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THE RESULTS OF THE RE-EXAMINATION OF THE TYPE SPECIMENS OF SOME PONTONIID SHRIMPS IN THE COLLECTION OF THE MUSÉUM NATIONAL D'HISTOIRE NATURELLE, PARIS [1]

A. J. BRUCE [2]

A visit to the Museum National d'Histoire Naturelle, Paris, in October 1966 enabled me to examine the type specimens of three species of pontoniid prawns of uncertain systematic position. The results of this re-examination are given in this paper, together with more detailed descriptions of the material concerned.

I wish to express my sincere thanks to J. Forest, of the Museum National d'Histoire Naturelle, for permission to examine these specimens and for his assistance during the course of my visit.

Anchistus armatus (H. Milne-Edwards, 1837).

Pontonia armata H. Milne-Edwards, 1837 : 359.
Anchistus (?) *armatus* Borradaile 1898 : 387.
Pontonia armata Holthuis, 1952 : 21.

The brief original description given by Milne-Edwards has not allowed the systematic position of this species to be determined with certainty. Borradaile (1898) provisionally transferred the species to the genus *Anchistus* Borradaile, 1898 and this was also accepted by Holthuis (1952). The species has not been re-discovered since the original material was collected by Quoy and Gaimard in 1817-1820.

The original material, consisting of a male and an ovigerous female, has been preserved in the collections of the Museum and both specimens are in a very good state of preservation although many of the pereiopods are missing. Re-examination of these two specimens confirms that they should be referred to the genus *Anchistus* Borradaile. The following notes will amplify the description given by Milne-Edwards.

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Description : The body is robust and distinctly swollen in the female. The carapace and abdominal segments are smooth. The rostrum is depressed and blunt, lacking a distinct midrib, and reaching anteriorly to the distal border of the proximal antennular peduncular segment in the female and to the middle of the intermediate segment in the male. In the female the tip of the rostrum is bluntly rounded but in the male the tip is feebly notched with a minute distal ventral tooth. A few short setae arise from the anterior notch. The inferior orbital angle is slightly produced. The antennal spine is well developed, acute, and arises from the anterior margin of the carapace. No post-orbital ridge is present. Supra-orbital and hepatic spines are absent. The antero-lateral angle of the carapace is bluntly obtuse.

The third abdominal segment is not produced posteriorly in the dorsal midline. The pleura of the fourth and fifth segments are rounded. The lateral and ventral posterior angles of the sixth segment are also bluntly rounded. The telson length is about three and a half times its basal width. Two pairs of small, short, submarginal dorsal spines are present, the anterior pair situated at three quarters of the telson length from the anterior margin and the posterior part half way between the anterior pair and the posterior margin of the telson. The terminal spines are also small and short, the intermediate spines being about twice the length of the lateral spines, which are subequal to the dorsal telson spines. The submedian species are slender and shorter than the intermediate spines.

The cornea is hemispherical and the peduncle is subcylindrical and stout. The peduncle is expanded proximally and exceeds the diameter of the cornea. It is also slightly dorso-ventrally compressed. No ocellus is visible.

The proximal segment of the antennular peduncle is broad. In the female, the stylocerite is broad and blunt. The disto-lateral margin is slightly produced and bluntly angled laterally without any distinct tooth. In the male, the stylocerite is more acute and the disto-lateral margin bears a small tooth. The intermediate segment bears a small lateral lamina and its length is subequal to the distal segment. Intermediate and distal segments together are equal to about three fifths of the length of the proximal segment.

The basicerite is unarmed laterally. The scaphocerite is broad with a small disto-lateral tooth which is far exceeded by the rounded anterior margin of the lamella. The scaphocerite is distinctly longer than the antennular peduncle. The carpocerite is robust and reaches to the level of the anterior margin of the intermediate segment of the antennular peduncle. The antennular flagella are well developed exceed the length of the body.

The mouthparts have not been dissected but the following features were observed. The mandible is without a palp. Exopods are present on all maxillipeds. The third maxilliped exceeds the length of the carpocerite by half the length the of terminal segment, which is about five times longer than wide and two thirds of the length of the penultimate

segment. The terminal and penultimate segments exceed the length of the ante-penultimate segment by half the length of the terminal segment. The antepenultimate segment is narrow, about five times longer than wide, and expanded proximally. The third maxilliped bears a well developed rounded epipod and a small arthrobranch.

The sternite of the fourth thoracic segment is broad with a feeble transverse ridge bearing a small notch in the midline.

The first pair of pereiopods is still attached in both specimens. They exceed the length of the antennular peduncle by the length of the chela and half the length of carpus. The fingers of the chela are stout, distally rounded, subspatulate with finely denticulate cutting edges. The palm of the chela is subcylindrical and subequal to the length of the fingers. The chela is about thirds of the length of the carpus, which is very slightly shorter than the merus. Both segments are unarmed and there is no median lobe on the coxa.

