Museum Leiden

Mouth of Suriname River near Braamspunt; obtained from fishermen; 5 April 1957; L. B. Holthuis no. 1218. — 2 males.

Description. Burkenroad, 1936, p. 315, figs. 1a, 2, 3.

Remarks. The size of the specimens examined varies from 174 to 222 mm.

Colour. Living specimens of this species were noted to be of a pale bluish grey colour.

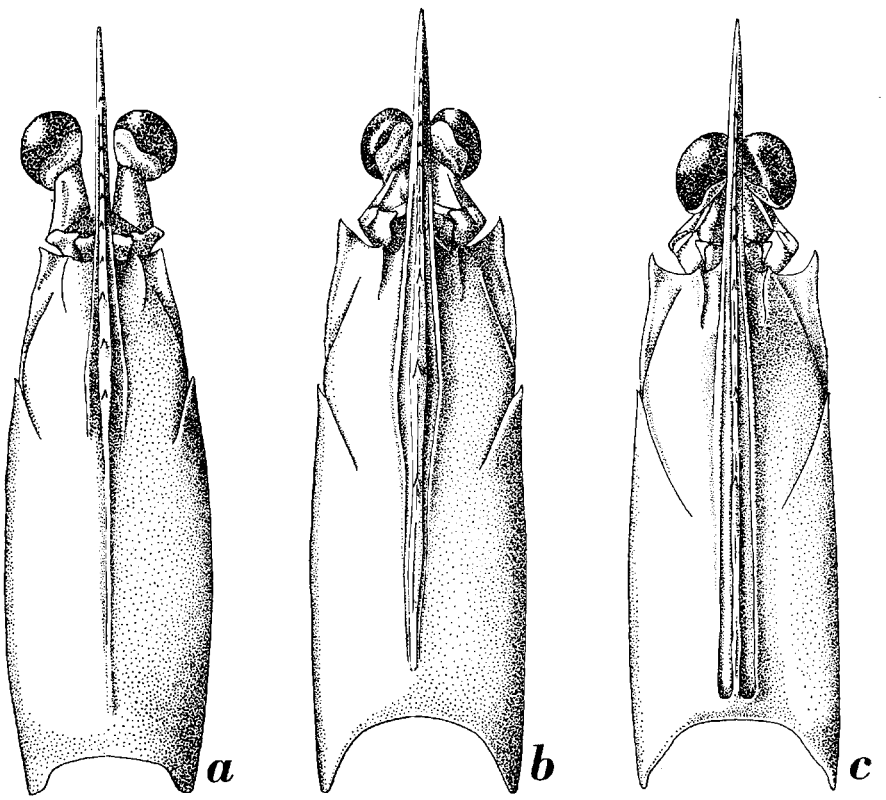


Fig. 6. Carapace in dorsal view. a, *Penaeus schmitti* Burkenroad, male from "Coquette" Sta. 203; b, *Penaeus aztecus* Ives, female from "Coquette" Sta. 254; c, *Penaeus brasiliensis* Latreille, female from "Coquette" Sta. 251. a-c, × 1.3. W. C. G. Gertenaar del.

Type locality. Kingston Bay, Jamaica.

Distribution. *Penaeus schmitti* is closely related to the "White Shrimp", *Penaeus setiferus* (L.), of the coast of the U.S.A., and until 1936 the two were treated as a single species. *P. setiferus* is known from the Atlantic coast of North America between New York, U.S.A. and Vera Cruz, Mexico, and furthermore from Cuba and Jamaica. *P. schmitti* has a more southern

distribution: Antilles (Cuba, Jamaica, Haiti, Santo Domingo, St. Thomas), Panama, Colombia, Venezuela, British, Dutch, and French Guiana, and Brazil (south to Santa Catharina).

Occurrence in Suriname. This species is apparently quite scarce near the Suriname coast and near the mouths of the rivers. During a visit to the fishermen's village of Braamspunt at the mouth of the Suriname River, a few specimens of *P. schmitti* were found among the enormous quantities of *Xiphopenaeus kroyeri* that were being dried there to be sold later on. Also in the Coquette material the number of specimens is relatively small. It may be more abundant farther offshore. Lindner (1957) stated that this species and *Penaeus aztecus* together comprise less than 1% of the total catch of shrimp in Suriname, the larger part being formed by *Xiphopenaeus*.

Penaeus aztecus Ives, 1891 (textfig. 6b)

Penaeus aztecus Holthuis, 1948, p. 1104; Holthuis, 1950a, pp. 27, 35; Lijding, 1956, p. 108; Lindner, 1957, pp. 153, 154.

Coquette Investigations

About 20 miles N.N.W. of the mouth of the Coppename River; depth 31 m; 1-5 April 1957; first voyage. — 4 males, 1 female. (L)

Between the mouths of the Nickerie and Coppename Rivers, about 20 miles offshore; depth 27 m; 15-20 April 1957; third voyage. — 2 females. (L)

About 20 miles N. of the mouth of the Suriname River; depth 9 m; 6-9 May 1957; sixth voyage. — 2 females. (L)

Station 2, off the mouth of the Suriname River, 6° 23′ N 55° 05.5′ W; bottom mud; depth 27 m; 11 May 1957. — 4 males, 7 females. (W)

Station 6, off the mouth of the Suriname River, 6° 24.5′ N 55° 03′ W; bottom grey mud and shells; depth 27 m; 11 May 1957. — 1 juvenile. (W)

Station 15, N.E. of the mouth of the Suriname River, 6° 24.5′ N 54° 59.5′ W; bottom mud and shells; depth 29 m; 11 May 1957. — 1 male. (W)

Station 20, N.E. of the mouth of the Suriname River, 6° 28′ N 54° 57.5′ W; bottom shells; depth 31 m; 11 May 1957. — 1 female. (W)

Station 36, N.E. of the mouth of the Suriname River, 6° 55′ N 54° 54′ W; bottom mud; depth 55 m; 12 May 1957. — 1 male, 1 female. (W)

Station 62, off N.W. French Guiana, 6° 02′ N 53° 41′ W; bottom shells; depth 26 m; 21 May 1957. — 1 male. (L)

Station 63, off N.W. French Guiana, 6° 01′ N 53° 34′ W; bottom mud and shells; depth 26 m; 21 May 1957. — 2 males, 5 females. (L)

Station 65, off N.W. French Guiana, 6° 01.5′ N 53° 30′ W; bottom hard mud; depth 26 m; 21 May 1957. — 1 male, 2 females. (L)

Station 77, off N.W. French Guiana, 5° 54′ N 53° 15′ W; bottom mud and shells; depth 29 m; 21 May 1957. — 10 males, 9 females. (L)

Station 104, N.E. of Enfant Perdu, French Guiana, 5° 07′ N 51° 58′ W; bottom mud; depth 29 m; 24 May 1957. — 6 males, 5 females. (L)

Station 138, N.E. of the mouth of the Suriname River, 6° 21′ N 54° 56′ W; bottom mud; depth 22 m; 30 May 1957. — 1 male, 2 females. (W)

Station 144, N.E. of the mouth of the Suriname River, 6° 22.5′ N 54° 58′ W; bottom mud; depth 26 m; 30 May 1957. — 3 males, 1 female. (W)

N.N.E. of the mouth of the Suriname River; depth 22 m; 1-3 June 1957. — 4 males, 4 females. (L)

Station 172, between the mouths of the Coppename and Suriname Rivers, 6° 20.5′ N 55° 42′ W; bottom mud; depth 27 m; 6 June 1957. — 1 male. (W)

Station 216, N.W. of the mouth of the Marowijne River, 6° 41.5′ N 54° 16′ W; bottom mud; depth 44 m; 14 June 1957. — 1 male, 1 female. (W)

Station 251, between the mouths of the Coppename and Suriname Rivers, 6° 41′ N 55° 30′ W; bottom mud and shells; depth 42 m; 19 June 1957. — 1 female. (W)

Station 254, between the mouths of the Coppename and Suriname Rivers, 6° 41′ N 55° 39′ W; bottom mud and shells; depth 44 m; 19 June 1957. — 1 female. (W)

Station 293, off the mouth of the Suriname River, 6° 27′—6° 25′ N 55° 05′—55° 10′ W; bottom mud and shells; depth 26 m; 28 June 1957. — 9 males, 23 females. (W + L)

Museum Leiden

Cocos Polder, Coronie; in ditch to the inside of the outer (sea) dike; muddy with little, if any, vegetation; 11 April 1957; L. B. Holthuis no. 1238. — 3 juveniles.

Cocos Polder, Coronie; in ditch near the projected pumping installation; muddy bottom; 11 April 1957; L. B. Holthuis no. 1240. — 1 juvenile.

Mouth of Coppename River near Coppename Punt; 25 October 1949; leg. R. M. J. Wirtz. — 1 specimen.

Mouth of Suriname River near plantation "Purmerend", N. of Leonsberg, N. of Paramaribo; in pool behind the river dike and near the shore of the river itself; 1 April 1957; L. B. Holthuis no. 1208. — 13 juveniles.

Mouth of Suriname River near Braamspunt; received from fishermen; 5 April 1957; L. B. Holthuis no. 1218. — 3 females.

Mouth of Suriname River near Resolutie; in shrimp traps; bottom mud; salinity 15.89 ‰; 22 December 1942; D. C. Geijskes. — 110 specimens.

Mouth of the Suriname River; bought at the fishmarket of Paramaribo; 1 March 1953; D. C. Geijskes. — 1 specimen.

Mouth of the Suriname River; bought at the fishmarket of Paramaribo; 1 April 1957; L. B. Holthuis no. 1207. — 1 female.

Mouth of the Suriname River; April 1957; H. W. Lijding. — 3 females.

Suriname River near Paramaribo; bank of the river at spring-tide; December 1949; D. C. Geijskes. — 14 juveniles.

Paramaribo, road to the sea; in the stomach of a kingfisher, *Chloroceryle americana* (Gmelin); 26 October 1957; F. Haverschmidt. — 1 badly damaged specimen.

Suriname River at 10 miles above its mouth; 11 February 1954; H. W. Lijding. — 5 specimens.

Near "Suriname Rivier" lightvessel; trawled; 12 and 13 January 1953; H. W. Lijding. — 1 female.

Near "Suriname Rivier" lightvessel; 1955; H. W. Lijding. — 1 male, 9 females.

Off the coast of Suriname, 5 to 8 miles E. of "Suriname Rivier" lightvessel; bottom soft brown mud; depth 3.5 m; 13 July 1953; D. C. Geijskes & H. W. Lijding. — 4 specimens.

In ditches and ponds of the Fishery Experiment Station "Matappica" at the Matappica Canal, N. of the Commewijne River; 6 April 1957; L. B. Holthuis no. 1221. — 24 specimens.

0.2 km S. of the coast near the Wiawia Bank; swamp behind first shore ridge; depth 0.1 to 0.3 m; salinity 21 to 33.76‰; 11 and 13 November 1948; 1948-1949 Suriname Expedition nos. 2613 and 3412. — 94 juveniles.

Suriname. — 1 female.

Off the coast of French Guiana near Cayenne; June-July 1955; J Durand. — 3 specimens.

Fishmarket, Cayenne, French Guiana; 10 September 1957, and 4 May 1958; J. Durand. — 15 specimens.

Museum Hamburg

Paramaribo; J. Michaelis; received 31 January 1899. — 24 specimens.

Description. Burkenroad, 1939, p. 34, figs. 20, 21, 24, 28-33.

Remarks. The specimens in the present collection vary greatly in size. The largest male is 187 mm long and the largest female 206 mm. The juvenile specimens (length 70 mm or less) cannot be identified with complete certainty, since the sexual organs are not fully developed; however, there are no indications that they should belong to a species different from *P. aztecus*.

All the fullgrown specimens belong to Burkenroad's (1939, p. 34) Form B. The adrostral grooves are rather narrow and ill-defined posteriorly, a character which is constant in the present material and which even serves as an easy means to distinguish Suriname specimens of this species from *P. brasiliensis*, which in the Suriname material has the adrostral grooves wide and ending in a sharply defined transverse posterior margin.

Colour. The colour of living specimens was noted to be uniformly greyish brown; no red spot is visible on the abdomen.

Type locality. Vera Cruz, Mexico.

Distribution. The range of the species extends from New Jersey, U.S.A. to Uruguay.

Occurrence in the Guianas. This is the most common *Penaeus* found in Suriname; it occurs closer to the shore than the other species of this genus. It is found in waters with a rather wide range of salinity, having been collected in the brackish estuaries of the rivers as well as in pools, which, because of a strong evaporation, have a salinity higher than sea water. The specimens found inshore and in the estuaries are as a rule not fullgrown. Such medium and small sized specimens occur in small numbers in the catches of *Xiphopenaeus kroyeri* made in the mouths of the rivers. In the fish ponds of the Fishery Experiment Station "Matappica", *Penaeus aztecus* proved to be the only species of Penaeidae present; the Matappica specimens measured 15 to 102 mm. The adult specimens (up to 206 mm) are as a rule found farther offshore in greater depths (22 to 55 m).

The species was reported for the first time from Suriname by Holthuis (1948) who dealt with the above mentioned specimens from Resolutie. The juveniles from near the Wiawia Bank were reported upon by Holthuis (1950). Lindner (1957) remarked that in Suriname the catch of this species

and of *P. schmitti* form less than 1% of the total shrimp catch. According to Lijding (1956) this percentage is 2, being far higher in the estuaries of the Coppename and Suriname Rivers during the months of July and August. Dr. J. Durand, Institut Français d'Amérique Tropicale, Cayenne, sent me some material of this species from off the coast of French Guiana, where it was collected in depths between 25 and 60 m, as a rule being found in smaller depths than the next species. Graham's (1955, p. 41, pl. 5 fig. 9) "Short Feelered Prawn" from British Guiana evidently is the present species.

Penaeus brasiliensis Latreille, 1817 (textfig. 6c)

Coquette Investigations

N.N.W. of the mouth of the Marowijne River, about 30 miles offshore; depth 37 m; 29 April—3 May 1957; fifth voyage. — 2 females. (L)

Station 1, off the mouth of the Suriname River, 6° 22' N 55° 06' W; bottom mud; depth 26 m; 11 May 1957. — 1 male, 2 females. (L)

Station 28, N.E. of the mouth of the Suriname River, 6° 48' N 54° 54' W; bottom shells; depth 46 m; 12 May 1957. — 1 male, 1 female. (W)

Station 31, N.E. of the mouth of the Suriname River, 6° 50' N 54° 53.5' W; bottom hard mud and shells; depth 49 m; 12 May 1957. — 1 male, 1 female. (W)

Station 33, N.E. of the mouth of the Suriname River, 6° 52' N 54° 53' W; bottom mud and shells; depth 51 m; 12 May 1957. — 1 male. (W)

Station 36, N.E. of the mouth of the Suriname River, 6° 55' N 54° 54' W; bottom mud; depth 55 m; 12 May 1957. — 1 male. (W)

Station 140, N.E. of the mouth of the Suriname River, 6° 24'—6° 22' N 54° 55'—54° 59' W; bottom mud; depth 26 m; 30 May 1957. — 1 female. (W)

Station 251, between the mouths of the Coppename and Suriname Rivers, 6° 41' N 55° 30' W; bottom mud and shells; depth 42 m; 19 June 1957. — 3 males, 4 females. (W)

Station 254, between the mouths of the Coppename and Suriname Rivers, 6° 41' N 55° 39' W; bottom mud and shells; depth 44 m; 19 June 1957. — 4 males, 2 females. (L)

Station 279, between the mouths of the Coppename and Suriname Rivers, 6° 44' N 55° 33' W; bottom mud and fine shells; depth 46 m; 26 June 1957. — 1 male. (W)

Station 289, N.E. of the mouth of the Coppename River, 6° 52.5' N 55° 53' W; bottom mud and fine shells; depth 49 m; 27 June 1957. — 3 males. (L)

Station 297, off the mouth of the Suriname River, 6° 45'—6° 50.5' N 55° 17'—55° 27' W; bottom mud and fine shells; depth 44 m; 28 June 1957. — 8 males, 5 females. (W)

Station 298, off the mouth of the Suriname River, 6° 45' N 55° 17' W; bottom mud and fine shells; depth 44 m; 28 June 1957. — 6 males, 11 females. (L)

Suriname; 1957. — 1 male. (W)

Museum Leiden

Off the coast of French Guiana near Cayenne; June—July 1955; J. Durand. — 2 specimens.

Description. Burkenroad, 1939, p. 27, figs. 16, 17, 22.

Remarks. All the specimens studied are fullgrown or almost fullgrown, the size of the males varying between 150 and 191 mm, that of the females between 172 and 216 mm.

The difference in the shape of the adrostral grooves of Suriname specimens of this and the previous species has already been discussed under *P. aztecus*. The differences in the thelycum and petasma of the two species check very well with Burkenroad's (1939) account.

Colour. The colour of living specimens is reddish with a dark red spot on each side of the abdomen near the third abdominal somite. This coloration is an easy means for the distinction of living specimens of this species from those of *P. aztecus*. Dr. Durand of Cayenne also found this character very helpful in sorting his material from French Guiana.

Type locality. "Les côtes du Brésil" (Latreille, 1817).

Distribution. The species is known to inhabit the western Atlantic between Bermuda and Rio de Janeiro, Brazil, being more common in the southern part of its range. Till 1939 it was not distinguished from its close relatives *P. aztecus* Ives and *P. duorarum* Burkenroad, so that the old records of the species as a rule are not to be relied upon.

Occurrence in Suriname and French Guiana. *Penaeus brasiliensis* is now reported for the first time from Suriname. It proves to be far less common here than *P. aztecus*, being found in deeper waters. While practically all of the examined "Coquette" material of *P. aztecus* was taken between 22 and 31 m and that species furthermore occurs in the shallow coastal and estuarine waters, the far larger part of the catches of *P. brasiliensis* are from between 37 and 55 m. Furthermore none of the specimens collected close inshore could be identified with certainty as belonging to the present species. Dr. J. Durand of the Institut Français d'Amérique Tropicale, Cayenne, informed me that off the coast of French Guiana *P. brasiliensis* is also found at greater depths than *P. aztecus*, being caught there mostly between 40 and 69 m.

Penaeus duorarum Burkenroad, 1939

Coquette Investigations

Station 27, N.E. of the mouth of the Suriname River, 6° 45′ N 54° 58′ W; bottom hard mud and shells; depth 42 m; 12 May 1957. — 1 female. (W)

Description. Burkenroad, 1939, p. 31, figs. 18, 19, 23, 25-27.

Remarks. The only specimen of this species in the present collection is an incomplete female the abdomen of which is lacking. The length of the carapace is 65 mm. It is certainly surprising to find this single incomplete specimen of *P. duorarum* among the extensive series of grooved shrimp collected by the "Coquette", all the other specimens being either *P. aztecus* or *P. brasiliensis*.

In the present specimen the thelycum has the shape typical for the species. The adrostral grooves of the carapace are wide clearly defined throughout their course with a distinct posterior margin, thereby resembling the Suriname specimens of *P. brasiliensis,* which, however, as a rule have these grooves slightly wider posteriorly.

Type locality. "Atlantis" Sta. 2813, off the coast of Alabama, U.S.A., roughly 30° N 88° W, depth 35 m.

Distribution. The species has been reported from the east coast of America (Bermuda and North Carolina to Brazil) and from West Africa (Mauritania to Angola). Until now it has not been reported from Suriname, where it seems to be extremely rare.

Trachypenaeus constrictus (Stimpson, 1871)

Coquette Investigations

About 20 miles off the Suriname coast between the mouths of the Nickerie and Coppename Rivers; depth 27 m; 15-20 April 1957; third voyage. — 1 male, 2 females. (L)

Station 2, off the mouth of the Suriname River, 6° 23′ N 55° 05.5′ W; bottom mud; depth 27 m; 11 May 1957. — 1 female. (W)

Station 5, off the mouth of the Suriname River, 6° 25′ N 55° 04′ W; bottom grey mud and shells; depth 27 m; 11 May 1957. — 1 female. (L)

Station 8, off the mouth of the Suriname River, 6° 24′ N 55° 02.5′ W; bottom grey mud and shells; depth 27 m; 11 May 1957. — 1 female. (L)

Station 250, between the mouths of the Coppename and Suriname Rivers, 6° 41′ N 55° 26.5′ W; bottom mud, shells and coral; depth 42 m; 19 June 1957. — 2 impregnated females. (W)

Station 260, between the mouths of the Coppename and Suriname Rivers, 6° 40′—6° 41.5′ N 55° 26′—55° 41′ W; bottom mud, shells and coral; depth 42 m; 20 June 1957. — 4 impregnated females. (L)

Station 267, N.E. of the mouth of the Coppename River, 6° 42′—6° 41′ N 55° 43′—55° 45′ W; bottom mud and fine shells; depth 44 m; 20 June 1957. — 1 female. (W)

Station 279, between the mouths of the Coppename and Suriname Rivers, 6° 44′ N 55° 33′ W; bottom mud and fine shells; depth 46 m; 26 June 1957. — 1 impregnated female. (W)

Station 280, between the mouths of the Coppename and Suriname Rivers, 6° 45′ N 55° 35′ W; bottom mud and fine shells; depth 48 m; 26 June 1957. — 1 impregnated female. (W)

Station 283, between the mouths of the Coppename and Suriname Rivers, 6° 47′ N 55° 40′ W; bottom mud and fine shells; depth 46 m; 26 June 1957. — 1 female. (L)

Station 284, between the mouths of the Coppename and Suriname Rivers, 6° 49′ N 55° 42′ W; bottom mud and fine shells; depth 46 m; 26 June 1957. — 1 female. (W)

Station 353, off the mouth of the Suriname River, 6° 45.5′ N 55° 14′ W; bottom mud and fine shells; depth 44 m; 21 July 1957. — 3 males and 5 females. (W)

Between the mouths of the Coppename and Suriname Rivers, 6° 19′—6° 55′ N 55° 13′—55° 40′ W; depth 26-53 m; 19-22 July 1957. — 6 females, 4 of which impregnated. (L)

Description. A. Milne Edwards & Bouvier, 1909, p. 232, textfigs. 60-63, pl. 5 figs. 7-10, pl. 6 figs. 1, 2.

Remarks. In the present material the females (17 specimens, 32 to 78 mm long) are far more numerous than the males (4 specimens, 45 to 59 mm long). The female from Sta. 284 was found in the stomach of an octopus.

Type localities. Harbour of Beaufort, North Carolina, U.S.A., and Charleston Harbor, South Carolina, U.S.A. Restricted by Schmitt (1935, p. 131) to Beaufort.

Distribution. Until now the species has been recorded from Bermuda, from the east and south coasts of the U.S.A. (from off Chesapeake Bay to Texas), from Puerto Rico and from Sombrero Island. It is now reported for the first time from Suriname, so that its known range of distribution is considerably extended.

Trachypenaeus similis (Smith, 1885)

Coquette Investigations

Station 2, off the mouth of the Suriname River, 6° 23′ N 55° 05.5′ W; bottom mud; depth 27 m; 11 May 1957. — 1 female. (W)

Station 32, N.E. of the mouth of the Suriname River, 6° 51′ N 54° 53.5′ W; bottom mud and shells; depth 51 m; 12 May 1957. — 1 female. (W)

Station 44, N.E. of the mouth of the Suriname River, 6° 18.5′ N 54° 51′ W; bottom mud; depth 18 m; 13 May 1957. — 3 females. (W)

Station 227, between the mouths of the Suriname and Marowijne Rivers, 6° 50′ N 54° 24′ W; bottom mud; depth 53 m; 15 June 1957. — 1 female. (L)

Station 360, off the mouth of the Suriname River, 6° 19′—6° 20′ N 55° 15′—55° 14′ W; bottom mud and shells; depth 26 m; 22 July 1957. — 1 female. (W)

N.N.W. of "Suriname Rivier" lightvessel, 7° 2′ N 55° 40′ W; depth 55 m; 8 August 1957. — 14 females. (L)

Museum Leiden

Off the coast of French Guiana, 4° 45′ N 51° 28′ W; depth 20 m; 7 August 1958; J. Durand no. 420. — 1 female.

Description. Burkenroad, 1934a, p. 96, figs. 10, 11.

Remarks. The specimens are 27 to 101 mm long. They agree quite well with the descriptions given of the species in the literature. The thelycum has the median plate between the bases of the fourth pereiopods with a deeply sunken T- or V-shaped groove on the upper surface, and not with a straight longitudinal groove like the one shown in Burkenroad's (1934) fig. 10. It is interesting to note that the present material does not contain any males.

Type locality. Gulf of Paria, 10° 37′ 40″ N 61° 42′ 40″ W; 57 m depth.

Distribution. The species is known from the Gulf coast of the United States and Mexico (from W. Florida to the Gulf of Campeche), from the northern Antilles (Cuba, Puerto Rico, Vieques, St. Thomas), Courtown

Key (Colombia), and the Gulf of Paria near Trinidad. It is now reported for the first time from Suriname and French Guiana.

Xiphopenaeus kroyeri (Heller, 1862) (textfig. 7)

"Garnalen of Steurkrabben" Teenstra, 1835, vol. 2, p. 442.
"Garnalen, Sarre Sarre" Kappler, 1881, p. 143.
Palaemon Kappler, 1887, p. 200.
Xiphopenaeus krøyeri Holthuis, 1948, p. 1105; Holthuis, 1950a, p. 35.
Xiphopenaeus kröyeri Lijding, 1956, p. 108.
Xiphopeneus kroyeri Lindner, 1957, pp. 153, 154, 156.

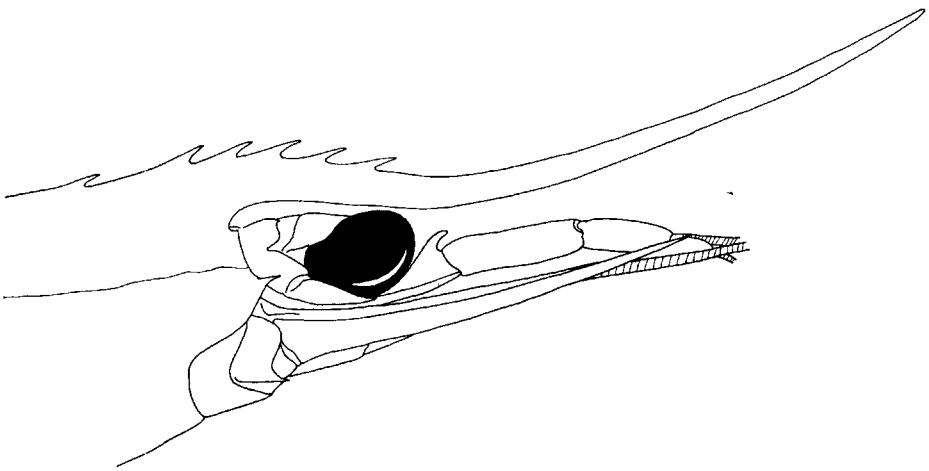


Fig. 7. *Xiphopenaeus kroyeri* (Heller). Anterior part of body in lateral view, specimen from "Coquette" Sta. 44. × 5.

