

**Zoology.** — *Note on some Crustacea Decapoda Natantia from Surinam.*

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Recently the Rijksmuseum van Natuurlijke Historie at Leiden received a small, but extremely interesting collection of Decapod Crustacea from Dutch Guiana, which was collected and donated by Dr. D. C. GEIJSKES of the Agricultural Experiment Station at Paramaribo. The present paper is an enumeration of the Natantia of this collection. Some specimens belonging to the genus *Macrobrachium* were too young to be identified with certainty, and several among them probably belong to undescribed species. These specimens are not included in the present list, just like a new species of *Palaemon*, which will be described in the near future by Dr. WALDO L. SCHMITT, head curator of the department of Zoology of the United States National Museum at Washington, D.C.

Dr. GEIJSKES kindly provided me with detailed descriptions of the various localities in which the specimens were collected, for which I wish to tender him my best thanks.

The shrimpf fauna of Surinam is so poorly known, that it certainly is worth while to pay some attention to it. This is the more so as some of the species are of economic importance. JOHNSON & LINDNER (1934) for instance state that in Surinam "Fresh shrimp are taken from the river and dried shrimp are imported in large quantities from the United States". Five species of shrimps were obtained by Dr. GEIJSKES from shrimp traps, which were placed by the population in the mouth of the Surinam River in the outward flowing water during low tide. The specimens contained in these traps for the larger part belong to *Penaeus aztecus* Ives (the grooved shrimp), while also *Xiphopenaeus krøyeri* (Heller) (the sea bob) and the new species of *Palaemon* are represented in considerable numbers. *Xiphopenaeus krøyeri*, *Penaeus aztecus* and the two other members of the *Penaeus brasiliensis* group are of some economic importance in the southern United States. In the latter region, however, *Penaeus setiferus* (Linnaeus), a species not represented in the present collection, is the most important species of shrimp from a commercial point of view.

***Penaeus aztecus* Ives, 1891**

Mouth of Surinam River, near Resolutie. In shrimp traps. Bottom mud, water muddy brown, salinity 15890 mg/l Cl, temperature of the water 27° C, December 22, 1942, 9 h. a. m.—110 specimens.

BURKENROAD (1939) divided the species, which up to that time was known as *Penaeus brasiliensis* Latr., into three distinct species: *Penaeus*

*brasiliensis* Latr., *Penaeus aztecus* Ives, and *Penaeus duorarum* Burkenroad. These three species only can be separated on the shape of the thelycum and the petasma in adult specimens. Juvenile specimens are very difficult to distinguish. In the present collection the large specimens showed the characteristics said by BURKENROAD to be typical for *Penaeus aztecus* Ives. It is not certain, however, that all specimens belong to that species as a large part of the material is immature.

The species is known from the Atlantic coast of America from New Jersey to Uruguay.

#### ***Xiphopenaeus krøyeri* (Heller, 1862)**

Mouth of Surinam River, near Resolutie. In shrimp traps. Bottom mud, water muddy brown, salinity 15890 mg/l Cl., temperature of the water 27° C, December 22, 1942, 9 h. a.m.—16 specimens.

The specimens generally are larger than those of *Penaeus aztecus* from the same capture.

*Xiphopenaeus krøyeri* occurs along the Atlantic coast of America from South Carolina to Brazil. Like the previous species the present form is of some economic importance in the Southern U.S.A.

#### ***Acetes americanus* Ortmann, 1893**

Mouth of Surinam River, near Resolutie. In shrimp traps. Bottom mud, water muddy brown, salinity 15890 mg/l Cl., temperature of the water 27° C, December 22, 1942, 9 h. a.m.—5 specimens.

BURKENROAD (1934) considers the species of *Acetes* from the Atlantic coast of America, which have one tooth behind the tip of the rostrum, to belong to one species. According to this author *Acetes brasiliensis* of HANSEN is identical with ORTMANN's *Acetes americanus*, while *Acetes carolinae* Hansen at most may be considered a subspecies of *A. americanus*. BURKENROAD himself described two new subspecies: *A. americanus louisianensis*, and *A. americanus limonensis*. He thus considers *Acetes america-*

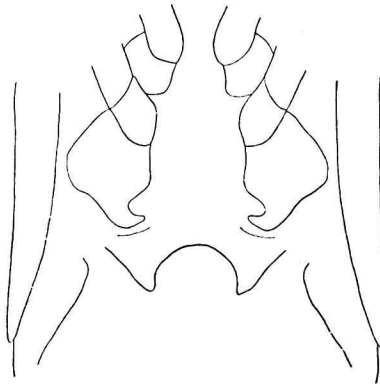


Fig. 1. *Acetes americanus* Ortmann, female specimen. Genital sternite in ventral view.  $\times 20$ .

