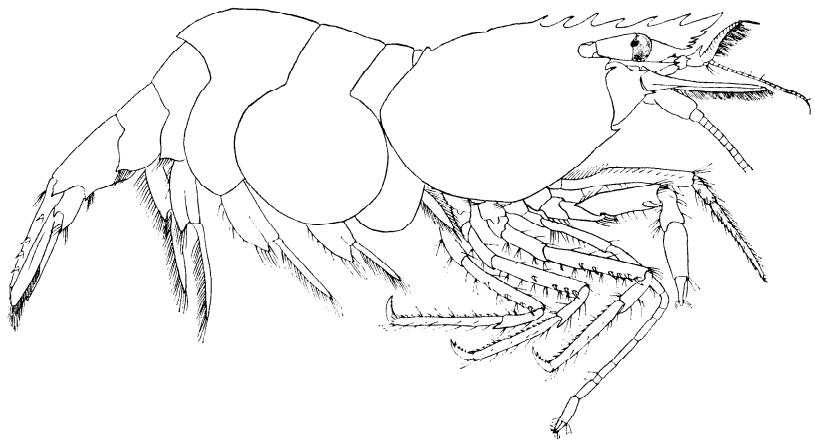

Fig. 1. *Heptacarpus rectirostris* (Stimpson), female, ×3.4.

The abdomen is smooth, not forming ridges or grooves. The pleura of the fourth and fifth somites are pointed posteriorly. The telson is shorter than the uropod, tapering and armed with usually four pairs of dorsal spines or asymmetrically with three spines on one side. The posterior margin of the telson ends in an acute triangular point and is armed with one long plumose hair and two, a long inner and a short outer, spines on either side of the acute point.

The eye is moderate in size and cylindrical, the cornea is slightly shorter than the stalk and the ocular spot is distinct in contact with the cornea.

The antennal peduncle reaches the middle of the scaphocerite. There is a marginal spine on each lateral side of the first and second segments, and the third is also provided with a similar spine at the top of the dorsal side. The stylocerite is pointed anteriorly, just reaching or falling short of the distal articulation of the second segment. The outer antennular flagellum is thickened and setose in the proximal seven (in juvenile) or 10-15 (in ovigerous females) segments. It reaches the distal tip of the scaphocerite. The scaphocerite is long, being about 2.8 times as long as wide and narrowed distally. The outer margin of the scaphocerite is straight and ends in a spine.

The mandibular palp is two jointed, the terminal segment being long and setose. There are four teeth on the distal apex of the incisor process. The molar process bears a tooth and many spinules.

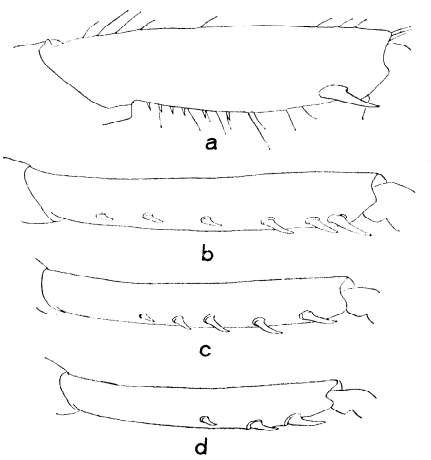


Fig. 2. Merus of *Heptacarpus rectirostris* (Stimpson), female. a, First pereiopod; b, third pereiopod; c, fourth pereiopod; d, fifth pereiopod.

The third maxilliped is slender and provided with an epipod but destitute of an exopod. It reaches with the distal half or distal third of the ultimate segment beyond tip of the scaphocerite. The ultimate segment is much shorter than the carapace and armed with seven corneous spines at the apex. The first pereiopod is rather large, reaching the distal tip of the scaphocerite. The merus is slender and cylindrical, being 3.5-4.0 times as long as wide, with a diagnostic spine on the subterminal portion of the outer side. There are a few marginal hairs on the dorsal side of the distal articulation of the merus. The chela is less than twice as long as the carpus. The second pereiopod is slender, reaching beyond the distal tip of the scaphocerite by the half of the carpus which is subdivided into seven joints. The ischium is somewhat compressed, being longer than the merus. The carpus is much longer than the chela. The movable finger is shorter than the palm. The third pereiopod reaches beyond the tip of the scaphocerite by the dactylus

which bears five spines excluding the terminal nail. The merus is armed with a series of four to six spines along the outer side. An epipod is present on the first three pereiopods. The fourth pereiopod fails to reach the apex of the scaphocerite. The merus is armed with four or five, rarely three, outer spines, situated along the distal two-thirds of the outer side. The fifth pereiopod reaches the tip of the antennular peduncle. The merus is armed with three to five spines on the distal half.