Coquette Investigations

Between the mouths of the Nickerie and Coppename Rivers, about 20 miles offshore; depth 27 m; 15-20 April 1957; third voyage. — 2 specimens. (L)

Near "Suriname Rivier" lightvessel; depth 7 m; 3 May 1957; fifth voyage. — 3 specimens. (L)

About 20 miles N. of the mouth of the Suriname River; depth 27 m; 6-9 May 1957; sixth voyage. — 2 specimens. (L)

Station 1, off the mouth of the Suriname River, 6° 22′ N 55° 06′ W; bottom mud; depth 26 m; 11 May 1957. — 101 specimens. (W)

Station 2, off the mouth of the Suriname River, 6° 23′ N 55° 05.5′ W; bottom mud; depth 27 m; 11 May 1957. — 8 specimens. (W)

Station 44, N.E. of the mouth of the Suriname River, 6° 18.5′ N 54° 51′ W; bottom mud; depth 18 m; 13 May 1957. — 387 specimens. (W)

Station 49, N.E. of the mouth of the Suriname River, 6° 04′ N 54° 51′ W; bottom mud; depth 5 m; 13 May 1957. — 2 specimens. (W)

Station 157, off the mouth of the Suriname River, 6° 22′ N 55° 03.5′ W; bottom mud; depth 24 m; 4 June 1957. — 4 specimens. (L)

Station 166, between the mouths of the Coppename and Suriname Rivers, 6° 18′ N 55° 26′ W; bottom mud and shells; depth 18 m; 6 June 1957. — 1 specimen. (W)

Museum Leiden

Mouth of the Nickerie River; bought on the fish market of Nieuw Nickerie; September 1953; D. C. Geijskes. — 34 specimens.

Sea coast near the mouth of the Nickerie River; 16 September 1953; D. C. Geijskes. — 25 specimens.

Coppename Punt, mouth of the Coppename River; 25 October 1949; R. M. J. Wirtz — 10 specimens.

Saramacca Punt, mouth of the Coppename River; 2 April 1957; L. B. Holthuis no. 1215. — 9 specimens.

Mouth of Suriname River near Braamspunt; 10 April 1957; L. B. Holthuis no. 1217. — 7 specimens.

Mouth of Suriname River near Resolutie; bottom mud; salinity 15.89‰; 22 December 1942; D. C. Geijskes. — 16 specimens.

Mouth of the Suriname River; bought on the fish market at Paramaribo; 1 March 1933 and 1 March 1953; D. C. Geijskes; 1 April 1957; L. B. Holthuis no. 1207. — 98 specimens.

Suriname River at Paramaribo; caught near the Fisheries Service pier; in trap-net; 7 April 1957; L. B. Holthuis no. 1224. — 3 specimens.

Near "Suriname Rivier" lightvessel; 1953; H. W. Lijding. — 3 specimens.

About 5 to 8 miles E. of "Suriname Rivier" lightvessel; bottom soft brown mud; depth 3.5 m; 13 July 1953; D. C. Geijskes & H. W. Lijding. — 14 specimens.

Mouth of the Warappa Creek, N. of the Commewijne River; bottom mud; salinity 6 to 13‰; 11 December 1942; D. C. Geijskes. — 26 specimens.

Suriname. — 1 specimen.

Coast of French Guiana near Cayenne; 1955; J. Durand. — 6 specimens.

Fishmarket, Cayenne, French Guiana; 10 September 1957; J. Durand. — 7 specimens.

Description. Burkenroad, 1934a, p. 103, fig. 12; Schmitt, 1935, p. 132, fig. 5.

Vernacular names. The Suriname name for this species is "redi sara-sara" (= red prawn), or "bigi sara-sara" (= big prawn).

Remarks. The length of the present specimens varies from 22 to 135 mm.

Colour. Fresh specimens of this species were noted to be whitish with the ventral part yellowish, while sometimes the yellow colour extends over the entire body, always being most distinct ventrally. Dark chromatophores are scattered all over; when they are expanded the animal obtains a greyish colour which then dominates over the yellow. The tip of the rostrum and the flagella are reddish. The legs are pinkish or yellowish-orange. The pleopods and uropods are yellowish at the base, becoming pink distally. The telson and the sixth abdominal somite are sometimes pink.

Type locality. Rio de Janeiro, Brazil.

Distribution. The species is known from the western Atlantic between South Carolina, U.S.A., and Brazil. It is of economic importance in the southern United States, in Venezuela, the Guianas and Brazil. The species

was reported from British Guiana by Graham (1955, p. 38, pl. 5 fig. 10; 1956, p. 170, figs. 171, 172) as "Coarse Shrimp" or "Large Prawn".

Occurrence in Suriname. *Xiphopenaeus kroyeri* is the most common commercial shrimp of Suriname and has already been mentioned as such by Lijding (1956) and Lindner (1957). It is caught in huge numbers in the estuaries of the rivers and sold fresh or dried on the markets of various towns. The shrimps are usually caught with trap-nets. As a rule a number of these nets, fastened to heavy wooden stakes, are placed in a transverse row, one next to the other, in the mouth of the river in not too deep water. When the nets are not in use, they are raised and hung over the horizontal upper bars which connect the vertical stakes; they are left there to dry. At incoming or outgoing tide the nets are lowered into the water, where they unfold and are kept open by the strong current. With the tidal currents numerous shrimp and small fish come up or down the river mouth, and large quantities are caught in the trap-nets. The fishermen, in small boats which they fasten to the stakes, stay with the nets and about every 15 minutes the contents of the bag at the end of the net is emptied into their boats. Between collecting, the catch is sorted. Depending upon the circumstances the shrimp is sold fresh, is cooked and dried, is put in cold storage, or is ground up to "trassi". At the markets of towns like Paramaribo and Nieuw Nickerie shrimp is sold fresh. In a few places, like Boskamp at the mouth of the Coppename River and in Paramaribo, there are facilities for cold storage so that the shrimp can be kept and has not to be sold immediately. Most of the shrimp, however, is dried. At the village of Braamspunt at the mouth of the Suriname River, I had the opportunity to observe the process of cooking and drying of shrimp: the fresh shrimp is brought in by small boats when the trap-net fishing is finished. It is then boiled in salt water in large drums. The cooked shrimps are spread out on trays made of loosely woven bamboo strips, which are placed on wooden frames out in the open so that they are about 50 cm above ground level. In the sun, with the wind passing over as well as under the trays, the shrimps dry in about 3 to 5 days; at intervals the drying shrimp is turned over with a kind of lance-shaped wooden ladles. When the shrimps are fully dried they are put out on a pile on the ground and by threshing them with a wooden club the shells are separated from the dried meat. The clean dried meat then is packed in bags and sent to the market. It also may be ground up for shrimp meal. The amount of shrimp caught is considerable: in 1950 in the estuaries of the Coppename and Suriname Rivers alone about 300 tons of shrimp was caught (Reyntjes, 1953, p. 85); Lindner (1957) estimated the total annual catch of shrimp in Suriname at 1 million pounds.

The same author mentioned that 600 fishermen work full-time there to catch both shrimp and fish. According to Lijding (1957, p. 117) about 150 trap-nets are in use for the shrimp fishery in Suriname. Dried shrimp has been exported in the past on a moderate scale. Lijding (1957, p. 118) indicated that in 1953 10.000 kg, and in 1954 8.026 kg of dried shrimp were exported; most of these were sent to Trinidad. At present *Xiphopenaeus* is peeled and frozen on a rather large scale for export to the U.S.A. and the Caribbean region.

According to Lijding (1956, p. 108) along the Suriname coast the concentration of *Xiphopenaeus* is greatest in depths down to 7 m, though bigger specimens are more numerous in depths of 7 to 20 m. The shrimps penetrate quite deep into the estuaries, going up the rivers especially far in the dry season. Dr. J. Durand, Institut Français d'Amérique Tropicale, Cayenne, informed me that in French Guiana "Les *Xiphopenaeus kroyeri* sont recoltées toute l'année dans les "barrières chinoises" de Cayenne, mais on les retrouve aussi dans toute la bande côtière jusqu'aux fonds de 25 mètres environ".

The first Suriname record of *Xiphopenaeus* is evidently that by Teenstra. Teenstra (1835, p. 442) remarked that on the Paramaribo market prawns are sold which resemble those caught in the fresh waters of the southern Netherlands (probably *Palaemon longirostris* H. Milne Edwards is meant), but being larger; he reported these Suriname prawns to be caught in the Matappica and nearby creeks. They are described by him as possessing a rostrum and having the eyes bulging, black and almost as big as a small pea. It is evident that these prawns are *Xiphopenaeus,* though Teenstra's statement that they attain a length of 2 palms (about 200 mm) is somewhat exaggerated. The specimens examined by me do not exceed 140 mm. The prawns mentioned by Kappler (1881, 1887) as being caught with nets in the brackish water of the river estuaries, also belong here, at least partly. Holthuis in 1948 dealt with the above mentioned Resolutie specimens, and in 1950 with those from the Warappa Creek and Coppename Punt.

Sicyonia dorsalis Kingsley, 1878

Coquette Investigations

About 20 miles N.N.W. of the mouth of the Coppename River; depth 31 m; 1-5 April 1957; first voyage. — 1 female. (L)

Between the mouths of the Nickerie and Coppename Rivers, 20 miles offshore; depth 27 m; 15-20 April 1957; third voyage. — 3 females. (L)

About 20 miles N. of the mouth of the Marowijne River; depth 27 m; 23-27 April 1957; fourth voyage. — 2 females. (L)

Near "Suriname Rivier" lightvessel; depth 7 m; 3 May 1957; fifth voyage. — 1 female. (L)

N.N.W. of the mouth of the Marowijne River, 20 miles offshore; depth 27 m; 29 April-3 May 1957; fifth voyage. — 5 females. (L)

About 20 miles N. of the mouth of the Suriname River; depth 27 m; 6-9 May 1957; sixth voyage. — 1 male, 11 females. (L)

Station 2, off the mouth of the Suriname River, 6° 23′ N 55° 05.5′ W; bottom mud; depth 27 m; 11 May 1957. — 13 males, 15 females. (W)

Station 15, N.E. of the mouth of the Suriname River, 6° 24.5′ N 54° 59.5′ W; bottom mud and shells; depth 29 m; 11 May 1957. — 1 female. (W)

Station 32, N.E. of the mouth of the Suriname River, 6° 51′ N 54° 53.5′ W; bottom mud and shells; depth 51 m; 12 May 1957. — 1 female. (W)

Station 86, N. of Isle du Salut, French Guiana, 5° 49.5′ N 53° 09′ W; bottom rocky with mud, shells and coral; depth 27 m; 22 May 1957. — 1 female. (L)

Station 144, N.E. of the mouth of the Suriname River, 6° 22.5′ N 54° 58′ W; bottom mud; depth 26 m; 30 May 1957. — 2 males, 3 females. (W)

Station 157, off the mouth of the Suriname River, 6° 22′ N 55° 03.5′ W; bottom mud; depth 24 m; 4 June 1957. — 2 males, 5 females. (W + L)

Station 159, off the mouth of the Suriname River, 6° 22′ N 55° 02.5′ W; bottom mud; depth 26 m; 4 June 1957. — 5 males, 34 females. (W + L)

Station 187, N.E. of the mouth of the Suriname River, 6° 23′ N 54° 56′ W; bottom mud; depth 27 m; 10 June 1957. — 1 male, 2 females. (W)

Station 212, between the mouths of the Suriname and Marowijne Rivers, 6° 45′ N 54° 30′ W; bottom mud; depth 26 m; 14 June 1957. — 1 female. (W)

Station 218, N.W. of the mouth of the Marowijne River, 6° 42′ N 54° 13.5′ W; bottom mud; depth 26 m; 14 June 1957. — 1 female. (W)

Station 223, off the mouth of the Marowijne River, 6° 49′ N 53° 59′ W; bottom mud and shells; depth 48 m; 15 June 1957. — 1 female. (W)

Station 224, off the mouth of the Marowijne River, 6° 51′ N 54° 03′ W; bottom mud; depth 51 m; 15 June 1957. — 1 female. (W)

Station 227, between the mouths of the Suriname and Marowijne Rivers, 6° 50′ N 54° 24′ W; bottom mud; depth 53 m; 15 June 1957. — 1 female. (W)

Station 260, between the mouths of the Coppename and Suriname Rivers, 6° 40′—6° 41.5′ N 55° 26′—55° 41′ W; bottom mud, shells and coral; depth 40 m; 20 June 1957. — 1 male. (W)

Between the mouths of the Coppename and Suriname Rivers, 6° 19′—6° 55′ N 55° 13′—55° 40′ W; depth 26-53 m; 19-22 July 1957. — 1 male. (L)

Museum Leiden

Off the coast of French Guiana, about 5° 17′ N 52° 14′ W; depth 35 m; 11 July 1958; J. Durand no. 411. — 6 males, 12 females.

Description. Burkenroad, 1934a, p. 121, figs. 13, 14.

Remarks. Burkenroad (1934a) made the position of the species clear and provided a good description, with which the present specimens agree quite well.

The preponderance in the present material of females (102 specimens, 18-57 mm long) over males (32 specimens, 14-53 mm long) is quite striking.

Type locality. Fort Jefferson, Dry Tortugas, Florida, U.S.A.

Distribution. *Sicyonia dorsalis* is known with certainty from the Atlantic

and Gulf coasts of the U.S.A. (North and South Carolina, Florida, Louisiana, Texas), and Colombia (Sabanilla). The species has been mentioned from several other localities, but these records may be based on material of the related western Atlantic species *S. stimpsoni* Bouvier or *S. wheeleri* Gurney. *Sicyonia dorsalis* is now reported for the first time from Suriname and French Guiana.

Sicyonia stimpsoni Bouvier, 1905

Coquette Investigations

Station 29, N.E. of the mouth of the Suriname River, 6° 49′ N 54° 54′ W; bottom hard mud and shells; depth 48 m; 12 May 1957. — 1 male. (W)

Station 31, N.E. of the mouth of the Suriname River, 6° 50′ N 54° 53.5′ W; bottom hard mud and shells; depth 49 m; 12 May 1957. — 1 male. (W)

Station 32, N.E. of the mouth of the Suriname River, 6° 51′ N 54° 53.5′ W; bottom mud and shells; depth 51 m; 12 May 1957. — 1 male. (W)

Station 33, N.E. of the mouth of the Suriname River, 6° 52′ N 54° 53′W; bottom mud and shells; depth 51 m; 12 May 1957. — 1 male. (W)

Station 36, N.E. of the mouth of the Suriname River, 6° 55′ N 54° 54′ W; bottom mud; depth 55 m; 12 May 1957. — 1 male, 1 female. (W)

Station 331, between the mouths of the Coppename and Suriname Rivers, 6° 51′ N 55° 25′ W; bottom mud and shells; depth 53 m; 20 July 1957. — 1 male. (W)

Station 334, between the mouths of the Coppename and Suriname Rivers, 6° 50′ N 55° 22′ W; bottom sand; depth 53 m; 20 July 1957. — 1 female. (L)

Station 337, off the mouth of the Suriname River, 6° 49′—6° 47′ N 55° 21′—55° 18′ W; bottom mud and fine shells; depth 49-53 m; 21 July 1957. — 4 males. (L)

Museum Leiden

Off the coast of French Guiana, about 6° 47′ N 53° 10′ W; depth 105 m; 25 July 1958; J. Durand no. 417. — 1 female.

Description. A. Milne Edwards & Bouvier, 1909, p. 253, textfigs. 86-88, pl. 8 figs. 4-13 (as *S. dorsalis* Kingsley).

Remarks. It is interesting to note that in the present form, in contrast with the previous species, the males (10 specimens, length 32-44 mm) are far more numerous than the females (3 specimens, 43 to 44 mm long).

The specimens agree with A. Milne Edwards & Bouvier's (1909) description and figures of this species, which they incorrectly identified with *S. dorsalis* Kingsley. The material is also in good agreement with Burkenroad's (1934a, pp. 123-125) account of the species.

The pleurae of the abdominal somites end in a distinct spine, which in the first four is curved outwards. In my material of *S. dorsalis,* the first four pleurae instead of these outwards directed spines show an angle or short tooth in the anterior part of their distal margin. In the third and fourth abdominal somites of *S. dorsalis* (not in the second as stated by Burkenroad, 1934a, p. 124) there is a second angle or tooth on the pleural

margin; this second angle is directed posteriorly and situated at the postero-lateral angle of the pleura, it is more acute than the anterior tooth. No such posterior angle or tooth is to be observed in my material of *S. stimpsoni*. The transverse groove on the pleurae of the second abdominal somite of the present species does not reach the upper margin of the somite, but about halfway the base of the pleura and the dorsal line of the segment it curves forwards and stops abruptly. A short groove which starts at the antero-dorsal part of the segment curving downwards and backwards does not contact the just mentioned pleural groove. In *S. dorsalis* these two grooves form an uninterrupted single groove, which extends from the dorso-median line down to the tip of the pleura.

In my material of *S. stimpsoni* the dorsal margins of the fourth and fifth abdominal somites both end in a distinct high and acutely pointed tooth. In *S. dorsalis* no trace of such a tooth is found in the fourth somite, while in the fifth the margin ends in a low rectangular tooth.

The distoventral lobe of the petasma in *S. stimpsoni* is simple and not bifurcated as in *S. dorsalis*.

In some of my specimens of *S. stimpsoni* an orange-coloured ring is visible in the posterior half of the branchial regions of the carapace, just below the posterior dorso-median tooth. In the specimen from French Guiana this ring is of a brownish colour inside, yellowish white in the outer half.

The name *Sicyonia stimpsoni* was originally a manuscript name of A. Milne Edwards's. It was published for the first time by Bouvier (1905, p. 748), who provided a short description, so that the name is available as from 1905 and has to be cited with Bouvier as the author. Later A. Milne Edwards & Bouvier (1909) incorrectly synonymized the species with *S. dorsalis* Kingsley. Burkenroad (1934a, p. 121) was the first to reestablish *S. stimpsoni* as a distinct species.

Type locality. "Mer des Antilles ... entre 60 et 110 brasses" (Bouvier, 1905). A. Milne Edwards & Bouvier (1909, p. 255) when dealing with a specimen from Sta. 273, made the remark: "Un mâle adulte de 25 mm. environ, très normal et pouvant servir de type." This specimen is now definitely selected to be the lectotype of *Sicyonia stimpsoni* Bouvier, 1905. By this action the type locality is restricted to off Barbados, British West Indies, 13° 03′ 05″ N 59° 36′ 18″ W, depth 103 fathoms.

Distribution. The species is known with certainty from the coast of the U.S.A. (North Carolina to Texas), Mexico (Gulf of Campeche), and the West Indies (Cuba, Puerto Rico, Dominica, Barbados, Grenada), while it is now reported for the first time from Suriname and French Guiana.

Sicyonia typica (Boeck, 1864)

Coquette Investigations

Station 267, N.E. of the mouth of the Coppename River, 6° 42′—6° 41′ N 55° 43′—55° 45′ W; bottom mud and fine shells; depth 44 m; 20 June 1957. — 1 female. (L)
Station 306, off the mouth of the Coppename River, 6° 54′ N 56° 14′ W; bottom shells and coral; depth 49 m; 7 July 1957. — 1 female. (W)
Station 350, off the mouth of the Suriname River, 6° 47.5′ N 55° 15′ W; bottom mud and fine shells; depth 46 m; 21 July 1957. — 1 male. (W)
N.N.W. of "Suriname Rivier" lightvessel, 7° 2′ N 55° 40′ W; depth 55 m; 8 August 1957. — 1 male. (L)

Description. Bate, 1888, Rep. Voy. Challenger, Zool., vol. 24, p. 294, pl. 43 figs. 2, 3 (as *S. carinata*); A. Milne Edwards & Bouvier, 1909, p. 251, pl. 8 figs. 1-3 (as *S. Edwardsi*).

Remarks. The specimens at my disposal, which are 60 to 74 mm long, agree with the descriptions given of this species in the literature. They differ from A. Milne Edwards & Bouvier's (1909, pl. 8 fig. 1) figure in that the dorsal carina of the fifth abdominal segment ends posteriorly in a distinct high tooth; furthermore the pleurae of the first four abdominal somites show a ventrally directed acute tooth on the distal margin. In these respects the specimens show more resemblance to Bate's (1888, pl. 43 fig. 2) illustration of the species. Schmitt's (1935, fig. 6) figure does not represent this species, but is a copy of A. Milne Edwards & Bouvier's (1909, pl. 8 fig. 4) figure of *S. stimpsoni*.

Type locality. Erroneously given as Molde Fjord, west coast of Norway, the type specimen evidently being incorrectly labelled.

Distribution. The actual range of the species is West Atlantic and includes the coast of the United States (North Carolina, Florida), the West Indies (the Cayman Sea, Cuba, St. Thomas, Flanagan Passage, Sombrero, Antigua), and Brazil south to Rio de Janeiro. It is now reported for the first time from Suriname.

Section Caridea

Family Palaemonidae

Palaemon (Nematopalaemon) schmitti Holthuis, 1950 (textfig. 8)

Palaemon schmitti Holthuis, 1950, p. 97; Holthuis, 1950a, p. 36.
Palaemon (*Nematopalaemon*) *schmitti* Holthuis, 1950b, p. 9; Holthuis, 1952, p. 169, pl. 43.
"Witte berie" Lijding, 1957, pp. 119, 121.

Coquette Investigations

About 20 miles N. of the mouth of the Suriname River; depth 27 m; 6-9 May 1957; sixth voyage. — 2 specimens. (L)

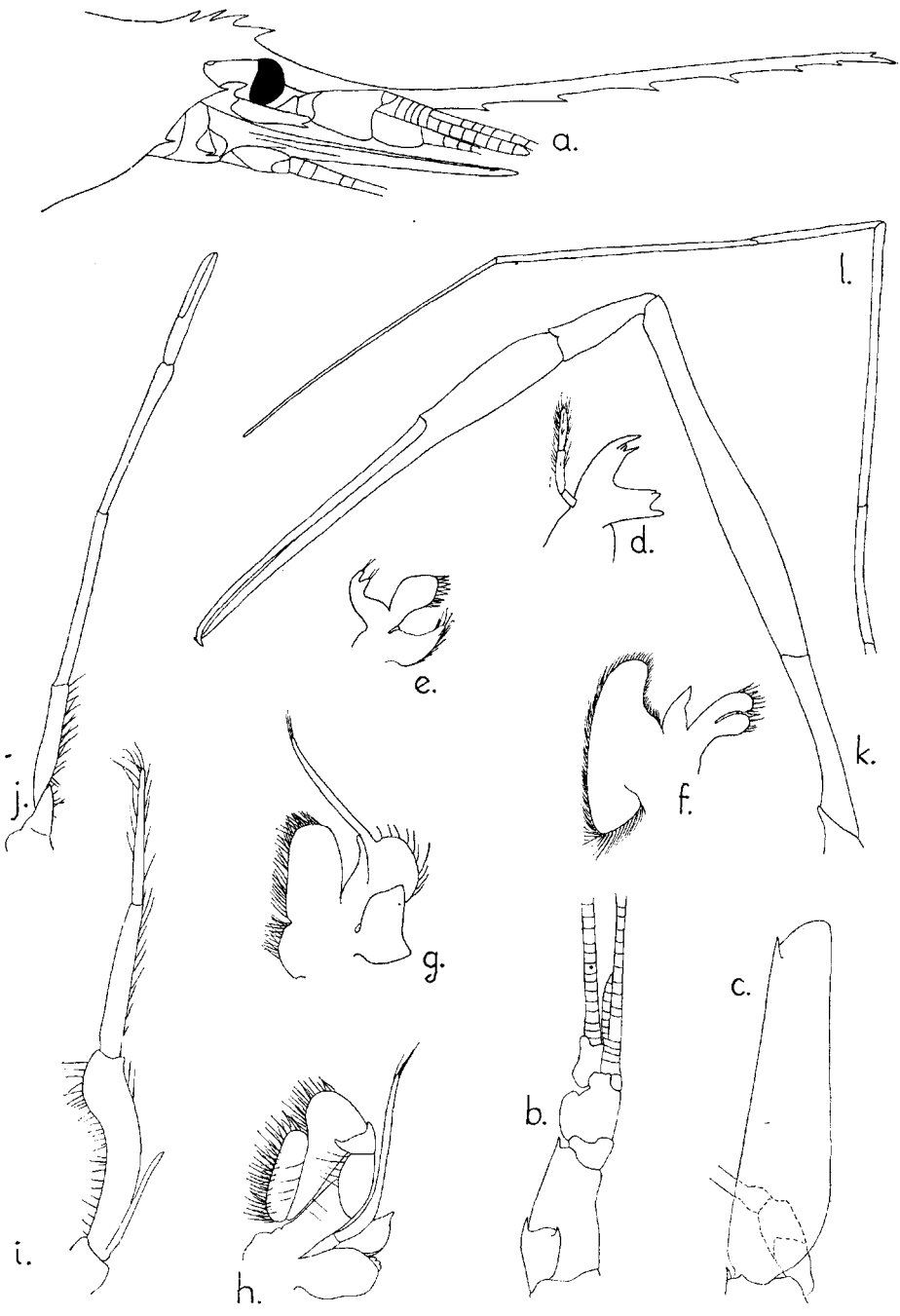


Fig. 8. *Palaemon (Nematopalaemon) schmitti* Holthuis. a, anterior part of body in lateral view; b, antennula; c, antenna; d, mandible; e, maxillula; f, maxilla; g, first maxilliped; h, second maxilliped; i, third maxilliped; j, first pereiopod; k, second pereiopod; l, third pereiopod (dactylus broken). Specimen from Suriname River near Resolutie. a, × 5; b, c, j-l, × 7; d-i, × 10. After Holthuis, 1952.

Station 1, off the mouth of the Suriname River, 6° 22′ N 55° 06′ W; bottom mud; depth 26 m; 11 May 1957. — 5 specimens. (W + L)

Station 26, N.E. of the mouth of the Suriname River, 6° 40′ N 54° 58′ W; bottom shells; depth 37 m; 12 May 1957. — 1 ovigerous female. (W)

Station 44, N.E. of the mouth of the Suriname River, 6° 18.5′ N 54° 51′ W; bottom mud; depth 18 m; 13 May 1957. — 1 ovigerous female. (W)

Station 49, N.E. of the mouth of the Suriname River, 6° 04′ N 54° 51′ W; bottom mud; depth 5 m; 13 May 1957. — 12 specimens (2 ovigerous). (W)

Station 166, between the mouths of the Coppename and Suriname Rivers, 6° 18′ N 55° 26′ W; bottom mud and shells; depth 18 m; 6 June 1957. — 11 specimens (2 ovigerous). (W)

Station 167, between the mouths of the Coppename and Suriname Rivers, 6° 18.5′ N 55° 28′ W; bottom mud and shells; depth 18 m; 6 June 1957. — 3 specimens (1 ovigerous). (W)

Museum Leiden

Mouth of the Nickerie River; bought on the fish market of Nieuw Nickerie; September 1953; D. C. Geijskes. — 116 specimens (21 ovigerous).

