

A COLLECTION OF FRESHWATER PRAWNS.
(CRUSTACEA DECAPODA, PALAEMONIDAE)
FROM AMAZONIA, BRAZIL,
COLLECTED BY Dr. G. MARLIER

BY

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During an expedition to Amazonia in 1963 and 1964, Dr. G. MARLIER, of the Institut royal des Sciences naturelles de Belgique, collected a number of Palaemonid prawns, some of which proved to be of exceptional interest. This collection forms the subject of the present paper. The ecological data on the collecting localities as given here were provided by Dr. MARLIER, who in a future publication will give a complete description of the principal collecting stations.

Several of the species of this collection are also represented in material brought together in 1953 and 1954 by Drs. Walter FORSTER and Otto SCHINDLER in the Amazon basin of Brazil and Bolivia. Thanks to the kind permission by Dr. FORSTER, director of the Zoologische Sammlung des Bayerischen Staates in Munich, Germany, remarks on this material, which is now housed in the Munich Museum, are incorporated in the present paper wherever appropriate. The Bolivian localities of the FORSTER-SCHINDLER collection are described in the paper by FORSTER (1955).

I wish to express my sincere gratitude to Dr. MARLIER for entrusting me with the study of his collection, which is held by the Brussels Institute; for donating some duplicates to the Rijksmuseum van Natuurlijke Historie at Leiden; and for providing me with data on the habitats in which the material was collected. To Dr. W. FORSTER I am much indebted for allowing me to publish here on his material, duplicates of which were also kindly deposited by him in the Leiden Museum.

All the specimens discussed here belong to the family Palaemonidae, of which two subfamilies, the Palaemoninae and Euryrhynchinae, are represented.

PALAEMONINAE.

Macrobrachium amazonicum (HELLER, 1862).

Material:

Rio Tapajoz near Santarem, Pará State, 54°45' W - 2°25' S; along the bank, collected at night; 14-VIII-1963; G. MARLIER, no. 57. — 1 specimen.

Left bank of Rio Tapajoz, near Santarem; 8-XII-1963; G. MARLIER. — 2 juveniles.

Rio Tapajoz, near Santarem; II-1964; leg. O. KNOWLES; G. MARLIER, no. 223. — 1 specimen.

Rio Tapajoz, near Santarem; III-1964; leg. O. KNOWLES; G. MARLIER, no. 250. — 1 adult specimen.

Lago Redondo, a small lake in the riverbed of the Amazon River on the right bank of the stream, about 59°48' W - 3°16' S; in « floating meadow », i.e. among the roots of floating grasses, mostly *Paspalum* and *Panicum*; water « white », i.e. with sand and clay in suspension, poor in humic acids, neutral, but poor in calcium, pH 6.8-7.0. 20-VIII-1963; leg. Antonio DOS SANTOS; G. MARLIER, species 31. — 1 specimen.

Lago Redondo; 30-VIII-1963; G. MARLIER no. 71. — 1 specimen.

Lago Redondo, near Careiro; 22-XII-1963; G. MARLIER, no. 136, species 31. — 1 juvenile.

Lago Redondo; 4-I-1964; G. MARLIER, no. 138. — 1 ovigerous female.

Parana do Careiro, right hand branch of the Amazon River, separating from the river near the mouth of the Rio Negro and rejoining it farther below, just before the mouth of the Rio Madeira, about 59°50' - 59°24' W - 3°12' S; deep with strong current, « white » water; VI/X-1963; G. MARLIER, no. 79. — 3 specimens.

Igarapé Pixuna do Lago Janauari, a small affluent (igarapé) of Lago Janauari on the right bank of the Rio Negro a little below Manaus, 60° W - 3°12' S; shaded stream with black humic water; 19-I-1964; G. MARLIER, no. 172. — 6 specimens.

The carapace length of the specimens varies between 18 and 52 mm, in the ovigerous female it is 26 mm.

The species is widely distributed in the fresh waters of the Atlantic drainage of South America: it is known from Venezuela, the three Guianas, the entire Amazon basin in Brazil, Peru, Ecuador and Bolivia, and the Paraná basin in southern Brazil and northern Paraguay. It is also well represented in this collection. The Zoologische Sammlung des Bayerischen Staates, Munich, Germany, possesses specimens of this species from the mouth of the Amazon River in Brazil (Belém, 15-VI-1954; Guamá near Belém, 15-VI-1954; Marajó, 8/10-VI-1954) and from the upper reaches of this river in Bolivia (Rio Chipiriri, a branch

of the Rio Chapare near San Francisco de Chipiriri, altitude 320-360 m, 28-X/7-XI-1953); all this material being collected by Drs. Walter FORSTER and Otto SCHINDLER.

