

ON SOME SPECIES OF *MACROBRACHIUM* (*CRUSTACEA DECAPODA*) FROM WEST AFRICA

BY

L. B. HOLTHUIS

(Leiden)

Recently a small but very interesting collection of prawns belonging to the genus *Macrobrachium* was submitted to me for study by Dr. Ricardo Zariquiey Alvarez of Barcelona. These prawns originate from the Spanish possessions on the west coast of Africa. Four species are represented, one of them is new. For comparison I examined West African material of the genus *Macrobrachium* present in the collections of the Rijksmuseum van Natuurlijke Historie at Leiden and of the Zoological Museum at Amsterdam. The present paper in the first place deals with the material from Dr. Zariquiey's private collection, while also notes on one new and one little known species, preserved in the Amsterdam Museum, are given.

I want to express here my sincere gratitude to Dr. R. Zariquiey Alvarez for his kindness to allow me to study his material. Furthermore I am much indebted to Prof. Dr. L. F. de Beaufort, director of the Zoological Museum at Amsterdam, for his kind permission to include notes on material of his Museum in the present paper.

***Macrobrachium macrobrachion* (Herklots)**

Collection Dr. R. Zariquiey

Fernando Poo, Rio Consul, 1 km from its mouth; August, 1934.—8 specimens, 42-61 mm (including 1 ovigerous female, 55 mm).

This species is one of the five known West African species of

this genus in which the eggs are numerous and small, the other four species are *Macrobrachium chevalieri* (J. Roux), *M. zariquieyi* nov. spec., *M. felicinum* nov. spec., and *M. vollenhoveni* (Herklots). In the species *M. dux* (Lenz), *M. foai* (Coutière), *M. lujae* (De Man), *M. raridens* (Hilgendorf)¹, and *M. sollaudii* (De Man) the eggs are large and few. Every one of the species with eggs numerous and small is represented by a very closely related form in the East American waters.

Macrobrachium macrobrachion is rather common in the mouths of West African rivers from Liberia to Angola. As far as I know the species has not yet been recorded from Fernando Poo. The type specimens of this species are preserved in the Rijksmuseum van Natuurlijke Historie at Leiden.

***Macrobrachium sollaudii* (De Man)**

Collection Dr. R. Zariquiey

Nkamayop, Rio Nkama (Nsok), Spanish Guinea; July 19, 1948; Mateu leg.—8 specimens, 43-66 mm (including 4 ovigerous females, 54-60 mm).

Ebomiku, Rio Chime, Spanish Guinea; July 25, 1948; Matéu leg.—6 specimens, 34-74 mm (including 2 ovigerous females, 55 and 61 mm).

This species has been described extensively by De Man (1904, p. 306, pl. 19, figs. 30-37; 1912, p. 205, pl. 1, fig. 2; 1925, p. 39, figs. 10 a-e). The slender second legs of the adult males, which have the fingers not felted, and the large eggs of the ovigerous females (2.0-2.7 mm in diameter in my material, 2.25-3.75 mm in De Man's specimens) distinguish this species at once from *M. macrobrachion*.

¹ The name *Palaemon paucidens* Hilgendorf (1893, p. 155) usually given to this form is not valid, as it is preoccupied by the name *Palaemon paucidens* De Haan (1841). Hilgendorf (1893 a, p. 181) himself already pointed to this fact and therefore proposed the new name *Palaemon* (*Eupalaemon*) *raridens* to substitute his 1893 name *Palaemon* (*Eupalaemon*?) *paucidens*. The species thus has to bear the name *Macrobrachium raridens* (Hilgendorf, 1893 a).

Macrobrachium sollaudii is known from Cameroon to the Belgian Congo. It has been recorded by Lenz (1910, p. 7) under the name *Palaemon (Eupalaemon) Foa* from Spanish Guinea. Lenz's specimens originated from the Bimvile River, a tributary of the Rio Benito. Cotypes of the species are present in the collection of the Zoological Museum at Amsterdam.