*nus* to consist of four subspecies: *A. americanus carolinae* Hansen from North Carolina, *A. americanus louisianensis* Burkenroad from Louisiana, *A. americanus limonensis* Burkenroad from Panama and *A. americanus americanus* Ortmann from Brazil. The subspecies *louisianensis* and *limonensis* are intermediate between the subspecies *carolinae* and *americanus*. The present specimens from Surinam, which all are females, nicely fit in the picture, by being intermediate between *A. americanus americanus* and *A. americanus limonensis*. The females of the four subspecies namely differ in the width of the concavity in the middle of the posterior margin of the genital sternite. In the Carolina specimens this concavity is deeper than broad, while it becomes gradually shallower in the more southern forms, being shallowest in *Acetes americanus americanus*. In the specimens from Surinam, the concavity is shallower than in those from Panama, but deeper than in those from Brazil. The specimens from Surinam have the same rights as those from Panama and as those from Louisiana to be considered to belong to a distinct subspecies. But considering the gradual transition of the character in material from the various regions from North of South, it seems to be not very useful to coin subspecific names for all the forms of the intermediate regions. We do better in my opinion to consider *Acetes americanus* Ortmann to be a large variable species with two extreme forms *A. americanus americanus* from the southern part of its range of distribution, which has the emargination of the genital sternite of the female very shallow and *A. americanus carolinae* Hansen from the northern part of the range of distribution with this emargination very deep.

**Hippolysmata (Exhippolysmata) oplophoroides nov. spec.**

Mouth of Surinam River, near Resolutie. In shrimp traps. Bottom mud, water muddy brown, salinity 15890 mg/l Cl., temperature of the water 27° C, December 22, 1942. 9 h. a.m.—2 specimens.

Description. The rostrum is long, slender, and directed somewhat upwards. It reaches with about half its length beyond the scaphocerite. In the basal part of the upper margin 9 or 10 teeth are placed close together, forming an elevated basal crest. One tooth is placed some distance behind the crest. Three or four teeth of the crest are placed behind, the others in front of the posterior limit of the orbit. The rest of the upper margin bears 5 or 6 widely separated teeth. The lower margin is provided with 10 to 13 teeth. The carapace is coarsely pitted and is provided with an antennal and a pterygostomial spine.

The abdomen, just like the carapace, is coarsely and shallowly pitted. The dorsal parts of all abdominal segments are evenly rounded, except that of the third segment, which bears a dorsal carina ending in a strong posteriorly directed spine, which overreaches the posterior margin of the third segment. This feature, together with that of the rostrum give the species a superficial resemblance with species of *Oplophorus*, for which reason the trivial name *oplophoroides* is given to the present form. The



