

between 4 and 8 mm (6 mm in the ovigerous female), were directly compared with three specimens (cl. 13 to 15 mm) from Tortugas, Florida (July 1925, H. Boschma; Leiden Mus. Reg. No. Crust. D 12587). The differences between the Suriname and Florida specimens have already been mentioned in the above description. They are so slight that, for the time being at least, the specimens are considered conspecific. In Schmitt's (1935) drawing of this species the spinules on the antennae and the walking legs are not shown, while also the characteristic squamiform sculpturation of these legs is omitted.

Type locality. Off Fort Jefferson dock, Garden Key, Dry Tortugas, Florida, U.S.A.; interstices of large *Porites* clumps.

Distribution. The species was only known from Florida (U.S.A.) and Puerto Rico; it is now reported for the first time from Suriname.

### **Paguristes oxyophthalmus** new species (textfigs. 22b, 23)

#### 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 ovigerous female. (L)

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 male. (L)

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 male. (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. (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. (L)

Station 274, between the mouths of the Coppename and Suriname Rivers, 6° 41' N 55° 27' W; bottom shells and coral; depth 42 m; 25 June 1957. — 1 male. (W)

Description. The carapace lengths of the specimens vary between 4 and 8 mm, in the ovigerous female it is 6 mm. The anterior shield of the carapace is about as long as broad. It is provided with some tufts of hair, while in the lateral parts there are about three transverse rows of spinules. The anterior of these rows is longest and lies a short distance behind the anterior margin of the carapace, laterally it curves backwards; the spinules of the two other rows are smaller and fewer. A longitudinal row of spinules is present on the largest of the lateral plates of the carapace. The rostrum is very short, broad and blunt; it fails to reach as far as the bases of the lateral teeth. Each of the latter ends in a distinct, though small, acute spinule.

The eyes are slender but are distinctly shorter than the anterior breadth of the carapace. The cornea is narrow and tapers anteriorly to a blunt point. It is about as long as broad and in the inner dorsal part of the basal margin it shows a very deep triangular emargination. The ophthalmic scales are

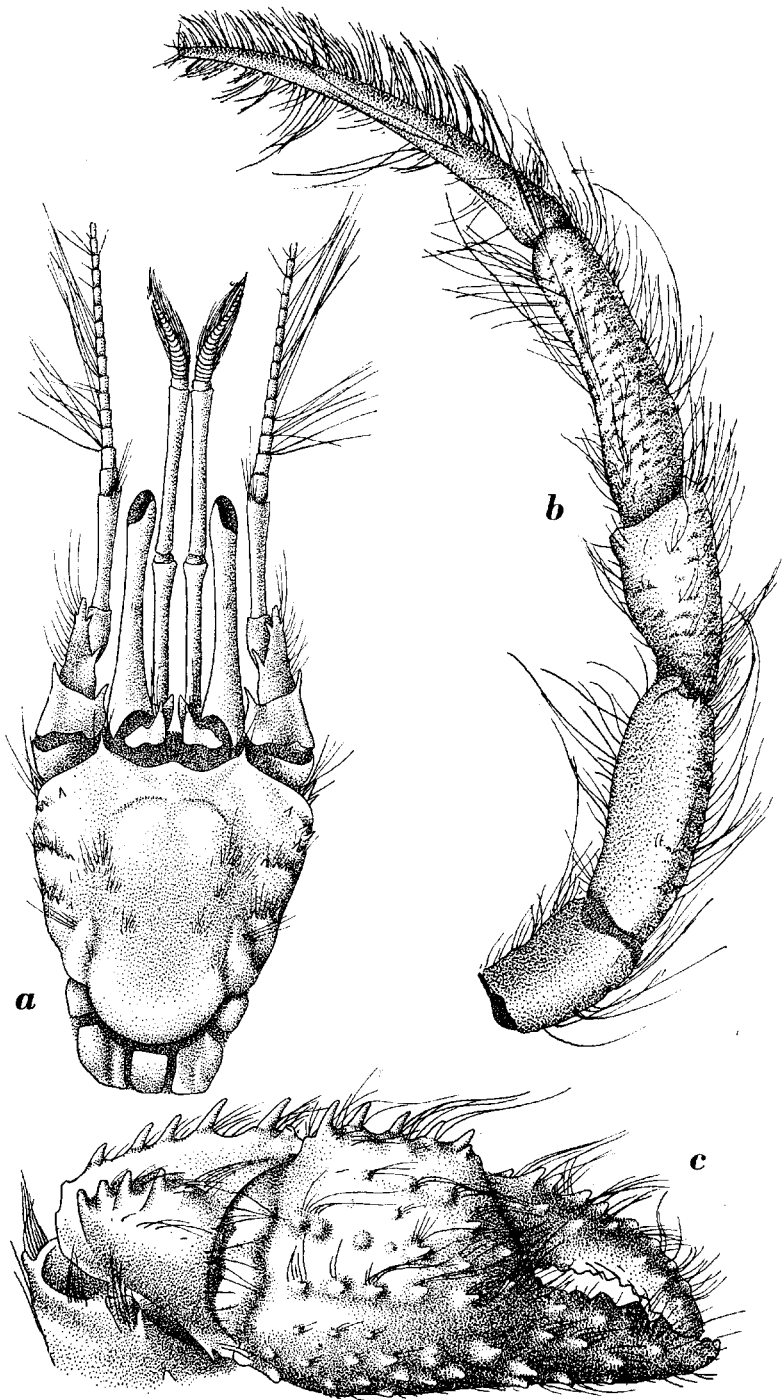


Fig. 23. *Paguristes oxyophthalmus* new species. a, anterior part of body in dorsal view; b, cheliped; c, third pereopod. a-c,  $\times 10$ . H. Heijn del.

separated by a narrow space; they are broad at their base; the inner part is produced forwards to a simply pointed process which reaches slightly beyond the base of the eyestalk.

The antennular peduncles reach beyond the eyes with about half the length of the ultimate segment. The antennal peduncle reaches only slightly beyond the eyes. The scaphocerite reaches somewhat beyond the base of the ultimate segment of the peduncle and on its inner margin it bears two or three teeth. The second segment of the peduncle shows two spines on the anterior margin, one on each side of the base of the scaphocerite, the outer being stronger than the inner. The ultimate segment of the peduncle is slender and bears no spines.