*Size.*

The ovigerous females are 27-32 mm in body length, having been taken in northern Japan from May to July and in southern Japan in March and August. The eggs are numerous and small, 0.50-0.42 mm in diameter. No males were among the material examined.

*Colour.*

According to de Man (1907), the ovigerous specimen is Prussian blue and the eggs are orange.

## *Heptacarpus futilirostris* (Bate, 1888)

(Figs. 3, 4, 6 and 7, e, f)

*Nauticaris futilirostris* Bate, 1888, 606, pl. 109 fig. 1 — Akashi Strait: 34° 38′ N, 135° 01′ E (Type locality).

*Spirontocaris rectirostris*, de Man, 1906, 403 — Inland Sea of Japan.

*Spirontocaris rectirostris*, de Man, 1907, 411, pl. 32 figs. 33, 34 (in part) — Inland Sea of Japan.

*Spirontocaris rectirostris*, Kemp, 1916, 386 — Tanabe, Wakayama Pref.

*Spirontocaris rectirostris*, Urita, 1921, 217 — Kagoshima Bay.

*Spirontocaris rectirostris*, Urita, 1926, 426 — Tsingtao, North China.

*Spirontocaris rectirostris*, Nakazawa, 1927, 1018, fig. 1958 — No new locality.

*Nauticaris futilirostris*, Nakazawa, 1927, 1021, fig. 1965 — No new locality.

*Spirontocaris rectirostris*, Nakazawa and Kubo, 1947, 776, fig. 2238 — No new locality.

*Heptacarpus rectirostris*, Liu, 1955, 36, pl. 13 figs. 1-5 — Northern China.

*Spirontocaris rectirostris*, Yasuda, 1956, 13, 30, 56, 75, figs. 42, 43 — Inland Sea of Japan.

*Heptacarpus rectirostris*, Utinomi, 1956, 59, pl. 29 fig. 6 — Tanabe Bay.

*Spirontocaris rectirostris*, Yokoya, 1957, 540, fig. 5 — No new locality.

*Spirontocaris rectirostris*, Miyake, 1961a, 9 — Amakusa Islands, Kumamoto Pref.

*Heptacarpus rectirostris*, Miyake, 1961b, 168 — Sea of Ariaké, Western Kyushu.

*Heptacarpus rectirostris*, Kubo, 1965, 615, fig. 972 — No new locality.

*Material examined.*

Arazaki, Kanagawa Pref., 8 ♂♂, 18 ovig. ♀♀, 2 ♀♀, ZLKU No. 10860, Shore, Apr. to June, H. Kuata leg.

Off Aburatsubo, Misaki, Kanagawa Pref., 1 ovig. ♀, ZLKU No. 1111, Apr. 18, 1957, O. Tabeta leg.

Tsunashirazu, Tanabe Bay, Wakayama Pref., 2 ♀♀, ZLKU No. 10812, Dec. 25, 1959, C. Araga leg.

Sakata-hama, Tanabe Bay, Wakayama Pref., 1 ♂, 1 ovig. ♀, ZLKU No. 10810, Apr. 2, 1938, H. Utinomi leg.

Kochi Pref., 1 ovig. ♀, ZLKU No. 9280, Apr. 1960, K. Sakai leg.

Munakata-oshima I., Fukuoka Pref., 1 ovig. ♀, ZLKU No. 1130, Feb. 4, 1957, Motomatsu leg.

Munakata-oshima I., Fukuoka Pref., 1 ovig. ♀, ZLKU No. 9282, Mar. 29, 1963, Collector unknown.