Macrobrachium chevalieri (J. Roux)

Collection Museum Amsterdam

Catumbella near Benguella, Angola; 1897; P. Kamerman leg.; coll. J. G. De Man.—2 specimens, 44 and 47 mm.

The present specimens have already been described and figured by De Man (1904, p. 319, pl. 20, figs. 75-80) under the name *Palaemon (Macrobrachium ?)* sp. Comparison of this material with the description given by J. Roux (1935, p. 193, figs. 1, 2) of the species named by him *Palaemon chevalieri* proved the two forms to be identical. *Macrobrachium chevalieri* is most closely related to *Macrobrachium heterochirus* (Wiegmann) (= *Palaemon appuni* Von Martens) from East American fresh waters. These species are characterized by the rather shallow rostrum, which has the first four or five dorsal teeth placed behind the orbit, while the first three or four teeth are rather thick and erect, differing conspicuously from the other dorsal teeth, which are more slender and pressed against the rostrum proper. The cutting edges of the fingers bear a row of denticles of equal size, which in adult specimens almost extend to the tip of the fingers. In adult males the second legs are equal in shape, though they are unequal in size. The fingers of the smaller second leg of the male never gape as they do in the species of the *olfersii* group. I am not yet able to enumerate the differences between the West African and the East American forms, as I have no adult male specimens at my disposal.

Macrobrachium chevalieri is known at present from the Cape Verde Islands and from Angola only.

Macrobrachium zariquieyi nov. spec. —

Palaemon spinimanus Bouvier, 1895, Bull. Mus. Hist. nat. Paris, vol. 1, p. 159, fig. 1.

Collection Dr. R. Zariquiey

Fernando Poo, Rio Consul, 1 km from its mouth; August, 1934.—6 specimens, 40-52 mm (including 3 ovigerous females, 40-47 mm).

Description. The rostrum is short and straight, it fails to reach the end of the antennular peduncle or reaches slightly

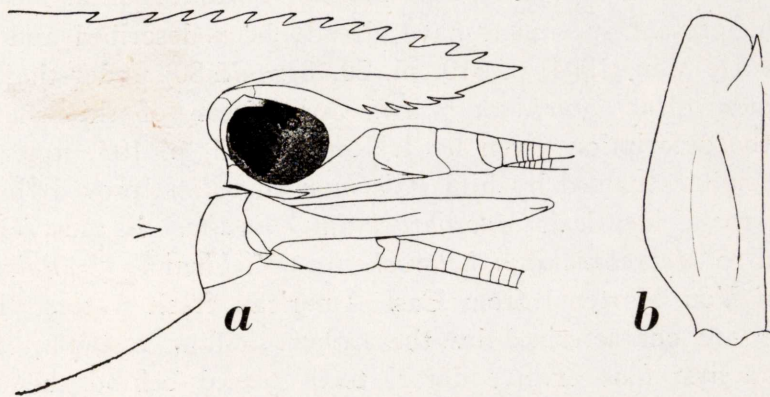


Fig. 1.—*Macrobrachium zariquieyi* nov. spec.: a), anterior part of body in lateral view; b), scaphorite. (a, b, $\times 4.5$)

beyond it. The upper margin is slightly convex and bears 11 or 12 teeth, which are placed at regular intervals and stand close together. The three or four proximal teeth are placed on the carapace behind the orbit. The lower margin bears 4 or 5 teeth. The carapace is smooth, even in the adult males. The antennal spine is strong and placed slightly below the broadly rounded lower orbital angle. The hepatic spine is much smaller than the antennal and is placed somewhat behind and below it.