The chelipeds are equal and are thickly covered by long hairs. The upper margin of the palm bears a row of five strong teeth. The outer surface is smooth but for three or four longitudinal rows of tubercles, each of which is surrounded by long hairs. Similar tubercles are visible on the fingers. The cutting edges of the fingers end in a small black tip and are provided with about 10 teeth of different size. The inner surface of the palm is convex and shows several blunt tubercles, one or two of which are conspicuously larger than the rest. The carpus bears two longitudinal rows of strong spines, one on the dorsal margin, the other over the outer surface. The merus ends in an antero-dorsal spine, behind which there is a smaller second spine. The lower outer margin bears a row of spines which increase in size anteriorly; a row of smaller spines is present on the lower inner margin. The walking legs reach with part of the dactylus beyond the chelipeds; they are clothed with long hairs, especially on the dorsal and ventral margins. The dactylus is distinctly longer than the propodus. The lower margin of the propodus bears some blunt tubercles. The propodus of the second leg has a longitudinal row of about 4 spines in the proximal half of the upper margin; no such spines are present in the propodus of the third leg. The carpus of the second leg has a row of dorsal spines, that of the third possesses a single antero-dorsal spine only. In both legs the merus shows some dorsal tubercles.

The lower blade of the first pleopod of the male bears at the end a crown of spinules, which as a rule are rather broad at the top, ending in two or more teeth. The distal lobe is blunt and reaches beyond the lower blade. The inner lobe is rather narrow but reaches almost to the end of the lower blade.

Colour. In my preserved material a few faint reddish spots are visible on the carapace, while a very small red spot is present in the basal part of the eyestalks. In the chelipeds there is a red band over the base of the palm. A red band extends along the external and posterior margin of the upper surface of the carpus and continues on the basal part of the inner surface;

a red spot is visible in the antero-internal part of the dorsal surface of the carpus. The merus has a red distal band and shows a red colour in the upper basal part. The walking legs show a red band in the basal and in the distal part of the propodus, carpus and merus, and furthermore in the basal part of the dactylus.

Remarks. The species is to be distinguished from all other known West Indian species of the genus by the narrow tapering cornea. In the long antennula and the short rostrum it comes closest to *Paguristes sayi* A. Milne Edwards & Bouvier and *P. lymani* A. Milne Edwards & Bouvier, from both of which it may immediately be distinguished by the simply pointed ophthalmic scales.

Type. The specimen collected during the first voyage of the "Coquette" is the holotype. It is inserted in the collection of the Leiden Museum under Reg. No. Crustacea D 12586.

### **Paguristes erythrops** new species (textfigs. 24, 25)

#### Coquette Investigations

Station 318, between the mouths of the Coppename and Suriname Rivers, 6° 42' N 55° 38' W; bottom mud and fine shells; depth 44 m; 20 July 1957. — 1 female. (L)

Description. The carapace length of the single specimen is 5 mm. The anterior shield of the carapace is longer than broad. The lateral parts show three transverse rows of spinules, while moreover a few spinules are present on the antero-lateral margin. The rostrum is broad, triangular, and ends in a minute acute point. It reaches beyond the bases of the ophthalmic plates. The lateral teeth of the anterior margin of the carapace are blunt, each ending in a minute point. The anterior margin between the lateral teeth and the rostrum is regularly concave. The lateral part of the anterior margin is directed obliquely backwards. Between the lateral teeth the anterior margin of the carapace and the margin of the rostrum are raised.

The eyes are distinctly shorter than the anterior breadth of the carapace. The cornea is broader than the distal part of the eyestalk and is rounded. It is broader than long and shows a distinct emargination in the dorsal part of its basal margin. The ophthalmic scales are separated by a distance which is equal to the basal breadth of the rostrum; the base of these scales is broad, the inner half is anteriorly produced to a simple sharply pointed triangle, without any lateral teeth or spines.

The antennular peduncle is about as long as the eye. The antennal peduncle reaches slightly beyond  $\frac{2}{3}$  of the length of the eyestalk. The scaphocerite falls only slightly short of the end of the peduncle. It bears two or three teeth on the outer margin, none on the inner, while two are present on the

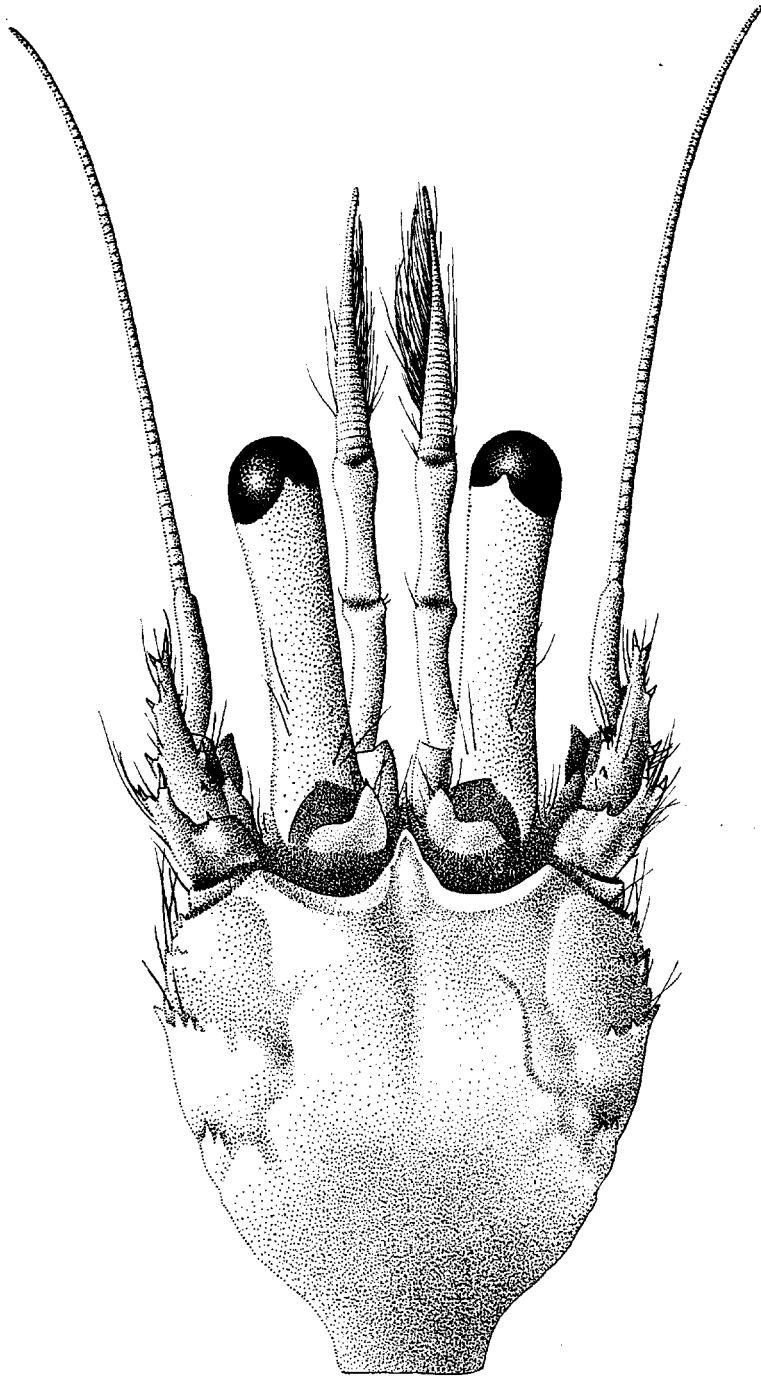


Fig. 24. *Paguristes erythropus* new species, holotype. Anterior part of body in dorsal view.  $\times 18$ . H. Heijn del.

