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A NEW GENUS OF PONTONIINID SHRIMP, *HAMODACTYLOIDES*,
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NATANTIA, PONTONIINAE), FROM THE RYUKYU ISLANDS

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A NEW GENUS OF PONTONIINID SHRIMP, *HAMODACTYLOIDES*,
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The author's recent investigation of the shrimps inhabiting the coral reefs of the Ryukyu Islands, Japan, reveals the occurrence of some pontoniinid shrimps commensal with hydroid corals. So far, the association of these host animals has scarcely been recorded among pontoniinid shrimps, though many have the habit of living commensally with various marine invertebrates. *Periclimenes spiniferus* de Man, most commonly found among the branches of scleractinian corals in the Ryukyu Islands, is present in this collection and also a much smaller undescribed species. The latter shrimp represents a close relation to the Indo-West Pacific genus *Hamodactylus* Holthuis, 1952, found in association with gorgonians. Of three species of *Hamodactylus* recorded so far the present species is most closely allied to *H. incompletus* Holthuis, 1958, especially in the taxonomically important characteristics that distinguish *H. incompletus* from the other species of *Hamodactylus*, such as the form of the mouthparts and the structure of the dactyli of the ambulatory pereopods. The second pereopods are found in the present species to be considerably different in configuration occurring in the other species of *Hamodactylus*. These features noted above are characteristic of the two species and so of generic importance, therefore a new genus, *Hamodactyloides*, is now established for them.

The author wishes to express his sincere thanks to Dr. A. J. Bruce of the East African Marine Fisheries Research Organization, Mombasa, Kenya, for the critical reading of the manuscript and for the useful suggestions and opinions in the course of this study.

***Hamodactyloides* gen. nov.**

Definition. — Small commensal pontoniinid shrimps associated with hydroid coelenterates. Rostrum well developed with teeth dorsally. Carapace smooth, with antennal and hepatic spines. No process nor spine present on thoracic sternites. Abdominal somites with pleura rounded. Telson elongate with two pairs of dorsal and three pairs of posterior terminal spines. Eyes well developed with

globular cornea. Basal segment of antennular peduncle broad with distinct anterolateral tooth. Stylocerite normally developed, slender. Basicerite of antennal peduncle with spine laterally. Antennal scale well developed with strong anterolateral tooth. Mandible without palp; well developed molar process, setiferous distally; incisor process toothed. Maxillula with simple palp. Maxilla with reduced unilobed endite; scaphognathite very broad anteriorly. First maxilliped without flagellum on exopod; caridean lobe broad, rounded; endite broad, not bilobed.