Off Tsuyazaki, Fukuoka Pref., 1 ♂, 1 ovig. ♀, 27 juv., ZLKU No. 9560, *Sargassum* belt, Small Danish seine, June 23, 1967, S. Matuura and T. Fujino leg.

Off Tsuyazaki, Fukuoka Pref., 1 ♀, ZLKU No. 9281, June 23, 1960, Collector unknown.

Mitoma, Fukuoka Pref., 1 ovig. ♀, ZLKU No. 1099, May 4, 1957, Ueki leg.

Off Shingu, Fukuoka Pref., 1 ovig. ♀, 1 juv., ZLKU No. 10845, Small Danish seine, June 23, 1967, S. Matsuura and T. Fujino leg.

Amakusa Is., Kumamoto Pref., 1 ♂, 1 ovig. ♀ ZLKU No. 1214, Dredge, Apr. 1, 1958, T. Habe leg.

Off Magarizaki, Tomioka Bay, Amakusa Is., 1 ♂, 2 ♀♀, ZLKU No. 3683, Dredge, Aug. 2, 1958, T. Kikuchi leg.

Tomioka Bay, Amakusa Is., 2 ♂♂, 1 ovig. ♀, 3 ♀♀, ZLKU No. 5166, *Zostera* belt, Small Danish seine, Apr. 24, 1959 T. Kikuchi leg.

Tomioka Bay, Amakusa Is., 1 ♂, ZLKU No. 5866, *Zostera* belt, Small Danish seine, June 21, 1959, T. Kikuchi leg.

Shiraiwa-zaki, Amakusa Is., 1 ♂, 3 ovig. ♀♀, ZLKU No. 8150, Low tidemark, Jnne 22, 1966, Y. Miya leg.

Off Tororo, Amakusa Is., 1 ♂, 3 ovig. ♀♀, 1 ♀, ZLKU No. 8401, 20 m deep, Dredge, 1961 (date uncertain), T. Kikuchi leg.

Tomioka Bay, Amakusa Is., 2 juv., ZLKU No. 8424, Plankton net, Sept. 2, 1966, T. Kikuchi leg.

Tomioka Bay, Amakusa Is., 1 ♂, 6 ovig. ♀♀, ZLKU No. 8442, Near low tidemark, Mar. 29, 1967, A. Taki leg.

Shiraiwa-zaki, Amakusa Is., 2 ♂♂, 8 ovig. ♀♀, 1 ♀, ZLKU No. 8449, Near low tidemark, Dip net, *Sargassum* belt, Mar. 29, 1967, K. Hayashi leg.

Tomioka Bay, Amakusa Is., 2 ♂♂, 7 ovig. ♀♀, ZLKU No. 8573, *Zostera* belt, Small Danish seine, Mar, 30, 1967, K. Hayashi leg.

Tomioka Bay, Amakusa Is., 1 ♀, 4 ovig. ♀♀, ZLKU No. 8924, *Zostera* belt, Small Danish seine, Apr. 1, 1967, K. Hayashi leg.
Hanase-zaki southern extremity of Satsuma Pen., Kagoshima Pref., 2 ♂♂, 5 ovig. ♀♀, ZLKU No. 9303, Feb. 26, 1966, Marine Ecological Researching Society of Kagoshima University (MERSKU) leg.
Hanase-zaki, 1 ♂, ZLKU No. 9310, May 23, 1966, MERSKU leg.
Hanase-zaki, 5 ♂♂, 5 ovig. ♀♀, 3 ♀♀, ZLKU No. 9311, Feb. 24, 1966, MERSKU leg.
Shidoko, Yaku-shima I., Kagoshima Pref., 1 ♀, ZLKU No. 10842, Tide pool, Early in March, 1967, MERSKU leg.
Locality uncertein, 1 ovig. ♀, ZLKU No. 10809, March 1963, I. Kubo leg.

The rostrum is straight or slightly downward, the apex only being somewhat curved upward. It reaches slightly beyond the tip of the antennular peduncle. The upper border is armed with five to seven, generally six, teeth, of which the first one or two are small and placed on the carapace behind the orbit. There are one to three, mostly two, teeth on the lower border near the apex. The carapace is smooth and longer than the rostrum. The antennal spine and the pterygostomian spine are present.