Macrobrachium jelskii (MIERS, 1877).

Material:

Rio Preto da Eva, a river which widens itself into a lake just before joining the Parana da Eva, a left hand branch of the Amazon River, about 59°23' W - 2°56'/3°8' S; humic water, pH 4.5, bottom hard sand and small lateritic pebbles, no aquatic vegetation, but dead leaves and twigs, and debris; IV-1964; G. MARLIER, no. 244. — 1 juvenile.

Lago Redondo, a small lake in the riverbed of the Amazon River on the right bank of the stream, about 59°48' W - 3°16' S; in « floating meadow », i.e. among the roots of floating grasses, mostly *Paspalum* and *Panicum*; water « white », i.e. with sand and clay in suspension, poor in humic acids, neutral, but poor in calcium, pH 6.8-7.0; 30-VIII-1963; G. MARLIER, no. 71. — 2 specimens.

Lago Redondo; 10-I-1964; G. MARLIER, no. 138. — 27 juveniles.

The specimens mostly are small, their carapace length varies from 7 to 20 mm.

So far the species was only known from Venezuela, Trinidad and the three Guianas, it is now reported for the first time from Brazil. The Zoologische Sammlung des Bayerischen Staates in Munich, Germany, holds a sample of this species from Bolivia (Rio Chipiriri, a branch of the Rio Chapare, near San Francisco de Chipiriri, altitude 320-360 m, 28-X/7-XI-1953, leg. W. FORSTER and O. SCHINDLER).

Macrobrachium nattereri (HELLER, 1862).

Material:

Left bank of Rio Tapajoz, near Santarem, Pará State, 54°45' W - 2°25' S; 8-XII-1963; G. MARLIER. — 3 juveniles.

Igarapé Mapiri, a small affluent of Rio Tapajoz, just south of Santarem; very shallow, water clear; 30-XI-1963; G. MARLIER, no. 145. — 23 specimens.

Igarapé Grande, small, very shallow stream with clear water, emptying in Lago Jurucui on the right bank of Rio Tapajoz, 54°57' W - 2°32' S; 6-XII-1963; G. MARLIER, no. 147. — 9 specimens.

Igarapé do Tendo, small, very shallow stream with clear water, emptying in Lago Jurucui; 6-XII-1963; G. MARLIER, no. 146. — 175 juveniles.

Parana da Eva, left hand branch of the Amazon River separating from the river at 59°23' W and rejoining it at 59°4' W, much less deep than the Parana do Careiro, east of Manaus; « white » water; 24-X-1963; G. MARLIER, no. 102. — 1 juvenile.

Lago Preto da Eva, a widening of Rio Preto da Eva just before this empties in the Parana da Eva; about 59°23' W - 2°56'/3°8' S; sandy shore; 1-III-1964; G. MARLIER, no. 201. — 2 ovigerous females.

Rio Preto da Eva; in very shallow littoral waters, pH 4.5, bottom hard sand and small lateritic pebbles, no aquatic vegetation, but some dead tree leaves and debris, many prawns were taken under the bark of rotten twigs; 2-III-1964; G. MARLIER, no. 202. — 1 adult, 10 juveniles.

Affluent of Rio Preto Superior (= Rio Preto da Eva before its widening); humic and acid water; caught with rotenone; 28-II-1964; G. MARLIER, no. 196. — 2 specimens.

Small stream (igarapé) in Ducke Reserve, a forest reserve of the Instituto de Pesquisas da Amazonia at 20 km N. of Manaus; forest stream with clear, fast flowing water; 20-X-1963; G. MARLIER, no. 95. — 26 specimens including 2 ovigerous females.

The carapace length of the specimens varies between 6 and 34 mm; in the ovigerous females it is 23 to 25 mm. The identity of the juveniles is not fully certain, as some of the critical characters are not yet developed.

The species is surprisingly well represented in the present collection, and probably is more common than hitherto supposed. So far it was known only from French Guiana and the Amazon basin (Rio Negro and Santarem). From the last two localities material is also in the present collection. HOLTHUIS's (1952, p. 83, pl. 20) description of this species is based on specimens from Santarem.

Palaemonetes ivonicus HOLTHUIS, 1950.