upper surface; the anterior of the latter two is larger than the posterior. The second segment of the peduncle has a small dorsal spinule on the anterior margin, at the base of the scaphocerite, while the outer antero-lateral angle is strongly produced and ends in two sharp equal teeth. The last segment of the peduncle shows two spines in the basal part of the outer margin.

The chelipeds are equal and have only short hairs. The upper margin of the palm bears four strong, broad, but short spines, which have the tips acute and curved forwards. The outer surface of the chela is rather regularly covered with tubercles of various sizes, which usually end in sharp horny

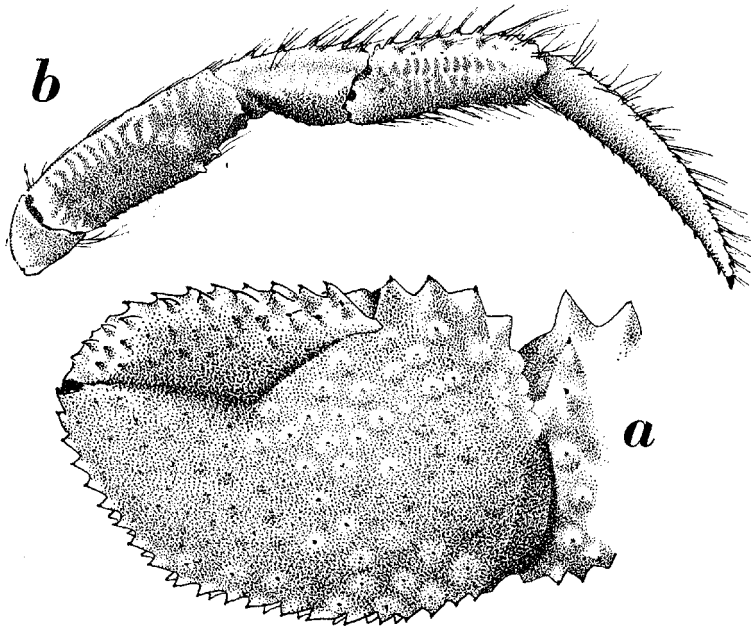


Fig. 25. *Paguristes erythroptus* new species, holotype. a, cheliped; b, second pereiopod. a,  $\times 20$ ; b,  $\times 12$ . H. Heijn del.

tips. The lower margin of the chela is convex, the upper is about straight. Each finger ends in a small dark coloured hoof; the fixed finger is about twice as high as the dactylus. The inner surface of the chela also bears pointed tubercles, which, however, are far fewer than on the outer surface. The outer and lower surfaces of the carpus have tubercles similar to those of the chela. The upper margin of the carpus is provided with three strong spines, like those of the palm. The merus has a few spiniform granules in the upper part and a row of tubercles along both the lower outer and the lower inner margins; both margins end in a small tooth. The second leg

reaches with part of the dactylus beyond the chela. The dactylus is about 1.5 times as long as the propodus; its tip is of a dark horn colour; a row of minute spinules of a similar colour is present on the lower margin. The upper margin of the dactylus bears a longitudinal row of horn-tipped teeth, which are placed slightly inwards, and which are most distinct in the basal part. A broad longitudinal groove is present in the upper part of the inner surface of the dactylus, being most distinct proximally. The propodus possesses sharp teeth both on the upper and lower margin; the upper teeth, about 10 in number, are larger than the lower. The dorsal surface of the carpus shows two longitudinal rows of distinct, sharply pointed spines. The outer surface of the carpus bears some tubercles, one of which, situated near the anterior margin, is largest. The merus bears tubercles and spinules on both lower margins. In the third leg no teeth are visible on the dorsal margin of the dactylus, propodus and merus, though spinules are present on the lower margin of the former segment. The carpus bears an antero-dorsal spine and a few spinules on the outer surface.

Colour. In my preserved specimen the general colour is whitish or very pale pink. The eyestalks are strikingly carmine in colour, while the two distal joints of the antennular peduncle are of similar, though lighter tinge. Furthermore scattered small roundish red spots are present on the carapace and on the three anterior legs.

The specimen inhabited the shell of a Gastropod mollusc belonging to the genus *Fusinus*.

Remarks. In the shape of the eyes, the front, and the antennae the present new species shows a close resemblance to *Paguristes puncticeps* Benedict (with which in my opinion *P. grayi* Benedict may be synonymous). The two species may be separated by (1) the shape of the ophthalmic scales, which in *P. erythrops* do not show a lobe on the inner margin, (2) the spinulation of the legs, and (3) the totally different colour pattern.

Type. The specimen mentioned above is the holotype. It is preserved in the collection of the Leiden Museum under Reg. No. Crustacea D 12482.

### ***Clibanarius vittatus* (Bosc, 1801-1802) (textfigs. 26, 27)**

"een soort van Kreeften" Merian, 1705, 1719, p. 59; 1730, p. 43, pl. 59.

"species cancrorum" Merian, 1705a, 1719a, 1726, p. 59, pl. 59; 1771, vol. 1, p. 59, pl. 59.

"espèce d'Ecrevices" Merian, 1726, p. 59, pl. 59.

"espèce d'Ecrevisses" Merian, 1771, vol. 1, p. 59, pl. 59.

"a parasitic crab" Guilding, 1834, p. 373.

"Bernard l'Hermite" Teenstra, 1835, p. 443.

*Pagurus symmetricus* Randall, 1840, p. 133.

*Pagurus* Kappler, 1887, p. 200.

Paguridae Jentink, 1912, p. 14.

## Museum Leiden

Mouth of the Suriname River near Pomona; 22 December 1942; D. C. Geijskes. — 5 specimens.