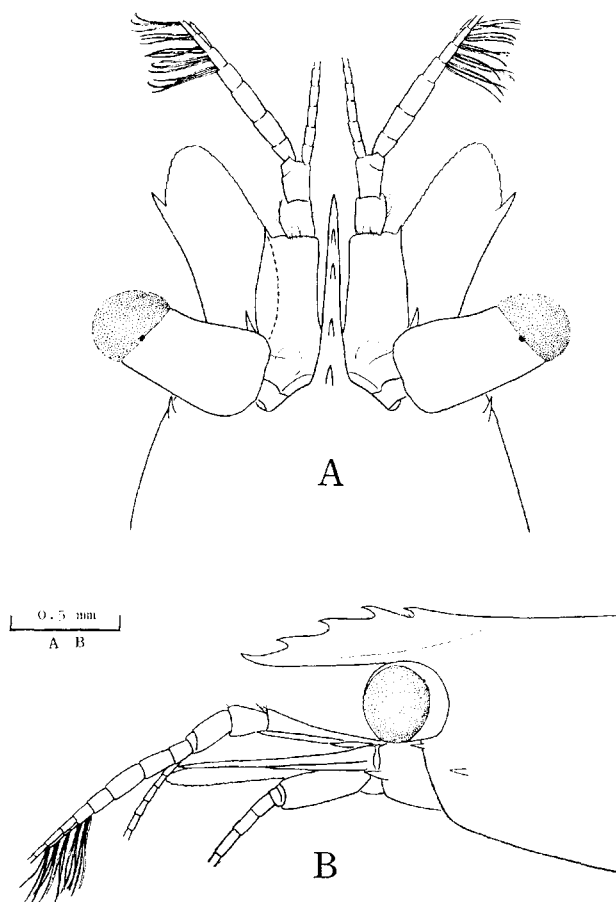


Fig. 1. *Hamodactyloides ishigakiensis* sp. nov., paratype, ovigerous female. A, anterior part of body in dorsal view; B, anterior part of body in lateral view.

Second maxilliped without exopod, with or without epipod. Third maxilliped slender, without exopod, with reduced arthrobranch. First pereopod slender, chela cylindrical. Second pereopods similar, excessively unequal in size; fingers without teeth. Ambulatory pereopods stout, short; dactylus short, strongly curved, and bluntly pointed with distinct basal protuberance. Pleopods normal. Exopod of uropods with a movable spine terminally.

Type species: *Hamodactylus incompletus* Holthuis, 1958.

Systematic position. — *Hamodactyloides* gen. nov. is closely related to the Indo-West Pacific genus, *Hamodactylus* Holthuis. *Hamodactylus* was established by Holthuis in 1952 on a new species, *H. boschmai* and its variety, *H. boschmai* var. ?, known from Djaban Island, on the east coast of the Aru Islands and from Ternate respectively. To the latter species no specific name was given at that time because of its being based upon only a single damaged specimen. This form was recently confirmed by Bruce (1970) as a species distinct from *H. boschmai*, being designated as *H. noumeae* Bruce. Holthuis (1958) also erected a species of this genus, *H. incompletus*, from Sinai Peninsula, the Red Sea. In this species, unfortunately the form of the second pereopods, which is often regarded as one of the most important specific or generic characters of pontoninids, is unknown due to the lack of the pereopods of the specimens examined. However, this species appears to be considerably different from the above-noted two species in the shape of the first pereopods, in the form of the dactyli of the ambulatory pereopods, and in the structure of the mouthparts. These characters of *H. incompletus* suggest the possibility of its separation from *Hamodactylus*. This idea is confirmed by the discovery of the present new species from the Ryukyu Islands, taken in association with a hydroid coelenterate. In the present species the extremely unequal second pereopods, the strongly hooked dactyli of the ambulatory pereopods, which bear a marked broad basal protuberance, the entire absence of the flagellum of the exopod from the first maxilliped, and the presence of the vestigial arthrobranch are particularly remarkable. These characters appear to be of value as distinguishing points from the members of *Hamodactylus* (s. str.). The second pereopods are rather feebly constructed and slender in *Hamodactylus*, and subject to a great variation in their morphology; in *H. boschmai* the pereopods are characteristically subchelate, and in *H. noumeae* they are normal in type. On the contrary, in *Hamodactyloides*, although only known in *H. ishigakiensis*, the pereopods are normal, almost equal in shape but excessively unequal in size. The larger pereopod is particularly large and robust.

Hamodactyloides also resembles the recently established genus, *Propontonia* Bruce, 1969, which was recorded from the western Indian Ocean in association with alcyonarians. The differences among these three genera are summarized in table I on next page.

The association of this genus with a hydroid host, although the host of *H. incompletus* is still unknown, is very interesting because with the exception of *Periclimenes galene* Holthuis (Bruce, in litt.) no pontoninid shrimps have ever been recorded in association with hosts of this class. With reference to the taxonomically related genera, *Hamodactylus* and *Propontonia*, the host animals are known to be gorgonians and alcyonarians, respectively. The hydroid, *Millepora*, among the branches of which *H. ishigakiensis* was obtained, often flourishes with scleractinian corals in the Ryukyu Islands.