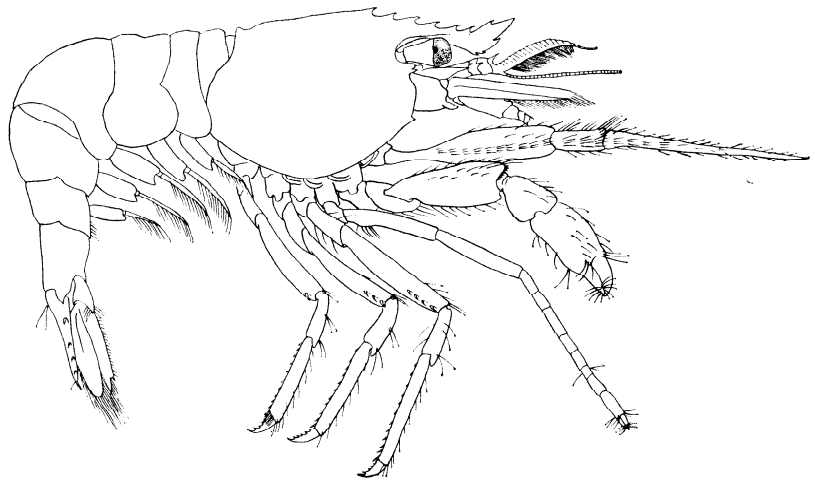

Fig. 3. *Heptacarpus futilirostris* (Bate), male, ×3.2.

The abdomen is smooth, not forming ridges of grooves. The pleura of the fourth and fifth somites are acutely pointed at the posterior angle. There are four pairs of spines on the dorsal side of the telson. The posterior margin of the telson is triangular, with two long plumose hairs and four spines as in the preceding species.

The eye and the antennal peduncle do not differ essentially from those in *H. rectirostris*. The outer antennular flagellum is thickend and setose in the proximal 10-29 segments. The scaphocerite is long, and narrowed distally, being about 3.0-3.5 (in male) or 2.6-3.0 (in female) times as long as wide. The outer margin is straight, and ends in a spine.

Like the species of the genera *Saron* and *Alope*, the secondary sexual differences are well developed in the third maxilliped and the first pereiopod. In the male the third maxilliped is enormously long, reaching with the antepenultimate segment beyond the scaphocerite. The ultimate segment is particularly slender and elongate, being almost twice as lnog as the carapace, and ends in one corneous spine. In the female the third maxilliped is normal, reaching with the whole length or distal two-thirds of the ultimate segment beyond the tip of the scaphocerite. The ultimate segment is shorter than the carapace, with seven corneous spines at the apex.

The first pereiopod in the female reaches the distal tip of the scaphocerite. The merus is compressed and rather broad, being 2.5-2.9 times as long as wide. There are 10-20 marginal spinules on the distal articulation of the merus. While the first pereiopod in the male is larger and more robust, but resembles more or less that in the female, reaching the distal articulation of the penultimate of the third maxilliped. The merus is 2.4-2.6 times as long as wide and provided with the similar marginal spinules. The third pereiopod reaches beyond the tip of the scaphocerite by the dactylus. The merus is armed with a series of two to five, generally two or three, spines near the distal articulation. The fifth pereiopod reaches the tip of the stylocerite. The merus is armed with one subterminal spine.

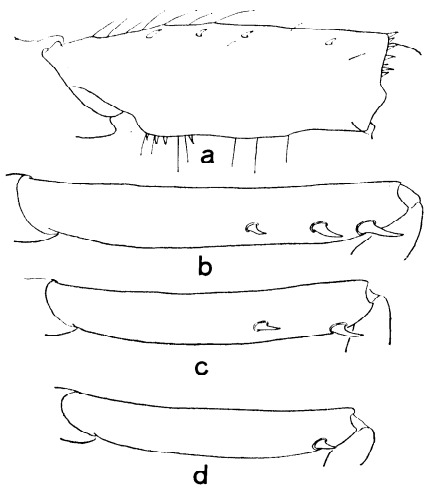


Fig. 4. Merus of *Heptacarpus futilirostris* (Bate), female. a, First pereiopod; b, third pereiopod; c, fourth pereiopod; d, fifth pereiopod.