Of the second pereiopods only that on the right side of the female is still preserved. It is very short and feebly developed and probably in the process of being regenerated. The dactyl is compressed, with a strongly hooked tip which distinctly exceeds the length of the fixed finger. Its cutting edge bears only two feebly developed teeth proximally. The fixed finger also has a distinctly hooked tip and its cutting edge bears five small acute teeth on its proximal half, the three distal teeth being rather larger than the two proximal teeth. The palm is subcylindrical.

Of the ambulatory pereiopods only the third and fourth are present on the left side of the female and third to fifth on the left side of the male, together with one detached pereiopod. These appendages are short and stout. The dactyls are short and stout, about one eight of the lenght of the propod. The tip of the dactyl is slender and acute and a well developed subequal accessory spine is present on the posterior margin close to the tip. In the male this spine is acute, robust and curved, but in the female it is subrectangular and bilaterally compressed. The propod is about seven times longer than wide. Numerous fine setae are present distally and a single short disto-ventral spine is present on the third pereiopod.

The appendix masculina on the second male pleopod is rather short and stout, not reaching to the distal end of the appendix interna. It is armed along the distal third of its medio-distal margin, with several short spines which increase in length distally. Appendices internae are presnt in the second to fifth pleopods in both sexes.

The basal segment of the uropods bears an acute, elongated tooth dorsally. The rami are broad and bluntly rounded distally, and distinctly exceed the tip of the telson. The lateral border of the exopod is feebly convex with a small blunt tooth and a minute mobile spinule distally. The ova are numerous and small.

Measurements. — Post-orbital carapace length ; female, 12.5 mms. ; male, 8.5 mm.

Type Locality. — Nouvelle Irlande.

Host. — Unknown.

Remarks. — *Anchistus armatus* (H. Milne-Edwards) may be readily distinguished from other species so far referred to this genus, with the exception of *A. misakiensis* Yokoya, by the presence of the following features : truncated rostrum lacking dorsal teeth ; antennal spine, narrow antepenultimate segment of the third maxilliped : accessory spines on dactyls of ambulatory pereiopods. *A. armatus* is closely related to *A. misakiensis* and the most striking difference between the tuo species is the very much greater size of the former species. Most of the morphological differences are small but the following points may be noted.

1) The terminal segment of the third maxilliped is two thirds of the length of the penultimate segment in *A. armatus*. These segments are subequal in length in *A. misakiensis*. The two distal segments distinctly exceed the length of the antepenultimate segment in *A. armatus* but not in *A. misakiensis*.

2) The fingers of the chela of the first pereiopod in *A. armatus* are broad and subspatulate with finely denticulated cutting edges. The presence of these features have not been reported in *A. misakiensis*.

3) The anterior pair of dorsal spines are situated at three-quarters of the telson length and the posterior pair half way between the anterior pair and the posterior margin in *A. armatus*. In *A. misakiensis* the anterior pair of dorsal spines appears to lie more anteriorly and the posterior pair closer to the anterior pair than to the posterior margin.

4) In *A. armatus* the intermediate pair of posterior telson spines is only about twice the length of the lateral pair. In *A. misakiensis* the intermediate spines are about 6-7 times the length of the lateral spines.

5) The dactyls of the ambulatory pereiopods are very short and stout in *A. armatus* and the robust accessory spine arises from the distal part of the posterior margin. In *A. misakiesnis* these dactyls are much more slender, with a slender accessory spine arising from the proximal part of the posterior margin.

The species at present known to belong to the genus *Anchistus* may be conveniently separated by the following key.

A Key to the Species of the Genus *Anchistus* Borradaile.

1. Dactyls of the ambulatory pereiopods simple..... 2
   Dactyls of the ambulatory pereiopods biunguiculate..... 4
2. Antennal spine absent ; antepenultimate segment of third maxilliped much broader than penultimate ; palm of chela of first pereiopod deeply cannulate ; rostrum toothless..... *A. custos* (Forsskal)

Antennal spine present ; antepenultimate segment of third maxilliped of subequal width to penultimate ; palm of chela of first pereiopod not cannulate 3

3. Rostrum with three dorsal and one ventral tooth..... *A. gravieri* Kemp
Rostrum toothless..... *A. pectinis* Kemp

4. Rostrum bearing small teeth dorsally..... 5
Rostrum toothless..... 6

5. Rostrum distally truncated ; antennal spine absent.. *A. demani* Kemp
Rostrum distally acute ; antennal spine present... *A. miersi* De Man.