Material:

Igarapé Pixuna do Lago Januári, a small affluent (igarapé) of Lago Januári on the right bank of the Rio Negro slightly below Manaus, 60° W - 3°12' S; 17-I-1964; shaded stream with black humic water; G. MARLIER, no. 172. — 1 ovigerous female.

The specimen has a carapace length of 13 mm. It agrees quite well with the description given by HOLTHUIS (1952, p. 222, pl. 53, figs. d-h) of the types. The rostrum bears 9 dorsal teeth, of which the ultimate is subapical. The distance between the subapical and the penultimate teeth is distinctly larger than the interspaces between the other teeth. The posteriormost dorsal rostral tooth is small and lies distinctly behind the orbit, the second tooth is situated just behind the orbital margin. The ventral margin of the rostrum bears three teeth, which are placed close together and are separated from the tip by a considerable distance.

The two branches of the upper antennular flagellum are fused for 6 or 7 segments, the free part of the shorter ramus is 9 or 10 segments long.

The second pair of pereopods is missing in this specimen.

The eggs are large and measure 1.1 by 1.6 mm in diameter.

In Bolivian specimens of this species present in the Munich Museum

the rostral formula is $\frac{6 - 7 + 1}{3 + 0}$; these specimens thus have slightly

fewer dorsal teeth than the one discussed above. In the Bolivian specimens the branchiostegal spine, though placed at a considerable distance behind the anterior margin of the carapace, reaches with its tip just beyond the margin. The anterior pair of dorsal spines of the telson lies slightly behind the middle, and the posterior pair lies about midway between the anterior pair and the posterior margin of the telson. Of the shorter branch of the upper antennular flagellum 4 segments are fused and 8 or 9 are free. The chela of the second leg overreaches the scaphocerite with part of its length only. In a male specimen (from Palmar) the basal toothed part of the upper margin of the rostrum is somewhat convex, forming a slightly elevated crest. In this specimen the ischium of the second legs is longer than the merus. Figures of the first and second pleopod of this male specimen are reproduced here.

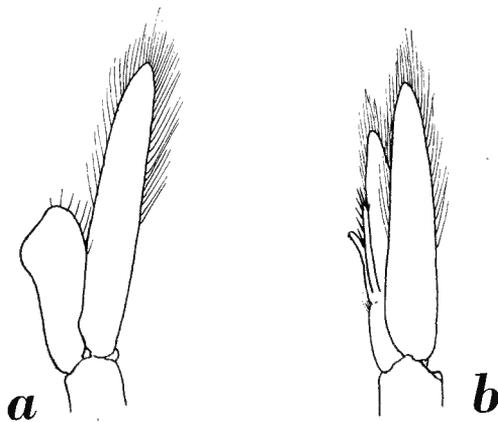


Fig. 1. — *Palaemonetes ivonicus* HOLTHUIS, ♂, from near Palmar, Bolivia.
a, first pleopod; b, second pleopod. a, b, $\times 15$.

So far *Palaemonetes ivonicus* was only known from the two type specimens which were collected in the Beni River near Ivon in northern Bolivia. In the collection of the Zoologische Sammlung des Bayerischen Staates in Munich, Germany, there are two samples of this species collected in 1953 by Drs. W. FORSTER and O. SCHINDLER in Bolivia :

(1) Left hand branch of Rio Palmar, near Palmar, north of Cochabamba,

between that town and San Antonio, altitude about 600 m, 22-X-1953. — 2 specimens; (2) Rio Chipiriri, a branch of Rio Chapare, near San Francisco de Chipiriri, altitude 320-360 m, 28-X/7-XI-1953. — 2 specimens. These specimens measured 21 to 22 mm. The specimen collected by Dr. MARLIER is the first specimen of this species to become known from outside Bolivia. The range of the species evidently is much more extensive than we realize at present.

Palaemonetes carteri GORDON, 1935.

Material:

Igarapé Mapiri, a small, very shallow affluent of Rio Tapajoz, just south of Santarem, about 54°45' W - 2°25' S; water clear; 30-XI-1963; G. MARLIER, no. 145. — 5 specimens.

Igarapé do Tendo, small, very shallow affluent of Lago Jurucui, a small lake on the right bank of Rio Tapajoz, about 54°57' W - 2°32' S; water clear; 6-XII-1963; G. MARLIER, no. 146. — 315 specimens.

Lago Redondo, a small lake in the riverbed of the Amazon River on the right bank of the stream, about 59°48' W - 3°16' S; in « floating meadow », i.e. among the roots of floating grasses, mostly *Paspalum* and *Panicum*; water « white », i.e. with sand and clay in suspension, poor in humic acids, neutral, but poor in calcium, pH, 6.8-7.0; 30-VIII-1963; G. MARLIER, no. 71. — 2 specimens.