The abdomen is smooth. The pleurae of the first three segments are broadly rounded, those of the fourth and fifth segments end in a blunt point. The sixth segment is about 1.5 times as long as the fifth and $\frac{2}{3}$ as long as the telson. The usual two

pairs of dorsal and two pairs of posterior spines are present on the telson. The dorsal spines are well developed, the anterior pair lies in the middle of the length of the telson, the second pair

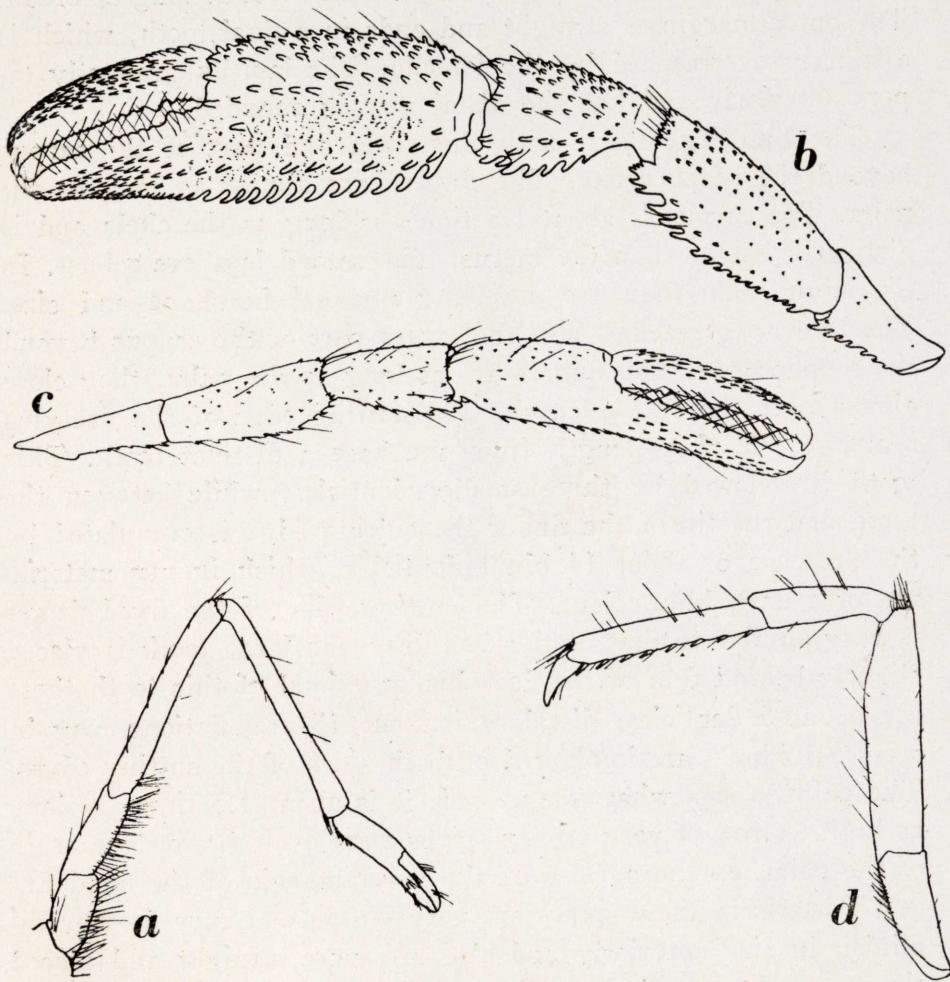


Fig. 2.—*Macrobrachium zariquieyi* nov. spec.: a), first pereiopod; b), larger second pereiopod of adult male, outside; c), smaller second pereiopod of adult male; d), third pereiopod.

(a, d, $\times 4.5$; b, c, $\times 3$)

lies midway between the anterior pair and the tip of the telson. The posterior margin of the telson ends in a sharp median point, which is distinctly overreached by the inner spines. Numerous setae are present on the posterior margin of the telson, between the inner spines.

The eyes are well developed, the cornea is globular, it is broader than and about as long as the eyestalk. An ocellus is present.