In the male the endopod of the first pleopod is different in shape from the following endopods; namely the distal fourth of it is cylinder form with minute coupling hooks, instead of the long plumose hairs. There is a large appendix

masculina, which is furnished with long bristles on the distal half, near the appendix interna of the endopod of the second pleopod.

*Size.*

The largest male with the elongate third maxilliped and robust first pereiopod is 35 mm in body length. The ovigerous females vary in length between 10-30 mm, having been collected in southern Japan from February to June. The eggs are numerous and small 0.50-0.40 mm in diameter.

*Colour.*

De Man (1907) described the colour of this species as "the male was scarlet" and Liu (1955) reported that it is changeable with its surroundings. In the Amakusa Islands, the colour is different in both sexes. The female have the carapace with irregular and reticulational marks and the abdomen with obscure transverse bands on all segments. The thoracic appendages are light brown with six dark bands, one on the ischium and carpus, two on the merus and propodus. The fully matured male is entirely dark brown with an irregular white patch on the posterior part of the carapace. The similar white patches are present on the dorsal sides of the second and fourth abdominal somites and on the pleuron of the fifth somite. As mentioned by Liu, the reticulations and the bands of the female and the entire body of the male from *Sargassum* belt are more clear and darker than those of the specimens from *Zostera* belt.

## Comparison

*Heptacarpus futilirostris* is very closely related to *H. rectirostris*, with which species it has been for a long time identified. The differences between these two species, mentioned below, prove to be constant even in the juvenile specimens.

1) In *H. rectirostris* the rostrum is almost straight ; the upper border is armed with five or six teeth of which the first two or three are present on the carapace; the lower border is armed with three or four teeth. The low postrostral carina reaches backward about the half distance to the posterior border of the carapace. In *H. futilirostris* the rostrum is slightly downward or straight, the apex only being curved upward ; the upper border is armed also with five to seven, of which the first one or two are present on the carapace ; there are one to three, mostly two, teeth on the lower border. The postrostral carina is fully absent.

2) In *H. futilirostris* the merus of the first pereiopod is compressed and broad, being about 2.4-2.9 times as long as wide, and is provided with

10-20 marginal spinules on the distal articulation but without the subterminal spine. (According to Dr. Gordon's sketch, the holotype has the very slender merus of the first pereiopod, about five times as long as broad, as represented in figure 6, d) In *H. rectirostris* it is slender, being 3.5-4.0 times as long as wide, and is provided with the well-developed subterminal spine on the outer side, and with a few marginal bristles instead of spinules in the former species on the distal articulation.

Fig. 5. Distribution of *Heptacarpus rectirostris* (●) and *H. futilirostris* (○). Uncertain localities omitted.

3) The series of the spines on each merus of the last three pereiopods is different in both species. In *H. futilirostris* two to five, generally two or three, spines are present on the merus of the third pereiopod and one to three spines are placed on that of the fourth pereiopod. These spines are restricted to the distal half or distal third portion of each segment. The merus of the fifth pereiopod is armed with only one spine on the subterminal portion. In *H. rectirostris* there are four to six spines along the outer side of the merus of the third pereiopod. The merus of the fourth is armed with three to five spines on the distal two-thirds of the outer side. Three to five spines are present on the distal half of the merus of the fifth pereiopod.

The male of *H. futilirostris* has the extremely long third maxilliped and the large first pereiopod. In *H. rectirostris*, however, we can not refer to this phenomenon, as no male specimens present in this study.

## Distribution

The two species seem to be separated geographically (Fig. 5). *H. rectirostris* is distributed in the sea around Japan, from Hokkaido to the southern Japan. While *H. futilirostris* appears to be affected by the warm Kuroshio current, and therefore, restricted in its distribution to the southern Japan, from Kanagawa Prefecture to Kagoshima Prefecture and North China.

Both the species are common in the littoral weed-belts. In southern Japan *H. rectirostris* does not occur near the shore, but is collected from the area on which the Danish seine fisheries were operated. *H. futilirostris*, on the other hand, is commonly found in the *Zostera* or *Sargassum* belts, though the type was taken from the rather deep water (50 fms).