TABLE I

	<i>Hamodactylus</i>	<i>Propontonia</i>	<i>Hamodactyloides</i>
mandible			
incisor process	expanded	normal	normal
molar process	reduced	normal	normal
maxillula			
palp	biid	simple	simple
maxilla			
scaphognathite	normal	normal	very broad
endite	bilobed	bilobed	rudimentary, simple or bilobed
1st maxilliped			
caridean lobe	normal	broad	very broad, rounded
flagellum on exopod	rudimentary	present	absent
2nd maxilliped			
exopod	absent	present	absent
3rd maxilliped			
arthrobranch	absent	rudimentary	rudimentary
2nd pereopods	equal	subequal	very unequal
ambulatory pereopods			
dactylus	slender, simple	robust, simple	stout, short, with basal protuberance
hosts	gorgonians	alcyonarians	hydroid corals

Hamodactyloides ishigakiensis sp. nov.

Material examined. — 2 ♂♂, 2 ovigerous ♀♀, 2 ♀♀, 1 juv., Kabira Bay, Ishigaki-jima Island, Ryukyu islands, coral reef, 1 m deep, 16 July 1969, T. Fujino leg.

Description of holotype (ovigerous female). — A very small-sized shrimp with extremely unequal second pereopods. The rostrum is directed forward, with the feebly upturned and pointed apex almost reaching the end of the second segment of the antennular peduncle. The upper border is considerably convex and bears four distinct teeth; the proximal tooth is situated over the orbit and is slightly smaller than the others; the proximal three teeth are directed obliquely upwards, but the foremost is horizontal in direction and separated from the apex by a distinct interval. The lower border is smooth, unarmed and gently curved distally. No distinct midrib is visible.

The carapace is slightly depressed. The surface is entire, with a small antennal spine a little behind the anterior margin of the carapace, below the rectangularly produced inferior orbital angle. The hepatic spine is larger than the antennal spine and is located behind and slightly below it. No supra-orbital spine is present.

The abdominal pleura are all rounded. The sixth somite is somewhat elongate and measures about twice as long as the fifth.

The telson is elongate and longer than the sixth abdominal somite. Two pairs of small spines lie dorsally on the posterior half; the posterior pair is halfway between the anterior pair and the posterior end of the telson. The posterior terminal margin is provided with three pairs of spines; the outer pair is the smallest and of equal size with the dorsal spines; the intermediate pair is the longest and stoutest; the submedian pair is shorter and weaker than the intermediate.