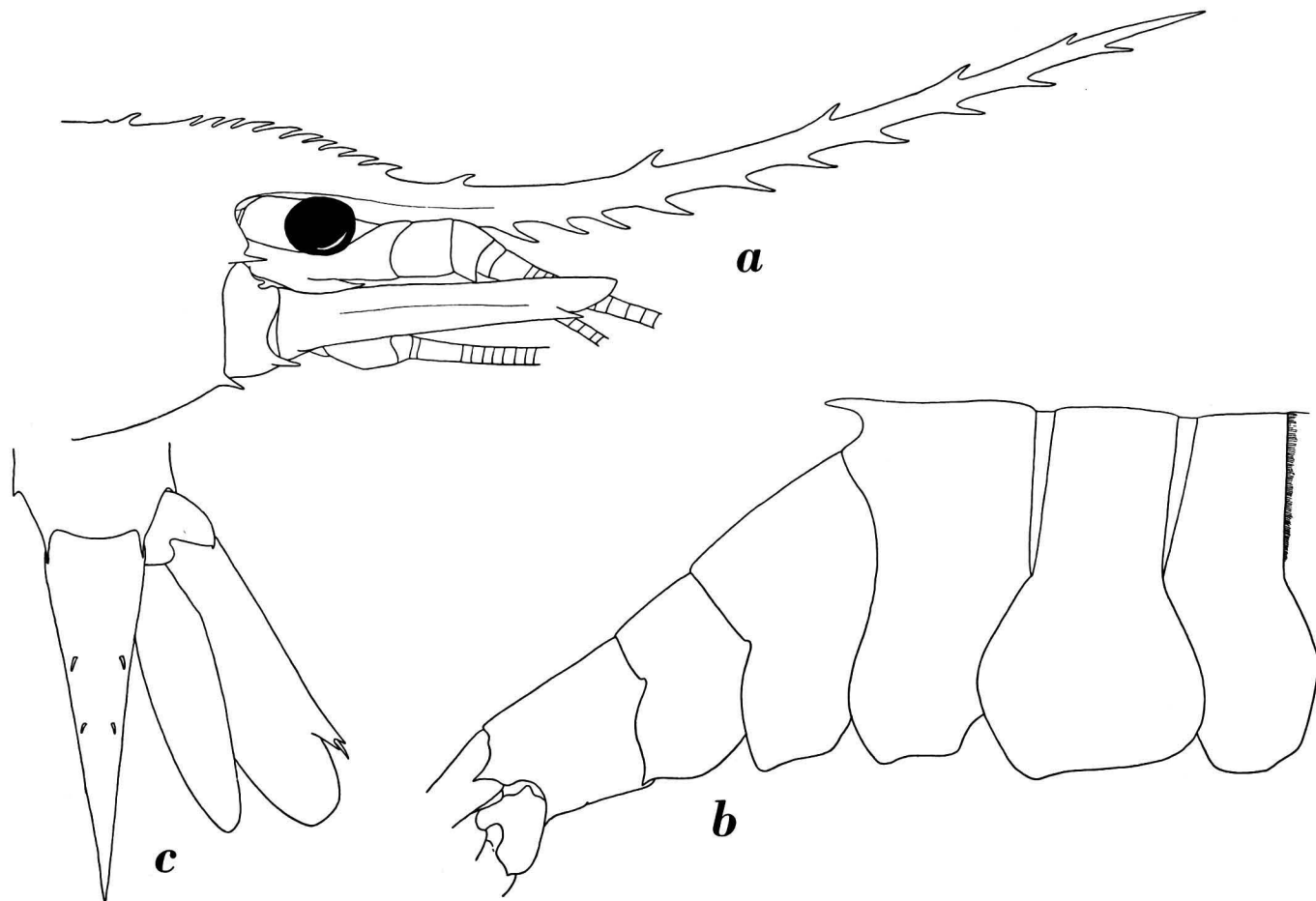


Fig. 2. *Hippolysmata* (*Exhippolysmata*) *oplophoroides* nov. spec. a. anterior part of the body in lateral view; b. abdomen in lateral view; c. telson and uropod in dorsal view. a—c,  $\times 7$ .