Beach near Braamspunt, mouth of the Suriname River; 20 August 1911, W. C. van Heurn; 17 August 1948, D. C. Geijskes; 5 April 1957, L. B. Holthuis no. 1219. — 107 specimens (3 ovigerous).

Near Paramaribo; July 1911, W. C. van Heurn; February 1914, A. J. Schimmelpenninck van der Oye. — 88 specimens (7 ovigerous).

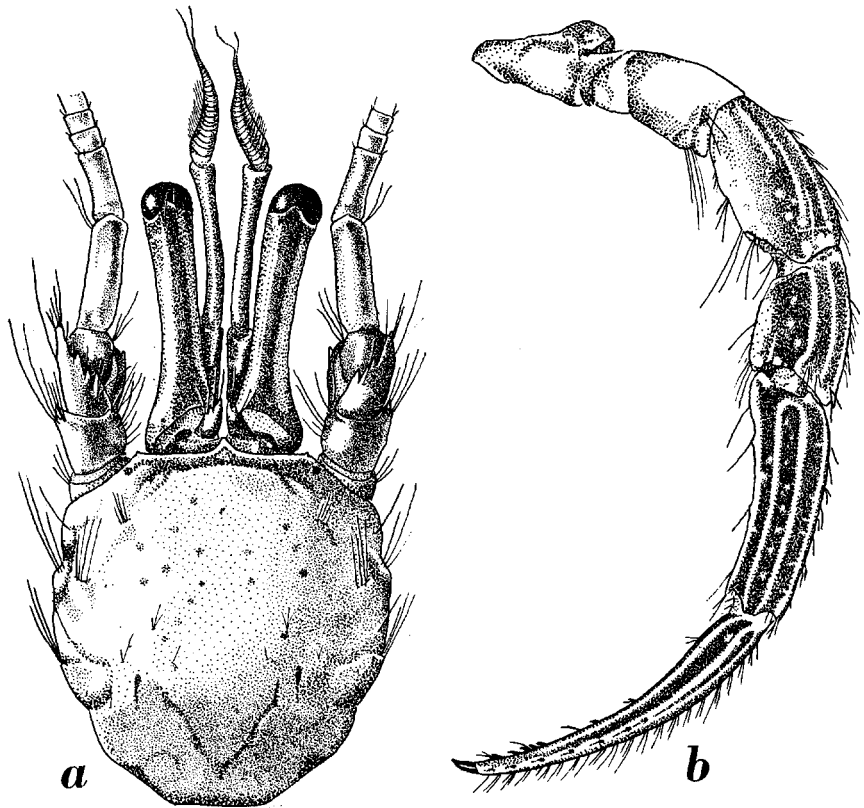


Fig. 26. *Clibanarius vittatus* (Bosc). a, anterior part of body in dorsal view; b, third pereopod. Specimen from Braamspunt (L. B. Holthuis no. 1219). a,  $\times 1,6$ ; b,  $\times 3,2$ . W. C. G. Gertenaar del.

Beach near the mouth of the Matappica Canal; 7 May 1948, D. C. Geijskes; 6 April 1957, L. B. Holthuis no. 1222. — 11 specimens.

Suriname; 1910 and 9 June 1910; D. G. J. Bolten. — 9 specimens.

Suriname; 1901; 1901 Coppename Expedition. — 2 specimens.

Suriname. — 10 specimens.



## Museum Hamburg

Paramaribo; 1 September 1908; C. Heller. — 6 specimens.

Paramaribo; C. Heller; received 24 May 1909. — 8 specimens.

## Museum Philadelphia

Suriname; C. Hering. — 1 specimen. Holotype of *Pagurus symmetricus* Randall.

Description. The specimens have carapace lengths ranging between 7 and 30 mm. Ovigerous females, with cl. 7 to 15 mm, were found in the months of July and August.

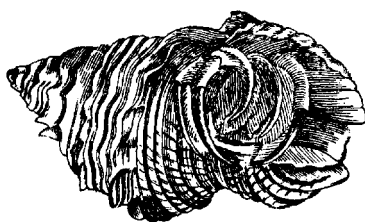


Fig. 27. *Clibanarius vittatus* (Bosc). Specimen from Suriname. After Merian, 1705.

The median part of the anterior margin of the carapace is straight, the lateral parts are directed obliquely backwards, forming a distinct obtuse angle with the median part. The rostrum is small, acute and triangular, reaching slightly beyond the bases of the ophthalmic scales. A distinct groove runs behind and parallel to the anterior margin; in its lateral part it gives off two branches which are directed more posteriorly. Tufts of hairs are implanted on the antero-lateral part of the carapace and behind the cervical groove.

The eyes are slender, measuring about  $\frac{5}{6}$  of the anterior breadth of the carapace. The cornea is small. The ophthalmic scales are triangular and have three spines in the distal part of the external margin.

The antennular peduncles reach beyond the eyes with a small part of their distal joint.

The antennal peduncle almost reaches the base of the cornea. The scaphocerite is triangular and reaches to or slightly beyond the base of the last segment of the peduncle. It bears four or five spines on the inner margin. A small spine is present in the basal part of the peduncle, just externally of the base of the scaphocerite.

The first legs are equal, reaching beyond the eyes with the carpus and the chela, sometimes with part of the merus. The chela is covered with many tubercles of various sizes, those on the fingers having the tips corneous, and

placed (especially on the dactylus) in more or less distinct longitudinal rows. The upper (= inner) margin of the palm bears a row of about four conically tipped tubercles. The inner (= lower) surface of the chela is strongly convex and bears tubercles similar to those of the outer surface, but of a more flattened shape. The cutting edges of the fingers bear a few blunt teeth, the distal of which is the largest. The tips of the fingers are provided with distinct black hoofs. Anteriorly the dorsal margin of the carpus ends in a tooth behind which there are some smaller denticles. The outer surface of the carpus shows some more tubercles. The merus has the lower inner margin granular. Two small teeth are present at the end of the lower outer margin. The second legs have the dactylus about 1.3 times as long as the propodus. It ends in a dark coloured tip; in its distal part the lower margin bears some dark coloured spines and it has tufts of hair over its entire length. Furthermore tufts of hair are arranged in longitudinal rows over the rest of the surface of the dactylus. The upper margin shows a blunt carina. The propodus is more or less cylindrical and bears scattered tufts of hair; the anterior margin sometimes shows one or two small spinules dorsally or internally. The carpus ends in one to three antero-dorsal teeth while the upper margin bears one to three teeth at some distance behind the anterior margin. Furthermore there may be one or two small spines in the external part of the anterior margin. The merus has the lower inner margin granular, the lower outer margin with a distal tooth. In the third legs the dactylus is relatively still longer than the propodus (almost 1.5 times). The general shape of the various segments of the third leg is similar to that of the segments of the second, only the carpus has a single antero-dorsal tooth, while the lower inner margin of the merus is not granular.