The eye has the cornea hemispherical, the anterior margin of which almost

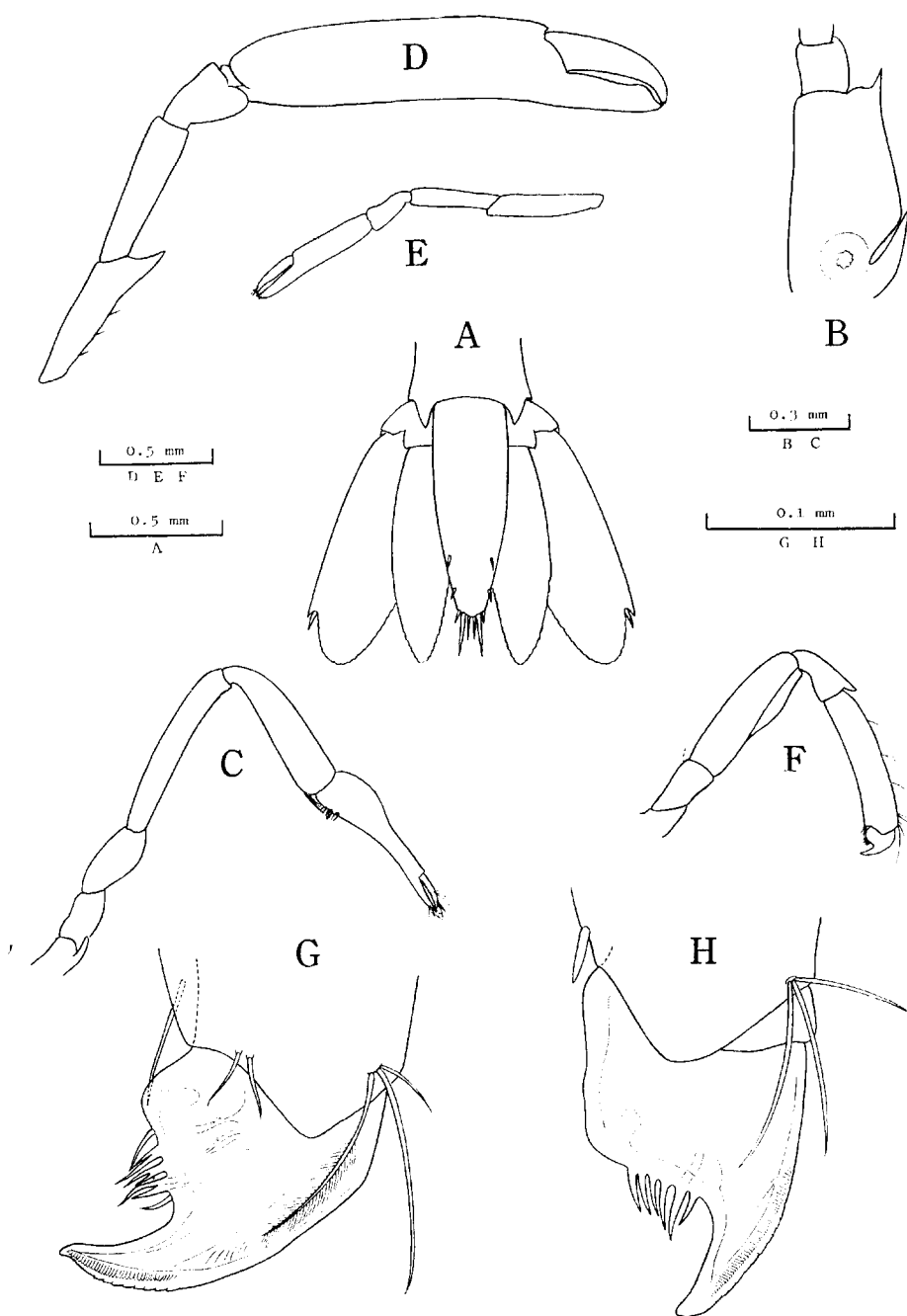


Fig. 2. *Hamodactyloides ishigakiensis* sp. nov., paratype, ovigerous female. A, telson and uropods; B, antennula; C, first pereiopod; D, larger second pereiopod; E, smaller second pereiopod; F, third pereiopod; G, dactylus of third pereiopod; H, dactylus of fourth pereiopod.

extends to the rostral apex. The peduncle is somewhat depressed and becomes thinner distally. A small ocellus is present.

The basal segment of the antennular peduncle is broad; the lateral margin is more or less convex with a well-marked terminal tooth, which outreaches the middle of the second segment. The anterior margin, interior to the anterolateral tooth, is somewhat produced into a round convexity. A sharply pointed slender stylocerite is present, extending nearly as far forward as the middle of the basal segment. The distal two segments are both short; the second segment is feebly broader and shorter than the distal. The upper flagellum is fused basally for five segments and bifurcated distally into a short and a long free ramus.

The basicerite of the antennal peduncle bears a well-defined spine laterally. The carpocerite is stout and subcylindrical. The lamella of the antennal scale is broad and expanded forward to form a bluntly rounded angle anteriorly. It is more than three times as long as the maximum breadth which lies in about the middle.