6. Fingers of chela of first pereiopod broad, subspatulate with denticulate cutting edges ; dactyls of ambulatory pereiopods short and stout, with robust accessory spines on the distal half of the posterior border ; a large species..... *A. armatus* (H. Milne-Edwards)

Fingers of chela of first pereiopod not subspatulate with denticulate cutting edges ; dactyls of ambulatory pereiopods slender with a slender accessory spine on the proximal half of the posterior border ; a small species.... *A. misakiensis* Yokoya.

Philarius brevinaris (Nobili 1906).

Periclimenes borradalei Nobili, 1904 : 159.
Periclimenes brevinaris Nobili, 1906 : 42, pl. 3, figs 7, 7a.
Periclimenes (*Cristiger*) *brevinaris*, Borradaile, 1917 : 364.
Periclimenes (*Ancylocaris*) *brevinaris*, Kemp 1922 : 195.
Periclimenes brevinaris Holthuis, 1952 : 20.

The single specimen, the holotype of this species, is unfortunately in very bad condition and consists of little more than a chitinous shell. The carapace and antennae are detached from the body. The fifth abdominal segment is destroyed and the sixth, with the telson but lacking the uropods, is also detached from the abdomen. However, examination of the remains of this specimen enables Nobili's description to be amplified and as the species has not been recaptured since its original discovery by Bonnier and Perez in 1901, the details are here recorded.

Description. — The carapace and abdomen are smooth. The rostrum is as figured by Nobili and its tip falls distinctly short of the anterior margin of the proximal segment of the antennular peduncle. The lamina is deep with a distinct midrib. The dorsal margin bears five large teeth, the most posterior lying well behind the orbital margin. Both dorsal and ventral margins are distinctly convex and none of the dorsal teeth lie on the distal third of the lamina. The inferior orbital angle is distinctly produced, blunt, with a convex upper margin. The antennal spine is well developed, acute and robust and arises slightly behind the anterior margin of the carapace at a level well below the inferior orbital angle. There is no supra-orbital spine or post-orbital ridge. The hepatic spine is absent. The antero-lateral angle of the carapace is broadly rounded.

The third abdominal segment is not produced posteriorly in the dorsal midline. The pleuron of the fourth segment is rounded. The posterior lateral and ventral angles of the sixth segment are acute. The telson is long and narrow with two pairs of dorsal spines. The anterior pair are slightly posterior to the half length of the telson and the posterior pair is a little closer to the anterior pair than to the tip. The lateral pairs of terminal spines is similar to the dorsal spines and the intermediate pair are long and slender, subequal to the anterior width of the telson. The submedian spines are shorter and more slender.

The cornea is hemispherical and its diameter is about half the length of the peduncle.

The proximal segment of the antennular peduncle has the antero-lateral margin feebly produced, bearing two small disto-lateral teeth on the right and one on the left. The stylocerite is long, slender and acute and exceeds half the length of the basal segment. The intermediate segment is about one and a half times the length of the intermediate segment. The upper antennular flagella are fused for the six proximal segments and the shorter ramus has three free segments.

The basicerite is unarmed laterally. The carpocerite reaches to the middle of the intermediate antennular peduncular segment. The scaphocerite has a very slightly convex lateral margin and an acute distal spine. The broad lamella, which far exceeds the lateral spine, has a distinctly convex anterior margin which is bluntly angulated with the medial margin.

Most of the mouthparts are missing but one mandible, which is without a palp, is present. The third maxilliped bears a well developed exopod and it consists of short stout segments which are not expanded.

Both of the first pair of pereiopods are still attached to the thoracic sternites. They are long and slender. The fingers of the chela are slender and pointed and about three fifths of the length of the palm, which is subcylindrical, tapering slightly distally. The carpus is about 1.3 times the length of the chela and slightly longer than the merus. The ischium is subequal to the length of the palm.

Both second pereiopods are present, that on the right being still attached to the thoracic sternites. The second periopods are subequal, similar and glabrous. When extended anteriorly the first and second pereiopods reach to the same level. The dactyl of the second pereiopod is compressed with a small hooked tip. The cutting edge is straight and entire except for a feeble blunt tooth proximally. The fixed finger is similar to the dactyl but less strongly compressed and without any trace of a tooth on a cutting edge. The fingers are slightly longer than half the length of the palm and subequal to the length of the carpus, which is twice as wide distally as proximally and unarmed. The merus is also unarmed and subequal to the length of the palm and of the ischium.

All ambulatory pereiopods are detached but three are preserved. The dactyls are robust and simple with slender, slightly curved tips. The base of the dactyl is of similar width to the distal end of the propod. The propods are slightly bowed, about nine times longer than wide,

and a little more than three times the length of the dactyls. The propods are devoid of spines and setae. The carpus is about half the length of the propod, which is also subequal to the length of the unarmed merus.