The scaphocerite reaches distinctly beyond the end of the antennular peduncle. It is slightly more than twice as long as broad. The outer margin is straight and ends in a final tooth, which is distinctly overreached by the lamella. The lamella gradually tapers anteriorly and has the distal margin rounded.

The first legs reach with the chela and part of the carpus beyond the scaphocerite. The fingers are almost as long as the palm. The carpus is about 1.5 times as long as the chela and is distinctly longer than the merus. The second legs are robust. In the adult male they are decidedly unequal in shape and size. The larger leg reaches with the larger part of the carpus beyond the scaphocerite. The fingers are as long as the palm, they close almost over the entire length. The cutting edge of the dactylus bears at $1/3$ of its length from the base a distinct tooth. This tooth is followed by three smaller denticles, while between the tooth and the tip of the finger the cutting edge is crenulated by the presence of about 14 blunt denticles, which in my material are of a dark blue colour. The cutting edge of the fixed finger is very similar to that of the dactylus: the large tooth is placed slightly behind that of the dactylus, proximal of this tooth there are about 5 denticles, distal of it some 15 crenulations may be seen. Stiff hairs are implanted on both sides of the cutting edges. The palm is somewhat compressed, it is about 1.5 times as long as high. A row of very strong spines runs over the lower margin of the palm, extending also on the lower margin of the fixed finger. Posteriorly these spines are very strong and curved, they diminish in size anteriorly and also are more straight and placed closer together in the anterior region. On the outer surface of the palm there are some spines in the upper part and one longitudinal row of strong spines in the lower half. The upper spines are smaller than the lower. On the inner surface of the palm very small spinules are present, these spinules are more numerous in the upper than in the lower half. Soft felty hairs are placed in the lower half of both surfaces of the palm, on the inner surface there are moreover several long and stiff hairs. The fingers bear numerous irregularly arranged spinules on both surfaces. These spinules are appressed and directed forwards. The carpus is so-

mewhat shorter than the merus, it is rather broad in the anterior part, but narrows rapidly posteriorly, being constricted near the base. There are several longitudinal rows of spines, the ventral of which are largest; some scattered long hairs are present. The merus is broadest in the middle, narrowing towards both sides. Numerous small spines are present on the merus, the ventrals of these are larger than the dorsals. The ischium is less than $\frac{2}{3}$ of the length of the merus. The smaller second leg of the adult male reaches with the chela only beyond the scaphocerite. The fingers are distinctly longer than the palm. They do not gape in my largest male, but possibly may do so in still older specimens. The dactylus has the cutting edge provided in the proximal part with one small tooth, behind which there are some 4 small denticles. The cutting edge of the fixed finger too possesses one small tooth, which is followed by some denticles. The tooth of the fixed finger is situated slightly behind that of the dactylus. In both fingers the cutting edge between the tooth and the tip of the finger is entire. Long and stiff hairs are placed at both sides of the cutting edge. Numerous irregularly placed appressed spinules are present on the surface of the fingers. The palm is about 1.5 times as long as broad, its spinulation is very similar to that of the larger leg, though the spinules are far smaller. Long and stiff hairs are present on the palm, these hairs are distinctly more numerous on the inner than on the outer surface. The carpus is about as long as the palm, and slightly shorter than the merus, it narrows regularly posteriorly. Small spinules and some long stiff hairs are present on carpus and merus. The third leg reaches about to the end of the scaphocerite. The dactylus is rather high and short. The propodus is thrice as long as the dactylus and bears a row of strong spinules on the posterior margin, it is somewhat more than 1.5 times the length of the carpus and slightly shorter than the merus. The fourth and fifth legs resemble the third; the fifth leg, however, is somewhat more slender.

The pleopods and uropods are of the usual shape.

In young specimens the second legs are equal, resembling the smaller leg of the adult male. In adult females the two legs differ in shape, though not as much as in the old males. The larger second leg of the female still shows a large resemblance to the

smaller leg of the male, by having the fingers long and without crenulated cutting edges; the leg is, however, higher than the smaller leg of the adult female. In juveniles the last three legs reach less far forwards than in adults.