Sea coast near the mouth of the Nickerie River; 16 September 1953; D. C. Geijskes. — 40 specimens.

Mouth of the Coppename River near Saramacca Punt; 2 April 1957; L. B. Holthuis no. 1215. — 19 specimens (5 ovigerous).

Mouth of the Suriname River near Braamspunt; caught in trap-nets; 4 and 5 April 1957; L. B. Holthuis nos. 1217 and 1218. — 26 specimens (3 ovigerous).

Mouth of the Suriname River near Resolutie; from trap-nets; bottom mud; salinity 15.89‰; 22 December 1942; D. C. Geijskes. — about 100 specimens (including ovigerous females).

Mouth of the Suriname River; bought on the Paramaribo fish market; 1 March 1953; D. C. Geijskes; 1 April 1957; L. B. Holthuis no. 1207. — 69 specimens (2 ovigerous females in 1957 lot).

Suriname River, 10 miles above its mouth; 11 February 1954; H. W. Lijding. — 14 specimens.

Suriname River at Paramaribo, shore at spring-tide; December 1949; D. C. Geijskes. — 5 specimens.

Suriname River at Paramaribo; caught in trap-net near the Fisheries Service pier; 7 April 1957; L. B. Holthuis no. 1224. — 19 specimens (17 ovigerous).

Between "Suriname Rivier" lightvessel and the coast; 27 July 1953; D. C. Geijskes. — 6 specimens (3 ovigerous).

Mouth of the Warappa Creek near Matappica, N. of the Commewijne River; bottom mud; salinity 6 to 13‰; 11 December 1942; D. C. Geijskes. — 28 specimens (including ovigerous females).

Fishmarket, Cayenne, French Guiana; 10 September 1957; J. Durand. — 70 specimens.

Description. Holthuis, 1952, p. 169, pl. 43.

Vernacular name. The native name of the species in Suriname is "Witti bere" (= white belly).

Remarks. The ovigerous females examined range in length between 59 and 80 mm; they seem to occur throughout the year, since in the present material they are represented from the months of April, May, June, July, September, and December.

Colour. The colour of fresh specimens is white with a few red chromato-

phores on the carapace and abdomen. These chromatophores, when extended, may give the animals a pinkish tinge. The pinkish colour is most distinct in the rostrum, along the hind margin of the abdominal somites, and in the tail fan. The flagella and legs are pink, the pleopods very pale pink, and the eggs yellowish.

Type locality. Mouth of the Suriname River near Resolutie; the type specimens being those listed above from that locality.

Distribution. I do not know of any records of this species outside British and Dutch Guiana. It is most probable that the "Long-beaked Prawn" of British Guiana which Graham (1955, p. 40, pl. 6 fig. 12) identified with *Spirontocaris* sp., actually belongs to the present species. Graham, namely, described her material as follows: "Its rostrum is of great length, very slender, and saw-edged below along the outer two thirds of its length. At its base it has four teeth above and none below. The swimming feet are long, and the walking feet differ from those of the large prawn [= *Xiphopenaeus*] in having only the first two pairs chelate. The second pair is the longest. The other three pairs are very slender and easily broken. In colour, the body is paler than in the large prawn, and there are no brown freckles. The tail fin and all the feet are pinkish; if the female is carrying any eggs, they are yellow. Length 2½ ins." This description agrees so closely with *Palaemon schmitti* that there can hardly be any doubt that the Long-beaked Prawn is this species. Graham's figure, however, shows an animal with a rather high rostrum which, apart from a dorsal crest of about seven teeth, shows two more teeth on the upper margin of the rostrum between the basal crest and the tip. This drawing is evidently incorrect as it does not check with the description.

Lindner (1957, pp. 2, 21) reported *Palaemon schmitti* from British Guiana, where according to him the native name is "fine shrimp" or "white bellies".

Occurrence in Suriname. *Palaemon schmitti* occurs in large quantities in the river estuaries and, next to *Xiphopenaeus kroyeri*, it is commercially the most important prawn in Suriname. It is distinguished by the native fishermen from *Xiphopenaeus*, and different names are applied to the two species; some people, however, consider *Palaemon* to be the young of *Xiphopenaeus*. Among catches of *Palaemon schmitti* offered for sale on the markets one finds now and then a few specimens of *Hippolysmata oplophoroides* Holthuis; this is quite similar to the occasional occurrence of *Penaeus aztecus* among *Xiphopenaeus*.

Like *Xiphopenaeus*, *Palaemon schmitti* is sold fresh on the various markets in Suriname, but is also dried; sometimes it is ground up for shrimp meal.

It is caught in the same way and in the same localities as *Xiphopenaeus*. Though Lindner (1957, p. 21) discussed the economic importance of *Palaemon schmitti* for British Guiana, where it proves to be the most abundant commercial prawn, he did not mention its fishery in Suriname. Previous Suriname records of the species are: mouth of the Suriname River near Resolutie (Holthuis, 1950, 1950a, 1952), Suriname River near Paramaribo (Holthuis, 1950a, 1952), Warappa Creek (Holthuis, 1950a, 1952), Suriname (Lijding, 1957).

Palaemonetes (Palaemonetes) carteri Gordon, 1935 (textfig. 9)

Palaemonetes carteri Holthuis, 1948, p. 1113; Holthuis, 1950a, pp. 32, 36.
Palaemonetes (Palaemonetes) carteri Holthuis, 1952, p. 218, pl. 52 figs. c-o, pl. 53 figs. a-c; Maccagno & Cucchiari, 1957, p. 70, fig. 17.

Museum Leiden

On highway between Coronie and Paramaribo at 19.7 to 19.8 km E. of Coronie; swamp creek with clear brown water, salinity 0.08‰, pH 5.5; 21 December 1948; 1948-1949 Suriname Expedition no. 4574. — 4 specimens.

Artificial pool on highway between Coronie and Paramaribo at 21.6 km E. of Coronie; clear water, salinity 0.09‰, pH 8; 20 December 1948; 1948-1949 Suriname Expedition no. 4387. — 28 specimens (10 ovigerous).

Ditch along the highway near Carl François, 86 km W. of Paramaribo; 2 April 1957; L. B. Holthuis no. 1209. — 37 specimens (1 ovigerous).

Pool along highway near Groningen, 45 km W. of Paramaribo; 2 April 1957; L. B. Holthuis no. 1216. — 2 specimens (1 ovigerous).

Saramacca Canal, Paramaribo; 27 June and 4 July 1958; D. C. Geijskes. — 8 specimens.

Small ditches along secondary road, Charlesburg near Paramaribo; 8 April 1957; L. B. Holthuis, no. 1226. — 31 specimens.

Paramaribo; August 1911; W. C. van Heurn. — 36 specimens.

Small creek near the highway from Paramaribo to Domburg, slightly N.W. of Para River; 31 March 1957; L. B. Holthuis no. 1201. — 5 specimens (2 ovigerous).

Ditch along Pericaweg, Lelydorp, S. of Paramaribo; stagnant water; 31 March 1957; L. B. Holthuis no. 1206. — 95 specimens (9 ovigerous).

Swamp along Meursweg near Onverwacht, S. of Lelydorp; 31 March 1957; L. B. Holthuis no. 1205. — 22 specimens.

Swamp near Bersaba near Republiek; 3 September 1955; P. Wagenaar Hummelinck no. 642. — 76 specimens (1 ovigerous).

Coropina Creek near Bersaba; fresh water; 9 April 1957; L. B. Holthuis no. 1232. — 54 specimens (2 ovigerous).

Side creek of Coropina Creek near railroad, Republiek; water brown, acid, fast flowing, pH 5, bottom sand with dead leaves; 4 September 1948; 1948-1949 Suriname Expedition no. 26. — 38 specimens.

Side creek of Coropina Creek near Vierkinderen near Republiek; open savanna creek, water flowing, pale brown, pH 5.5-6; bottom kaolin-clay with rather much vegetable mould; 5 September 1948; 1948-1949 Suriname Expedition nos. 79, 81, 82. — 228 specimens (1 ovigerous).

Coropina Creek near Republiek; fresh water; 9 April 1957; L. B. Holthuis no. 1231. — 201 specimens (15 ovigerous).

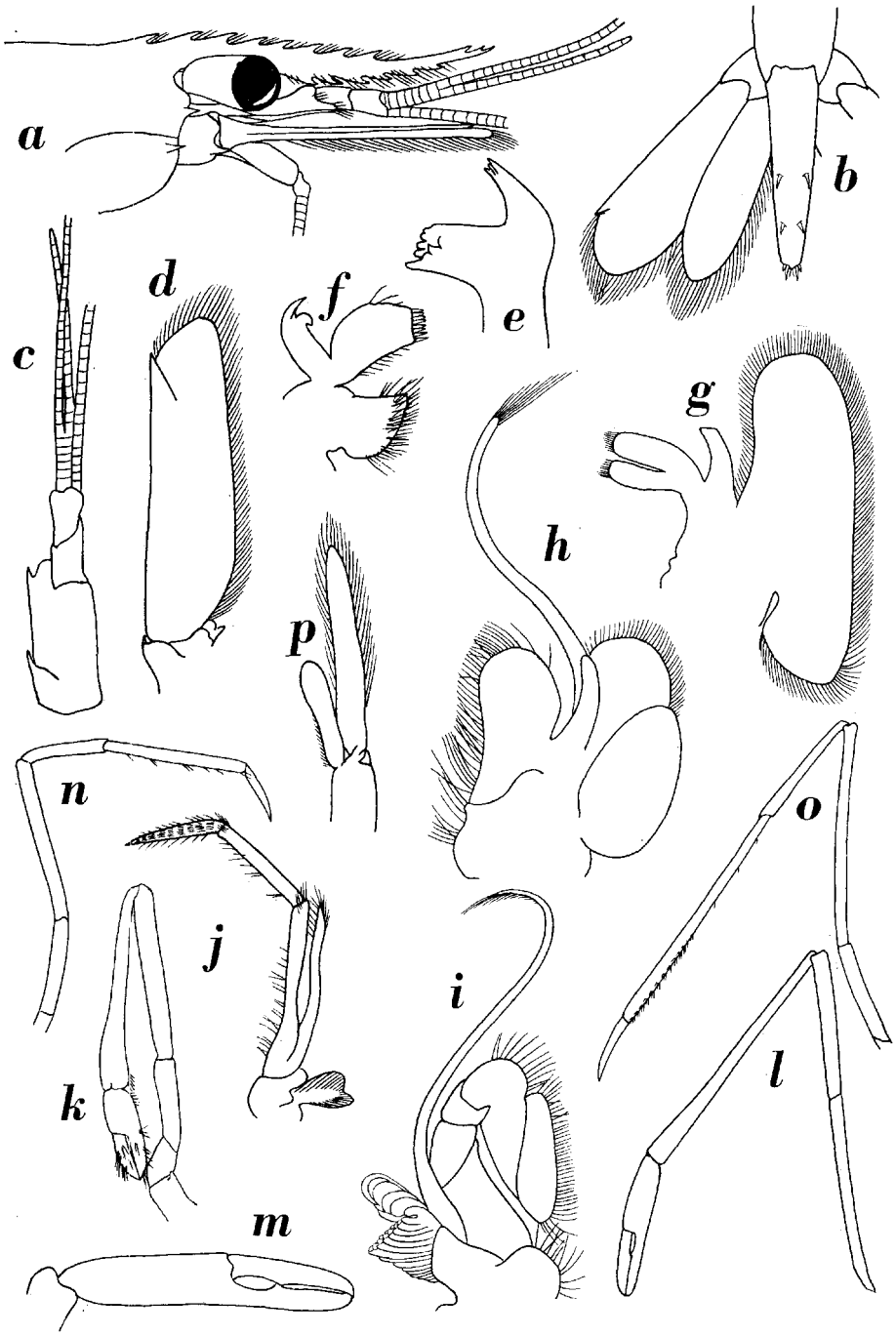


Fig. 9. *Palaemonetes carteri* Gordon. a, anterior part of body in lateral view; b, telson and uropod in dorsal view; c, antennula; d, scaphocerite; e, mandible; f, maxillula; g, maxilla; h, first maxilliped; i, second maxilliped; j, third maxilliped; k, first pereiopod; l, second pereiopod; m, chela of second pereiopod; n, third pereiopod; o, fifth pereiopod; p, first pleopod of male. Specimen from Suriname. a-d, j-l, × 10; e-i, × 25; m, × 20; n-p, × 6. After Holthuis, 1952.

Troelinde Creek near Zanderij, about 40 km S. of Paramaribo; forest creek, water brown, acid, pH 4.5; 14 January 1943; D. C. Geijskes. — 1 specimen.

Zanderij; 3 August 1948; P. Wagenaar Hummelinck no. 409. — 25 specimens (5 ovigerous).

Small forest creek near Zanderij; water brown, acid, shaded; 9 April 1957; L. B. Holthuis no. 1229. — 78 specimens (5 ovigerous).

Open creek near Zanderij airfield; 9 April 1957; L. B. Holthuis no. 1230. — 73 specimens (10 ovigerous).

Small forest creek near Sectie O, on the railroad from Paramaribo into the interior at about 70 km S. of Paramaribo; 10 April 1957; L. B. Holthuis no. 1233. — 5 specimens (1 ovigerous).

Small forest creek near Sectie O, about 70 km S. of Paramaribo on the railroad; water clear, pH 5.4; bottom shingle; 7 June 1947; D. C. Geijskes. — 9 specimens.

Guyana Goud Placer, about 95 km S. of Paramaribo on the railroad; October 1911; W. C. van Heurn. — 20 specimens (2 ovigerous).

Small forest creek near Gros, about 100 km S. of Paramaribo on the railroad; 10 April 1957; L. B. Holthuis no. 1234. — 33 specimens (10 ovigerous).

Small forest creek near Brownsweg, about 115 km S. of Paramaribo on the railroad; creek containing but little, clear water; 10 April 1957; L. B. Holthuis no. 1235. — 39 specimens (6 ovigerous).

Kabel, about 130 km S. of Paramaribo at the end of the railroad; in artificial pool; water fresh, brownish; bottom kaolin-clay; 23 September 1938; D. C. Geijskes. — 6 specimens.

Makambi Creek near Kabel; 24 September 1938; D. C. Geijskes. — 8 specimens.

Makambi Creek near Kabel; 31 August 1955; P. Wagenaar Hummelinck no. 647. — 9 specimens.

Shore of Suriname River near Kabel; 1 September 1955; P. Wagenaar Hummelinck no. 644. — 1 specimen.

Kabel; in ditch; 2 September 1955; P. Wagenaar Hummelinck no. 646. — 58 specimens (1 ovigerous).

Swamp 7.7 km S. of the coast near the Wiawia Bank; water brownish, salinity 0.06 ‰, pH 5.2-5.5; 24 November 1948; 1948-1949 Suriname Expedition no. 3624. — 3 specimens.

Forest pool 7.8 km S. of the coast near the Wiawia Bank; salinity 0.06 ‰, pH 6.6; 24 November 1948; 1948-1949 Suriname Expedition no. 3612. — 12 specimens.

Swamp 9.2 km S. of the coast near the Wiawia Bank; water clear, salinity 0.06 ‰; bottom clay; 28 November 1948; 1948-1949 Suriname Expedition no. 3969. — 73 specimens (3 ovigerous).

Forest pool 12.1 km S. of the coast near the Wiawia Bank; bottom black mouldy mud with dead leaves and branches; 26 November 1948; 1948-1949 Suriname Expedition no. 3826. — 4 specimens.

Pool 12.6 km S. of the coast near the Wiawia Bank; water clear, brown, acid; bottom with many dead leaves and roots; 26 November 1948; 1948-1949 Suriname Expedition no. 3825. — 24 specimens (6 ovigerous).

Swamp 13.3 km S. of the coast near the Wiawia Bank; 27 November 1948; 1948-1949 Suriname Expedition no. 3965. — 37 specimens (4 ovigerous).

Pool in swamp 13.7 km S. of the coast near the Wiawia Bank; 27 November 1948; 1948-1949 Suriname Expedition no. 3966. — 14 specimens (1 ovigerous).

Third Swamp, 19 km N. of Moengotapoe; water clear, brown; 22 October 1948; 1948-1949 Suriname Expedition no. 2298. — 9 specimens.

First Swamp, 17.3 km N. of Moengotapoe; salinity 0.01 ‰, pH 6.7; bottom clay; 24 October 1948; 1948-1949 Suriname Expedition no. 2299.— 1 specimen.

Djai Creek, 8.4 km N. of Moengotapoe; water turbid brown, pH 5.3-5.4; 8 October 1948; 1948-1949 Suriname Expedition nos. 1258, 1262. — 131 specimens.

Wane Creek, 5.3 km N. of Moengotapoe; water brown, acid, salinity 0.015 ‰, pH 5.3; September 1948; 1948-1949 Suriname Expedition no. 856. — more than 1500 specimens.

Small forest creek 0.4 km N. of Moengotapoe; bottom sand with many dead leaves; 21 September 1948; 1948-1949 Suriname Expedition no. 387. — 1 specimen.

Lai Creek, Moengotapoe; water brown, acid, pH 5-5.5; bottom sand with dead leaves; 21 September 1948; 1948-1949 Suriname Expedition no. 386. — 41 specimens (8 ovigerous).

Near the Marowijne River; autumn 1951; E. C. Stoll don. — 2 specimens (1 ovigerous).

Suriname; August 1951; E. C. Stoll don. — 6 specimens.

Museum Amsterdam

Zanderij; 12-13 February 1957; J. van der Kamp. — 4 specimens.

Museum Berlin

Upper Commewijne River; February 1908; C. Heller. — 2 specimens (1 ovigerous). (There is also a label with this material reading "Paramaribo Niederl. Guyana. C. Heller").

Suriname; J. Michaelis. — 29 specimens (20 ovigerous).

Museum Hamburg

Paramaribo; J. Michaelis, received 30 September 1898 and 31 January 1899; 1908 and 1909, C. Heller. — 61 specimens (26 ovigerous).

Side creek of Para River; 10 April 1910; C. Heller. — 12 specimens (11 ovigerous).

Upper Para River; J. Michaelis; received 13 June 1901. — 21 specimens (5 ovigerous).

Description. Holthuis, 1952, p. 218, pl. 52 figs. c-o, pl. 53 figs. a-c.

Remarks. The specimens examined vary in length between 8 and 36 mm. The ovigerous females are 22 to 36 mm long, they were collected in the months of February, March, April, August, September, October, November, and December, and thus appear to be found all through the year.

Colour. In the living specimen the eggs are of a green colour. Often two or three dark lines are visible on the gills. A colour description of Suriname specimens was given by Holthuis (1952).

The Trench Shrimp described and figured by Graham (1955, p. 41, pl. 5 fig. 8) after material from British Guiana, probably is the present species, to which possibly also belongs her Freshwater Shrimp (Graham, 1956, p. 172, fig. 173), though both may represent *Macrobrachium jelskii* (Miers).

Type locality. Creek near Upper Cuyuni River, British Guiana.

Distribution. Venezuela and the three Guianas.

Occurrence in Suriname. *Palaemonetes carteri* is the most common prawn of small streams, ditches, pools and swamps of the coastal region of Suriname. As a rule it may be found in shallow waters among water plants, often in sunny, but also in heavily shaded places. Though it seems to have a slight preference for somewhat acid milieus, it has been found in waters with pH

ranging from 4.5 to 8. It is decidedly a fresh water form, and has been reported from waters with the salinity ranging from 0.01 to 0.09‰. In the last 10 years the species has been repeatedly mentioned from Suriname. Holthuis (1948) reported upon the above mentioned material from Troelinde Creek, Sectie O, and Kabel; the same author (Holthuis, 1950a) mentioned the material collected by the 1948-1949 Suriname Expedition, the localities of which were described more extensively than has been done here, while also the material from Paramaribo, Guyana Goud Placer and Makambi Creek (leg. Geijskes) was reported upon, the locality Saramacca River Basin given in the same publication rests upon a lapsus. In 1952 Holthuis described and figured the species, giving at the same time an enumeration of all the localities whence it was known at that time. Maccagno & Cucchiari (1957) dealt with material from Sta. 856 of the 1948-1949 Suriname Expedition (Wane Creek) which has been presented by the Leiden Museum to the Istituto e Museo di Zoologia of Turin, Italy.

Macrobrachium amazonicum (Heller, 1862) (textfig. 10)

Palaemon Amazonicus De Man, 1879, p. 166.
Palaemon Dieperinkii (De Haan MS) De Man, 1879, p. 167; Sunier, 1925, p. cxv.
Palaemon lamarrei Thompson, 1901, p. 19.
Palaemon amazonicus Jentink, 1912, p. 13; Sunier, 1925, p. cxv.
Macrobrachium amazonicum Holthuis, 1950a, p. 29; Holthuis, 1952, p. 18, pl. 2.

Museum Leiden

Saramacca River near Groningen; September 1911; W. C. van Heurn. — 1 ovigerous female.

"Suriname Rivier" lightvessel; 1953; H. W. Lijding. — 1 ovigerous female.

Suriname River 10 miles above the mouth; 11 February 1954; H. W. Lijding. — 2 specimens (1 ovigerous).

"Geijersvlijt" plantation, just N. of Paramaribo; July 1911; W. C. van Heurn. — 2 specimens.

Swamp behind "Cultuurtuin" (Agricultural Experiment Gardens), Paramaribo; 10 March 1939; H. W. C. Cossee. — 1 specimen.

Saramacca Canal, Paramaribo; 25 November 1957, 27 June 1958; D. C. Geijskes. — 11 specimens (2 ovigerous, from 25 November).

Paramaribo; 1911; W. C. van Heurn. — 13 specimens.

Suriname River near "Peperpot" Plantation, S. of Paramaribo; muddy eastern shore of the river, water brackish; 5 January 1949; 1948-1949 Suriname Expedition no. 6209. — 1 specimen.

Pool near the confluence of the Para and Suriname Rivers, S. of Paramaribo; fresh water; bottom muddy with dead leaves; 31 March 1957; L. P. Holthuis no. 1203. — 27 specimens.

Suriname River near Kabel, about 130 km S. of Paramaribo; 21-28 September 1938; D. C. Geijskes. — 10 specimens.

Mouth of the Marowijne River near Langamankondre; shallow brackish water; sandy bottom; 19 September 1948; 1948-1949 Suriname Expedition no. 282. — 1 specimen.

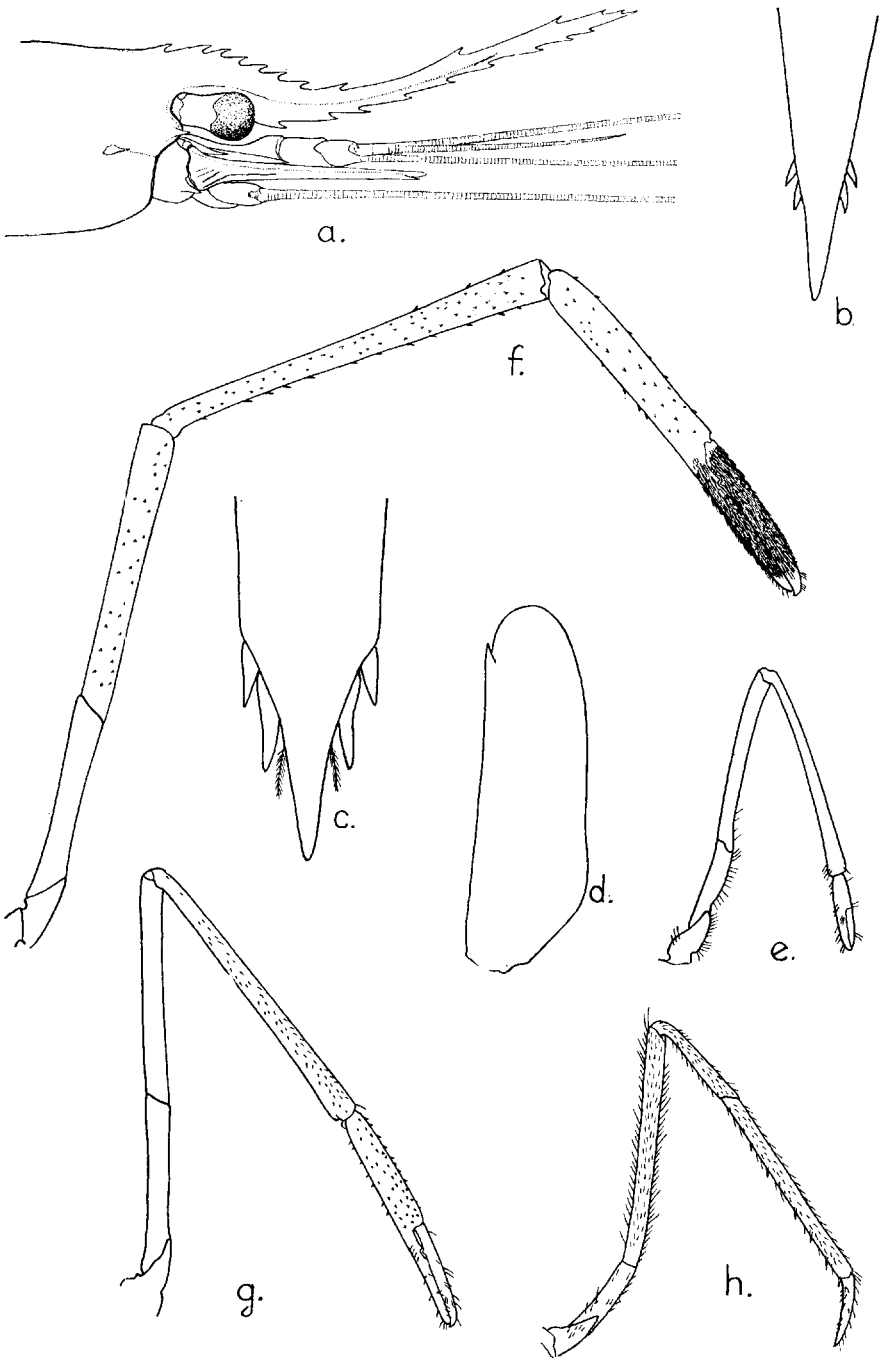


Fig. 10. *Macrobrachium amazonicum* (Heller). a, anterior part of body in lateral view; b, tip of telson of adult specimen; c, tip of telson of juvenile; d, scaphocerite; e, first leg; f, second leg of adult male; g, second leg of female; h, third leg of adult male. Specimens from Suriname. a, × 1.5; b, × 10; c, × 50; d-h, × 2. After Holthuis, 1952.