The carapace length of these specimens varies between 7 and 11 mm.

The species is very common in the coastal region of Venezuela and the three Guianas, but had so far not been reported from Brazil. The large number of individuals collected by Dr. MARLIER shows that the species evidently is not rare at all in Amazonia.

EURYRHYNCHINAE.

Euryrhynchus burchelli CALMAN, 1907.

Material:

Lago Preto da Eva, a widening of Rio Preto da Eva just before this empties in the Parana da Eva, a left hand branch of the Amazon River, about 59°23' W - 2°56'/3°8' S; low north bank; humic water, pH 4.5, bottom hard sand and small lateritic pebbles, no aquatic vegetation, but dead leaves and twigs, and debris; 2-III-1964; G. MARLIER, no 204. — 1 specimen.

Rio Preto da Eva; 2-III-1964; G. MARLIER, no. 202. — 1 female.

Affluent of Rio Preto Superior (the unwidened part of the Rio Preto da Eva; humic and acid water; caught with rotenone; 28-II-1964; G. MARLIER, no. 196. — 1 specimen.

Lago Redondo, a small lake in the riverbed of the Amazon River on the right bank of the stream, about $59^{\circ}48' W - 3^{\circ}16' S$; in « floating meadow », i.e. among the roots of floating grasses, mostly *Paspalum* and

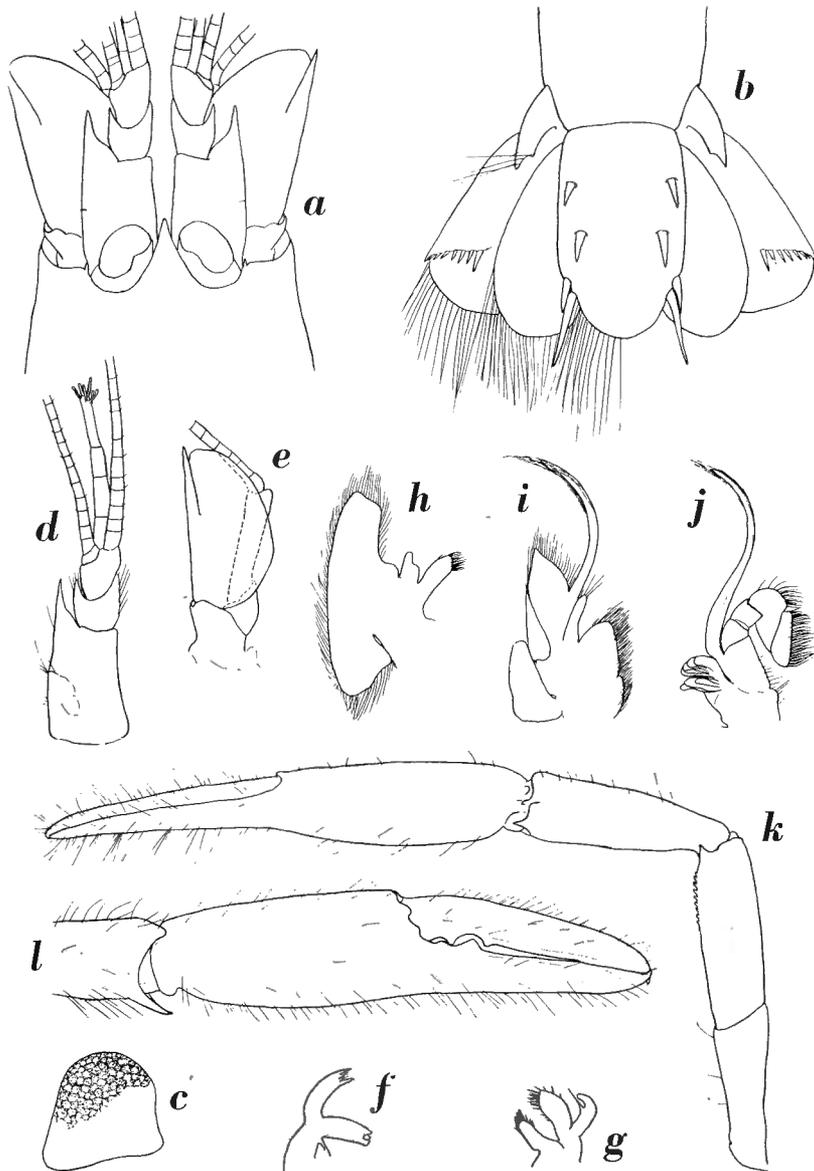


Fig. 2. — *Eurychynchus burchelli* CALMAN, from Lago Jari, Amazonia, Brazil.
 a, anterior part of body in dorsal view; b, posterior part of body in dorsal view;
 c, eye; d, antennula; e, antenna; f, mandible; g, maxillula; h, maxilla; i, first
 maxilliped; j, second maxilliped; k, second pereopod; l, chela of second pereopod
 in lateral view. a, b, d-l, $\times 14$; c, $\times 28$.