The mouthparts on the left side have been dissected and examined. They are similar to those of *H. incompletus* but for the absence of the epipod from the second maxilliped. The mandible consists of a well-developed, large molar process with thickly packed spinules at the tip and a comparatively short incisor process, which narrows towards the distal edge, and which bears three small teeth. Three minute spines are present on the lateral borders distally. The palp of the maxillula is oblong and unilobed, with a fine spinule terminally; the upper lacinia is rather broad and provided on the distal border with four stout teeth, several spines and coarse plumose setae; the lower lacinia is curved and tapers strongly distally, being fringed near the top with a number of stiff setae. The maxilla has the scaphognathite very broad anteriorly, the palp is well developed and the naked simple lobular endite has a seta distally. The first maxilliped consists of a short palp, a very broad and round caridean lobe which completely lacks the flagellum on the exopod, a well-expanded unilobed endite, and a distinctly bilobed round epipod. The second maxilliped completely lacks the epipod and the exopod; the short distal segment of the endopod is provided with very coarse long setae; the other segments are rather broad and short. The third maxilliped also lacks the exopod; it is slender and to some extent curved inwards; the two distal segments are approximately equal in length and breadth, with several tufts of setae; the antepenultimate segment is slightly broader than the distal, measuring two and a half times the length of the terminal segment; both the inner and the outer borders have several irregular simple setae. A round and rigid epipod and an obsolescent arthrobranch are present.

The first pereopods are slender and extend beyond the antennal scale by the length of the movable finger. The chela is cylindrical, elongate, and thick proximally, suddenly decreasing in breadth in the distal half to the short and narrow fingers. The palmar portion is about three times as long as the fingers. The fingers are narrow, curved and gape distally; the cutting edges are found to be