The fourth thoracic sternite is unarmed.

The anterior pleopods are still present. A short appendix masculina, not exceeding the length of the appendix interna, is present on the second pair of pleopods. The basal segments of the uropods are still attached to the abdomen but the rami are missing. The dorsal surface of the basal segment bears two rounded lobes.

Measurements. — Not recorded.

Type Locality. — Persian Gulf, off the coast of the Trucial Oman, Mission Bonnier et Perez, Station XLVII, 25°10′N 55°10′E to 24°55′N 54°40′E.

Ecological Data. — Caught by trawl, at 10-15 fms, over a bank of pearl oysters.

Remarks. — The re-examination of the only known specimen of Nobilis *Periclimenes brevinaris* confirms the opinion of Kemp (1922) that the spine described as antennal is in fact the inferior orbtital angle and the hepatic is actually the antennal spine. The hepatic spine is therefore definitely absent and as a result this species cannot be retained in the genus *Periclimenes* Costa 1844.

The features described above show that the specimen has the closest resemblance to the genus *Philarius* Holthius 1952, which at present contains only two species, *P. gerlachei* (Nobili) and *P. imperialis* (Kubo). Both of these are shallow water, coral-inhabiting species of robust squat appearance, depressed body form, with large chelae on the second pereiopods and short stout ambulatory pereiopods with short strongly hooked dactyls. *P. brevinaris*, in contrast, appears to have been a lightly built species, probably free-living, with feebly developed second pereiopods and longer, more slender ambulatory pereiopods, showing no special adaptions. The body does not appear to have been depressed. Both *P. gerlachei* and *P. imperialis* have a well developed median spine on the fourth thoracic stermite. In the Pontoniinae so far examined by the author, the presence or absence of this process appears to be a valid generic character. Such a process is absent in *P. brevinaris*. Although placed provisionally in the genus *Philarius*, it seems probable that the examination of fresh material belonging to this species may well indicate that the erection of a separate genus for its inclusion is necessary.

Anchistiodes compressus Paulson 1875.

Anchistiodes compressus Paulson, 1875 : 115.
Amphipalaemon seurati Nobili, 1906 : 259 ; 1907 : 364.
Anchistiodes compressus Kemp, 1925 : 339.
Anchistiodes compressus Holthuis, 1952 : 18.

In her report on the species of *Anchistiodes*, Gordon (1935) states that she was able to examine the types of all species referred to this genus with the exception of *A. seurati* (Nobili) which could not then be found in the Paris Museum. The systematic position of this species was therefore left in some doubt, although its very close resemblance to *A. compressus* Paulson was noted. The single specimen of this species, on which Nobili's description was based, has since been re-located in the collections of the Museum. It is unfortunately in very poor condition and many of the appendages are missing.

Description. — The carapace is detached from the body, of which little remains, and is badly torn but in its general appearance is close to that figured by Nobili (1907). The post-orbital tubercles are distinct and the rostral lamella is deep with eleven dorsal and eight ventral teeth. The most posterior dorsal tooth arises from a position well in front of the orbital margin. The inferior orbital angle is slightly produced and bluntly rounded. The antennal spine is robust and arises from the anterior margin of the carapace at a slightly lower level than the inferior orbital angle. The hepatic spine is absent.

The pleura of the abdominal segments are rounded and the telson is missing.

The left eye only is still present. The cornea is hemi-spherical and its diameter is subequal to the length of the peduncle.

Only the left antenna in remains. The basicerite is unamed. The carpocerite is short and stout, being only slightly longer than wide. The scaphocerite is broad with a slightly convex lateral border ending in a strong spine, which is far exceeded by the lamella. The anterior margin of the lamella is feebly convex and the anterior and medial margins are bluntly angulated.

Some of the mouthparts are still present but are in very poor condition and were not detached for examination. All pereiopods are missing. The sternite of the fourth thoracic segment lacks a median spine. The uropods are present and the exopod has a feebly convex lateral border ending in a large acute tooth with a small spinule medially.

Locality. — Nobili's specimen was collected by G. Seurat in 1903 from Tearia in the Tuamotu Islands.

Remarks. — Nobili did not describe the scaphocerite of *A. seurati* but Gordon has noted that his figure represents it as being broad with a rounded apex. The present examination shows that this illustration is not correct and confirms that the shape of the scaphocerite is the same as that of *A. compressus*. The only other difference reported between the two species is that in *A. seurati* the fingers of the first pair of pereiopods are slightly longer than the palm in contrast to the condition in *A. compressus* where they are slightly shorter. This small difference alone is not sufficient to justify the separation of the two species and no additional differences could be detected in the remains of *A. seurati*. *Amphipalaemon seurati* Nobili is therefore considered to be a synonym of *Anchistiodes compressus* Paulson.

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