Suriname; 1816-1836; H. H. Dieperink. — 15 specimens (types of *Palaemon dieperinkii* (De Haan MS) De Man).
Suriname; C. F. Kraepelin & H. Holm. — 2 specimens (1 ovigerous).
Suriname; fresh water; 1907; M. D. Horst. — 4 specimens.
Suriname; 1910; D. G. J. Bolten. — 10 specimens.
Saint Laurent, Marowijne River, French Guiana; May 1958; J. Durand. — 2 specimens.
Port Inini, Marowijne River, French Guiana; November 1952; J. Durand. — 1 specimen.

Museum Amsterdam

Sommelsdijksche Creek, Paramaribo; brackish water; February 1923. — 1 specimen.
Suriname. — 1 specimen.

Museum Berlin

Paramaribo; C. Heller. — 11 specimens.
Marowijne River near Albina; C. Heller. — 5 specimens.

Museum Hamburg

Paramaribo; J. Michaelis, received 31 January 1899; 1908 and 1909, C. Heller. — 25 specimens (1 ovigerous).

Description. Holthuis, 1952, p. 18, pl. 2.

Remarks. The specimens examined vary between 12 and 125 mm in length. Ovigerous females were found in the months of February, September, and November.

Colour. The following colour description was made after living specimens from a pool near the confluence of the Para and Suriname Rivers. The body is transparent and gives a general impression of grey. A dark line extends over the distal 3/4 of the midrib of the rostrum; another longitudinal dark line is visible on the carapace behind the antennal spine. Along each of the lateral margins of the telson a line of dark colour can be seen. The ophthalmic peduncle is provided with a spot formed by red and yellow chromatophores. The antennular peduncle has its entire inner margin and the outer margin of its basal segment of a dark colour. Also the entire inner flagellum of the antennula is darkly coloured, the outer flagellum being pale. The exopod of the uropod possesses a dark line along its outer margin, while a conspicuous dark spot is present in the distal part of this exopod. Another dark longitudinal line extends just externally of the middle of the uropodal endopod.

Type locality. "Wurde von Natterer im Amazonenstrome gefunden" (Heller, 1862, p. 419). Johann Natterer, who from 1817 to 1835 collected in Brazil for the Vienna Museum, travelled from Rio de Janeiro across the Matto Grosso to the Rio Negro and then followed the Amazon down (cf. Eigenmann, 1917, Mem. Mus. comp. Zoöl. Harvard, vol. 43, pl. 1). The

type locality of the present species therefore is the Amazon River somewhere between Manaos and its mouth.

Distribution. The species is known from various rivers in Venezuela and the three Guianas, from the Amazon basin in Brazil, Bolivia, Peru, and Ecuador, and from the Paraguay River basin. The species was reported from British Guiana by Graham (1955, p. 40, pl. 5 fig. 11) under the name "Small Prawn".

Occurrence in Suriname. In Suriname *Macrobrachium amazonicum* has been found mostly in the larger rivers, in fresh or brackish water. The find of the species near the "Suriname Rivier" lightvessel, provided that the lot is correctly labelled, seems to indicate that it is sometimes washed out into the sea. Previous Suriname records are: Saramacca River near Groningen (Holthuis, 1950a, 1952), Suriname River near Paramaribo and near Kabel (Holthuis, 1950a, 1952), Marowijne River near Langamankondre (Holthuis, 1950a, 1952), Suriname (De Man, 1879; Thompson, 1901; Jentink, 1912; Sunier, 1925; Holthuis, 1950a, 1952). As already pointed out by De Man (1879), Sunier (1925), and Holthuis (1952), the specimen which De Haan (1849, p. 171) reported upon as *Palemon Lamarrei* from Japan, actually belongs to the present species. It is most likely that it has been incorrectly labelled as to the locality and originally had formed part of Dieperink's Suriname collection.

The 15 specimens listed above as collected by Dieperink in Suriname probably are those mentioned by him in his list of the consigment sent on 1 April 1827 as "Surinaamsche kreeftgarnalen" (see p. 22). The specimens are the types of *Palaemon Dieperinkii* (De Haan MS) De Man, 1879.

Macrobrachium jelskii (Miers, 1877) (textfig. 11)

Macrobrachium amazonicus Reyne, 1923, p. 39.

Macrobrachium jelskii Holthuis, 1948, p. 1111; Holthuis, 1950a, p. 30; Holthuis, 1950b, p. 15; Holthuis, 1952, p. 26, pl. 4 figs. a-d; Maccagno & Cucchiari, 1957, p. 132, fig. 36.

Museum Leiden

Nanni Creek near Dam van Wouw, Nickerie River basin; swamp creek; pH about 5; 12 February 1942; D. C. Geijskes. — 4 juveniles.

In artificial pool along highway 21.6 km E. of Coronie; salinity 0.09 ‰, pH 8; bottom clay; 20 December 1948; 1948-1949 Suriname Expedition no. 4387. — 11 specimens.

"Geijersvlijt" plantation just N. of Paramaribo; July 1911; W. C. van Heurn. — numerous specimens, including ovigerous females.

Saramacca Canal, Paramaribo; 25 November 1957, 27 June and 4 July 1958; D. C. Geijskes. — 40 specimens (1 ovigerous, from 25 November).

Paramaribo; 1911, July 1911, August 1911; W. C. van Heurn. — numerous specimens, including ovigerous females in the lots of 1911 and July 1911.

Coropina Creek near Bersaba, near Republiek; fresh water; 9 April 1957; L. B. Holthuis no. 1232. — 2 specimens.

Coropina Creek near Republiek; fresh water; 9 April 1957; L. B. Holthuis no. 1231. — 95 specimens (3 ovigerous).

Side creek of Coropina Creek near Vierkinderen bridge, Republiek; water pale brown, pH 5.5-6; bottom kaolin clay with rather much vegetable mould; 5 September 1948; 1948-1949 Suriname Expedition no. 79. — 1 specimen.

Upper course of Coropina Creek; 29 October 1953; D. C. Geijskes. — 1 specimen.

Side creek of Warappa Creek, N. of the Commewijne River; in pool; 7 April 1957; L. B. Holthuis no. 1223. — 14 specimens.

Mouth of the Marowijne River near Galibi; in a small creek which empties in the river; water brackish and muddy; 9 November 1948; 1948-1949 Suriname Expedition no. 2511. — 4 specimens.

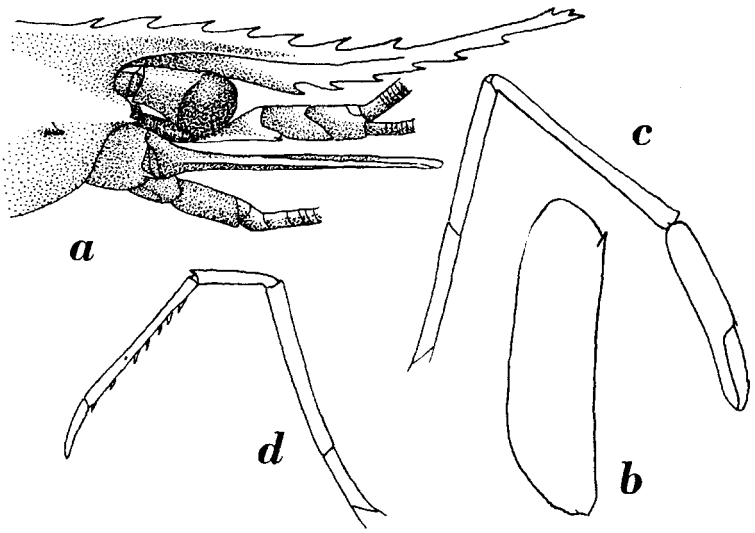


Fig. 11. *Macrobrachium jelskii* (Miers). a, anterior part of body in lateral view; b, scaphocerite; c, second leg of adult male; d, third leg of adult male. Specimen from Suriname. After Holthuis, 1952.

Museum Amsterdam

"Pieterszorg" plantation, mouth of the Commewijne River near Paramaribo; February 1923. — 16 specimens (1 ovigerous).

Suriname; 1922 Suriname Expedition to Hendrik Mt.; J. W. Gonggrijp & G. Stahel. — 19 specimens.

Museum Berlin

Suriname; J. Michaelis. — 9 specimens.

Suriname; H. B. Möschler. — 13 specimens (12 ovigerous).

Museum Hamburg

Coronie; fresh water trench; November 1909; C. Heller. — 6 specimens.

Paramaribo; J. Michaelis, received 30 September 1898 and 31 January 1899; 1908 and 1909, C. Heller. — 6 specimens.
Side creek of Para River; 10 April 1910; C. Heller. — 2 specimens.
Upper Para River; J. Michaelis; received 13 June 1901. — 1 specimen.
Side creek of Upper Commewijne River; November 1908; C. Heller. — 4 specimens.

Museum Washington

Plantation ditches, Paramaribo; 1922; A. Reyne. — 32 specimens (13 ovigerous).

Description. Holthuis, 1952, p. 26, pl. 4 figs. a-d.

Remarks. The present specimens are 20 to 53 mm long, the ovigerous females 47 to 52 mm.

Type locality. Oyapock, French Guiana.

Distribution. The species has been reported from Venezuela, Trinidad, Suriname and French Guiana.

Occurrence in Suriname. Though this is essentially a fresh water species, it has also been found in somewhat brackish habitats; that it is not very particular as far as habitats are concerned is furthermore shown by that it is found in clear as well as in muddy, in stagnant as well as in running, in acid as well as in alcaline waters (pH 5.5-8). Ovigerous females have been collected in the months of February, April, July and November.

In the 1922 annual report of the Department of Agriculture, Industry and Trade of Suriname, Reyne (1923, p. 39) mentioned "Macrobrachium amazonicus Heller (= M. jelskii Miers = M. ensiculus Smith), zoetwatergarnaal (Sarra-sarra), algemeen in de plantagetrenzen; wordt gegeten." (M.a. ... fresh water prawn, native name Sarra-sarra, common in plantation ditches; used for food). Reyne indicated that the identification of this material was made at the U.S. National Museum, Washington, D.C. In 1948 Reyne's material, which originated from Paramaribo, was examined by me in Washington and proved to belong to *M. jelskii*. It has been mentioned by me in previous papers (Holthuis, 1950a, p. 30; 1952, p. 27) before I was aware of Reyne's publication. Reyne thus was the first to report upon Suriname specimens of the present species. The next Suriname record of *M. jelskii* concerned the above mentioned material from Nanni Creek (Holthuis, 1948, 1952), while the specimens from the 1948-1949 Suriname Expedition, those from "Geijersvlijt" plantation, and those from Paramaribo (leg. Van Heurn), all of which are listed in the present paper, have been mentioned before by Holthuis (1950a, 1952). Maccagno & Cucchiari (1957) dealt with material from "Geijersvlijt" plantation obtained by the Turin Museum from the Rijksmuseum van Natuurlijke Historie at Leiden.

Macrobrachium acanthurus (Wiegmann, 1836)

Palaemon p.p. Bakhuis, 1902, p. 839.
Palaemon acanthurus Jentink, 1903, p. 11; Jentink, 1904, p. 6.
Palaemon (Eupalaemon) acanthurus De Man, 1912, p. 243.
Macrobrachium acanthurus Holthuis, 1950a, p. 35; Holthuis, 1952, p. 45, pl. 8, pl. 9 figs. a, b.

Museum Leiden

Coppename River; 1901; 1901 Coppename Expedition. — 3 specimens (2 ovigerous).
Suriname; Koloniaal Museum, Haarlem, don. — 1 specimen.

Description. Holthuis, 1952, p. 45, pl. 8, pl. 9 figs. a, b.

Type locality. Brazil.

Distribution. The species inhabits fresh and brackish waters of the American east coast between Georgia (U.S.A.) and southern Brazil, it is rather common in the West Indies.

Occurrence in Suriname. This species seems to be comparatively rare in Suriname. The Leiden Museum possesses only the above 4 specimens, while no other Suriname material is known to me. The first record of this species from Suriname was the one by Jentink (1903), who mentioned the above listed specimen from the Haarlem Colonial Museum. The same specimen was mentioned again by Jentink (1904) and De Man (1912). All of the material listed above was dealt with by me in 1950a and 1952.

The "3 Palaemon" collected by the Coppename Expedition and mentioned by Bakhuis (1902, p. 839) in his narrative of this expedition, probably stand for the three lots of *Macrobrachium* brought home by that expedition, one of these lots being formed by the above three specimens of *M. acanthurus*, the other two consisting of *M. olfersii* (Wiegmann).

Macrobrachium surinamicum Holthuis, 1948 (textfig. 12)

Macrobrachium surinamicum Holthuis, 1948, p. 1112; Holthuis, 1950a, p. 35; Holthuis, 1950b, p. 18; Holthuis, 1952, p. 57, pl. 12.

Museum Leiden

Mouth of the Suriname River; 5 July 1944; D. C. Geijskes. — 6 specimens (paratypes).

"Geijersvlijt" plantation N. of Paramaribo; July 1911; W. C. van Heurn. — 94 specimens (60 ovigerous, 1 with Bopyrid in branchial chamber) (holo- and paratypes).

Saramacca Canal, Paramaribo; 1 October 1953, 27 June and 4 July 1958; D. C. Geijskes. — 148 specimens (16 and 9 ovigerous females from 27 June and 4 July respectively; 1 specimen with a Bopyrid and one with a Cymothoid parasite).

Suriname River near Paramaribo; 23 March 1939; H. W. C. Cossee. — 1 specimen (paratype).

Paramaribo; July and October 1911; W. C. van Heurn. — 121 specimens (70 ovigerous, 1 with Bopyrid in branchial chamber) (paratypes).

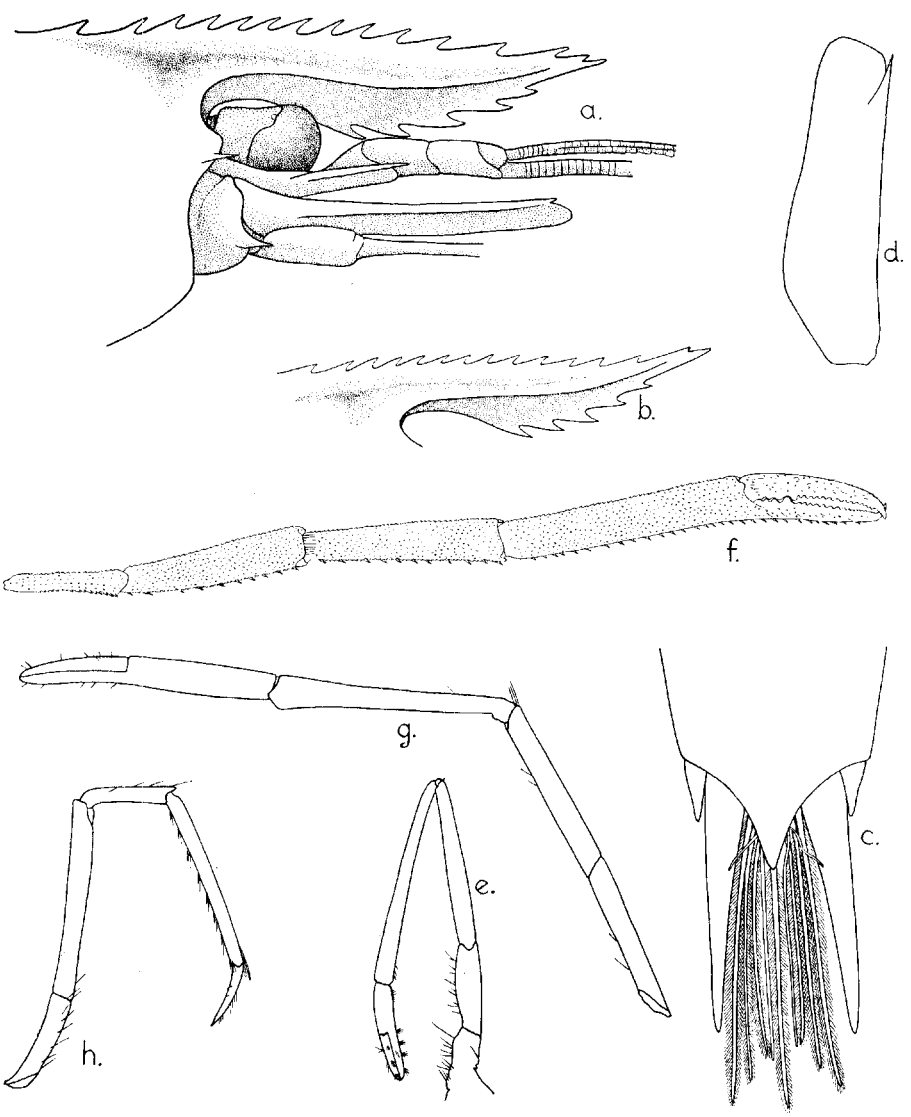


Fig. 12. *Macrobrachium surinamicum* Holthuis. a, anterior part of body of male in lateral view; b, rostrum of ovigerous female in lateral view; c, tip of telson in dorsal view; d, scaphocerite; e, first pereiopod; f, second pereiopod of adult male; g, second pereiopod of female; h, third pereiopod. Specimens from plantation "Geijersvlijt", Paramaribo. a, b, d, e, g, h, × 5.5; c, × 40; f, × 3. After Holthuis, 1952.

Pool near the confluence of the Para and Suriname Rivers, S. of Paramaribo; fresh water; bottom muddy with dead leaves; 31 March 1957; L. B. Holthuis no. 1203. — 3 juveniles.

Suriname; fresh water; 1907; M. D. Horst. — 3 specimens (paratypes).

Suriname; 6 July 1944; D. C. Geijskes. — 6 specimens (3 ovigerous) (paratypes).

Museum Berlin

Paramaribo; C. Heller. — 5 specimens (2 ovigerous).

Museum Hamburg

Paramaribo; J. Michaelis, received 31 January 1899; 1908 and 1909, C. Heller. — 5 specimens (2 ovigerous).

Description. Holthuis, 1952, p. 57, pl. 12.

Remarks. The specimens are 17 to 55 mm long. Ovigerous females are 27 to 45 mm, and were found in the months of June, July, and October. The largest specimen, a male of 55 mm, is the holotype.

Type locality. "Geijersvlijt" plantation N. of Paramaribo.

Distribution. The species has been reported from Colombia, British Guiana, and Suriname, while there is also a doubtful record from Venezuela. The species lives in fresh and also in somewhat brackish waters.

Occurrence in Suriname. Previous Suriname records are: mouth of the Suriname River (Holthuis, 1948, 1952), "Geijersvlijt" plantation (Holthuis, 1948, 1952), Suriname River near Paramaribo (Holthuis, 1950a, 1952), Suriname (Holthuis, 1948, 1950a, 1950b, 1952).

Macrobrachium brasiliense (Heller, 1862)

Macrobrachium brasiliense Holthuis, 1948, p. 1111; Holthuis, 1950a, p. 30; Holthuis, 1952, p. 79, pl. 19.

Museum Leiden

Well in the Emma Range, basin of the Rechter Coppename River; altitude 150 m; water clear, pH 6; 30 October 1943; D. C. Geijskes. — 1 specimen.

Bigidjompo, Lolobroki, and Mispel Creeks, near the railway at 121 km S. of Paramaribo; 30 November 1949; C. Bleys. — 34 specimens.

Waktibasoe Creek near goldmining camp near Browns Mt.; 10 August 1958; D. C. Geijskes. — 1 specimen.

In mountain creek near the summit of Browns Mt.; altitude 400 m; water clear, pH 6.2; 16 September 1938; D. C. Geijskes. — 8 specimens.

Creek near Browns Mt.; below the first waterfall; 17 September 1938; D. C. Geijskes. — 1 juvenile.

Lower course of creek near Browns Mt., near Suriname River; 18 September 1938; D. C. Geijskes. — 1 juvenile.

Makambi Creek near Kabel; 27 September 1938; D. C. Geijskes. — 9 juveniles.

Makambi Creek near Kabel; 31 August 1955; P. Wagenaar Hummelinck no. 647. — 3 juveniles.

Suriname River near Kabel, in pool; 1 September 1955; P. Wagenaar Hummelinck no. 644A. — 2 juveniles.

Mapane Creek in Commewijne basin; forest creek; 10 December 1953; D. C. Geijskes. — 1 juvenile.

Small forest creek 0.4 km N. of Moengotapoe; water acid, brown; bottom sand with many dead leaves; 21 September 1948; 1948-1949 Suriname Expedition no. 387. — 3 specimens.

Nassau Range, 2 km W. of Marowijne River at 4° 47′ N; water fast flowing, clear, pH 6.7; bottom shingle and sand; 22 and 25 February 1949; 1948-1949 Suriname Expedition nos. 7392 and 7646. — 56 specimens.

Bleeders Creek, Nassau Range at 7 km W. of Marowijne River at 4° 47′ N; between branches and leaves among stones at the foot of a large fall; water fast flowing, clear; 7 March 1949; 1948-1949 Suriname Expedition no. 8327. — 1 specimen.

Small creek in Nassau Range, 3.6 km W. of Marowijne River at 4° 47′ N; fast flowing clear water; 11 March 1949; 1948-1949 Suriname Expedition no. 8697. — 25 specimens.

Shaded mountain creek in Nassau Range, 11.2 km W. of Marowijne River at 4° 47′ N; water clear, pH 6.5; bottom sand and shingle; 15 March 1949; 1948-1949 Suriname Expedition no. 9008. — 147 specimens (1 ovigerous).

Apisiké, upper Paru River, Brazil, just S. of the Suriname border, Grens Range; 15 to 20 April 1952; 1952 Medical Expedition no. 1265. — 1 specimen.

Apisiké; forest creek; 20 April 1952; 1952 Medical Expedition no. 1267. — 2 specimens.

Saut Patawa, Mana River, French Guiana; October 1957; J. Durand. — 10 specimens.

Description. Holthuis, 1952, p. 79, pl. 19.

Remarks. The identity of the above mentioned juveniles (length 10 to 35 mm) is not fully certain, since it is very hard to distinguish them from juveniles of related species.

Type locality. "In einem Bache zu Camaroes in Brasilien" (Heller, 1862, p. 419). As has already been pointed out by previous authors the word "Camaroes" probably is not a locality but the native (Portuguese) name for prawns.

Distribution. E. Colombia (Orinoco basin), British Guiana, Suriname, the Amazon basin (N.E. Peru, E. Ecuador, W. Brazil), Matto Grosso.

Occurrence in Suriname. The species seems to prefer rather fast flowing small mountain streams; most specimens have been found in the anterior mountain range and farther into the interior of Suriname. The specimens from near Moengotapoe show that the species may also penetrate into the coastal region. Previous Suriname records are: Right Coppename River basin in Emma Range (Holthuis, 1948, 1952), near Browns Mt. (Holthuis, 1948, 1952), Bigidjompo, Lolobroki, and Mispel Creeks (Holthuis, 1950a; 1952), near Moengotapoe (Holthuis, 1950a, 1952), Nassau Range (Holthuis, 1950a, 1952). All this material is treated in the present paper.

Macrobrachium olfersii (Wiegmann, 1836)

Palaemon p.p. Bakhuis, 1902, p. 839.
"een vlugge garnalensoort" Geijskes, 1942, p. 121; Geijskes, 1957, p. 287.
Macrobrachium? olfersii Holthuis, 1948, p. 1112; Holthuis, 1950a, p. 35.
Macrobrachium olfersi Holthuis, 1952, p. 95, pl. 24, pl. 25 figs. a, b.

Museum Leiden

Raleigh Falls, Coppename River; 23 August 1901; 1901 Coppename Expedition. — 2 specimens.

Raleigh Falls; among grass-like plants at the foot of the falls; 22 August 1957; D. C. Geijskes. — 26 specimens (1 ovigerous).

Coppename River S. of the Raleigh Falls; September 1901; 1901 Coppename Expedition. — 1 specimen.

Fall near Pretibroekoe, Coppename River; 28 July 1943; D. C. Geijskes. — 1 juvenile.

Zand Creek, Wilhelmina Range; water clear, pH 6.1; bottom sandy with some rocks; 18 and 19 August, and 2 September 1943; D. C. Geijskes. — 5 specimens.

Jandé Creek near Brokopondo on Suriname River; in waterfall; 21 July 1953; D. C. Geijskes. — 1 ovigerous female.

Rapids in the Suriname River just N. of Kabel; among rocks under Podostemonaceae; 10 April 1957; L. B. Holthuis no. 1236. — 18 specimens.

Suriname River near Kabel; 21-28 September 1938; D. C. Geijskes. — 20 specimens (4 ovigerous, 1 with Bopyrid in branchial chamber).

Suriname River near Kabel; in falls; 21 September 1938; D. C. Geijskes. — 1 juvenile.

Armina Falls, Marowijne River; 9 February 1949; 1948-1949 Suriname Expedition, no. 6480. — 6 juveniles.

Bonnidoro Island, Marowijne River; 20 October 1952; D. C. Geijskes. — 4 specimens.

Poeloegoedoe Falls, Marowijne River; 31 August 1939; D. C. Geijskes. — 2 specimens.

Poeloegoedoe Falls; among Podostemonaceae of the genus *Oenone;* 20 August 1953; D. C. Geijskes. — 1 specimen.

Description. Holthuis, 1952, p. 95, pl. 24, pl. 25 figs. a, b.

Remarks. The above material does not contain any fully developed male. The largest male specimen examined is 44 mm long; it lacks the large cheliped, while the smaller has the fingers already distinctly gaping, the gap being filled with long stiff hairs.

Type locality. Brazilian coast.

Distribution. Florida (probably introduced), and the continent of Central and S. America from Mexico to southern Brazil.

Occurrence in Suriname. In Suriname the species is quite frequent in rapids and falls where it lives in the shallow rocky parts among Podostemonaceae and other plants. Previous Suriname records are: Wilhelmina Range (Holthuis, 1948, 1952), Poeloegoedoe Falls (Geijskes, 1942, 1957; Holthuis, 1948, 1952). With "3 Palaemon" Bakhuis (1902) evidently meant the three lots of *Macrobrachium* collected by the 1901 Coppename Expedition which now are preserved in the collection of the Leiden Museum. One of these lots contains *M. acanthurus* (Wiegmann), the other two are the lots of *M. olfersii* mentioned above: Geijskes's (1942, 1957) record of a "vlugge garnalensoort" (agile species of shrimp) is based on the specimens which were collected by him on 31 August 1939 at the Poeloegoedoe Falls, and which now form part of the collection of the Leiden Museum.