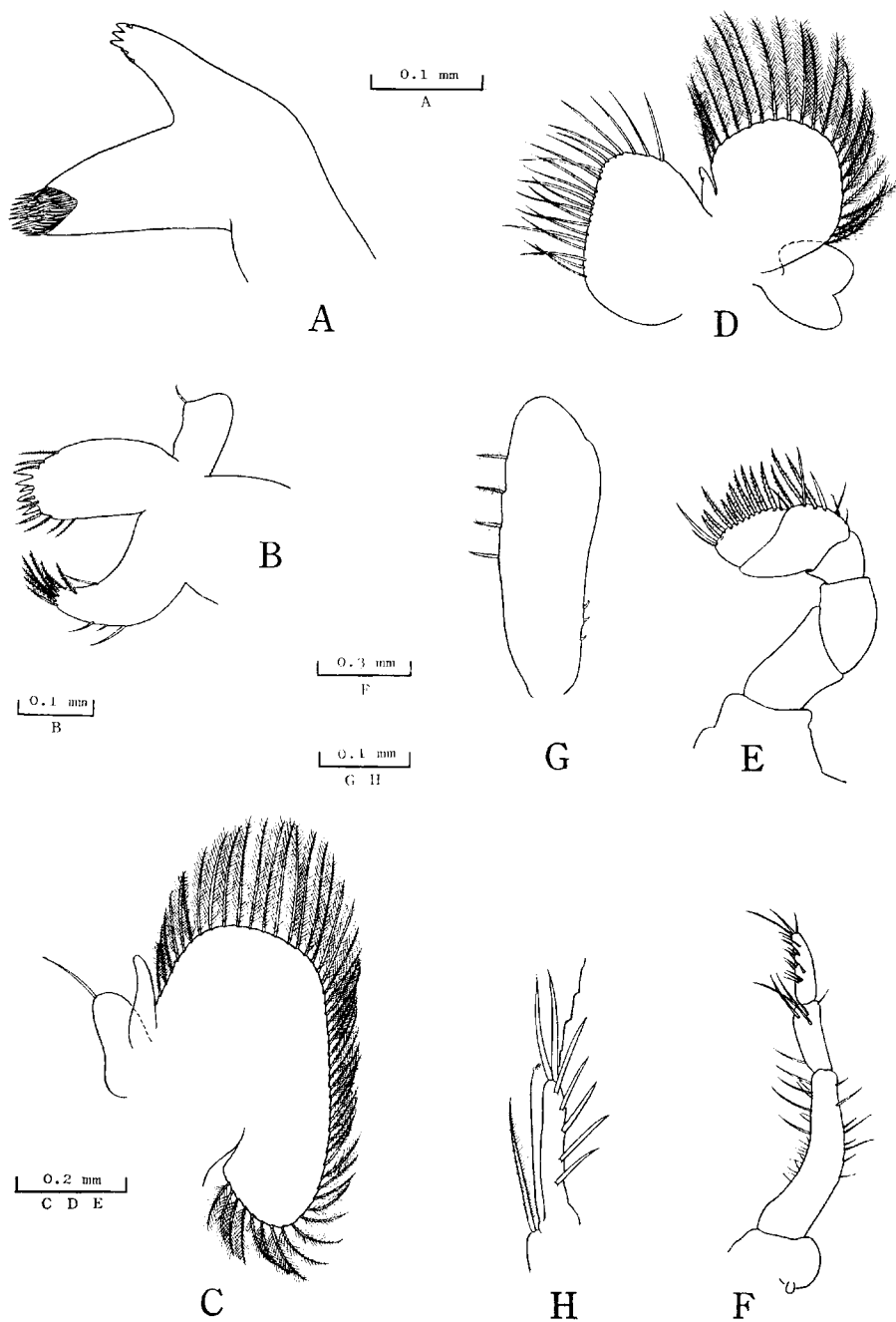


Fig. 3. *Hamodactyloides ishigakiensis* sp. nov., paratype, male. A, mandible; B, maxillula; C, maxilla; D, first maxilliped; E, second maxilliped; F, third maxilliped; G, endopod of first pleopod; H, appendix interna and masculina.

finely pectinate under high magnification. The inner side of the chela is provided proximally with three tufts of two bristles. The carpus is cylindrical and thicker distally, a trifle shorter than the chela; a bunch of long setae is present at the posterior distal corner. The merus is more slender and longer than the carpus. The ischium and the basis are short and somewhat swollen. A narrow lobular process is produced from the inner ventral extremity of the basis.

The second pereopods are extremely unequal in size, but generally similar in shape. The larger pereopod is robust and long. The movable finger is strongly curved distally to a pointed end and moves horizontally. The cutting edge is entire, without any teeth. The fixed finger is broader than the movable, the outer margin is almost straight and then strongly curved to a hooked and pointed tip; the cutting edge is somewhat sinuous and distally forms a round convexity. The palm is depressed and elongate, and both the anterior and the posterior borders are approximately parallel to each other; it is about four times as long as broad and measures somewhat less than two and a half times the length of the movable finger. The carpus is short and conical with the distal border entire. The merus is slightly less than half as long as the palm. The ischium is the same in length as the merus; a very strong spinous process is present distally on the inner angle. The basis is short and lacks any spines or projections. The smaller second pereopod is more slender and much shorter than the first pereopod. It exceeds the antennal scale by the length of the dactylus. The fingers are nearly symmetrical and bear hooked tips, the cutting edges being smooth and straight. The palm is narrow and depressed, less than twice the length of the fingers. The carpus is rather elongate in comparison with that of the larger pereopod. The merus is shorter and more slender than the ischium, the latter having a posterior angled projection distally.

The ambulatory pereopods are stout and resemble one another. The dactylus is short, broad and strongly curved, ending in a strong pointed and hooked tip. The basal portion has a well-marked broad, quadrate protuberance, which is provided distally with several unusual, fixed, spinous and closely situated projections of unequal size, some of which are bifurcated distally. Under high magnification the anterior margin of the dactylus appears to be finely and uniformly corrugated from the distal third to almost as far forward as the tip. The propodus is entire posteriorly save for a distal spinule. The carpus is short and conical. The merus is subequal to the propodus in length. The ischium is short.

The endopod of the first pleopod of the male is broad and oblong and the distal border rounded; marginal spines and plumose setae are visible. The appendix masculina of the second pleopod is narrow and bar-shaped, with several long and coarse setae both laterally and distally. The appendix interna is of slender form and somewhat longer than the appendix masculina.