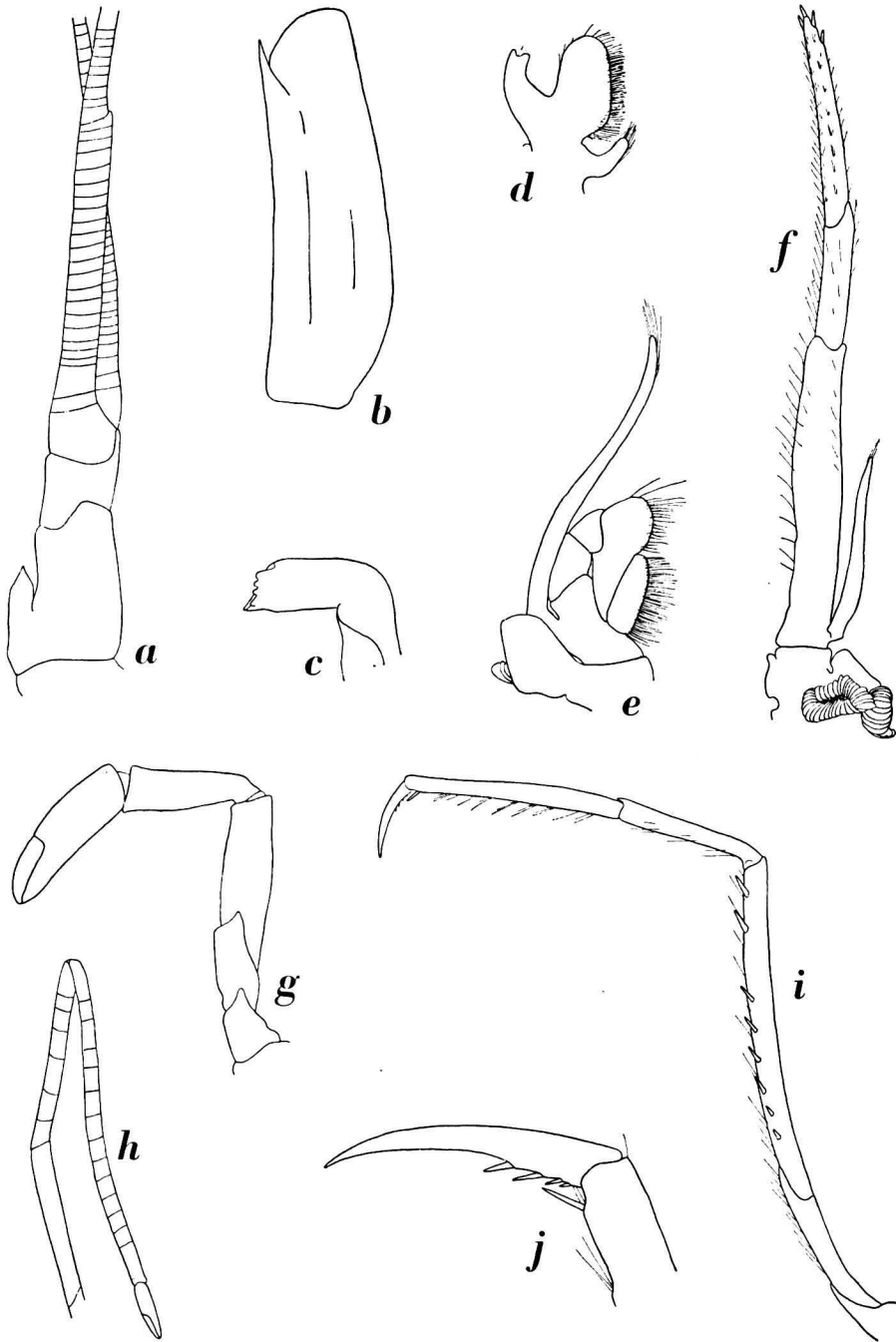


Fig. 3. *Hippolysmata (Exhippolysmata) oplophoroides* nov. spec. a. antenna; b. scaphocerite; c. mandible; d. maxillula; e. second maxillipede; f. third maxillipede; g. first pereopod; h. second pereopod; i. third pereopod; j. dactylus of third pereopod. a, b, f–i,  $\times 8$ ; c–e,  $\times 12$ ; j,  $\times 28$ .

The epipods on the first four pereopods are very small, but distinct. The first pereopods are equal, they reach somewhat beyond the end of the antennal peduncle. The fingers are short and blunt. The fixed finger ends in a dark coloured sharp point, which fits between the two points in which the dactylus ends. The tips of the dactylus too have a darker colour than the rest of that finger. The outer surface of the closed fingers is convex, the inner surface is strongly concave. The fingers measure  $5/8$  of the length of the palm. The carpus is slightly shorter than the chela and is  $3/4$  of the length of the merus. The ischium reaches in its posterior part with an elongate process beyond the base of the merus. The second legs are slender, the left and right are slightly unequal in size, but equal in shape. They almost reach to the end of the third maxillipede. The chela is small and slender. The carpus is about 5 times as long as the chela. It is divided into 13 to 15 joints. The first and the last of these are longer than the other joints. The merus is  $4/7$  of the length of the carpus and consists of 7 or 8 joints. The ischium is slightly shorter than the merus and is not subdivided. The last three legs are slender and similar in shape. The third leg reaches with the dactylus beyond the scaphocerite. The dactylus is simple and slender, it possesses about four small spines in the proximal part of the posterior margin. The propodus is slender, being about thrice as long as the dactylus. The posterior margin of the propodus bears some hairs, while a pair of spines is present near the base of the dactylus. The carpus is  $2/3$  of the length of the propodus and  $3/7$  of the length of the merus. The merus is provided near the posterior margin with 6 to 8 strong movable spines. The ischium is less than half as long as the merus.