Colour. The legs are olive-green or brown. The tubercles on the outer surface of the chela are bluish white. The dactylus of the walking legs shows one longitudinal pale streak above and below, and two on each lateral surface. The propodus shows four pale longitudinal streaks on each surface. The carpus has one dorsal and two external streaks, while on the outer surface of the merus also two pale streaks may be seen. There is a dark longitudinal line on the dorsal surface of the eyestalk, flanked by two paler lines. The last segment of the antennal peduncle has a pale line on the dorsal surface.

The specimens inhabited a rather great variety of Gastropod shells: *Pomacea glauca* (L.) (1 specimen), *Natica canrena* (L.) (1 specimen), *Bursa spadicea* (Montf.) (9 specimens), *Murex chrysostoma* Sow. (6 specimens), *Thais* (*Stramonita*) *haemastoma floridana* (Conrad) (57 specimens), *Thais* (*Thais*) *trinitatensis* (Guppy) (27 specimens), *Melongena melongena* (L.) (2 specimens), *Pugilina morio* (L.) (27 specimens).

Remarks. The present species is closely related to *Clibanarius scolopetarius* (Herbst)<sup>1</sup>), from which it differs in the following points.

1. In *C. scolopetarius* the rostrum is rounded or truncate at the tip, in *C. vittatus* it is triangular and more acute.

2. In *C. scolopetarius* the eyestalks are longer than the anterior breadth of the carapace, in *C. vittatus* they are distinctly shorter than that breadth.

3. The last segment of the antennal peduncle is less than 2.5 times as long as broad in *C. vittatus*, more than 2.5 times in *C. scolopetarius*.

4. The dactylus of the walking legs in *C. scolopetarius* is dark above and below, the lateral surface showing only two broad longitudinal pale streaks. Also the propodus and carpus show two broad, light stripes on the external and internal surfaces. Three broad stripes are present on the external surface of the merus. The pale lines on the legs of *C. vittatus* are narrower and more numerous.

*Pagurus symmetricus* Randall, 1840, was described from Suriname and has been overlooked by most subsequent authors. The species is not even mentioned in Alcock's (1905) enumeration of the Paguridae of the world. Randall's description, for its time, is reasonably good, and there can be little doubt that he described the only Pagurid which is commonly found on the Suriname sea shore, where so far no other species of hermit crab has been observed. All the other Paguridae dealt with in the present paper were trawled at considerable distances from the coast.

My Suriname specimens of this species were directly compared with specimens of *C. vittatus* from Florida, which Mr. Marvin L. Wass kindly placed at my disposal. This made it possible for me to establish the specific identity of the two forms. Apart from the fact that in the Suriname material the light bands on the legs are relatively somewhat narrower, the Florida and Suriname specimens show a complete resemblance, both in form and in the colour pattern.

It seems most probable that Miers's (1877) new species *Clibanarius cayennensis* is identical with the present form and that it is based on a specimen in which one cheliped is regenerating and thereby shorter than the other, while the absence of any colour pattern probably is due to the method of preservation of the animal. The possibility exists that also *Clibanarius spe-*

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1) This species is often indicated with the name *Clibanarius cubensis* (De Saussure, 1858). As Mr. Marvin L. Wass, University of Florida, Gainesville, informed me in litt., there can be little doubt that De Saussure's species is identical with *Cancer scolopetarius* Herbst, 1791. I thank Mr. Wass for this information and for his permission to make use of it in the present paper.

*ciosus* Miers should be placed in the synonymy of the present species. An examination of Miers's types is most desirable.

Type locality. "Les côtes de la Caroline" (Bosc, 1801-1802, vol. 2, p. 79). The type locality of *Pagurus symmetricus* Randall, 1840, is Suriname.

Distribution. East coast of America from North Carolina (U.S.A.) to Brazil. Graham (1955, p. 35, pl. 5 fig. 4) described and figured this species from British Guiana as the "common Hermit Crab of Demarara", identifying it on p. 77 of her book with *Clibanarius cubensis*. The type material of *C. cayennensis* Miers originates from French Guiana.

Occurrence in Suriname. The species is the only hermit crab so far found on the Suriname shores. It is quite common on the beaches of sand or hard mud near the mouths of the rivers, where the specimens are mostly found close to the water line.

The first record of this species dates from 1705, when Merian published her book on Suriname Insects. Pl. LIX of this work shows a hermit crab, which was collected at the Suriname coast. Though the figure is not up to the standard of Merian's other illustrations, there can be little doubt that the present species is depicted. Merian's text gives no clue at all: "Ik heb ook laten hoorntjes uit de grond der Zee opvissen, om te zien wat voor beestjens daar in zitten mogten, ik heb dan zeer veel gehad, daar de beestjens nog levendig in zaten, ik heb verscheide met geweld daar uit getrokken, en bevonden dat se van vooren een soort van Kreeften waren, maar van achter waren se Slakken in het hoorntje ingedraait, des daags lagen se stil, maar des nachts maakten se een stil geluid met haare pooten, en waren zeer onrustig." (I also had some shells fished for me from the sea, in order to find out what kind of animals inhabited them. I received many in which the animals were still alive. I pulled several out by force and found them to be a kind of lobster anteriorly, but posteriorly they were snails twisted into the shell. In the daytime they were quiet, but at night they made a soft noise with their legs and were very restless). Guilding (1834) in his comments on Merian's work remarked of her pl. 59: "The Pýrula, and another shell with a parasitic crab, are not worthy of mention." Teenstra (1835) reports the presence of a hermit crab in Suriname without giving any details. Kappler (1887, p. 200) spoke of "einigen Arten Einsiedlerkrebse, *Pagurus*, die auf den Sandbänken in angeschwemmten Schneckenschalen hausen" without stating whether he actually did recognize more than one species. Though *Clibanarius vittatus* is very common in Suriname, no modern author seems to have reported upon Suriname material.