The eggs are numerous and small, measuring 0.45 to 0.60 mm in diameter.

Remarks. The specimens up till now recorded in literature under the name *Macrobrachium* (or *Palaemon*, or *Bithynis*) *olfersii* from West Africa do not belong to that species, which is an inhabitant of fresh waters of the eastern part of America. All the West African specimens probably belong to the present and the following species. The only specimens recorded in literature, which may be brought with certainty to *Macrobrachium zariquieyi* are those mentioned by Bouvier (1895). This French author, namely, gives a figure of the larger second leg of an adult specimen. Bouvier's material originated from San Thomé. The specimens recorded by Osorio (1895, p. 57) and Balss (1914, p. 98) from Fernando Poo under the name *Palaemon olfersii* probably also belong to the present form. Balss's material, just like the specimens seen by me, was taken from Rio Consul. «*Palaemon olfersii*» has been recorded from the African continent (Ashanti, Cameroon, Congo, Angola) and from the islands Fernando Poo, Principe, Rolas, San Thomé and Annobon. The specimens from Ashanti and Angola, however, belong to the next species.

Macrobrachium zariquieyi is closely related to a species from fresh water of the eastern part of America, which has not yet been described, but the description of which I hope to publish very soon.

I take a pleasure in naming this species after Dr. Ricardo Zariquiey Alvarez, who, like his father Dr. Ricardo Zariquiey Cernarro, has done so much to further our knowledge of the Spanish Decapods.

Macrobrachium felicinum nov. spec.

Palaemon (*Macrobrachium*) *olfersii* De Man, 1904, Trans. Linn. Soc. Lond. Zool., ser. 2, vol. 9. p. 314, pl. 20, figs. 54-74.

Collection Museum Amsterdam

Catumbella near Benguella, Angola; 1897; P. Kamerman leg.; coll. J. G. De Man.—63 specimens, 20-45 mm (including 1 ovigerous female, 42 mm).

De Man (1904) gave an extensive description and good figures of specimens of a *Macrobrachium* species from West Africa, which he thought to belong to the American *Macrobrachium olfersii* (Wiegmann). The material from Catumbella reported upon by De Man formed part of his private collection and after the death of this Dutch carcinologist was inserted in the collections of the Zoological Museum at Amsterdam. These specimens could be examined by me. They at once may be distinguished from *Macrobrachium olfersii* by having the lower border of the rostrum armed with more (4 to 7 instead of 2 or 3) teeth. That the specimen from Ashanti belongs to the same species as the Catumbella material is distinctly shown by De Man's description and figures of the former. As already pointed out the specimens from West Africa mentioned in literature under the name *Macrobrachium* (or *Palaemon*, or *Bithynis*) *olfersii* may belong to *M. zariquieyi* nov. spec. or to *M. felicinum* nov. spec. Generally not enough data are given by authors dealing with West African specimens of «*Palaemon olfersii*» to make the identity of their material certain. The differences between *M. felicinum* and *M. zariquieyi* are the following:

1. In *M. felicinum* the rostrum bears more (14-17) dorsal teeth and it generally is longer.

2. The fifth abdominal segment in *M. felicinum* has the pleurae ending in a distinct sharp point, while it is bluntly topped in *M. zariquieyi*.

3. The anterior pair of dorsal spines of the telson in *M. felicinum* is situated more proximal than in *M. zariquieyi*, they lie slightly before the middle.

4. The scaphocerite is somewhat more elongate in *M. felicinum*.

5. The larger second leg of the adult male in *M. felicinum* has the carpus longer than the merus. The spinules on the outer surface of the palm are smaller, more numerous and more evenly distributed over the surface. The denticles distally of the large tooth of the cutting edge of both fingers are placed wider apart than in *M. zariquieyi*: in *M. felicinum* the cutting edge is not crenulate but denticulate.