## Discussion

In 1888 Bate described a new species, *Nauticaris futilirostris*, based on the one ovigerous female collected from the Akashi Strait at the depth of 50 fms. This species, however, later never has been recorded in literature as a valid species, though Nakazawa (1927) introduced it into the Japanese fauna, based on no material. Holthuis (1947) ranged it under the species incertae and suggested that it belongs to either *Heptacarpus* or *Eualus*. Through the kind examination of Dr. I. Gordon and Dr. A. L. Rice, Bate's species proved to belong not to *Nauticaris* but to *Heptacarpus*.

The holotype of *Heptacarpus futilirostris*, however, may be rather aberrant form, because it was collected from the rather deep water at the depth of 50 fms., and has the very slender first pereiopod and a fewer rostral teeth such as five on the upper border and only one on the lower.

Twenty eight years before Bate's description, Stimpson (1860) had reported the species under the name *Hippolyte rectirostris* from Hakodate. His description is short and insufficient for finding the differences between *H. rectirostris* and *H. futilirostris* and unfortunately his type is not extant. However, Rathbun (1902) reported one specimen from the type locality. We indebted to Dr. F. A. Chace, Jr., for examining her specimen and comparing it with our material collected from the Buzen

sea. He kindly informed us that her specimen has a distinct meral spine on the first pereiopod and shows the same spinulation of the pereiopods as in our *H. rectirostris*. Judging from the result of the examination of Rathbun's specimen and the distributional inclination of

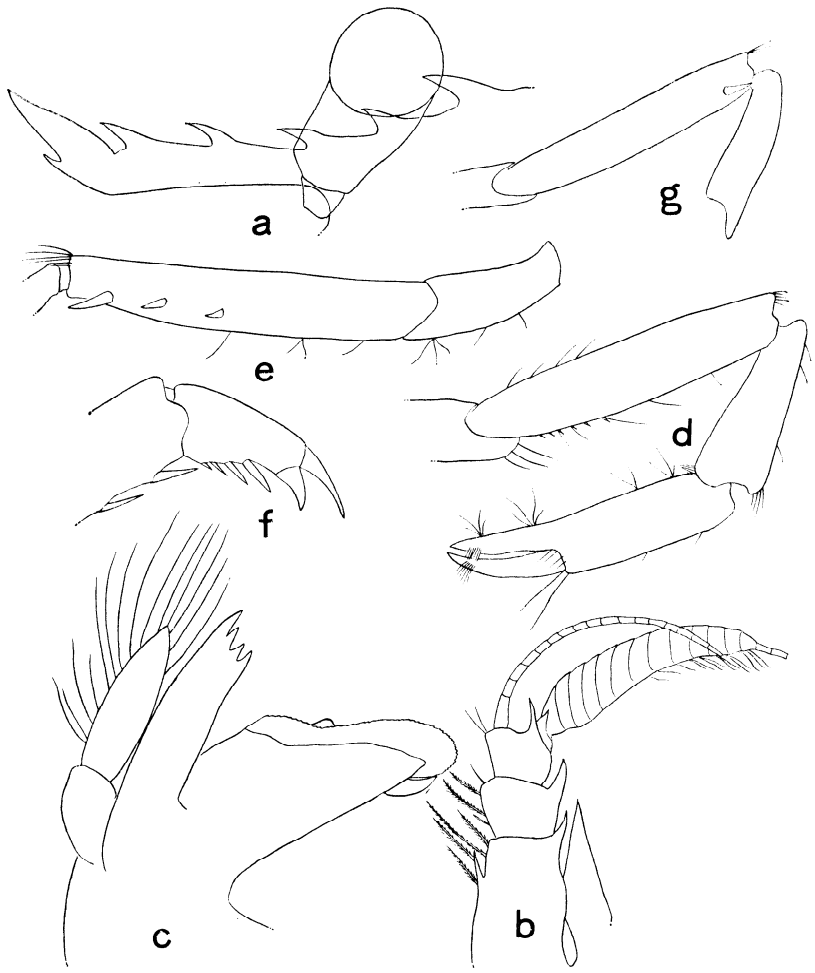


Fig. 6. *Heptacarpus futilirostris* (Bate), holotype.
a, Rostrum, ×14; b, antennular peduncle, ×14; c, mandible, highly magnified; d, first pereiopod, ×14; e, merus and ischium of third pereiopod, ×14; f, dactylus of the same pereiopod, ×33; g, carpus and merus of fifth pereiopod, ×14. After camera lucida sketches by I. Gordon.

the two species, Stimpson's species may refer to our *H. rectirostris* rather than *H. futilirostris*.