The pleopods in my two specimens, which both are females, are normal in shape. The endopod of the first pleopod ends in a narrowly elongated tip.

The uropods are elongate. The outer margin of the exopod ends in two distinct teeth, between which a slender movable spine is present.

Size. The two female specimens (both of which non-ovigerous) are 47 and 51 mm long.

Remarks. Up till now three species of the present subgenus have been described: *Hippolysmata ensirostris* Kemp (with the var. *punctata* Kemp), *Hippolysmata tugelae* (Stebbing) and *Hippolysmata hastatoides* (Balss). The former two species probably are identical (vid. HOLTHUIS, 1947, p. 74). *Hippolysmata ensirostris* is known from India and the Malay Archipelago, *H. tugelae* from the Cape region, while *H. hastatoides* is known from the west coast of Africa from Cameroon to Angola. *Hippolysmata oplophoroides* may be recognized at once from these species by possessing a distinct spine at the third abdominal segment. From *Hippolysmata hastatoides* the present species moreover differs in the dentition of the rostrum, by having the ultimate half of the rostrum provided with teeth on the dorsal margin and by possessing more ventral rostral teeth. Furthermore the telson in *H. oplophoroides* is more slender than in *H.*

*hastatoides*, while, if BALSS's (1925) figure 74 is correct, also the uropods in the new species are different by having the outer margin of the exopod ending in two teeth and a movable spine (BALSS figures only 1 tooth there).

#### ***Euryrhynchus wrzesniowskii* Miers, 1877**

Zanderij I, a locality about 40 km S. of Paramaribo along the railroad from Paramaribo into the interior. Savanna region, Troelinde creek, a forest creek with brownish acid water (pH 4.5), temperature 24°.5 C., Januari 14, 1943. — 7 specimens.

Sectie Q, a locality on the railroad from Paramaribo to the interior, about 70 km S. of that town. Savanna region, small forest creek, with shingle bottom and clear water (pH 5.4), temperature 23° C, February 6, 1942. — 7 specimens and June 7, 1944. — 1 specimen.

This is the third record of this curious Crustacean in literature. The species was described by MIERS (1877) from Cayenne, French Guiana. Then it was reported upon again in 1935 by GORDON, who described and figured specimens from the Upper Cuyuni and Mazaruni River basins, British Guiana. GORDON's specimens were found in a swamp, which "occupied a hollow, without outlet, on rather high ground in the forest, and therefore in the full shade of the canopy. The bottom of the swamp was covered by a very thick layer of dead leaves... The water was very yellow and highly deoxygenated. There was much H<sub>2</sub>S among the leaves. The plankton was slight except for *Euryrhynchus*, which was present in considerable numbers in the water and among the upper layer of the leaves, and small fishes (*Rivulus urophthalmus* and *Pyrrhulina filamentosa*) swimming chiefly near the surface of the water." Though the records of the species from British and French Guiana made it highly probable that the species should occur also in Dutch Guiana, the find of it in the latter region is very interesting and the detailed description of the habitat by Dr. GEIJSKES is a welcome addition to GORDON's description of the curious environments in which the species lives.

#### ***Macrobrachium jelskii* (Miers, 1877)**

Nannikreek, Nickerie River basin, W. Surinam, Near Dam van Wouw. Nannikreek is a swamp creek with rather acid water (pH about 5), which is used for irrigating the rice fields, February 12, 1942, — 4 juveniles.

The specimens, though rather young, agree quite well with the descriptions given in literature and with adult material at my disposal. The species is known from Venezuela, Trinidad, Dutch and French Guiana.

#### ***Macrobrachium brasiliense* (Heller, 1862)**

Right Coppename River, line 3. From a well in the Emma Mountains. Altitude 150 m. This well is situated at the line between granite and diabase, the water is clear, with a temperature 23° C, pH. 6, October 30, 1943. — 1 specimen.