Macrobrachium carcinus (Linnaeus, 1758) (textfig. 13)

Squilla, Crangon, Americana, major Seba, 1761, p. 54, pl. 21 fig. 4.

Astacus major Fermin, 1765, p. 74; Fermin, 1769, vol. 2, p. 274; Fermin, 1770, vol. 2, p. 247; Teenstra, 1835, p. 442.

"Rivier-kreeften" Hartsinck, 1770, p. 118.

"River lobsters called sarasara" Stedman, 1796, vol. 1, p. 391; Stedman, 1813, p. 406.

"écrevisses de rivière" Stedman, 1798, vol. 2, p. 103.

"Rivier-kreeften, welke zij sarasara noemen" Stedman, 1799, vol. 2, p. 173.

"Ecrevisse" Benoit, 1839, p. 56.

Palaemon jamaicensis Semper, 1869, pp. 585, 586; De Man, 1912, p. 234; Tesch, 1914a, p. 250.

Palaesmon Kappler, 1881, p. 143.

Astacus Kappler, 1887, p. 200.

Palaemon (Macroterocheir) jamaicensis De Man, 1925, p. 51, fig. 13.

Macrobrachium carcinus Holthuis, 1950a, p. 31; Holthuis, 1952, p. 114, pl. 30, pl. 31 figs. a-c.

Macrobrachium carinus Geijskes, 1954, p. 69.

Museum Leiden

Suriname River near Marinetrap, Paramaribo; between the stones of a stone facing of the riverside; 3 June 1949; 1948-1949 Suriname Expedition no. 9726. — 1 specimen.

Suriname River near "Groot Chatillon" plantation, south of Paramaribo; 7 October 1952; C. F. A. Bruijning. — 1 specimen.

Suriname River near Kabel; under rocks in a shallow part of the river; 10 April 1957; L. B. Holthuis no. 1236. — 1 specimen.

Suriname River near Gansee; October 1951; J. H. C. B. Heyde. — 1 specimen.

Marowijne River near Langatabbetje; found in the stomach of a snake; 19 February 1952; D. C. Geijskes. — 1 specimen.

Marowijne River near Bonnidoro Island; 20 October 1952; D. C. Geijskes. — 1 specimen.

Suriname; 1910; D. G. J. Bolten. — 11 specimens.

Suriname. — 6 specimens.

Saint Laurent, Marowijne River, French Guiana; May 1958; J. Durand. — 1 specimen.

Museum Hamburg

Paramaribo; 1908 and 1909; C. Heller. — 3 specimens (1 ovigerous).

Description. Holthuis, 1952, p. 114, pl. 30, pl. 31 figs. a-c.

Vernacular name. The Suriname name of the present species is "stone sara-sara" (= rock prawn).

Remarks. The examined specimens range in length from 65 to 175 mm. The ovigerous female is 175 mm long.

Type locality. "In Americae fluviis" (Linnaeus, 1758, p. 631). Restricted to Jamaica by Holthuis (1952).

Distribution. Eastern America from Florida to southern Brazil, and the West Indies. Fresh water.

Occurrence in Suriname. In Suriname *Macrobrachium carcinus* is mainly found in the larger rivers among rocks and stones. Because of the large

size (up to 233 mm) which can be attained by this species, and because of its value as food, it is the best known of the fresh water prawns of Suriname. There can be little doubt that the old Suriname records of river-lobsters or crayfish pertain to this species, the other fresh water prawns as a rule being too small to be of much culinary interest. The oldest record of the present species from Suriname is that by Seba (1761) who published an excellent figure and a short description. Seba stated "Je l'ai reçue de Surinam" without giving a more precise locality indication. Fermin (1765, p. 74) gave a short diagnosis of his *Astacus major*: "Cette espèce d'Ecrévisse de riviere, differe considérablement avec celles d'Europe, en ce qu'elle est deux fois plus grosse & qu'elle a les pattes d'une autre figure & trois fois plus longues que les nôtres. Elles sont très-excellentes. Trois de ces Ecrévisses suffisent pour la refection d'une personne." In his later book (1769, vol. 2, p. 274) this description was extended as follows: "On trouve suffisamment d'*Ecrevisses* dans les rivieres, & dans les criques de la Colonie; & elles ne different de celles d'Europe que par leurs mordants, qui sont plus longs, plus affilés, & plus égaux, dans toute leur longueur; mais qui se serrent & ne coupent pas moins pour cela. Elles sont, en outre, une fois, & je pourrois même dire deux fois, plus grosses que les nôtres: leurs pattes sont aussi plus longues, mais plus étroites. Elles sont fort délicates; & trois ou quatre suffisent pour le souper d'une personne, tant elles sont nourissantes." As already shown on p. 8 of the present paper, the first line of this text (from "On trouve" till "ne coupent pas moins pour cela") is practically literally copied from Labat (1724, vol. 1 pt. 1, p. 105). There can be little doubt that Fermin actually meant to describe the Suriname *Macrobrachium carcinus*. The name *Astacus major*, which Fermin evidently borrowed from Barrère (1741, p. 183) has no nomenclatural status, Fermin's book being non-binominal, while that of Barrère is prelinnean.

Hartsinck (1770, p. 118) also dealt with the present species: "Aan *Kreeften* is hier ook geen gebrek: zy vallen wel tweemaal zo groot als de Europische, en hebben de Pooten van eene andere gedaante en driemaal langer als de onze. Men vindt 'er ook *Rivier*-Kreeften als hier te Land, welke zich onder de Takken der Mangrove Boomen onthouden" (There is no scarcity of crayfish here: they are twice as big as the European and have the legs differently shaped, being three times as long as ours. One finds also river-crayfish like in Holland, these are found under the branches of mangrove trees). Hartsinck's account of the crayfish is clearly based on Fermin's (1765, p. 74) "ecrévisse" and thus is *Macrobrachium carcinus*. I do not know what Hartsinck meant with his river-crayfish, his account of these animals perhaps is inspired on Herlein's (1718, p. 200) "Kreeften"

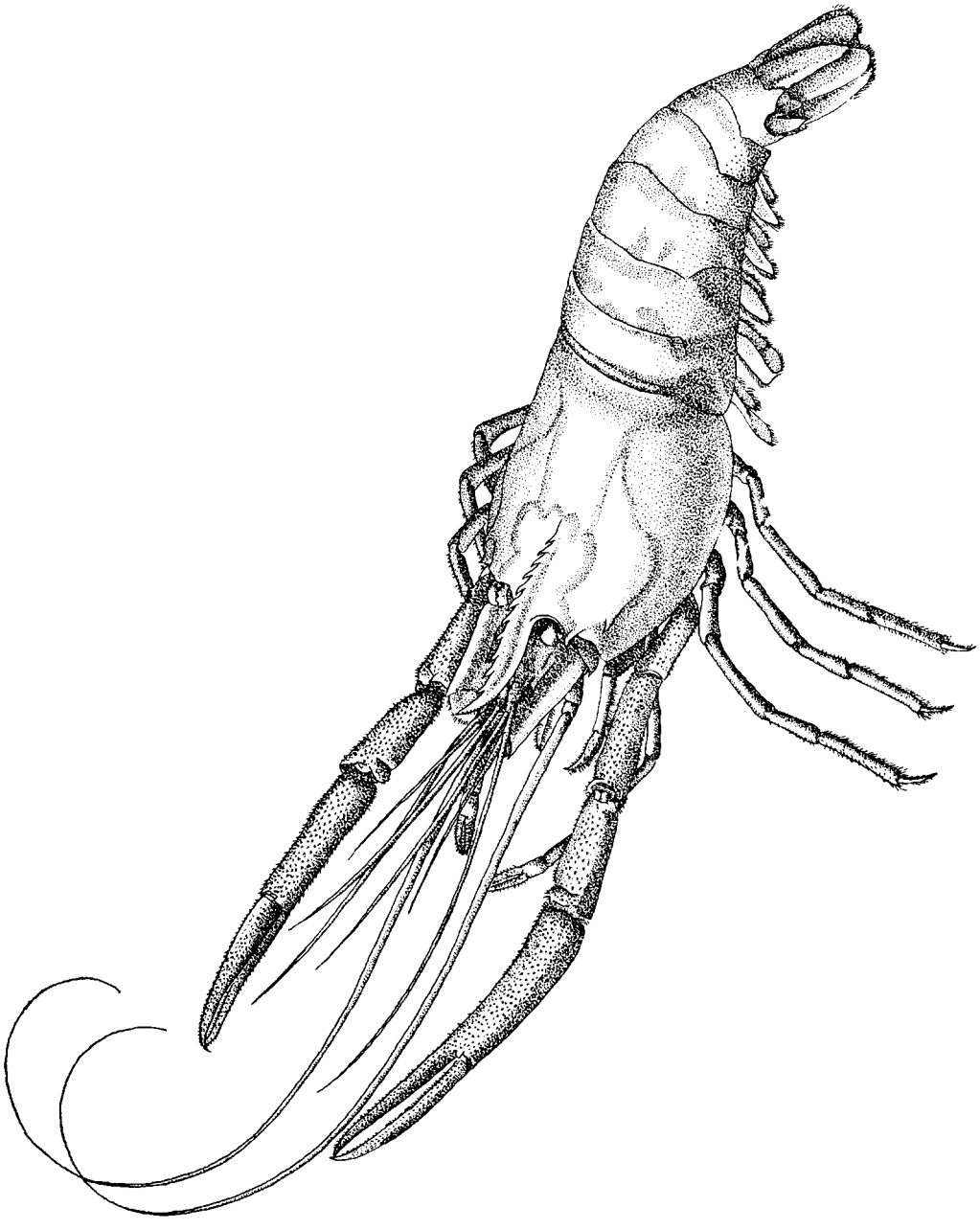


Fig. 13. *Macrobrachium carcinus* (L.). Specimen from Suriname. After Seba, 1761.

which "houden haar onder de struiken van de Bomen aan den oever van de zee" (see p. 6 above) and with which actually Antillean crabs are meant. Stedman (1796) did not provide any description of his "river lobsters called *sarasara,* which are here in great abundance", he only remarked that they are eaten by the Indians. Teenstra's (1835, p. 442) *Astacus major* clearly belongs here. He made the following remarks about these animals: "*Kreeften* (*Astacus major*) vindt men hier in alle rivieren; hebbende ongemeen lange, dunne scharen en pooten. Over het algemeen zijn de Surinaamsche kreeften iets grooter, dan de rivierkreeften in *Europa,* en voedzaam, maar niet gezond. Zij houden zich veel in brak water op." (Crayfish is found here in all rivers; they have unusually long and slender chelae and legs. As a rule the Suriname crayfish is somewhat bigger than the European; they are nourishing, but not wholesome. They are frequently found in brackish water). Benoit (1839) does not provide much information on the species: "Les écrevisses sont très-abondantes dans les criques et dans les rivières de Surinam. Elles sont plus grosses que les nôtres, et la chair en est délicieuse". Kappler (1881) stated: "In den Flüssen findet man in Felsenlöchern und hohlen Bäumen einen sehr wohlschmeckenden Krebs, Palaesmon(?). Er ist grösser als der Edelkrebs, manchmal über einen Fuss lang, mit langen dünnen walzenförmigen Scheeren; schwärzlich von Farbe wird er durch das Kochen hochroth". In his 1887 book Kappler indicated this species as *Astacus* and stated it to occur in the mouth of the Marowijne River, lacking in several other rivers; here Kappler gave the length of the chelipeds as 12 cm. Geijskes (1954, p. 69) remarked of this species: "Een twee decimeter grote garnalensoort die in de rivier tussen de stenen leeft, wordt gegeten. Men kapt de dieren 's nachts bij de lantaarn. Het is een bijkomstige lekkernij, die in het dieet van de Bosnegers echter geen rol van betekenis speelt." (A species of prawn, 20 cm long, which lives in the river among stones, is often eaten. They are caught at night by killing them with a chopping knife at the light of a lantern. It is an incidental delicacy for the bush negroes and does not play any significant rôle in their diet". The specimens from Suriname mentioned by De Man (1912, 1925), Tesch (1914a), and Holthuis (1950a, 1952) all are preserved in the Rijksmuseum van Natuurlijke Historie. The Suriname records of the present species are: Suriname River near Paramaribo (Holthuis, 1950a, 1952), Suriname River (Tesch, 1914a), Marowijne River (Kappler, 1887; Geijskes, 1954), Suriname (Seba, 1761; Fermin, 1765, 1769, 1770; Hartsinck, 1770; Stedman, 1796, 1798, 1799; Teenstra, 1835; Benoit, 1839; Semper, 1869; Kappler, 1881; De Man, 1912, 1925; Holthuis, 1950a, 1952).

Subfamily Euryrhynchinae

Euryrhynchus wrzesniowskii Miers, 1877 (textfig. 14)

Euryrhynchus wrzesniowskii Holthuis, 1948, p. 1111; Holthuis, 1950a, p. 28; Holthuis, 1951, p. 5, pl. 1, pl. 2 figs. a-f.

Museum Leiden

Coropina Creek near Republiek; fresh water; 9 April 1957; L. B. Holthuis no. 1231. — 4 specimens.

Troclinde Creek near Zanderij; forest creek in savanna region; water brownish, acid, pH 4.5; 14 January 1943; D. C. Geijskes. — 7 specimens.

Zanderij; 3 August 1948; P. Wagenaar Hummelinck no. 409. — 9 specimens.

Zanderij; in shady savanna creeks; 30 October 1949; D. C. Geijskes. — 10 specimens (1 ovigerous).

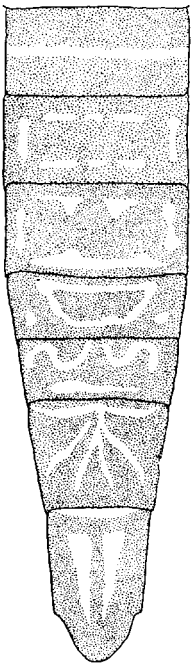


Fig. 14. *Euryrhynchus wrzesniowskii* Miers. Colour pattern of abdomen.

Zanderij; shady forest creek; water brown, acid; 9 April 1957; L. B. Holthuis no. 1229. — 67 specimens (10 ovigerous).

Sectie O on railroad about 70 km S. of Paramaribo; forest creek; 10 April 1957; L. B. Holthuis no. 1233. — 2 specimens (1 ovigerous).

Sectie O on railroad about 70 km S. of Paramaribo; small forest creek; water clear, pH 5.4; bottom shingle; 6 February 1942 and 7 June 1944; D. C. Geijskes. — 8 specimens.

Kabel on Suriname River; in ditch; 2 September 1955; P. Wagenaar Hummelinck no. 646. — 1 specimen.

Swamp 9.2 km S. of the coast near the Wiawia Bank; water clear, salinity 0.06‰; bottom clay; 28 November 1948; 1948-1949 Suriname Expedition no. 3969. — 2 specimens.

Pool 12.6 km S. of the coast near the Wiawia Bank; water clear, brown, acid; bottom with many dead leaves and roots; 26 November 1948; 1948-1949 Suriname Expedition no. 3825. — 6 specimens.

Swamp 13.3 km S. of the coast near the Wiawia Bank; 27 November 1948; 1948-1949 Suriname Expedition no. 3965. — 4 specimens.

Pool in swamp 13.7 km S. of the coast near the Wiawia Bank; 27 November 1948; 1948-1949 Suriname Expedition no. 3966. — 33 specimens (4 ovigerous).

Third Swamp, 19 km N. of Moengotapoe; water clear, brown; 22 October 1948; 1948-1949 Suriname Expedition no. 2298. — 1 specimen.

Djai Creek, 8.4 km N. of Moengotapoe; water turbid, brown, pH 5.3-5.4; 8 October 1948; 1948-1949 Suriname Expedition no. 1262. — 2 specimens.

Small forest creek 0.4 km N. of Moengotapoe; bottom sand with many dead leaves; 21 September 1948; 1948-1949 Suriname Expedition no. 387. — 1 specimen.

Lai Creek, Moengotapoe; water brown, acid, pH 5-5.5; bottom sand with dead leaves; 21 September 1948; 1948-1949 Suriname Expedition no. 386. — 9 specimens.

Neighbourhood of Drietabbetje on the Tapanahoni River; 7 May 1954; D. C. Geijskes. — 14 specimens (6 ovigerous).

Museum Hamburg

Para district; fresh water; 10 March 1909; C. Heller. — 64 specimens (5 ovigerous).

Forest creek near the Upper Suriname River; on decaying wood in shaded forest creek; 20 January 1909; C. Heller. — 3 specimens.

Description. Holthuis, 1951, p. 5, pl. 2 figs. a-f.

Remarks. The specimens examined range from 7 to 17 mm in length. The ovigerous females are 11 to 17 mm long; they were collected in the months of April, May, October, and November.

Colour. The following colour description was made after living specimens from Zanderij (Holthuis no. 1229). The body is of a greenish blue colour. Some red chromatophores are scattered among the blue, but as a rule they are hardly noticeable. On the carapace the colour is somewhat mottled, being darker in some places than in others. On the abdomen the greenish blue colour is interrupted by irregular uncoloured bands that are arranged in such a way that they form a pattern which shows a superficial resemblance to the pattern of grooves found on the abdomen of *Nephrops norvegicus* (L.) (see textfig. 14). The first abdominal somite shows a transverse uncoloured band in the middle. On the second and third somites the uncoloured lines form a quadrangle; the lines themselves are interrupted in several places. In the fourth somite the lines adopt the shape of a kind of trapezium which has the longest side parallel to the anterior margin of the somite. In the fifth somite there are two transverse uncoloured bands: a straight band along the posterior margin and a strongly sinuous one along the anterior margin. The sixth somite shows six uncoloured lines which radiate from near the middle of the anterior margin of the somite, spreading out laterally

and posteriorly. The pleurae are uncoloured. The tail fan is very pale greyish blue with distinct red chromatophores. The telson shows two narrow longitudinal uncoloured triangles, one at each side of the median line, while also the basal part of the telson is uncoloured. The antennular peduncle shows blue lines along the anterior and inner margins of the segments; here too red chromatophores are visible. The flagella of both antennula and antenna are pale greyish blue. The scaphocerite and the antennal peduncle, as well as the chelipeds are pale greyish green, while the scaphocerite and the antennal peduncle may show a bluish colour. The last three pairs of pereiopods are colourless. The oral parts and the bases of the legs are pale blue. The lines separating the abdominal sternites are blue. The protopod of the pleopods is bluish, the exo- and endopods are colourless.

Type locality. Cayenne, French Guiana; in a well.

Distribution. Until now the species has been reported from British, Dutch and French Guiana only.

Occurrence in Suriname. *Euryrhynchus* inhabits shallow forest creeks and pools, in which the bottom is covered with a thick layer of dead leaves. The animals as a rule live in heavily shaded places where the water is fresh and acid (pH 4.5 to 5.5), and often of a brownish colour. The species has been found only in the coastal area from the foot hills of the anterior mountain range to about 9 km from the sea shore. It was first recorded from Suriname in 1948, when the present author reported upon the above listed material from Troelinde Creek and Sectie O. Later (Holthuis, 1950a) I dealt with the material of the 1948-1949 Suriname Expedition and with the specimens from Zanderij (October 1949, leg. Geijskes); in the cited publication the localities of the 1948-1949 Expedition have been more extensively described than in the present paper. In 1951 I provided a description and figures of the species, while the specimens reported upon in 1948 and 1950a were again listed.

Family Alpheidae

Alpheus heterochaelis Say, 1818 (pl. III fig. 1)

Museum Leiden

Eastern shore of the mouth of the Suriname River near Braamspunt; in soft mud which is exposed at low tide; 5 April 1957; L. B. Holthuis no. 1219. — 1 male and 1 ovigerous female.

Suriname River, 10 miles above its mouth; 11 February 1954; H. W. Lijding. — 1 ovigerous female.

Description. Schmitt, 1935, p. 144, fig. 16 (as *Crangon h.*); Verrill, 1922, p. 76, pl. 22 figs. 1, 2, 4, pl. 24 fig. 7, pl. 30.

Remarks. The specimens are 36 to 46 mm long. The ovigerous females measure 42 and 46 mm. They agree with the descriptions given of this species. In the male the dactylus of the smaller first chela is distinctly Balaeniceps-shaped. This same specimen carries a Bopyrid parasite in the left branchial chamber.

Type localities. Coast of South Carolina and Amelia Island, Florida. Here restricted to Amelia Island, Nassau Co., N.E. Florida, U.S.A.

Distribution. Bermuda and Virginia (U.S.A.) to S. Brazil and the West Indies. The species had not been reported before from Suriname. It is evidently the same species as that which Graham (1955, p. 42, pl. 5 fig. 14) reported from British Guiana as "Demerara Lobster".

Alpheus intrinsecus Bate, 1888

Coquette Investigations

Near the lightvessel "Suriname Rivier", off the mouth of the Suriname River; depth 7 m; 3 May 1957; fifth voyage. — 1 male. (L)

Station 360, off the mouth of the Suriname River, 6° 19'—6° 20' N 55° 15'—55° 14' W; bottom mud and shells; depth 26 m; 22 July 1957. — 1 ovigerous female. (W)

Description. Bate, 1888, p. 557, pl. 100 fig. 1.

Remarks. The male specimen is 33 mm long, the ovigerous female 21 mm. They agree perfectly with the descriptions of this species. The smaller chela of the male has the dactylus Balaeniceps-shaped.

Type locality. Off Bahia, Brazil; 7 to 20 fathoms.

Distribution. Brazil (Bahia, São Sebastião), and West Africa (Rio de Oro to Belgian Congo and São Thomé). The species is now reported for the first time from Suriname.

Synalpheus apioceros Coutière, 1909

Coquette Investigations

About 20 miles off the coast of Suriname between the mouths of the Nickerie and Coppename Rivers; depth 27 m; 15-20 April 1957; third voyage. — 1 juvenile. (L)

Description. Coutière, 1909, p. 27, figs. 9-13.

Remarks. The specimen, length 10 mm, is evidently juvenile, and for that reason it cannot be assigned to any of the subspecies recognized by Coutière (1909). It differs from Coutière's description of the typical *S. apioceros* in having the final tooth of the scaphocerite shorter, reaching only slightly beyond the antennular peduncle. Furthermore the last segment of the antennal peduncle (carpocerite) is more slender. Though the spine at the end of the palm of the larger chela is directed somewhat downwards, there is no swollen tubercle at its base. In many respects the specimen resembles

the subspecies *mayaguensis* Coutière, but it has the carpocerite less broad and reaching less far beyond the antennula.

Type locality. Marco, Collier Co., S.W. Florida, U.S.A.; in sponges.

Distribution. East coast of America (Florida to S. Brazil and the West Indies), and Lower California. So far the species was not known from Suriname.

Synalpheus brooksi Coutière, 1909

Coquette Investigations

Station 302, between the mouths of the Coppename and Suriname Rivers, 6° 49′ N 55° 25′ W; in sponge; bottom mud and fine shells; depth 44 m; 28 June 1957. — 6 specimens. (W + L)

Description. Coutière, 1909, p. 69, fig. 41.

Remarks. The specimens show some minor differences from Coutière's description of the species. Both the scaphocerite and the spine of the carpocerite reach beyond the end of the second segment of the antennular peduncle. The spines on the dorsal surface of the telson are longer. The large chela of my specimens resembles most that figured by Coutière (1909) in his fig. 41KB. The smaller first leg is slightly less slender than those figured by Coutière. The exopod of the uropod shows two teeth on the outer margin, but in some specimens an indication of a third tooth is visible on either the left or the right uropod.

Type locality. Sugar Loaf Key, Florida, U.S.A.

Distribution. Florida and the Bahamas to Yucatan and Brazil. The species is now reported for the first time from Suriname.

Family Hippolytidae

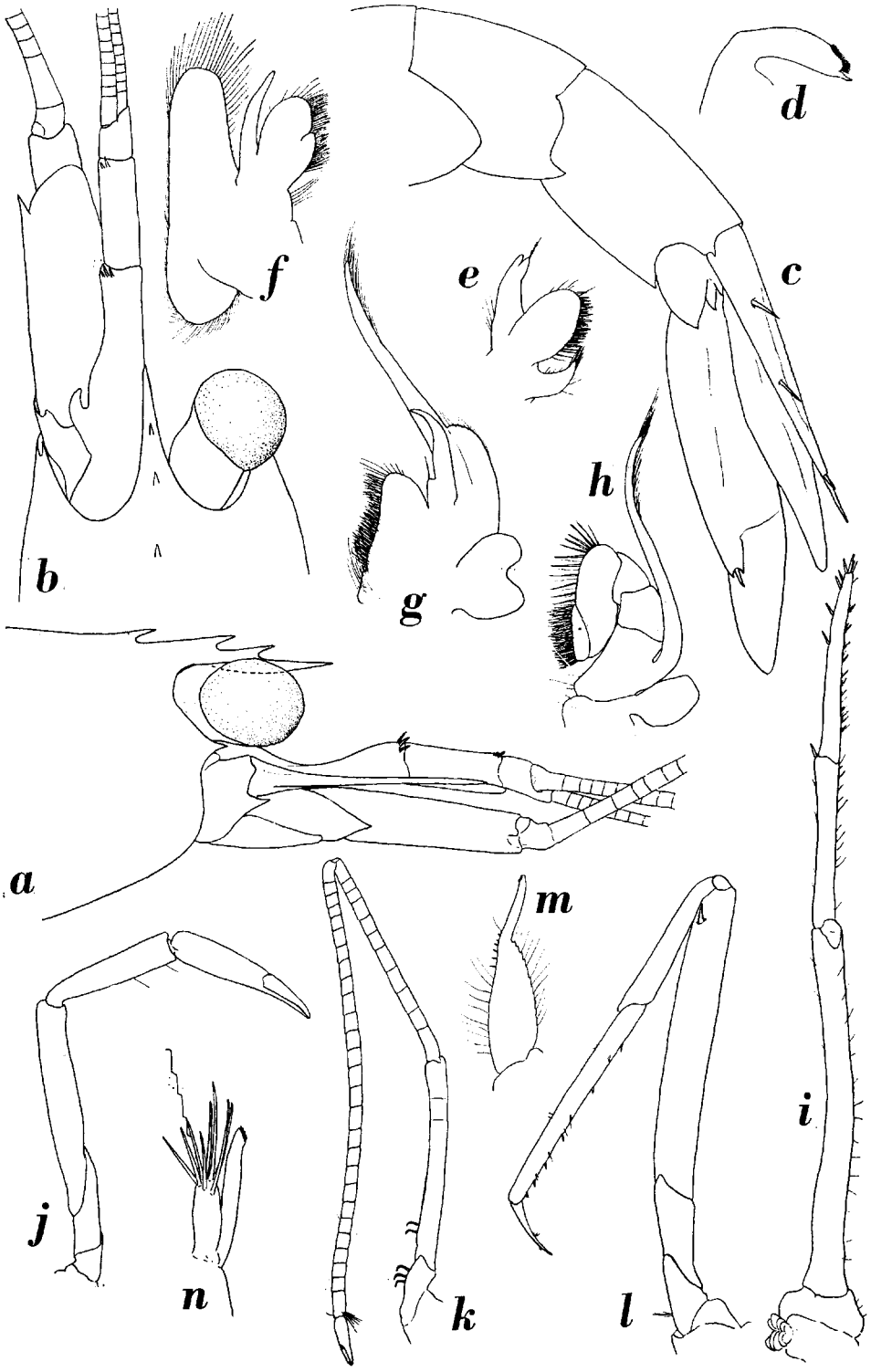
Merguia rhizophorae (Rathbun, 1900) (textfigs. 15 and 16)

Museum Leiden

Small ditch near Matappica Canal, behind „Matappica" Fishery Experiment Station, N. of Alliance; 6 April 1957; L. B. Holthuis no. 1221. — 18 specimens.