6. The last three pairs of pereopods are slenderer.

For an extensive description and good figures of the present species I, refer to those of De Man (1904).

The species is known with certainty from Ashanti (Gold Coast) and Catumbella (Angola). It may be considered to be the representative of *Macrobrachium olfersii* (Wiegmann) in West African waters.

Macrobrachium vollenhoveni (Herklots)

Collection Dr. R. Zariquiey

Fernando Poo, Rio Consul, about 1 km from its mouth; August, 1934.—17 specimens, 41-110 mm.

Part of the younger specimens are damaged and lack the second pereopods. The identity of this material therefore is not certain, the specimens possibly may belong to *Macrobrachium zariquieyi*. The identity of the fullgrown and half fullgrown specimens, however, is certain.

Macrobrachium vollenhoveni is known from the Cape Verde Islands and from Liberia to Angola. The species has already been mentioned from Fernando Poo by Osorio (1895, p. 57), who used the name *Palaemon jamaicensis* for it. The types of this species are preserved in the collection of the Leiden Museum.

L i t e r a t u r e

FALSS, H.

1914. «Decapode Crustaceen von den Guinea-Inseln, Süd-Kamerun und dem Congogebiet». *Ergebn. 2. Deutsch. Zentral-Afrika Exped.*, vol. 1 Zool., pp. 97-108, figs. 1-12.

BOUVIER, E. L.

1895. «Sur les Palémons recueillis dans les eaux douces de la Basse-Californie par M. Diguët». *Bull. Mus. Hist. nat. Paris*, vol. 1, pp. 159-162, figs. 1, 2.

HILGENDORF, F.

1893. «Die von Herrn Dr. Büttner im Togolande gesammelten Onisciden und zwei neue Macruren». *Sitz.-Ber. Ges. naturf. Fr. Berlin*, pp. 152-157.

HILGENDORF, F.

- 1893 a. «Umänderung des Names *Palaemon* (*Eupalaemon* ?) *pau-cidens* in *P. (Eu.) raridens*». *Sitz.-Ber. Ges. naturf. Fr. Berlin*, p. 181.

IENZ, H.

1910. «Dekapode Crustaceen Aequatorialafrikas». *Wiss. Ergebn. Deutsch. Zentral-Afrika Exped.*, vol. 3, Zool. I pt. 3, pp. 1-14, pl. 3.

MAN, J. G. DE.

1904. «On some Species of the Genus *Palaemon*, Fabr., from Tahiti, Shanghai, New Guinea, and West Africa». *Trans. Linn. Soc. London (Zoology)*, ser. 2, vol. 9, pp. 291-327, pls. 18-20.

MAN, J. G. DE.

1912. «Sur quelques *Palaemonidae* et sur une espèce de *Penaeus* de l'Afrique occidentale, avec des observations sur le *Palaemon (Eupalaemon) acanthurus*». *Wiegmann de l'Amérique du Sud*. *Ann. Soc. zool. malac. Belge*, vol. 46, pp. 197-253, pls. 1-4.

MAN, J. G. DE.

1925. «Contribution à l'étude des Décapodes Macroures marins et fluviatiles du bassin du Congo Belge». *Ann. Mus. Congo (Zool.)*, ser. 3, sect. 3 pt. 1, fasc. 1, pp. 1-54, figs. 1-13 d, tabs. A-H'.

OSORIO, B.

1895. «Peixes e Crustaceos da Ilha de Fernão do Pó e de Elobey». *J. Sci. math. phys. nat. Lisboa*, ser. 2, vol. 4, pp. 55-58.

ROUX, J.

1935. «Sur deux espèces de *Palaemon* (Crust. Décap.) provenant des îles du Cap-Vert». *Bull. Mus. Hist. nat. Paris*, ser. 2, vol. 7, pp. 190-196, figs. 1, 2.