Panicum; water « white », i.e. with sand and clay in suspension, poor in humic acids, neutral, but poor in calcium, pH 6.8-7.0; 20-VIII-1963; leg. Antonio dos Santos; G. MARLIER, species no. 27. — 6 specimens.

Lago Jari, a lake formed by the Rio Jari, a right hand branch of the Rio Purus, itself a large affluent of the Amazon River, about 62°20' W - 5° S; caught near the sandy shore in very shallow water (0.1-0.5 m deep), among dead leaves and branches, water crystal clear, acid, pH 4.7; no other prawns were found in this lake; 26-III-1964; G. MARLIER, no. 217. — 13 specimens.

The carapace length of the above specimens varies from 2 to 6 mm.

The rostrum is depressed and triangular, it ends in a sharp point which reaches slightly beyond the eyes and surpasses the middle of the first antennular segment by a very short distance. Some long hairs are implanted along the distal part of the lateral margins of the rostrum. The antennal spine is distinct and placed on or slightly above the lower orbital angle. The pterygostomial angle is forwards produced and sharp, it reaches distinctly beyond the tip of the rostrum.

The abdomen is smooth. The pleura of the first five somites are rounded. In the ovigerous female the pleura of the first and second somites, but especially that of the second, are enormously enlarged, the left and right overlapping in the median line of the body and forming a true brood pouch. The pleura of the third somite is normal. The sixth somite is about as long as the fifth and shorter than the telson. The telson is broad. Its dorsal surface bears two pairs of spines; the anterior pair stands in the anterior third of the telson, the posterior pair is placed slightly behind the middle of the telson. The posterior pair is larger than the anterior and is placed closer to the lateral margins of the telson. The posterior margin is wide and broadly rounded, it bears two spines at each lateral end. The inner of these spines are long and strong and overreach the end of the telson; the outer pair of spines is short. Numerous hairs are implanted on the margin.

The eyes have a distinct pigmented cornea with many optical elements. The cornea is somewhat narrower than the eyestalk, but not so narrow as shown by Calman (1907, fig. 3).

The stylocerite is inconspicuous and pressed against the basal antennular segment, so that it is hardly at all visible. The antero-lateral angle of the basal segment is produced into a large sharply pointed tooth, which reaches beyond the second segment of the peduncle. The second segment is shorter than the third, its anterolateral angle is also produced, but is blunt. There are three antennular flagella. Two of these are very long and slender, being multi-articulate. The third is short, much broader than the others and consisting of 5 segments, the last of which ends bluntly and bears some aesthetascs in its distal part.

The scaphocerite is slightly longer than the antennular peduncle. The outer margin is about straight and ends in a slender tooth, which slightly

overreaches the lamella. The scaphocerite is more than half as wide as long. A long slender spine is placed on the antennal peduncle below the base of the scaphocerite, and is not visible in dorsal view. The antennal peduncle reaches almost as far as the antennular peduncle.

The oral parts are very similar to those of *Euryrhynchus wrzesniowskii* MIERS (see GORDON, 1935, p. 327, figs. 13-21; HOLTHUIS, 1951, p. 5, pl. 1, pl. 2, figs. a-f). The mandible has no palp; the incisor process ends in 4 teeth, of which the outer are definitely larger than the inner; the molar process ends in some blunt knobs. The maxillula has the two endites slender, the upper is blunter than the lower and bears spinules instead of hairs; the palp is bilobed, the upper lobe is distinctly longer and wider than the lower, the lower bears a strong single hair. The maxilla bears a single slender undivided endite; the palp is short and truncate, it widens suddenly near the base; the scaphognathite is large. The three maxillipeds all are provided with well developed exopods. The endites of the first maxilliped are separated by a small notch; the palp is well developed; the caridean lobe is large and pointed; the epipod is undivided. The second maxilliped is of the usual form, it bears a podobranch on the epipod. The third maxilliped is slender. The last segment is about $\frac{4}{5}$ of the length of the penultimate and more than half as long as the antepenultimate. An epipod and an arthrobranch are present.