Table 1. Number of meral spines on pereiopods of de Man's *Spirontocaris rectirostris*.

| | Female (=*H. rectirostris*) | | Male (=*H. futilirostris*) | |
|---|---|---|---|---|
| Pereiopods | left | right | left | right |
| 1st | 1 | 1 | 0 | 0 |
| 3rd | (4) | 5 | (4) | 3 |
| 4th | (4) | (4) | 2 | 3 |
| 5th | missing | missing | 1 | 1 |

Numbers in parentheses are probably correct, for the corresponding pereiopods are detached from the body.

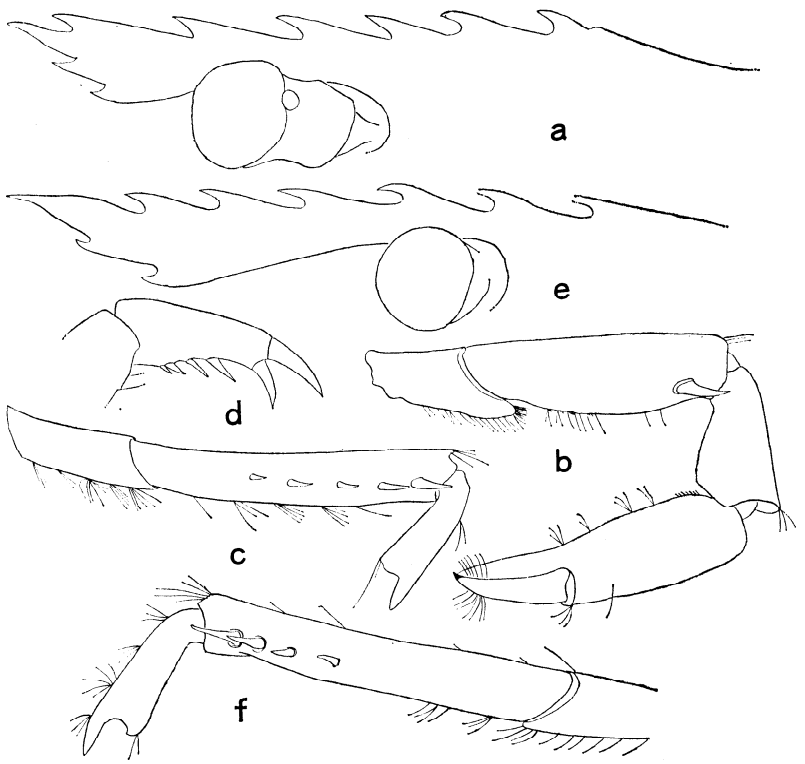


Fig. 7. a-d, *Heptacarpus rectirostris* (Stimpson); e, f, *H. futilirostris* (Bate). a, e, Rostrum, ×11; b, first pereiopod, ×11; c, f. carpus and ischium of third pereiopod, ×7.2; d, dactylus of third pereiopod, ×27. British Museum specimens (1907. 4. 27, 24-25) referred to *Spirontocaris rectirostris*(Stimpson) by de Man (1906, 1907). After camera lucida sketches by I. Gordon.

De Man (1906, 1907) gave the description and figures of the male and female specimens under the name *Spirontocaria rectirostris* from the Inland Sea of Japan. Owing to the kind re-examination of Dr. I. Gordon, we ascertained that de Man's male is not identical with the true *H. rectirostris* but referred to *H. futilirostris* (Table 1). Up till now many subsequent authors seem to have followed his ill identification.

Balss (1914) reported *H. rectirostris* from three different localities of Japan. The specimens from Aomori is obviously referred to that species, but we have some doubt of the identification of those from Nagasaki and Sagami Bay. For the time, we placed them in the present species, for we could not actually examine the specimens.

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