Brownsberg, Saramacca River basin, about 120 km S. of Paramaribo. In mountain creek, altitude 400 m, water clear, pH 6.2, temperature 22.5° C, September 16, 1938. — 8 specimens.



As several of the specimens are adult males, the identity of the material could be made fully certain. *Macrobrachium brasiliense* is known from British Guiana, Colombia (Orinoco River basin), and from the upper Amazon basin in W. Brazil, E. Ecuador and N.E. Peru.

***Macrobrachium surinamicum* nov. spec.**

Mouth of Surinam River, Juli 5, 1944. — 6 specimens.

As this species will be described more extensively in a future publication, here only the most important characters are given:

The rostrum is about straight, with 13 to 16 dorsal and 4 to 6 ventral teeth, which are regularly divided over the rostral margins. Three or four rostral teeth are placed behind the orbit. The carapace in adult males is smooth, just like the abdomen.

The telson has the posterior margin distinct and provided with two pairs of spines, the inner of which overreaches the tip of the telson.

In the adult male the second pereopods are equal in shape, but unequal in size. The joints are spinulate. The fingers bear one or two teeth in the proximal part of their cutting edges, while distally of these large teeth the edges bear about 12 distinct blunt teeth, which are smaller than the proximal teeth, and which diminish in size anteriorly. No velvety pubescence is present on the chela (except for a small row of pubescence close along the cutting edges), but a layer of short velvety hairs is present on the lower surface of the carpus and merus.

The specimens of this species seen by me are up to 55 mm long.

Type: The holotype of this species is a specimen from Plantation "Geyersvlijt" near Paramaribo, Surinam, July, 1911, W. C. VAN HEURN coll. The specimen is preserved in the Leiden Museum.

The species is readily distinguished from allied species by the shape of the rostrum and the second legs: especially by the large number of rostral teeth placed behind the orbit, by the large number of ventral rostral teeth, and by the dentition of the cutting edges of the second legs. I have seen material of *Macrobrachium surinamicum* from Colombia, British and Dutch Guiana.

***Macrobrachium? olfersii* (Wiegmann, 1836)**

Wilhelmina Mountains, Zandkreek, Lijn I, Central Surinam. Creek with clear water and a sandy bottom with some rocks, pH 6.1, temperature of the water 23° C, August 18 and 19 and September 2, 1943. — 5 specimens.

Poeloegoedoe Falls, Marowijne River, E. Surinam. Broad river with rapids. The shrimps were collected between Podostemonaceae of the genus *Mourera*, pH 6.1, temperature of the water 30° C, August 31, 1939. — 2 incomplete specimens.

As all the specimens available are small and some of them are moreover incomplete by missing several of the legs, it is impossible to state with certainty to which species they belong. They show most resemblance to *Macrobrachium olfersii* (Wiegmann), a species occurring in fresh water of

the continent of Central and South America from S. Mexico to S. Brazil, while the species moreover probably is introduced in Florida.

***Palaemonetes carteri* Gordon, 1935**

Zanderij I, a locality about 40 km S. of Paramaribo along the railroad from that town into the interior. Savanna region, Troelinde creek, a forest creek with brownish acid water with pH 4.5 and temperature 24.5° C, January 14, 1943. — 1 specimen.

Sectie Q, a locality on the railroad from Paramaribo to the interior, about 70 km S. of that town. Savanna region, small forest creek, with shingle bottom and clear water (pH 5.4), temperature 23° C, June 7, 1947. — 9 specimens.

Kabelstation, a locality likewise situated on the railroad from Paramaribo to the interior, still farther inland and close near the Suriname River. Savanna region. Shrimps found in a pool of brownish fresh water in an excavation in the kaolin-like clayish soil, which excavation was made during the building of the railroad, September 23, 1938. — 6 specimens.

The specimens entirely agree with the description given by GORDON (1935) of specimens which originated from the Mazaruni and Upper Cuyuni River basins in British Guiana. It is curious that a large part of my specimens were found in company of *Euryrhynchus wrzesniowskii*, while all specimens of *Palaemonetes carteri* recorded by GORDON came from different localities as her *Euryrhynchus* specimens. The present record of the species is the second in literature.

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