The uropods are longer than the telson. The outer border of the exopod is gently convex and terminates in a triangular tooth with a distinct movable spine medially.

The thoracic sternite is glabrous, without any spines and processes.

The ova are large and about thirty in number, measuring 0.4 mm in the greatest diameter.

Description of paratypes. — The males are rather smaller than the ovigerous females. The rostrum of some specimens is shallower and the upper border elevation is less conspicuous than in the holotype. Of the six specimens, excluding the juvenile, five bear four and one has three teeth on the upper border of the rostrum.

In one male the anterior margin of the basal segment of the antennular peduncle on the right side, interior to the anterolateral tooth, has a small tooth which fails to reach the level of the end of the anterolateral tooth. In the other specimens this portion, similarly to the holotype, is roundly convex and does not form such a tooth.

The larger second pereopod of the male is somewhat shorter and less heavy than in the holotype. In this case the convexity on the cutting edge of the dactylus is somewhat less marked.

Measurements. — The holotype (ovigerous female) is the largest. The large male measures 1.2 mm in carapace length.

	holotype (ovig. ♀)	allotype (♂)
body length	7.7 (mm)	6.0 (mm)
carapace length	1.5	1.2
rostrum length	1.0	0.9
telson length	0.9	0.7
length of antennal scale	1.0	0.9
length of chela of larger 2nd pereopod	1.9	1.3
length of chela of smaller 2nd pereopod	0.7	0.5

Colouration. — Detailed data on colour are not available, but the body is probably generally transparent.

Ecology. — The specimens were living attached to the branches of the hydroid, *Millepora tenera* Boschma.

Types. — An ovigerous female is selected as holotype and deposited in the Zoological Laboratory of Kyushu University, ZLKU No. 17247; male allotype, ZLKU No. 17248.

Remarks. — In its general morphology *Hamodactyloides ishigakiensis* presents a close resemblance to the other species of this genus, *H. incompletus* (Holthuis, 1958). The distinctions between these species may be noted in regard to the following characteristics.

1. The entire absence of the epipod on the second maxilliped is peculiar to this species and is of an important distinction from *H. incompletus*. The reduction and absence of the epipod of the second maxilliped is otherwise only found in some species of the genus *Onyccaris* Nobili (Fujino & Miyake, 1969).

2. The rostral teeth of the present species are three or four instead of five as in *H. incompletus*, although only one specimen of the latter species was available for Holthuis's examination.

3. The stylocerite of *H. incompletus* is slender and slightly exceeds the middle

of the basal antennular segment. In the present species it fails to extend as far forward as the middle of that segment.

4. There is included in the present material one specimen which is provided, on one side, with an additional anterior tooth on the basal segment of the antennular peduncle. In the other specimens, this margin is smoothly convex and without a tooth. In *H. incompletus* the basal segment bears a distinct tooth on either side, which is well-marked and somewhat larger than the anterolateral tooth.

5. The molar process of the mandible of the present species is surrounded by thick spines, which cover the top completely, whereas that of *H. incompletus* ends in some blunt teeth with spines.

6. In the present species the endite of the maxilla is reduced to a simple lobe, whereas it ends in two lobes in *H. incompletus*.

ZUSAMMENFASSUNG

Die neu entdeckte Gattung *Hamodactyloides*, wird mit der Art *H. ishigakiensis* sp. nov. beschrieben. Sie gehört zur Unterfamilie Pontoniinae. Gefunden wurde sie an Hydrocoelenteraten der Gattung *Millepora* im Korallenriff der Ryukyu Inseln im Süden Japans. *Hamodactyloides* ist mit der indopazifischen Gattung *Hamodactylus* Holthuis, 1952, nahe verwandt. Merkmale an Mundwerkzeugen und Beinen rechtfertigen die Aufstellung dieser neuen Gattung. *Hamodactylus incompletus* Holthuis, 1958, sollte der neuen Gattung *Hamodactyloides* zugeordnet werden.

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