Description. The length of the specimens ranges from 13 to 25 mm. The rostrum is slender and in the larger specimens it reaches slightly beyond

Fig. 15. *Merguia rhizophorae* (Rathbun). a, anterior part of body in lateral view; b, anterior part of body in dorsal view; c, posterior part of abdomen in lateral view; d, mandible; e, maxillula; f, maxilla; g, first maxilliped; h, second maxilliped; i, third maxilliped; j, first pereiopod; k, second pereiopod; l, third pereiopod; m, endopod of first pleopod of male; n, appendix interna and appendix masculina of second pleopod of male. Specimen from near Fishery Service Station "Matappica", Suriname. a-c, i-l, × 10; d-h, m, × 25; n, × 50.


a
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the eyes but fails to attain the end of the basal segment of the antennular peduncle. Its dorsal margin bears three teeth, one of which is placed behind the orbit, the two others are situated on the rostrum proper. The tip is slender and sharply pointed. No teeth are found on the lower margin. In dorsal view the rostrum is narrowly triangular. In the juveniles the rostrum is shorter, failing to reach the end of the eyes; its dorsal armature is reduced and consists of two teeth, or even of just one. The carapace of the species bears a distinct and sharp antennal spine on the lower orbital angle, no other spines are present; the pterygostomian angle is broadly rounded.

The pleurae of the first four abdominal somites are rounded, that of the fifth ends in a posteriorly directed tooth. The sixth somite is 1.5 times as long as the fifth and practically as long as the telson. The pleura of the sixth somite is pointed, the postero-lateral angle is truncated with the upper part of the truncated margin ending in a distinct tooth. The dorsal surface of the telson bears two pairs of strong spines, which are placed at about 1/3 and 2/3 of the length of the telson. The posterior margin of the telson is truncated and bears two pairs of spines, the inner of which are longer and stronger than the outer. Two strong feathered setae are placed between the inner spines.

The eyes are large. The cornea is globular and distinctly broader than the stalk.

The antennular peduncle is long and slender. The stylocerite is short and blunt, it fails to reach 1/3 of the length of the basal segment of the peduncle. The dorsal surface of the segment bears a transverse row of two or three spinules before the distal margin. The second segment of the peduncle is about half as long as the first and twice as long as the third, it also bears a few (generally one or two) subterminal spinules. The two flagella are simple, the outer has about 30 of the basal joints thickened.

The scaphocerite is 2.5 to 3 times as long as broad. The outer margin is about straight and ends in a distinct tooth, which, however, does not reach the end of the lamella. The antennal peduncle is about as long as the antennular peduncle and reaches distinctly beyond the scaphocerite. A sharp spine is present in the basal part of the outside of the antennal peduncle below the base of the scaphocerite.

The mandible lacks the incisor process and bears no palp. The maxillula has the palp bilobed, the upper lacinia is broad, the lower short and narrow. The maxilla has the scaphognathite well developed with the lower margin rounded; the palp is long and slender; the upper endite is distinctly bilobed. The first maxilliped has the exopod long with a distinct caridean lobe; the epipod is bilobed; the palp shows a distinct notch in the basal part of the

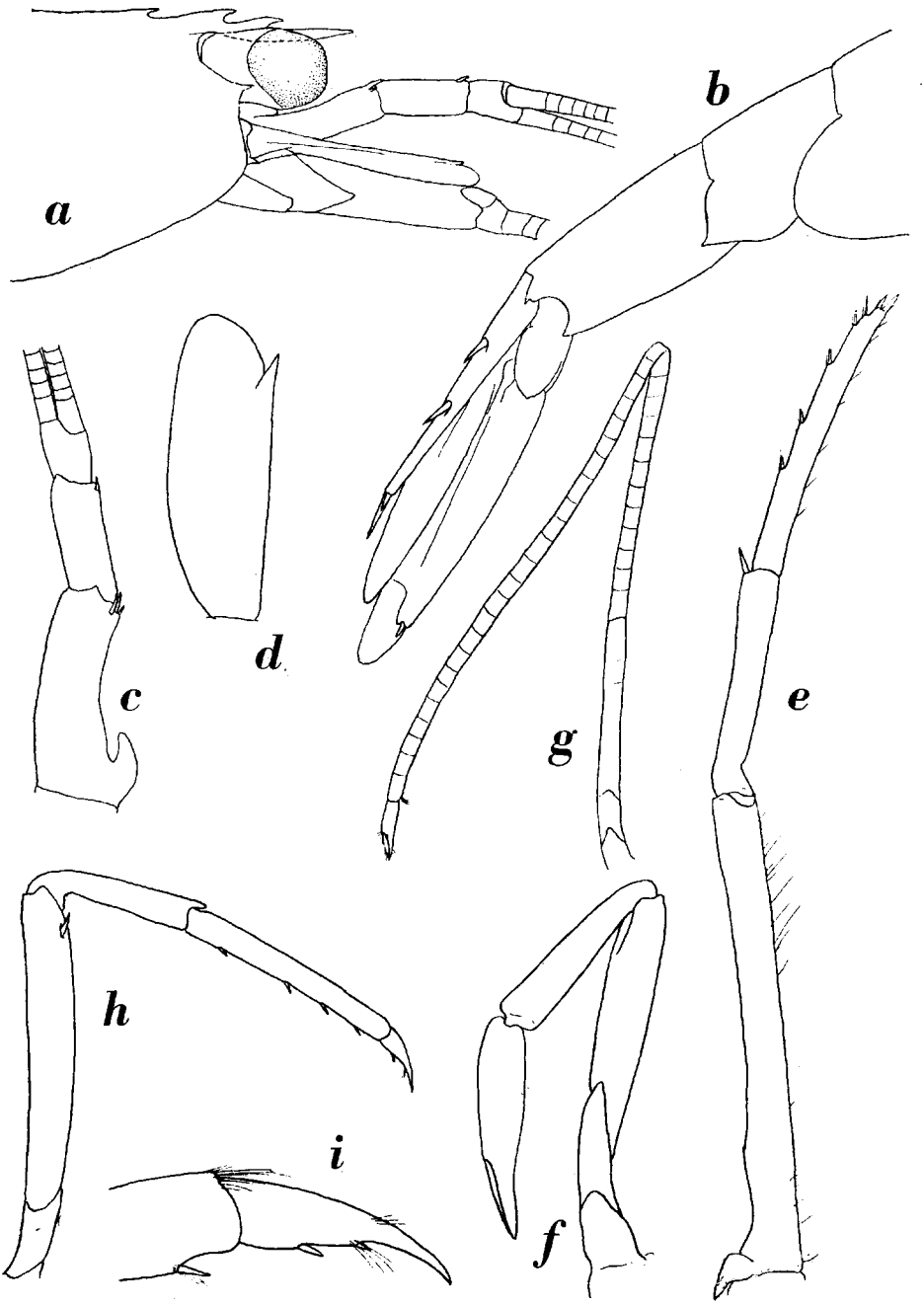


Fig. 16. *Merguia rhizophorae* (Rathbun), holotype. a, anterior part of body in lateral view; b, posterior part of abdomen in lateral view; c, antennula; d, scaphocerite; e, third maxilliped; f, first pereiopod; g, second pereiopod; h, third pereiopod; i, dactylus of third pereiopod. a-h, × 9; i, × 36.

inner margin. The exopod of the second maxilliped is also well developed; an epipod but no podobranch is present. The third maxilliped reaches with a small part of the penultimate segment beyond the scaphocerite. The distal part of the last segment bears some spines, it is slightly longer than the penultimate segment, which bears a distal spine on the external margin. The antepenultimate segment is about as long as the ultimate two together. No trace of an exopod is visible on this maxilliped, but an epipod and an arthrobranch are present.

The branchial formula of the present species is as follows:

	maxillipeds			pereiopods				
	1	2	3	1	2	3	4	5
pleurobranchs	—	—	—	1	1	1	1	1
arthrobranchs	—	—	1	—	—	—	—	—
podobranchs	—	—	—	—	—	—	—	—
epipods	1	1	1	—	—	—	—	—
exopods	1	1	—	—	—	—	—	—

The first pereiopod reaches with the fingers beyond the scaphocerite. The fingers are more than half as long as the palm. The carpus is somewhat shorter than the chela. The merus is about 4/3 of the length of the chela. The second legs are equal. They reach with the mero-carpal articulation slightly beyond the base of the second segment of the antennular peduncle. The chela is small. The carpus consists of 24 to 27 articles (in juveniles less, sometimes as few as 20) and is fully twice as long as the merus which is subdivided into 10 to 14 articles. The ischium is somewhat shorter than the merus and shows traces of a subdivision in its distal part. The proximal part of the inner margin of the ischium, as well as the inner margin of the basis, bears some strong hooked hairs. The third leg reaches with more than half the propodus beyond the scaphocerite. The dactylus is slender and simple. The propodus is about 3.5 times as long as the dactylus. Its posterior margin bears about 5 spinules. The carpus is distinctly more than half as long as the propodus. The merus is much longer and more heavy than the propodus; it shows a strong spine in the distal part of the outer surface. The two following pairs resemble the third leg.

The first pleopod of the male has the endopod oval with a distinct appendix interna on top; in the second male pleopod the appendix masculina is much shorter than the appendix interna, and bears several strong distal spines. The uropods are longer than the telson. The exopod has the outer margin ending in two teeth between which there is a movable spine. A diaeresis is present.

Remarks. The holotype of this species, an ovigerous female, was examined by me in the U.S. National Museum, Washington, D.C. It agrees in all important points but one with the present Suriname material, the sole difference being found in the shape of the dactyli of the last three pairs of pereiopods. Instead of being simple, this dactylus bears two posterior spines and is less slender. In this respect the dactyli of the type strongly resemble those found in the Indo-West Pacific *Merguia oligodon* (De Man), where in both males and females these two posterior spines are present. With the material at hand it is difficult to explain the nature of the difference between the holotype and the Suriname material. Possibly the short and spiniferous dactylus is only found in ovigerous females of *M. rhizophorae* (though in *M. oligodon* it occurs in both sexes); it must be admitted, however, that perhaps this difference is of a specific nature. More material must decide this question.

The eggs of the holotype are in an advanced stage of development and measure 0.5 to 0.9 mm in diameter.

Merguia rhizophorae closely resembles the only other species of this genus, *Merguia oligodon* (De Man),which is known from the Mergui and Malay Archipelagoes. The most striking difference between the two is that in the males of *M. rhizophorae* the dactylus of the last three pairs of pereiopods is slender and unarmed.

The present species was described in 1900 under the name *Hippolysmata rhizophorae* by Rathbun. No later records have been published and until now its true generic status was not known.

Type locality. Rio Parahyba do Norte, Parahyba State, N.E. Brazil; on mangroves.

Distribution. Until now the species was only known from the original record.

Occurrence in Suriname. The present specimens were found in a ditch near the Fishery Experiment Station "Matappica" on the Matappica Canal, which connects the Matappica Creek (belonging to the Commewijne River system) with the sea (pl. IV). The locality lies to the N.E. of Paramaribo. The type and only specimen known so far is an ovigerous female of 27 mm, which was found "on mangroves". This seemed such a peculiar habitat for a shrimp, that before having collected the species myself, I considered the indication "on mangroves" as highly dubious. Now, however, after knowing more of the habits of the species of the genus *Merguia,* it seems quite probable that Rathbun's indication is correct. Twelve specimens of the present species were found by Dr. Geijskes and myself among grass roots of a turf sod which we tore off the side of a ditch at least 0.2 m above the

water level. This ditch connected several artificial fish ponds of the Fisheries Experiment Station "Matappica" with the Matappica Canal. The ditch is in open connection with the canal, and thus with the sea, while it is separated from the fish ponds by a wooden sluice; it is located at about 2 km from the sea. It is about 2 m wide, and at the time of collecting it was less than 0.5 m deep, with a muddy bottom and rather steep sides, bare and only in the extreme upper part covered with grass and short herbs. The salinity of the water in the ditch is rather variable. The exact values are not known to me, but the salinity of the water of the Matappica Canal on 6 April 1957 was 26.5‰ (Dr. Geijskes, in litt.). It has been reported for the years 1952 and 1953 to vary between 6 and 22‰, and for 1954 between 7 and 61‰ (Lijding, 1956, p. 115; 1957, p. 122). As a rule the salinity varies between 12 and 19‰ (Dr. Geijskes, in litt.). In the rainy season the salinity is lowest because of the fact that (1) the water then is directly diluted with rain water, (2) more fresh water is carried by the rivers so that the sea water can penetrate less far into the estuaries, and (3) the evaporation is less strong than in the dry season.

The water in the ditch is under tidal influence and the place where the shrimps were found at low tide must have been below water level at high tide. It remains unusual, however, to find shrimps out of the water, even if in humid conditions.

The general shape of the specimens shows a strong resemblance to that of specimens of the genus *Processa,* and when collected they at first were supposed to belong to the latter genus. As it is known that *Processa* is nocturnal in its habits and is far more easy to collect at night than in the daytime, Dr. Geijskes and I decided to make another search for the shrimps at night, since apart from the twelve specimens found among the grass roots we had not been able to locate any additional material. Between 10 and 11 o'clock at night the same locality was again visited. Hauls with the hand net in the fish ponds yielded only small specimens of *Penaeus aztecus.* In the ditch where we had collected *Merguia* in the daytime, we at first did not meet with success either, probably because of lack of vegetation in the water. At one place, however, some of the plants growing alongside the ditch had fallen over and were hanging in the water. It was in this spot only that we managed to obtain additional material of *Merguia,* which we had not found among these plants in the daytime. It seems probable therefore that *Merguia,* like *Processa,* is nocturnal in its habits.

It is interesting to compare the habits of *Merguia rhizophorae* with those of the Indo-West Pacific *M. oligodon*. A specimen of the latter species was found by me in February 1955 at low tide under the bark of a tree on the beach near the village of Sarawandori, on the south coast of Japen Island, Netherlands New Guinea (see Holthuis, 1958, p. 233). Like *M. rhizophorae*, *M. oligodon* may evidently occupy habitats that are left exposed at low tide, if they are sufficiently humid for survival. The find of the Indo-West Pacific species on the trunk of a tree immediately recalls Rathbun's (1900) statement that the type of the American species was found "on mangroves".

Hippolysmata (Hippolysmata) wurdemanni (Gibbes, 1850)

Coquette Investigations

N.N.W. of the mouth of the Marowijne River, about 20 miles offshore; depth 27 m; 29 April-3 May 1957; fifth voyage. — 2 specimens. (L)

Station 23, off the mouth of the Suriname River, 6° 24′ N 54° 59.5′ W; bottom shells; depth 27 m; 12 May 1957. — 1 ovigerous female. (W)

Station 24, off the mouth of the Suriname River, 6° 23.5′ N 55° 00′ W; bottom mud and shells; depth 27 m; 12 May 1957. — 1 ovigerous female. (W)

Station 86, N. of Isle de Salut, French Guiana, 5° 49.5′ N 53° 09′ W; bottom rocky with mud, coral and shells; depth 27 m; 22 May 1957. — 7 specimens (6 ovigerous). (L)

Museum Leiden

Off the coast of French Guiana, about 5° 56′ N 52° 47′ W; depth 30 m; 20 May 1954; J. Durand no. 60. — 1 ovigerous female.

Description. Hay & Shore, 1918, p. 392, pl. 26 fig. 12.

Remarks. The present material was compared with two specimens from St. Augustine, Florida, U.S.A. (from buoy, 25 January 1935, G. Robert Lunz; 41 and 46 mm) and 6 specimens from Boca Geiga Bay, Pine Key, Florida (January 1884, H. Hemphill; 24-34 mm, including 2 ovigerous females 30 and 34 mm). The Guiana specimens are 24 to 49 mm long, the ovigerous females measuring 31 to 49 mm. In the Florida specimens the rostral formula is $\frac{1+4+0}{3-5}$, while in the Guiana specimens it is $\frac{1+4-6+0}{3-5}$, but as only one of the specimens had 7 and one 5 dorsal rostral teeth the formula in the majority of the specimens from Guiana is $\frac{1+5+0}{3-5}$. In most of the Coquette material the stylocerite falls only slightly short of the end of the basal segment of the antennular peduncle, being longer than in the Florida material, but in the specimens from Station 24 and in those of the fifth voyage of the "Coquette" the stylocerite is as in the typical form. The scaphocerite has the final tooth usually shorter than in the Florida specimens, reaching hardly if at all beyond the lamella;

the lamella itself is more squarely truncated. The legs in the Guiana specimens are somewhat more slender than in the northern material. The number of carpal articulations of the second leg in my Guiana specimens varies between 33 and 37, in the Florida material between 27 and 31. More material from a greater number of localities should be studied before a decision can be reached as to whether two different forms are involved here.

Type locality. Key West, Florida, and Charleston Harbor, South Carolina, U.S.A. Since the Florida material was collected by Dr. F. Wurdemann, for whom the species is named, the type locality may be restricted to Key West.

Distribution. All previous records but one deal with specimens found on the coasts of the United States between the lower part of Chesapeake Bay and N. W. Florida. The one exception is Rathbun's (1900) record of the species from Mamanguape, Parahyba State, N. E. Brazil. *Hippolysmata wurdemanni* is now reported for the first time from Suriname and French Guiana.

Hippolysmata (Exhippolysmata) oplophoroides Holthuis, 1948

(textfig. 17)

Hippolysmata (Exhippolysmata) oplophoroides Holthuis, 1948, p. 1106, figs. 2, 3; Holthuis, 1950a, p. 35.

Coquette Investigations

About 20 miles off the coast of Suriname between the mouths of the Nickerie and Coppename Rivers; depth 27 m; 15-20 April 1957; third voyage. — 1 ovigerous female. (L)

About 20 miles N. of the mouth of the Marowijne River; depth 27 m; 23-27 April 1957; fourth voyage. — 2 ovigerous females. (L)

Near "Suriname Rivier" lightvessel; depth 7 m; 3 May 1957; fifth voyage. — 2 specimens (1 ovigerous). (L)

About 20 miles N. of the mouth of the Suriname River; depth 27 m; 6-9 May 1957; sixth voyage. — 64 specimens (50 ovigerous). (L)

Station 1, off the mouth of the Suriname River, 6° 22′ N 55° 06′ W; bottom mud; depth 26 m; 11 May 1957. — 7 specimens (5 ovigerous). (W)

Stations 39 and 40, N.E. of the mouth of the Suriname River, 6° 19′ N 54° 58′ W and 6° 20.5′ N 54° 57′ W; bottom mud; depth 16 and 18 m; 13 May 1957. — 20 specimens (18 ovigerous). (W)

Station 44, N.E. of the mouth of the Suriname River, 6° 18.5′ N 54° 51′ W; bottom mud; depth 18 m; 13 May 1957. — 6 ovigerous females. (W)

Station 49, N.E. of the mouth of the Suriname River, 6° 04′ N 54° 51′ W; bottom mud; depth 5 m; 13 May 1957. — 1 ovigerous female. (W)

Station 167, between the mouths of the Coppename and Suriname Rivers, 6° 18.5′ N 55° 28′ W; bottom mud and shells; depth 18 m; 6 June 1957. — 13 specimens (11 ovigerous). (W)

Museum Leiden

British Guiana; leg. Miss V. Graham; don. British Museum. — 3 specimens (1 ovigerous).

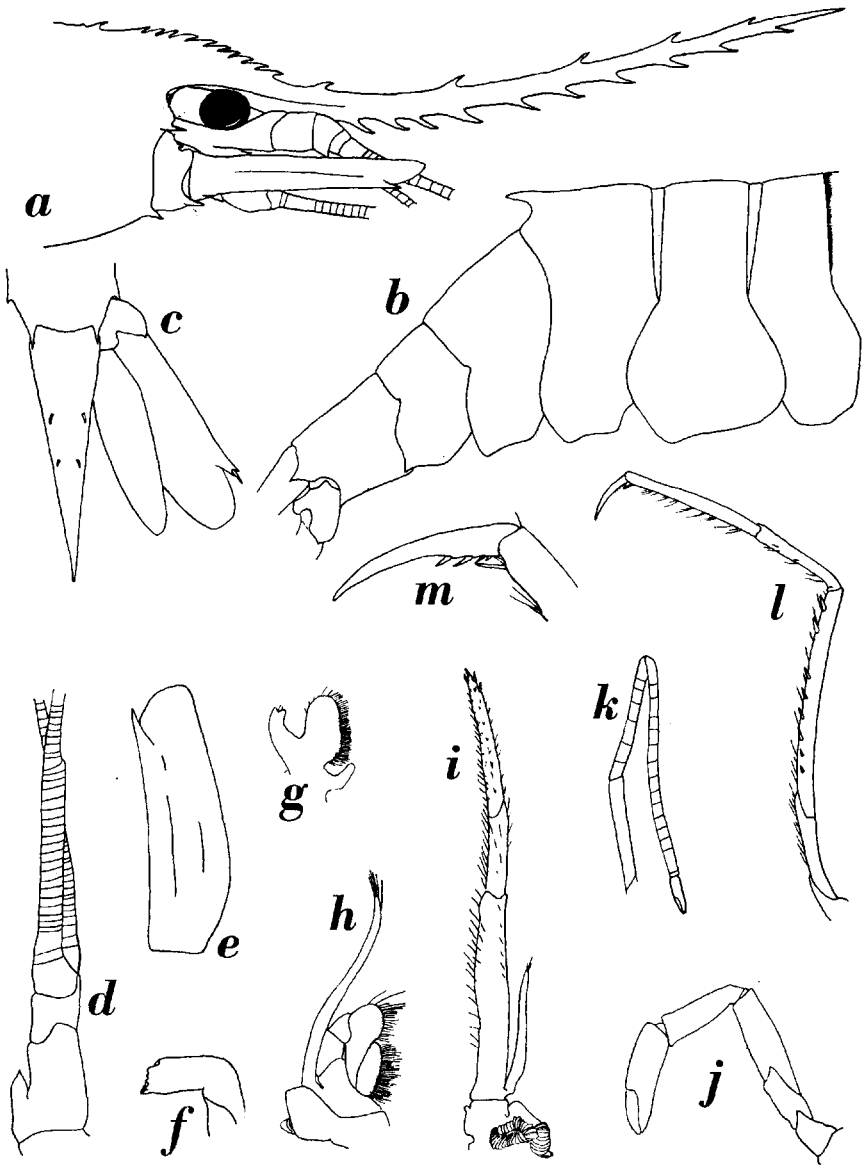


Fig. 17. *Hippolysmata (Exhippolysmata) oplophoroides* Holthuis. a, anterior part of body in lateral view; b, abdomen in lateral view; c, telson and uropod in dorsal view; d, antennula; e, scaphocerite; f, mandible; g, maxillula; h, second maxilliped; i, third maxilliped; j, first pereiopod; k, second pereiopod; l, third pereiopod; m, dactylus of third pereiopod. Specimen from Suriname River near Resolutie. a-c, i-l, × 5; f-h, × 8; m, × 19. After Holthuis, 1948.

Mouth of the Nickerie River; bought at the fishmarket of Nieuw Nickerie; September 1953; D. C. Geijskes. — 1 specimen.

Mouth of the Coppename River near Coppename Punt; 25 October 1949; R. M. J. Wirtz. — 2 specimens.

Mouth of the Coppename River near Saramacca Punt; 2 April 1957; L. B. Holthuis no. 1215. — 28 specimens (21 ovigerous).

Between "Suriname Rivier" lightvessel and the Suriname coast; 27 July 1953; D. C. Geijskes. — 2 ovigerous females.

Mouth of the Suriname River near Braamspunt; 4 and 5 April 1957; L. B. Holthuis nos. 1217 and 1218. — 94 specimens (75 ovigerous).

Mouth of the Suriname River near Resolutie; bottom muddy; water brown, salinity 15.89‰; 22 December 1942; D. C. Geijskes — 2 ovigerous females.

Mouth of Suriname River; bought at Paramaribo fishmarket; 1 March 1953, D.C. Geijskes; 1 April 1957, L. B. Holthuis no. 1207. — 15 specimens (1 ovigerous).

Near Cayenne, French Guiana; 1955; J. Durand. — 3 specimens (2 ovigerous).

Description. Holthuis, 1948, p. 1106, figs. 2, 3.

Vernacular names. Near the mouth of the Coppename River the species is named "kaka" by the fishermen. The word "kaka" means "cock", and in this connection it is interesting to note that Graham (1955, p. 40), when dealing with specimens of this species from British Guiana, gave it the name of "Cock Shrimp". At the mouth of the Suriname River the name "tranga bakka", meaning "strong back", is given to this species; this name may refer to the characteristic strong dorsal spine of the third abdominal somite.

Remarks. The specimens examined range in length between 42 and 79 mm. The ovigerous females are 50 to 79 mm long, they were found in the months April, May, June, July, and December.

Graham's (1955, p. 40) statement that the species has only the first pair of legs chelate is misleading. The second pair, which are very slender, do have chelae, though these are small and may be easily overlooked.

Colour. The general colour impression given by living specimens is pink. The rostrum and the anterior part of the carapace are pink; the posterior part of the carapace being white and yellowish. The abdomen is white and pink, the pink colour being especially distinct along the posterior margins of the first to fourth somites. The spine on the third somite is almost red. The fifth and sixth somites are entirely pink. The tailfan is red, except for the basal part which is pink. The antennular and antennal flagella are pink. The legs are red, being sometimes purplish in their distal part. The pleopods are also of a red colour. The eggs are yellow or greenish.

Type locality. Mouth of the Suriname River near Resolutie, Suriname.