***Clibanarius foresti*** new species (textfig. 28)

## Coquette Investigations

About 20 miles N.N.W. of the mouth of the Coppename River; depth 31 m; 1-5 April 1957; first voyage. — 9 specimens (4 ovigerous). (L)

N.N.W. of the mouth of the Marowijne River, about 20 miles offshore; depth 35 m; 8-12 April 1957; second voyage. — 1 specimen. (L)

Off the Suriname coast between the mouths of the Nickerie and Coppename Rivers, about 20 miles offshore; depth 27 m; 15-20 April 1957; third voyage. — 1 specimen. (L)

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

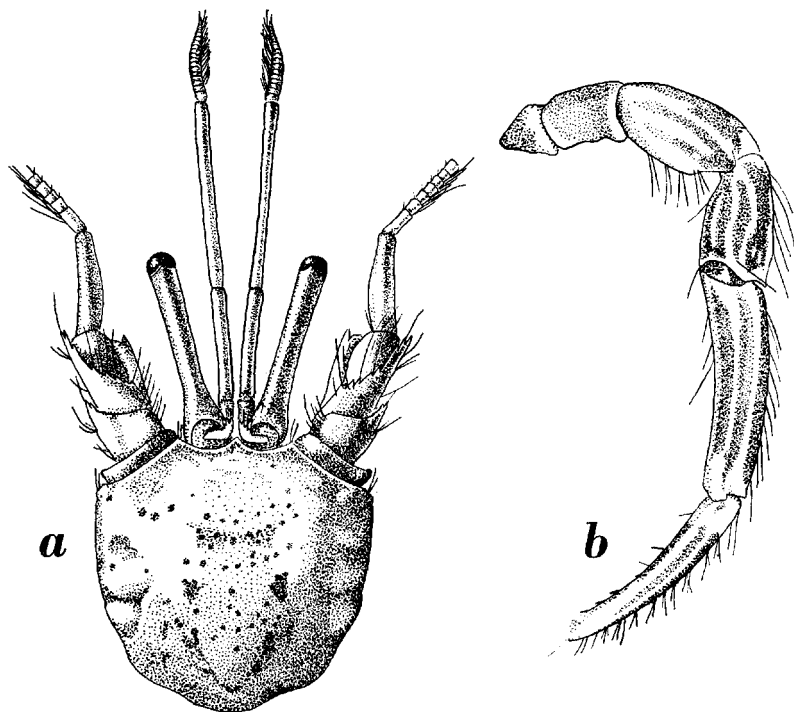


Fig. 28. *Clibanarius foresti* new species. a, anterior part of body in dorsal view; b, third pereiopod. Specimen from "Coquette" Sta. 166. a,  $\times 7$ ; b,  $\times 5$ . W. C. G. Gertenaar del.

About 15 miles N. of "Suriname Rivier" lightvessel; depth 18 m; 3 May 1957; fifth voyage. — 1 specimen. (L)

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

Station 1, off the mouth of the Suriname River,  $6^{\circ} 22' N 55^{\circ} 06' W$ ; bottom mud; depth 26 m; 11 May 1957. — 1 specimen. (W)

Station 2, off the mouth of the Suriname River,  $6^{\circ} 23' N 55^{\circ} 05.5' W$ ; bottom mud; depth 27 m; 11 May 1957. — 7 specimens (2 ovigerous). (W)

Station 15, N.E. of the mouth of the Suriname River,  $6^{\circ} 24.5' N 54^{\circ} 59.5' W$ ; bottom mud and shells; depth 29 m; 11 May 1957. — 1 specimen. (L)

Station 19, N.E. of the mouth of the Suriname River, 6° 27' N 54° 58' W; bottom shells; depth 31 m; 11 May 1957. — 1 specimen. (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. — 5 specimens. (W)

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. — 1 specimen. (W)

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 specimen. (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. — 1 specimen. (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. — 21 specimens (7 ovigerous). (W)

Station 178, N.E. of the mouth of the Coppename River, 6° 19' N 55° 50.5' W; bottom mud and shells; depth 27 m; 6 June 1957. — 1 specimen. (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 specimen. (W)

Station 320, between the mouths of the Coppename and Suriname Rivers, 6° 47' N 55° 36' W; bottom shells, coral and sponges; depth 48 m; 20 July 1957. — 1 specimen. (W)

**Description.** The carapace length of the specimens varies between 2 and 12 mm; that of the ovigerous females between 4 and 8 mm.

The rostrum is very small and fails to reach the base of the ophthalmic scales. It is acute but not clearly set off from the front, the lateral margins merge insensibly into the anterior margin of the carapace. The lateral teeth of the front are also acutely pointed and are similar to the rostrum in shape and size. Between the rostrum and each lateral tooth the anterior margin of the carapace forms an evenly curved slightly concave line. Externally of the lateral teeth the margin of the carapace is directed obliquely posteriorly. The anterior margin of the carapace is somewhat elevated but behind it no distinct transverse groove is present as in *C. vittatus*. The region before the cervical groove is about as long as broad. A few hairs are visible in the anterior half of the carapace; most of these are situated laterally; far more hairs are visible behind the cervical groove.

The eyes are slender, but are definitely shorter than the anterior breadth of the carapace. They reach to or fail to reach to the end of the antennal peduncle, and fall far short of the middle of the last segment of the antennular peduncle. The ophthalmic scales are placed close together. They are triangular and end in one or two sharp teeth; in its distal half the outer margin bears one or two small denticles.

The antennulae are long, reaching with distinctly more than half the length of the ultimate segment of the peduncle beyond the eyes.

The scaphocerite reaches to the end of the penultimate segment of the antennal peduncle and bears about five well-developed teeth on its inner margin.

One or two strong spines are visible on the antennal peduncle near the external part of the base of the scaphocerite.

The chelipeds reach with about half or less than half the merus beyond the eyes. The chelae are practically equal, the left being slightly broader than the right. The outer surface of the palm bears a number of rather acute tubercles, some of which are horn-tipped. The four or five tubercles on the upper margin of the palm, and one near the articulation with the carpus are stronger and more sharply pointed than the rest. The inner surface of the palm bears blunt and flattened tubercles. The fingers have the tubercles as on the palm. Their cutting edges show two to four teeth, which are of equal size or show slight differences, the proximal then being larger than the distal. The tips of the fingers are pointed and show the usual dark coloured hoofs. The carpus bears a strong antero-dorsal spine, behind which there is a row of smaller less conspicuous teeth. The outer surface of the carpus bears several tubercles which in the upper part are more conspicuous than in the lower. The upper margin of the merus shows no spine. The outer surface is slightly granular, but bears a distinct tooth at the distal end of the lower margin; behind this tooth there is a groove, posteriorly of which a few minute spinules may be seen. The lower inner margin of the merus bears a row of small spinules or granules. The dactylus of the second legs is distinctly longer than the propodus; it ends in a black tip and bears a row of spines in the distal part of the ventral margin. The dorsal margin shows an indistinct longitudinal ridge. Many long tufts of hairs are present in the upper inner part of the dactylus; there is a longitudinal row of these tufts in the lower part of the inner surface, and four rows of very short tufts are visible on the outer surface, one of these on the lower margin. The propodus is curved and possesses an indistinct antero-ventral tooth; the arrangement of the tufts of hair is similar to that on the dactylus. The carpus bears a distinct acutely horn-tipped spine at the antero-dorsal point; behind this spine the dorsal margin sometimes shows some denticles. The outer anterior margin of the merus bears a strong spine below the articulation with the carpus. The right third leg strongly resembles the second, only the propodus is relatively slightly shorter. The left third leg has both the dactylus and the propodus with a distinct dorsal carina and a flattened outer surface. The propodus is distinctly shorter and higher than in the second leg and has the lower margin serrate. The merus also is somewhat shorter and higher than in the second leg.