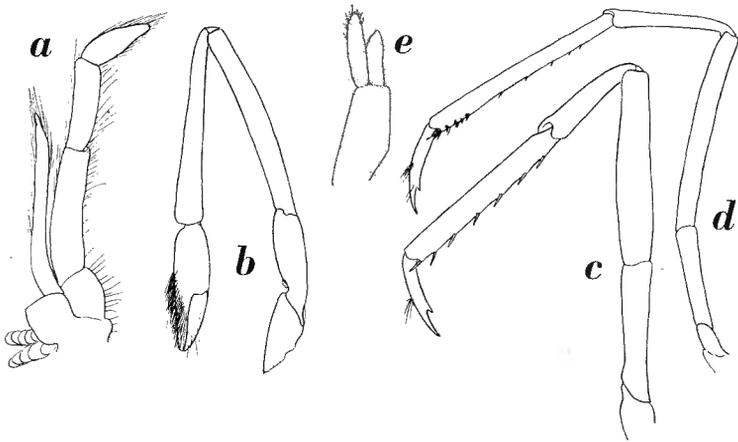


Fig. 3. — *Euryrhynchus burchelli* CALMAN, from Lago Jari, Amazonia, Brazil.

a, third maxilliped; b, first pereopod; c, third pereopod; d, fifth pereopod; e, first pleopod of female. a-e, $\times 14$.

The first pereopod is slender and reaches with about half the carpus beyond the scaphocerite. The fingers are somewhat shorter than the palm. A heavy tuft of strong hairs is present in the distal part of the lower surface of the palm and on the lower surface of the fixed finger. The carpus is about 1.5 times as long as the chela and about as long as the merus. The second legs are equal. In the adult female they reach

with the larger part of the carpus beyond the scaphocerite. The fingers are about as long as the palm. The cutting edges show two teeth in their proximal part, those of the dactylus being placed before those of the fixed finger. The carpus is somewhat shorter than the palm. Its anterior margin bears a strong and sharp ventral tooth. On the lower surface of the carpus some minute tubercles are present. The merus is slightly shorter than the carpus. Its lower surface is also rugose; the rugosities are more conspicuous here than in the carpus. The anterior margin of the merus bears a sharp tooth in the lower part of the external face, on the internal face it shows a broadly rounded lobe. The ischium is shorter than the merus. The third leg reaches with part of the propodus beyond the scaphocerite. The dactylus is bifid, bearing a distinct additional tooth in the anterior third of the lower margin; a tuft of bristles is placed in the middle of the upper margin. The propodus is somewhat more than twice as long as the dactylus; it bears a row of about 7 well-developed spinules on its posterior margin. The carpus is somewhat longer than the dactylus. The merus is about of the same length as the propodus. The ischium measures about $\frac{3}{4}$ of the length of the merus. The fifth leg reaches with the dactylus only beyond the scaphocerite. The dactylus has the same shape as that of the third leg. The propodus is more than twice as long as the dactylus; its posterior margin bears several very small spinules and, in the distal part, some transverse rows of short hairs. The carpus measures $\frac{3}{5}$ of the length of the propodus, while the merus is slightly shorter than that segment. The ischium is about half as long as the merus. The fifth leg is more slender than the third.

The pleopods of the female consist of a well-developed protopodite bearing an oval endopodite and exopodite. The exopodite is longer than the endopod, neither shows any appendages.

So far *Euryrhynchus burchelli* was known only from the single dry type specimen, an animal collected at Pará, Brazil, as long ago as 4 September 1829. It was not described until 1907, when CALMAN discovered the specimen in the collection of the Hope Museum at Oxford. No new material of the species has been reported upon since then. CALMAN's description is very short, but his figures are quite instructive, considering the age and state of preservation of his specimen.

As already pointed out by CALMAN the main difference between the present species and *Euryrhynchus wrzesniowskii* is to be found in the presence of teeth on the merus and carpus of the larger chelipeds in *E. burchelli*. These teeth are placed on the anterior margins of these segments and are not subterminal as CALMAN's figures seem to suggest.

The present material shows that *Euryrhynchus burchelli* is not as rare as has always been thought. Probably it has not been looked for in the right places. *E. wrzesniowskii*, which is only known from the three Guianas, lives there in small shadowy creeks in which the water is slightly acid.

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