Distribution. The range of the species extends along the Atlantic coast of America from North Carolina to Brazil. In a mimeographed report Lunz (1955) gave the following localities for the present species: North Carolina (off Cape Fear River), South Carolina (off Kiawah Island), and off

the coasts of Georgia, Texas and Brazil. Graham (1955, pp. 40, 77, pl. 5 fig. 13, under the names "Cock Shrimp" and *Exhippolysmata opophoroides*) and Lindner (1957, pp. 2, 21, under the name *Hippolysmata oplothoroides*) reported the species from British Guiana; Lindner stated that in British Guiana this species and *Palaemon schmitti* are more abundant than *Xiphopenaeus*. Dr. J. Durand of the Institut Français d'Amérique Tropicale, Cayenne, in 1955 sent me material from off the coast of French Guiana; the species is found there off Cayenne and off the mouth of the Approuague River. Dr. Durand informed me that specimens of this species "semblent peu abondants et se trouvent en petit nombre en estuaire et dans la zône littorale proche, mélangés aux *Xiphopenaeus*".

Occurrence in Suriname. *Hippolysmata oplophoroides* is found in the estuaries of the Suriname rivers and is caught there by the fishermen fishing for *Xiphopenaeus* and *Palaemon schmitti*. When sold, *Palaemon schmitti* is separated from *Xiphopenaeus, Hippolysmata* being left in with *Palaemon*, where it forms only a negligeable percentage of the total quantity. The previous Suriname records of the species are: Mouth of Coppename River near Coppename Punt (Holthuis, 1950a), mouth of Suriname River near Resolutie (Holthuis, 1948).

Family Processidae

Processa guyanae new species (textfigs. 18, 19)

Coquette Investigations

Stations 281 and 282, between the Coppename and Suriname Rivers, 6° 46′ N 55° 36.5′ W and 6° 46.5′ N 55° 38′ W; bottom mud and fine shells; depth 46 m; 26 June 1957. — 1 specimen. (W)

Station 287, N.E. of the Coppename River, 6° 52′ N 55° 50′ W; bottom mud, shells and coral; depth 48 m; 26 June 1957. — 2 specimens (1 ovigerous). (L)

Station 306, N.W. of the Coppename River, 6° 54′ N 56° 14′ W; bottom shells and coral; depth 49 m; 7 July 1957. — 1 specimen. (W)

Station 353, off the mouth of the Suriname River, 6° 45.5′ N 55° 14′ W; bottom mud and fine shells; depth 44 m; 21 July 1957. — 2 specimens (1 ovigerous). (W)

Description. The specimens are 23 to 35 mm long, the two ovigerous females are 28 and 35 mm in length.

The rostrum is slender, straight, and reaches almost to the end of the eyes. The tip is bifid, the lower tooth reaching slightly beyond the upper. The lower margin of the rostrum is somewhat convex in its proximal half, slightly concave in the distal part. Hairs are implanted on the lower margin of the rostrum and at the tip. The carapace shows no post-orbital groove. The lower orbital angle is inconspicuous and broadly rounded. The anterior margin of

the carapace between this angle and the antennal spine is only slightly concave. The antennal spine itself is well developed.

The fifth abdominal somite has the distal margin of the pleurae about

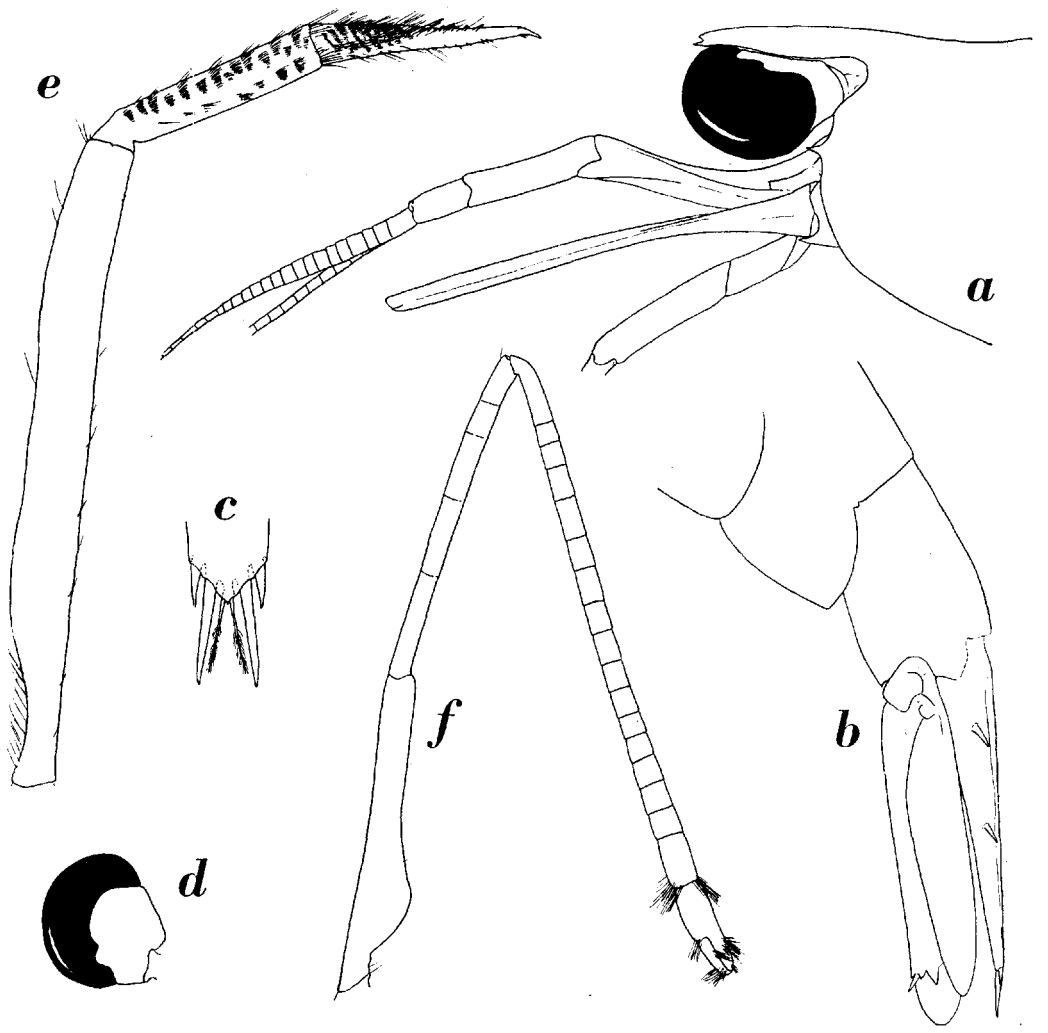


Fig. 18. *Processa guyanae* new species. a, anterior part of body in lateral view; b, posterior part of abdomen in lateral view; c, tip of telson in dorsal view; d, eye in dorsal view; e, third maxilliped; f, left second pereiopod. a-e, female from "Coquette" Sta. 287; f, female from "Coquette" Sta. 353. a, b, d-f, × 10; c, × 28.

straight or even slightly concave. The postero-lateral angle does not show a tooth, but is approximately rectangular. The sixth segment is less than 1.5

times as long as the fifth. The pleura is pointed. The truncated postero-lateral process of the somite, which overhangs the antero-lateral angle of the telson, does not show any tooth on the posterior margin. The telson is less than three times as long as broad, and dorsally shows a distinct median groove. The posterior margin forms a median angle, the tip of which ends in a minute point. There are two pairs of posterior spines; the outer of these are less than half as long as the inner. Between the inner spines there are two setose hairs, which are almost as long as the spines themselves.

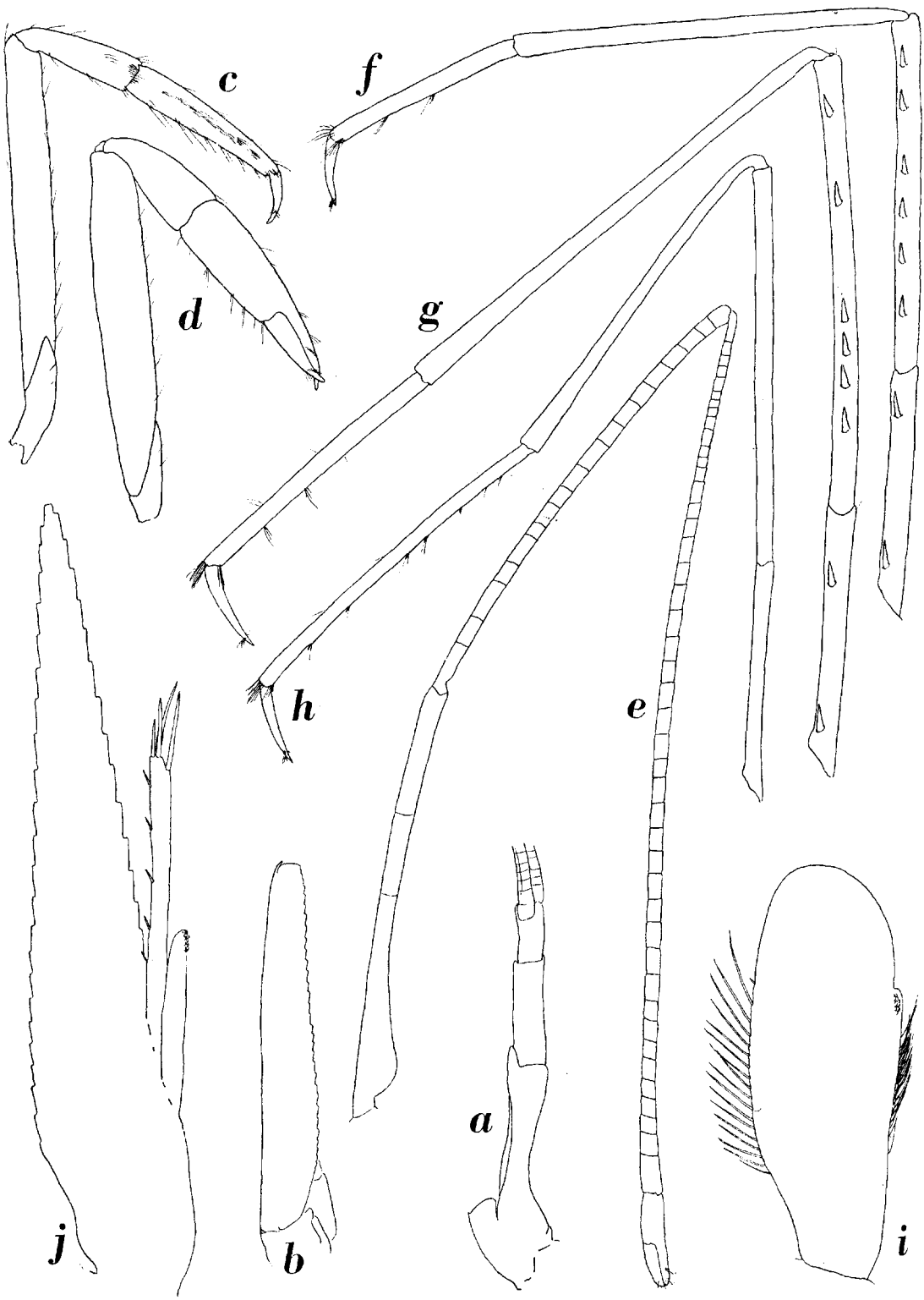
The eyes are very large and flattened dorsally. In lateral view the cornea is slightly longer than high, in dorsal view it is very short compared to its width. The peduncle is very short in lateral view; in dorsal view it is broad and has the outer margin slightly more than half as long as the inner.

The antennular peduncle reaches with about $^1/_3$ of the length of the basal segment beyond the rostrum. The stylocerite is short with the anterior margin broadly truncated. This margin is straight or slightly convex, with a faint indication of an external antero-lateral tooth. In the females the second segment of the peduncle is about twice as long as the third; in the males the third is only slightly shorter than the second. The thin distal part of the outer flagellum in the male is shorter than the thickened basal part, in the females these two parts are of about equal length. In the males the thickened part consists of 23 to 27 joints, in the females of 17 to 24.

The scaphocerite distinctly overreaches the antennular peduncle, but the difference is less than the length of the third antennular segment. The length of the scaphocerite is about 6.5 times its breadth. For its larger part the outer margin is straight, only the distal part is somewhat convex and the final tooth is curved inwards. This tooth hardly at all overreaches the end of the lamella. The antennal peduncle reaches about to the middle of the second segment of the antennular peduncle. A spine is present below the external part of the base of the scaphocerite.

The third maxilliped reaches with the distal two segments beyond the scaphocerite. The ultimate segment ends in a point and bears some spines on the dorsal margin, it is about as long as the penultimate segment and measures about $^3/_8$ of the length of the antepenultimate segment. A well developed exopod and an epipod are present.

The first legs reach with the mero-carpal articulation to or almost to the end of the basal segment of the antennular peduncle. The left leg has the dactylus simple and about $^1/_3$ as long as the propodus; no chela is present here. The propodus is quite slender, being about five times as long as broad. The carpus measures about $^3/_4$ of the length of the propodus. The merus is about twice as long as the propodus. The right leg is chelate. The fingers are about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$^2/_3$ as long as the palm. The carpus is somewhat shorter than the palm. The merus is about as long as carpus and chela combined. There is no arthrobranch at the base of the first legs. Pleurobranchs are present on all the legs. The second pereiopods are strongly unequal. The right reaches with the mero-carpal articulation beyond the scaphocerite, sometimes it even reaches with half the merus beyond that scale. The chela has the fingers slightly shorter than the palm. The carpus is about 9 times as long as the chela and consists of 44 to 47 articles. The merus is somewhat more than half as long as the carpus and is subdivided in 18 to 20 articles. The ischium is slightly shorter than the merus; it shows two articulations in its distal half and bears a lobe on the inner side of its proximal half. The left second leg reaches with the mero-carpal articulation to or almost to the end of the eyes. The fingers are shorter than the palm. The carpus is more than five times as long as the chela and consists of 17 or 18 articles. In the merus three to five distinct and some indistinct articulations may be seen; its length is about $^3/_5$ of that of the carpus, and it is somewhat longer than the ischium. Like in the right leg the ischium shows a lobe on the inner margin of the basal part. The third leg reaches with half or more than half the carpus beyond the scaphocerite. The propodus is about three times as long as the dactylus; it bears some hairs but no spines on the posterior margin. The carpus is almost twice as long as the propodus. The merus is somewhat shorter than the carpus and on its outer surface is provided with a longitudinal row of about 6 or 7 strong spines. The ischium is about $^3/_5$ of the length of the carpus and on its outer surface bears two strong spines. The length of propodus and carpus combined is about equal to that of ischium and merus combined. The fourth leg reaches with more than half to about the entire carpus beyond the scaphocerite. It is much longer than the third leg. The propodus is about three times as long as the dactylus and is slightly more than half as long as the carpus; it bears no spines. The merus is distinctly shorter than the carpus; on the outer surface it shows a longitudinal row of 5 or 6 strong spines. The ischium measures about $^4/_7$ of the length of the merus; it has two strong spines on its outer surface. The combined length of propodus and carpus far exceeds that of ischium and merus. The fifth leg reaches with about half the carpus (sometimes with somewhat more, sometimes with less) beyond the scaphocerite. The propodus is about 4 times as long as the dactylus and bears about 5 or 6 spines on the posterior margin. These spines are separated by

Fig. 19. *Processa guyanae* new species. a, antennula; b, scaphocerite; c, left first pereiopod; d, right first pereiopod; e, right second pereiopod; f, third pereiopod; g, fourth pereiopod; h, fifth pereiopod; i, endopod of first pleopod of male; j, endopod of second pleopod of male (hairs omitted). a-h, female from "Coquette" Sta. 287; i, j, male from "Coquette" Sta. 287. a-h, × 10; i, j, × 50.

wide intervals, the ultimate of them being placed near the base of the dactylus. The carpus is only slightly longer than the propodus. The merus is slightly longer than the carpus. The ischium measures about $^3/_5$ of the length of the merus. Neither merus nor ischium shows any spines.

The endopod of the first male pleopod is about half as long as the exopod. The distal part is broadly rounded and has no hairs. The retinacular lobe is only slightly produced. The endopod of the second male pleopod has a longitudinal row of spinules along the outer margin of the appendix masculina; the top of the appendix bears four strong spines, the inner of which is placed on a lower level than the others. The abdominal sternites bear no spines, except for the sixth which is provided with a small preanal spine. The protopodite of the uropods ends posteriorly in a broadly rounded lobe. The outer margin of the exopod ends in two blunt teeth between which there is a movable spine. The diaeresis is distinct and bears two broad acute triangular posteriorly directed teeth; one of these is placed close to the outer margin, the second lies at the inner end of the diaeresis.

The eggs are numerous and small, being 0.4 to 0.6 mm in diameter.

Remarks. Until now only three species of *Processa* have been reported from Atlantic American waters: *Processa canaliculata* Leach, 1815, *Processa bermudensis* (Rankin, 1900), and *Processa wheeleri* Lebour, 1941. In the course of time many species have been confused under the name *Processa canaliculata,* and it is quite possible that all the American material indicated in the literature with that name actually belongs to entirely different species. At present *Processa canaliculata* is known with certainty only from European waters (from the North Sea to the eastern Mediterranean). *Processa bermudensis* and *P. wheeleri* both have been reported from Bermuda, no other reliable records being available; it it possible that all or part of the American records of P. *canaliculata* pertain to these two species. A revision of the American species of the genus *Processa* is badly needed. *Processa bermudensis* may immediately be distinguished from *P. wheeleri* and *P. guyanae* by the absence of the antennal spine. In many respects the present new species resembles *P. wheeleri,* but it may be separated from it by the following features: The number of carpal and meral articles of the right second leg is far smaller in *P. wheeleri,* being 23 and 7 respectively; in the left leg of that species these numbers are 15 and 5. The third maxillipeds and all the legs are much shorter in Lebour's species, while the ratio of the length of the various segments is different. Unfortunately no direct comparison of the present material with *P. wheeleri* could be made, since no material of the latter species was available. Of the European species it is *P. canaliculata* which resembles the present form most closely, but that species may be

distinguished from *P. guyanae* by that (1) the tip of the telson is rounded, (2) the stylocerite has the antero-external tooth much stronger, (3) the carpus of the right second leg has fewer articles, viz., 30 to 35, (4) the ratio of the length of the segments of the following legs is different, and (5) the exopod of the first male pleopod and the appendix masculina of the second male pleopod have a different shape (cf. Nouvel & Holthuis, 1957, p. 33, figs. 149-173).

Types. Holotype is the male specimen from "Coquette" Station 306, the other specimens are paratypes. The holotype is preserved in the collection of the U.S. National Museum in Washington, D.C.

Family Pandalidae

Parapandalus longicauda (Rathbun, 1901)

Coquette Investigations

Station 331, between the mouths of the Coppename and Suriname Rivers, 6° 51′ N 55° 25′ W; bottom mud and shells; depth 53 m; 20 July 1957. — 1 ovigerous female. (W)

Description. Rathbun, 1901, p. 117, fig. 24.

Remarks. The present specimen is referred with some doubt to Rathbun's species of which no material was available for comparison. The number of differences from Rathbun's original description is considerable and it is possible that the Suriname specimen represents an as yet undescribed species.

The rostrum is broken, the remaining part reaches beyond the scaphocerite for a distance about equal to $^1/_3$ of the length of the latter. The upper margin bears numerous teeth, which are placed close together and of which the first four are placed behind the orbit; in the types of the species only two or three teeth are placed behind the orbit. In my specimen there are 28 dorsal and 15 ventral rostral teeth. The small median spine on the carapace mentioned by Rathbun is visible in my specimen as a blunt tubercle. The rostrum continues backwards as a distinct carina, which in my specimen becomes obsolete some distance behind the middle of the carapace.

The third maxillipeds, which Rathbun stated to be "a little longer than the antennal scale", in my specimen reach beyond that scale with the ultimate and half the penultimate segment. The penultimate segment in the Suriname specimen is about half as long as the ultimate and certainly not "subequal" as in the type. The first legs in my specimen reach with more than half the carpus beyond the scaphocerite, while in her description of *P. longicauda* Rathbun remarked: "The propodus of the first pair of feet reaches the end of the antennal scale". Some confusion must have taken place in Rathbun's description, since she continued: "Carpus and dactylus subequal; propodus

1.5 times as long as carpus". The dactylus of the first pereipod, like in all Pandalidae, is extremely small, so that Rathbun's statement must be incorrect. In my specimen the carpus is slightly shorter than the merus and about twice as long as the propodus. The second legs are equal and reach with the merocarpal articulation to about the end of the antennular peduncle; fully extended they reach with more than $^1/_3$ of the carpus beyond the scaphocerite. The carpus consists of about 25 articles and is about 1.5 times as long as the merus. The fifth legs of my specimen are both defective, but it is still to be observed that they reach with part of the carpus beyond the scaphocerite.

The sixth abdominal somite is less than twice as long as the fifth and is rounded in the median dorsal line.

Type locality. Off N.W. Florida, 28° 42′ 30″ N 85° 29′ W; 161 m depth.

Distribution. The species is known from the type locality and from Puerto Rico, having been taken in depths ranging from 53 to 411 m.

Section Stenopodidea

Family Stenopodidae

Stenopus scutellatus Rankin, 1898

Coquette Investigations

Station 86, N. of Isle de Salut, French Guiana, 5° 49.5′ N 53° 09′ W; bottom rocky with mud, corals and shells; depth 27 m; 22 May 1957. — 1 specimen. (L)

Station 221, N.W. of the mouth of the Marowijne River, 6° 42.5′ N 54° 10′ W; bottom mud; depth 42 m; 14 June 1957. — 1 ovigerous female. (W)

Station 276, between the mouths of the Coppename and Suriname Rivers, 6° 41.5′ N 55° 31′ W; bottom shells and coral; depth 42 m; 25 June 1957. — 1 ovigerous female. (L)

Stations 281 and 282, between the mouths of the Coppename and Suriname Rivers, 6° 46′ N 55° 36.5′ W and 6° 46.5′ N 55° 38′ W; bottom mud and fine shells; depth 46 m; 26 June 1957. — 1 specimen. (W)

Station 306, N.W. of the mouth of the Coppename River, 6° 54′ N 56° 14′ W; bottom shells and coral; depth 49 m; 7 July 1957. — 1 ovigerous female. (W)

Museum Leiden

Off the coast of French Guiana, about 5° 17′ N 51° 45′ W; depth 60 m; 30 August 1957; J. Durand no. 374. — 1 specimen.

Description. Holthuis, 1946, p. 28, pl. 3 figs. a, b.

Remarks. The present specimens measure 25 to 36 mm, the ovigerous females being 28 to 36 mm long.

The characters used to distinguish *Stenopus scutellatus* Rankin from *S. spinosus* Risso seem to be subject to a certain amount of variation. In the specimens examined the lateral surface of the rostrum is usually provided with a single spine, but in two specimens (from Sta. 276 and 281-282) there is one spine on one side, while there are two on the other. The upper surface

of the scaphocerite is generally smooth, but in some specimens (Sta. 221, 281-282) it shows one or two spines, or even a distinct row of 7 or 8 spines (Sta. 276). The base of the outer margin of the scaphocerite generally shows a single spine, sometimes having a minute spinule before it, but in one specimen (Sta. 276) one of the scaphocerites has two small spines placed in front of the basal one. The present species seems to be much smaller than *Stenopus spinosus*: while specimens of up to 73 mm are known of *S. spinosus*, the largest *S. scutellatus* recorded so far measured 36 mm, ovigerous females ranging between 23 and 36 mm.

Type locality. Silver Cay, New Providence, Bahama Islands; under coral near low water.

Distribution. The species is known from Bermuda, the Bahamas, the Gulf of Mexico, Glover Reef near British Honduras, St. Thomas, St. Martin, St. Eustatius, Barbados, Curaçao and Fernando Noronha. It is now reported for the first time from Suriname and French Guiana.

Stenopus hispidus (Olivier, 1811)

Museum Leiden

Off the coast of French Guiana, about 5° 30′ N 51° 39′ W; depth 65 m; 10 July 1954; J. Durand no. 102. — 1 ovigerous female.

Description. Holthuis, 1946, p. 12, pl. 1 figs. a-g.

Remarks. The present specimen, an ovigerous female, is 47 mm long. It agrees well with the published accounts of the species.

Type locality. "Australasiatic Seas".

Distribution. Indo-West Pacific region (from the Red Sea and S.E. Africa to Japan, Hawaii and Tuamotu Islands), and West Indian region (from Bermuda and Florida to French Guiana and the West Indies). The species is now reported for the first time from French Guiana; it has not yet been collected in Suriname waters.

Supersection Macrura Reptantia

Section Palinuridea

Family Palinuridae

Panulirus laevicauda (Latreille, 1817)

Coquette Investigations

Station 69, off the N.W. coast of French Guiana, 5° 58.5′ N 53° 25′ W; bottom coral and shells; depth 29 m; 21 May 1957. — 1 male. (L)

Station 354, between the mouths of the Coppename and Suriname Rivers, 6° 44′-6° 55′ N 55° 14′-55° 31′ W; bottom mud and fine shells; depth 44-46 m; 21 July 1957. — 1 male. (W)

Description. Gruvel, 1911, p. 45, fig. 21.

Remarks. The specimen from Station 69 is 95 mm long, the other measures 215 mm; both are males.

Colour. In the smaller specimen almost all colour has disappeared, but in the larger the colour pattern is still distinctly visible. The horns over the eyes are red with yellowish tips; about four, often interrupted white rings are present. The carapace itself is yellowish with a pinkish tinge, which in the median region becomes purplish; in the antero-lateral parts it is more reddish. A dark red ring is visible around the strong spine which is placed obliquely behind each of the horns. A whitish streak extends over the lateral part of the carapace; also the lateral margin is of that colour. White spots of various sizes are especially distinct near the margins of the carapace. On the anterior half of the first abdominal somite rather large white spots are visible; such spots are also present on the abdominal pleurae, the one near the articulation with the previous somite being especially conspicuous. The dorsal surface of the abdominal somite is spotted with minute dots, which (especially in the median region) are so inconspicuous that they escape a cursory examination; only along the posterior margin of the somites these dots form a more or less conspicuous, usually single row; the posterior margin itself is of a dark red or purplish colour. On the sixth somite the dots are more distinct than on the preceding. The calcified parts of the tail fan show quite large whitish spots similar to those of the abdominal pleurae. The upper surface of the antennular peduncle is streaked, that of the antennal peduncle is spotted. The legs show alternating whitish and purplish longitudinal streaks on the dorsal surface of merus, carpus, and propodus.

Type locality. Brazil.

Distribution. The species has been reported from Bermuda, Florida, Cuba, Jamaica, Curaçao, French Guiana, and Brazil. It seems to be the most common species of Spiny Lobster in Brazil, while it is rather rare in the other localities. It has not been reported before from Suriname.