Colour. In preserved specimens an orange-red mottling is visible in the anterior part of the carapace and on the antennal peduncles. The eyestalks present no colour at all or are of a pinkish colour which becomes somewhat more distinct near the base of the cornea. The outer surface of the palm of the

chelipeds is orange-red, the tubercles are white; the outer surface is of a darker red, the inner surface being paler. The tips of the fingers and the base of the dactylus are white, the hoofs are almost black. The carpus and merus are mottled with orange-red. A conspicuous purple spot is present in the distal part of the inner surface of the merus. The dactylus and propodus of the walking legs have a dark dorsal line of red. The outer surface of both segments shows two broad longitudinal red streaks, while also on the inner surface of the dactylus two broad red streaks are visible. The lower margin of the dactylus also shows a red band. These red streaks do not attain the very base of the dactylus, and also end at a short distance before the dark tip; hereby the impression is obtained that the dactylus is provided with a white basal and distal ring. In the white basal region a small oblique red spot is visible. The inner surface of the propodus shows four longitudinal red streaks, which sometimes are more or less distinctly fused. The propodus shows a distal, but no basal white band; in this distal band the upper outer and the one but upper inner red band are continued as a narrow line. The carpus has the dorsal line white, while four rather broad red bands extend over the full length of the outer surface. Also the inner surface shows some red bands, which often are not distinctly separated the one from the other. The upper half of the outer surface of the merus is red with a few white spots, the lower half shows two longitudinal red bands. The third legs have a colour pattern which is very similar to that of the second.

The specimens inhabited the shells of the following Gastropod molluscs: *Natica canrena* (L.) (3 specimens), *Bursa spadicea* (Montf.) (11 specimens), *Murex* (*Murex*) spec. (2 specimens), *Thais* (*Stramonita*) *haemastoma floridana* (Conrad) (2 specimens), *Nassarius* spec. (1 specimen), *Marginella* spec. (3 specimens).

Remarks. The present new species is most closely related to *Clibanarius vittatus* (Bosc) and *C. sclopetarius* (Herbst), resembling these species in having the dactyli of the walking legs longer than the propodus and in the striped colour pattern of the legs. From both these species *C. foresti* may be at once distinguished by the short rostrum and by the very long antennulae. Furthermore the shape and coloration of the legs is different. Also *C. foresti* is a distinctly smaller species than either *C. vittatus* or *C. sclopetarius*.

Type. Holotype is the specimen from N.N.W. of the mouth of the Marowijne River at about 20 miles offshore (second voyage of the "Coquette"). It is inserted in the collection of the Rijksmuseum van Natuurlijk Historie under the registered number Crustacea D. 12588. The other specimens are paratypes.

The species is named for M. Jacques Forest, Muséum National d'Histoire Naturelle, Paris, who at present is the foremost authority on the Paguridae.



**Petrochirus diogenes** (Linnaeus, 1758)

## 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)

Stations 267 and 273, between the mouths of the Coppename and Suriname Rivers, 6° 42'—6° 41' N 55° 43'—55° 45' W and 6° 41'—6° 40.5' N 55° 41'—55° 25' W; bottom mud and shells; depth 44 m; 20 and 21 June 1957. — 1 male. (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. (L)

Description. Benedict, 1901, p. 140; Schmitt, 1935, p. 206, fig. 66 (both under the name *Petrochirus bahamensis* (Herbst)).

Remarks. The specimens are well developed; their carapace length lies between 32 and 60 mm.

The species is best known as *Petrochirus granulatus* (Olivier, 1811) or as *P. bahamensis* (Herbst, 1791). The correct name, however, proves to be *Petrochirus diogenes* (Linnaeus, 1758). Linnaeus (1758, p. 631) described his *Cancer Diogenes* as follows:

“C. [ancer] macrourus parasiticus, chelis muricatis: dextra majore.

*Brown. jam.* 424. *Astacus maximus*, cauda subnuda molli, chelis subverrucosis tuberculatis: dextra majore.

*Rumph. mus. t.* 5. f. K. L.

*Catesb. car.* 2 t. 34.

*Habitat in Oceano Asiatico, Americano, intra testas varias Concharum.*”

Rumphius's animal represents an Indo-West Pacific species of *Coenobita*. As the figures printed in Rumphius's work all are the mirror images of the original drawings, the *Coenobita* is shown with the right chela larger than the left. Catesby's (1754, p. 34, pl. 34) description and figure make it beyond any doubt that his *Cancellus maximus Bahamensis* is identical with the present *Petrochirus* species. Browne's (1756, p. 424) latin description which is quoted in its entirety by Linnaeus is rather short, but also indicates the present species, which is furthermore confirmed by Browne's reference to Catesby's plate 34 and by his statement that “This shell-fish grows to be one of the largest of the tribe in America”. *Cancer Diogenes* L., 1758, thus is a composite species, being based on the E. American *Petrochirus* species and on one of the Indo-West Pacific species of *Coenobita*. In order to definitely settle the identity of this composite species I now select as its lectotype the specimen figured by Catesby (1754) on pl. 34 of the second volume of his *Natural History of Carolina*.

Herbst's (1791, vol. 2, p. 30) *Cancer Bahamensis* is based exclusively on the description and figure of Catesby's *Cancellus maximus Bahamensis*; thus

*Cancer Diogenes* L. and *Cancer Bahamensis* Herbst have the same specimen as type specimen and therefore are objective synonyms of each other.