Panulirus guttatus (Latreille, 1804) (text fig. 20)

Squilla, Crangon, Americana, altera Seba, 1761, p. 54, pl. 21 fig. 5.

Description. Gruvel, 1911, p. 29, textfig. 12, pl. 3 fig. 3.

Remarks. Seba (1761) described and figured a species of *Panulirus* of which he stated "Elle vient aussi de Surinam". The description gives hardly any useful information on the species, but the figure is good and judging by the fact that the antennular plate shows only two spines and that the abdominal somites have straight uninterrupted grooves, the species has to be assigned to *Panulirus guttatus* (Latreille), the only East American species showing these characters. The identity of Seba's specimen with *Panulirus guttatus* has been recognized by practically all authors, and even Latreille

(1804, p. 392) in the original description of the species refers to Seba's figure.

Latreille's original description is short but clear. It mentions the presence of two spines on the antennular plate, the grooves on the abdominal segments, and the spotted colour pattern of the body. The fact that Latreille in this description refers to previous authors (Fabricius, 1798, Linnaeus, 1764,

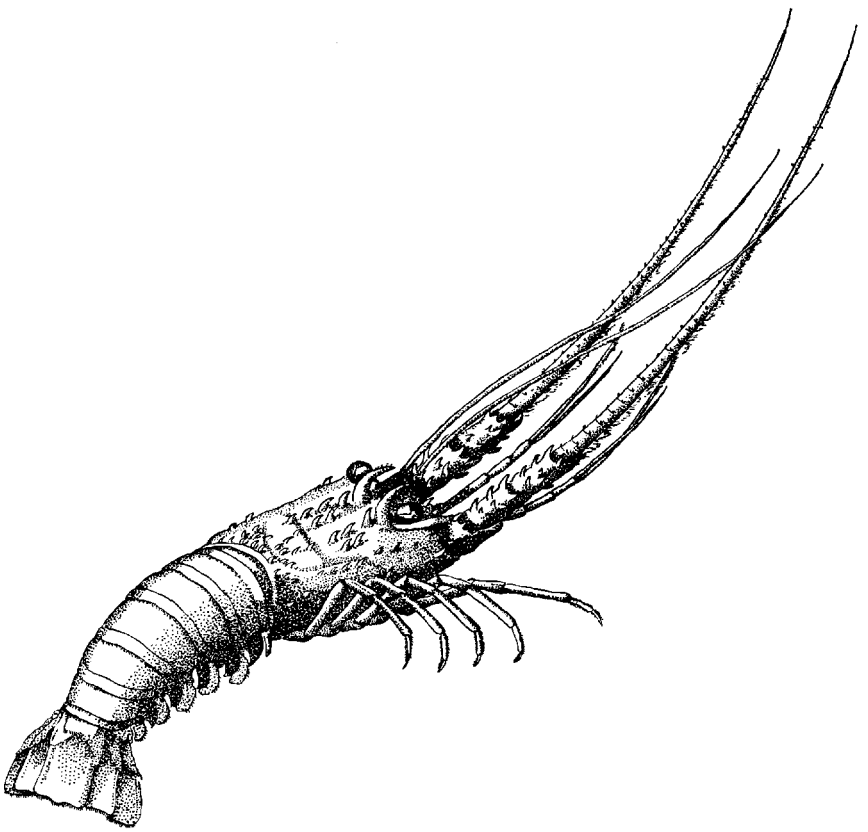

Fig. 20. *Panulirus guttatus* (Latreille). Specimen from Suriname. After Seba, 1761.

Linnaeus, 1767, Herbst, 1793, and Seba, 1761), who deal with different species, makes *Palinurus guttatus* Latreille a composite species. Fabricius's (1798, p. 400) record is based on material of *Panulirus homarus* (L.), *P. laevicauda* (Latr.), *P. guttatus* (Latr.) and *Palinurus elephas* (Fabr.). Linnaeus's (1764, p. 457) *Cancer Homarus* is a species dubia, his 1767 record is based on *Jasus lalandei* (H. Milne Edw.), *Panulirus laevicauda* (Latr.), *P. homarus* (L.), and *P. guttatus* (Latr.). Herbst (1793, pl. 31 fig. 1)

figured *Panulirus ornatus* (Fabr.), while Seba's specimen, as shown above, is *Panulirus guttatus* (Latr.). In order to definitely establish the identity of *Palinurus guttatus* Latreille, 1804, in harmony with current usage, I select now as its lectotype the specimen figured by Seba (1761, pl. 21 fig. 5).

Type locality. Latreille (1804, p. 393) gave as the locality of the species "les mers des Grandes-Indes", evidently meaning the Indian Ocean. Through the above type selection the erroneous type locality is now corrected to Suriname.

Distribution. Western Atlantic Ocean from Bermuda and Florida (U.S.A.) to Brazil and the West Indies. Apart from Seba's record the species has not been reported from Suriname.

Family Scyllaridae

Scyllarus americanus (Smith, 1869)

Coquette Investigations

N.N.W. of the mouth of the Marowijne River, about 20 miles offshore; depth 27 m; 29 April-3 May 1957; fifth voyage. — 1 female. (L)

Station 2, off the mouth of the Suriname River, 6° 23′ N 55° 05.5′ W; bottom mud; depth 27 m; 11 May 1957. — 1 male, 1 female. (L)

Station 3, off the mouth of the Suriname River, 6° 24′ N 55° 05′ W; bottom shells; depth 27 m; 11 May 1957. — 1 male, 1 female. (L)

Station 4, off the mouth of the Suriname River, 6° 25′ N 55° 05′ W; depth 29 m; 11 May 1957. — 3 males, 2 ovigerous females. (L)

Station 8, off the mouth of the Suriname River, 6° 24′ N 55° 02.5′ W; bottom grey mud and shells; depth 27 m; 11 May 1957. — 1 female. (L)

Station 33, N.E. of the mouth of the Suriname River, 6° 52′ N 54° 53′ W; bottom mud and shells; depth 51 m; 12 May 1957. — 1 female. (W)

Station 279, between the mouths of the Coppename and Suriname Rivers, 6° 44′ N 55° 33′ W; bottom mud and fine shells; depth 46 m; 26 June 1957. — 1 female. (W)

Station 281-282, between the mouths of the Coppename and Suriname Rivers, 6° 46′ N 55° 36.5′ W and 6° 46.5′ N 55° 38′ W; bottom mud and fine shells; depth 46 m; 26 June 1957. — 1 male, 3 females. (W)

Station 283, between the mouths of the Coppename and Suriname Rivers, 6° 47′ N 55° 40′ W; bottom mud and fine shells; depth 46 m; 26 June 1957. — 2 males, 1 female. (L + W)

Station 286, N.E. of the mouth of the Coppename River, 6° 51′ N 55° 49′ W; bottom mud, sponges and shells; depth 48 m; 26 June 1957. — 1 male. (L)

Station 287, N.E. of the mouth of the Coppename River, 6° 52′ N 55° 50′ W; bottom mud, shells and coral; depth 48 m; 26 June 1957. — 1 male. (W)

Station 289, N.E. of the mouth of he Coppename River, 6° 52.5′ N 55° 53′ W; bottom mud and fine shells; depth 49 m; 27 June 1957. — 1 male, 1 female. (L)

Station 290, N.E. of the mouth of the Coppename River, 6° 53′ N 55° 55′ W; bottom mud, shells and coral; depth 49 m; 27 June 1957. — 1 male. (L)

Station 304, N.W. of the mouth of the Coppename River, 6° 57′ N 56° 18′ W; bottom mud and shells; depth 53 m; 7 July 1957. — 1 male, 1 ovigerous female. (L)

Station 334, between the mouths of the Coppename and Suriname Rivers, 6° 50′ N 55° 22′ W; bottom sand; depth 53 m; 20 July 1957. — 1 male, 1 ovigerous female. (W)

Station 337, off the mouth of the Suriname River, 6° 49'—6° 47' N 55° 21'—55° 18' W; bottom mud and fine shells; depth 49-53 m; 21 July 1957. — 2 males, 1 ovigerous female. (W)

Off Suriname. — 6 males, 5 females (4 ovigerous). (W)

Description. Bouvier, 1925 p. 447, textfigs. 14-16, pl. 7 fig. 3.

Remarks. The males are 24 to 47 mm long, the females 26 to 53 mm. The ovigerous females measure 38 to 53 mm.

Colour. In some specimens traces of the original colour pattern are still visible. On the pereiopods of these specimens there is a purple spot in the middle of the propodus, carpus and merus. Furthermore there are four dark spots, 2 submedian and 2 lateral, in the anterior half of the dorsal surface of the first abdominal somite. Dark brown hairs form a dark transverse band over the anterior part of the dorsal surface of the carapace. This band extends between the orbital ridges and is interrupted by the anterior median tooth of the carapace, while furthermore there are two almost circular light spots where the hairs are absent.

Type locality. Egmont Key, west coast of Florida, U.S.A.

Distribution. East coast of the U.S.A. (North and South Carolina, Florida), the eastern Gulf of Mexico, the West Indies (Cuba, Vieques, St. Thomas, Flanagan Passage, Guadeloupe), and Brazil (Cape S. Roque). The species is now reported for the first time from Suriname.

Scyllarides americanus Verrill, 1922 (pl. III fig. 2)

Coquette Investigations

Station 250, between the mouths of the Coppename and Suriname Rivers, 6° 41' N 55° 26.5' W; bottom mud, shells and coral; depth 42 m; 19 June 1957. — 1 male.

Description. Verrill, 1922, p. 24, pls. 5,6.

Remarks. The specimen, a male, is 150 mm long. Its carapace has a length of 63 mm, with a maximum breadth of 56 mm. The anterior breadth of the carapace is 54 mm. The lateral margins are slightly constricted behind the eyes. The antero-lateral angles are acute and directed somewhat forwards. The orbits are open at the ventral side; a tooth of the basal segment of the antenna fills part of the opening. The inner margin of the orbit shows three teeth. The carapace is more uneven than in *Scyllarides aequinoctialis* (Lund). In the median line before the cervical groove there are two elevations, one at the level of the posterior margin of the orbits, the other more posteriorly. The anterior elevation bears two submedian tubercles, the posterior elevation shows a single median tubercle. A longitudinal row of several tubercles extends over each branchial region. The surface of the carapace consists of numerous closely placed bluntly topped granules which are more elevated

than in *Scyllarides aequinoctialis*. In the abdomen these granules are very similar to those of the just named species. There is no median carina on any of the abdominal somites, only a slight median elevation may be observed. The first abdominal somite has the pleurae ending in a broad anterior lobe and a narrow posterior tooth. The pleurae of the second somite are broad and end in a posteriorly directed tooth; on the anterior margin two or three large teeth and several small ones are visible, the posterior margin bears one large and several small teeth. The pleurae of the third somite are truncated, the top bears three teeth, the two anterior are separated from the posterior by a distinct gap. The fourth and fifth somites have the pleurae ending in two blunt teeth, the anterior of which is broader than the posterior.

In the distal part of its outer margin the last segment of the antenna shows a distinct angle. The penultimate segment ends in an acute antero-lateral angle; the outer margin of the segment shows two broad and some small teeth, the anterior margin bears a distinct tooth.

The propodi of the first legs are short and high with a distinct dorsal carina. The carpus possesses an antero-dorsal tooth. The anterior margin of the merus shows several teeth, the strongest being the antero-dorsal, which forms the end of the dorsal carina. In the second leg the carina of the propodus is absent. In the following pereiopods the dorsal carina is very distinct, while also a lateral carina is visible on the outer surface of the propodus. The carpus of the second to fifth legs possesses a dorsal carina which ends in an antero-dorsal tooth, while in the third to fifth legs an additional tooth is visible in the proximal half of the carina. In these legs a lateral carina is present on the outer surface of the carpus. The merus of the second to fifth legs possesses a very high dorsal carina, which ends in a strong tooth. The outer lower margin of the merus in the second leg is smooth, in the third it is slightly denticulate, and in the fourth and fifth it shows a strong tooth behind which the margin is denticulate. The ischium of the fifth legs shows a lateral spur.

The sternites of the second to fifth abdominal somites are finely denticulate.

Colour. The preserved specimen still shows a distinct colour-pattern. On the carapace behind the cervical groove there are four submedian red spots, which form a quadrangle. The anterior two of these spots are placed immediately behind either end of the short transverse median section of the cervical groove. The colour pattern of the first abdominal somite, which is of a high systematic value in this genus, is as follows: In the middle there is a large circular red spot, while halfway between this spot and the base of each pleura a smaller spot of a more triangular outline is visible. On the

anterior part of the second somite (and much less distinctly also on that of the following somites) a median red spot may be seen. The eyestalks show several longitudinal red bands. There are traces of a red banding on the legs, each of the meri, carpi, and propodi showing such a transverse band.

The present specimen agrees in most details, though not all, with Verrill's description of *Scyllarides americanus*. In my opinion one of the most important points of resemblance is the coloration of the first abdominal somite, which in the genus *Scyllarides* often serves as an easy means to distinguish two related species. The main difference is that in the Suriname specimen the surface of the carapace and the abdomen is far less rough than in the type specimen, while there are no median carinae on the abdominal somites.

The specimen described by Verrill (1922) had the carapace 110 mm long, being almost twice as long as the specimen now under consideration. It is possible, therefore, that the differences between Verrill's description and our specimen are only due to age. On the other hand, Verrill also had a specimen with cl. 75 mm, of which he gave some measurements, but no description. It is not precluded that this specimen lacked the abdomen as Verrill in his table of measurements only indicated the length of its carapace and did not give the total length.

As the present Suriname specimen possibly is not fully adult, it seems better to assign it provisionally to Verrill's species, in the hope that more and fullgrown material will finally determine the systematic position of the Suriname species.

Type locality. Bermuda.

Distribution. Bermuda, U.S.A. (Savannah, Georgia, and Cape Canaveral and off Pensacola, Florida), Cuba.

Scyllarides aequinoctialis (Lund, 1793)

and

Parribacus antarcticus (Lund, 1793)

These two species were reported by Neumann (1878, pp. 33 and 34, respectively) from Suriname under the names of *Scyllarus aequinoctialis* and *Ibacus antarcticus*. As already pointed out (p. 14), the specimens on which these records are based probably do not originate from Suriname but from the West Indian Islands.

Section Thalassinidea

Family Callianassidae

Callianidea typa H. Milne Edwards, 1837

This species was reported from Suriname by Neumann (1878, p. 34). On p. 14 it has been emphasized that this and similar material mentioned by Neumann from Suriname

probably is incorrectly labelled and may actually come from the West Indian Islands. In the latter case the correct name for Neumann's specimens might be *Callianidea laevicauda* Gill, *C. typa* being an Indo-West Pacific species.

Suborder Anomura

Section Paguridea

Family Paguridae

Subfamily Diogeninae

Paguristes depressus Stimpson, 1859

Coquette Investigations

Station 29, N.E. of the mouth of the Suriname River, 6° 49′ N 54° 54′ W; bottom hard mud and shells; depth 48 m; 12 May 1957. — 3 specimens. (L)

Station 30, N.E. of the mouth of the Suriname River, 6° 49.5′ N 54° 54′ W; bottom hard mud and shells; depth 48 m; 12 May 1957. — 1 specimen. (W)

Station 32, N.E. of the mouth of the Suriname River, 6° 51′ N 54° 53.5′ W; bottom mud and shells; depth 51 m; 12 May 1957. — 1 specimen. (W)

Station 275, between the mouths of the Coppename and Suriname Rivers, 6° 41′ N 55° 29′ W; bottom shells and coral; depth 42 m; 25 June 1957. — 1 specimen. (W)

Station 279, between the mouths of the Coppename and Suriname Rivers, 6° 44′ N 55° 33′ W; bottom mud and fine shells; depth 46 m; 26 June 1957. — 1 specimen. (L)

Station 280, between the mouths of the Coppename and Suriname Rivers, 6° 45′ N 55° 35′ W; bottom mud and fine shells; depth 48 m; 26 June 1957. — 1 specimen. (W)

Station 306, N.W. of the mouth of the Coppename River, 6° 54′ N 56° 14′ W; bottom shells and coral; depth 49 m; 7 July 1957. — 1 specimen. (W)

Description. Benedict, 1901, p. 144, pl. 4 fig. 5.

Remarks. The carapace lengths of the specimens examined vary between 5 and 15 mm. They were found in the following Gastropods: *Distorsio* (*Rhysema*) spec. (Sta. 280), *Conus* spec. (Sta. 30, 279, 306). The specimens inhabiting *Conus* shells have the body strongly flattened, other specimens are of a more normal type. The smallest specimen (cl. 5 mm, Sta. 275) could not be identified with complete certainty.

As a rule in my specimens the base of the ophthalmic plates is broader than shown in Benedict's figure of this species. Several of the granules of the upper surface of the palm have minute horny tips. The tips of the fingers are black and pointed. The outline of the chelae is triangular, being broad at the base and regularly tapering towards the tips of the fingers.

Type locality. "In a *Strombus pugilis* dredged in two fathoms, sandy bottom, at the island of St. Thomas" (Stimpson, 1859, p. 88).

Distribution. Puerto Rico, St. Thomas. The species is now reported for the first time from Suriname.

Paguristes tortugae Schmitt, 1933 (textfigs. 21, 22a)

Coquette Investigations

Station 23, N.E. of the mouth of the Suriname River, 6° 24′ N 54° 59.5′ W; bottom shells; depth 27 m; 12 May 1957. — 6 specimens (1 ovigerous). (L + W)

Station 26, N.E. of the mouth of the Suriname River, 6° 40′ N 54° 58′ W; bottom shells; depth 37 m; 12 May 1957. — 1 specimen. (W)

Description. The anterior shield of the carapace is much longer than broad. Some spinules are to be seen in the antero-lateral parts of the carapace. The rostrum is well developed, tongue-shaped with an acute point; it reaches beyond the base of the eyestalk. The lateral teeth end in a small spinule. The lateral margin of the rostrum and the anterior margin of the carapace between the lateral teeth is distinctly raised and is curved backwards between the rostrum and the teeth.

The eyes are rather slender, but their length is less than $^3/_4$ of the anterior breadth of the carapace. The cornea is rounded at the top, it is slightly broader than the end of the stalk, and shows only an indistinct shallow posterior emargination. Some hairs are implanted on the dorsal surface of the eyestalk. The ophthalmic plates practically touch the rostrum; they have a broad base. The inner part of the plates is produced anteriorly to a slender process, which reaches distinctly beyond the tip of the rostrum and ends in two or three (sometimes four) sharply pointed teeth.

The antennular peduncle reaches beyond the eyes with less than half the distal segment, at least in my Suriname specimens; in Florida specimens it fails to reach the cornea. The antennal peduncle in my Suriname material almost attains the base of the cornea, in the Florida specimens examined it reaches about $^2/_3$ of the length of the eyestalk. The basal segment of the antennal peduncle shows a small antero-external spinule. The second segment possesses a distinct antero-internal spine, while the antero-external angle is produced forwards to a distinct process which ends in a sharp tooth; the outer margin of the segment (including that of the process) bears three to five teeth. The scaphocerite is slender and almost reaches the end of the last segment of the antennal peduncle; the outer margin bears three or four teeth, while on the inner margin one (in Florida specimens) or two (in Suriname specimens) teeth are present in the basal part. No spines are visible on the ultimate segment of the peduncle.

The chelipeds are equal and thickly covered with hairs. The upper margin of the palm bears a row of two or three sharply pointed teeth. The outer surface of the propodus bears numerous low tubercles, which have a small sharp anteriorly directed horny tip. The hairs are implanted along the anterior part of the base of the tubercles; hereby the chela obtains a squamose

appearance. In its upper part the outer surface of the dactylus bears about seven more or less distinct transverse rows of small horny-tipped tubercles,

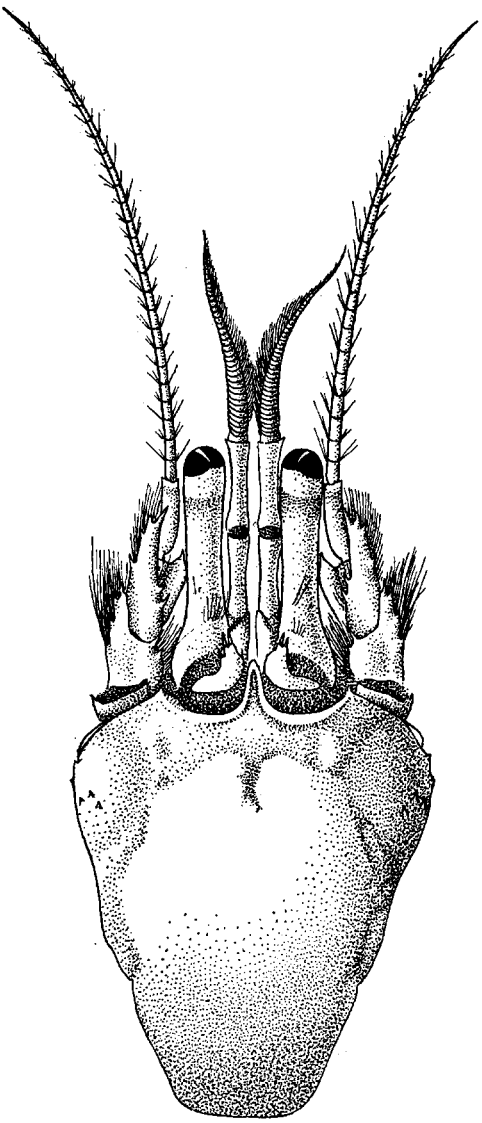

Fig. 21. *Paguristes tortugae* Schmitt. Anterior part of body in dorsal view. Specimen from "Coquette" Sta. 23. × 10. H. Heijn del.

those on the upper margin being largest. The fingers have the cutting edges ending in distinct black hoofs, behind which there are several small teeth.

The lower surface of the chela, apart from some tufts of hairs, is smooth. The upper margin of the carpus bears five teeth, all or part of which have a sharp horny tip. The outer surface of the carpus bears squamiform tubercles which may end in sharp horny tips. The lower margin of the outer surface is sometimes indicated by a row of larger tubercles. Near the articulation with the chela the outer surface sometimes shows a tubercular thickening. A small antero-ventral spine is present. The merus has one or two (in Suri-

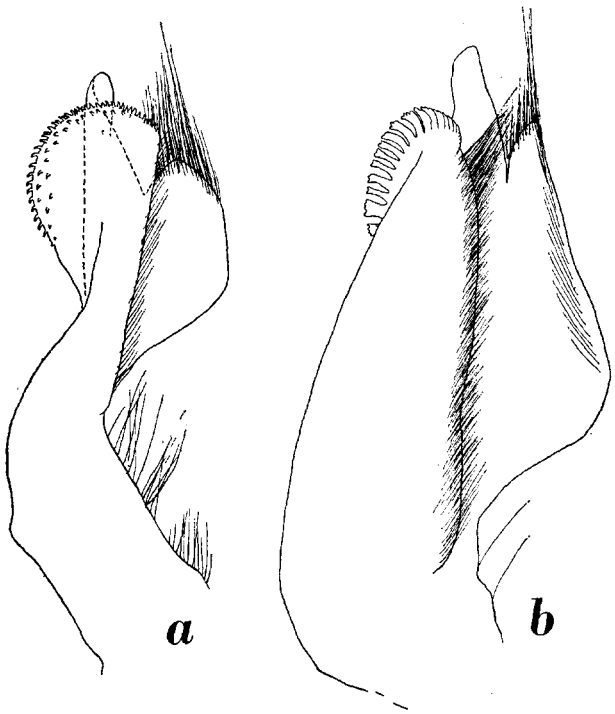

Fig. 22. First pleopod of male. a, *Paguristes tortugae* Schmitt; b, *Paguristes oxyophthalmus* new species. a, b, × 50.

name specimens) or three or four (in Florida specimens) small antero-dorsal spines. The lower inner margin bears a longitudinal row of spinules; the lower outer margin shows some granules and an anterior tooth. The walking legs reach with about the dactylus beyond the chelipeds. Both upper and lower margins of these legs bear an uninterrupted row of long hairs, while some tufts are also present on the lateral surfaces. The dactyli are somewhat longer than the propodi, the tip is of a dark horn colour, while small spinules of the same colour are placed in a row on the ventral margin of the dactylus. The inner surface of the dactylus and propodus of both walking legs shows

near the upper and lower margin a squamiform sculpturation, which is the more pronounced as the implantations of the hairs coincide with the squames, which furthermore have small horny spinules placed on their margins. The upper part of the inner surface of carpus, propodus, and dactylus of the second leg shows a shallow longitudinal groove. The outer surface of both walking legs is smooth with one or two longitudinal rows of tufts of short hairs. The upper margin of the dactylus of the second pereiopods (= first pair of walking legs) bears some denticles in the basal region; these denticles have tips of a horny yellow colour. The upper margin of the propodus of that leg is distinctly serrate, the teeth being horny tipped. In the third pair of pereiopods (= second pair of walking legs) neither the dactylus nor the propodus bears dorsal spines, only the minute spinules on the squames being visible. The carpus of the second pereiopods has two rows of spines dorsally (one on the upper margin and one in the upper part of the inner surface), while only one such row is present in the carpus of the third legs. The merus bears a sharp antero-ventral spine in both the second and third legs; in the third leg a row of spinules may be present on the dorsal margin, while it is not found in the second leg. A small outer antero-ventral tooth is present on the meri of both legs, while the second sometimes has the lower margin of the merus with a row of small spinules.

The top of the lower blade of the first pleopod of the male is broadly, almost circularly rounded, and is provided with many short, often recurved, horny spinules. The distal lobe is blunt and reaches beyond the lower blade, the inner lobe is rather short and narrow.

Colour. In my preserved specimens the carapace shows no colour markings at all. The distal part of the eyestalks bears a red ring, which is separated from the cornea by a whitish ring; the rest of the eyestalk is of a pale pinkish colour, while sometimes an indication of a red ring may be observed in the basal part. The distal two segments of the antennular peduncle both have in their distal part a red ring, which is separated from the anterior margin by a whitish ring; a second red ring is visible in the proximal half of the distal segment. The last segment of the antennal peduncle shows a red ring slightly behind the anterior margin. The thickened part of the upper antennular flagellum is pinkish, becoming paler distally. The antennal flagella show red rings. The legs are rather uniformly pinkish.

The specimens from Sta. 23 inhabited the shells of the following Gastropod species: *Bursa* (*Bursa*) *spadicea* (Montf.) (3 specimens), *Murex* (*Murex*) spec. (1 specimen), *Thais* (*Stramonita*) *haemastoma floridana* (Conrad) (3 specimens).

Remarks. The present Suriname specimens, which have the cl. varying