The specific name *diogenes* L. has not been in use for the last 40 years and its reintroduction for the American *Petrochirus* species will not produce any confusion. Also the disappearance of the specific name *bahamensis* will not cause any difficulties, first because the species in question was not very often referred to in the literature, and second while the use of that specific name is not of very long standing, in the previous century the species being generally indicated as *Petrochirus granulatus* (Olivier). There is no good reason therefore not to strictly follow the Rules here.

The specific name *diogenes* formerly has often erroneously been given to the species *Coenobita clypeatus* (Herbst, 1798). This incorrect identification of *Cancer diogenes* L. is caused by that Linnaeus (1767, p. 1049) in the 12th edition of his *Systema Naturae* changed his views as to the status of the various species of hermit crabs and attached the name *diogenes* to a species which he described as follows:

"C.[ancer]macrourus parasiticus, chelis laevibus pubescentibus: sinistra majore.

*Gron. zooph.* 983.

*Rumph. mus.* t. 5. f. K.L.

*Catesb. car.* 2. t. 33. f. 1, 2.

*Kaempf. jap.* t. 13. f. 7.

*Habitat in Oceano Asiatico, Americano, intra testas varias Cochlearum*".

Most of the references now given by Linnaeus deal with species of the genus *Coenobita*. So Catesby's (1754) pl. 33 figs. 1, 2, clearly show *Coenobita clypeatus* (Herbst). Rathbun (1919, p. 329) was the first to point to the fact that the name *diogenes* cannot be used for the east American *Coenobita* and she adopted the correct name *C. clypeatus* for that species, being followed in this by practically all subsequent authors. Though Rathbun rejected the specific name *diogenes* for *Coenobita clypeatus*, she did not use this name for the E. American *Petrochirus* though she stated that "the remainder of Linnaeus's description is not inapplicable" to that species.

Type locality. "*In Oceano Asiatico, Americano*" (Linnaeus, 1758, p. 631). By the present lectotype selection the type locality is now restricted to "near the shores of the *Bahama Islands*" (Catesby, 1754, vol. 2, p. 34).

Distribution. East coast of America from North Carolina (U.S.A.) to Brazil and the West Indies. The species is now reported for the first time from Suriname.

**Dardanus venosus** (H. Milne Edwards, 1848)

## Coquette Investigations

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

N.N.W. of the mouth of the Marowijne River; 20 miles offshore; depth 35 m; 8-12 April 1957; second voyage. — 1 male, 1 ovigerous female. (L)

20 miles N. of the Suriname coast between the mouths of the Nickerie and Coppename Rivers; depth 27 m; 15-20 April 1957; third voyage. — 2 males, 2 juveniles. (L)

20 miles N. of the mouth of the Marowijne River; depth 27 m; 23-27 April 1957; fourth voyage. — 1 female. (L)

N.N.W. of the mouth of the Marowijne River, about 30 miles offshore; depth 37 m; 29 April-3 May 1957; fifth voyage. — 1 male. (L)

20 miles N. of the mouth of the Suriname River; depth 9 m; 6-9 May 1957; sixth voyage. — 1 female. (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. (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. — 1 male. (W)

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

Station 11, off the mouth of the Suriname River, 6° 24' N 55° 01' W; bottom mud; depth 27 m; 11 May 1957. — fragments. (L)

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. — 1 female. (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 juvenile. (W)

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 juvenile. (W)

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, 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. — 2 males. (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 ovigerous female. (W)

Station 159, off the mouth of the Suriname River, 6° 22' N 55° 02.5' W; bottom mud; depth 26 m; 4 June 1957. — 1 juvenile. (W)

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. — 2 juveniles. (W)

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 female. (L)

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)

Station 318, between the mouths of the Coppename and Suriname Rivers, 6° 42' N 55° 38' W; bottom mud and fine shells; depth 44 m; 20 July 1957. — 1 ovigerous female. (W)

Description. Benedict, 1901, p. 141 (as *Pagurias insignis*); Schmitt, 1935, p. 201, fig. 62.

Remarks. The species is represented by specimens which have cl. ranging between 4 and 25 mm; the ovigerous females have cl. between 10 and 15 mm.

The specimens inhabited the shells of the following gastropod molluscs: *Natica canrena* (L.) (1 specimen), *Bursa spadicea* (Montf.) (1 specimen), *Tonna galea* (L.) (2 specimens), *Murex (Chicoreus) brevifrons* Lam. (1 specimen), *Turbinella laevigata* Anton (1 specimen). The shell of the specimen from Station 2 (*Polinices* spec.) carried a sea-anemone of the species *Calliactis tricolor* (Lesueur, 1817), which was identified by Dr. Charles E. Cutress, U.S. National Museum, Washington, D.C. The shell of the specimen from Station 318 was overgrown by a sponge to such an extent that the shell was not at all visible; the diameter of the sponge was about  $60 \times 80$  mm.

Type locality. Guadeloupe.

Distribution. East American waters from Bermuda and Florida to Brazil and the West Indies. The species has not been reported before from Suriname.

### ***Pylopagurus spinulosus* new species (textfigs. 29, 30)**

#### Coquette Investigations

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

Description. In many respects the present species resembles *P. unguulatus* (Studer) as described by A. Milne Edwards & Bouvier (1893, p. 80, pl. 6 figs. 15-18). The carapace length of the present specimen is 6 mm. The rostrum ends in a triangular point the tip of which is rounded. The anterolateral angles of the carapace are rounded. The ophthalmic plates are like those described for *P. unguulatus*: broad at the base and ending in a narrower lanceolate tip below which there is a distinct spine. The eyes are slightly broader than figured by the French authors; they are overreached by the scaphocerite. The cornea is distinctly broader than the stalk and is somewhat flattened anteriorly. The last segment of the antennular peduncle is almost twice as long as the penultimate. The antenna does not seem to differ from that of *P. unguulatus*.

In the right cheliped the merus and carpus are remarkable by that the lower margin of each shows a large protuberance, which in the merus is conical, in the carpus more obtuse. Especially on the anterior margin of the outer surface these protuberances show a fine granulation. The lower end of the anterior margin of the outer surface of the merus bears two small teeth. The upper surface of the carpus, like in *P. unguulatus*, bears numerous sharp spinules, being bordered on the inner side by a row of much larger spinules. The outer row of spinules, however, is not very distinct. Both the outer and the inner surface of the carpus show an oblique carina which extends from

the antero-dorsal angle obliquely posteriorly and ventrally. The outer surface of the chela is ovate with a raised rim. With this chela the animal, which lived in a tube formed by Bryozoans, could perfectly shut off the opening of the tube. The rim of the chela consists of irregularly alternating large and small spines. The outer surface of the chela itself is covered with spinules of vary-

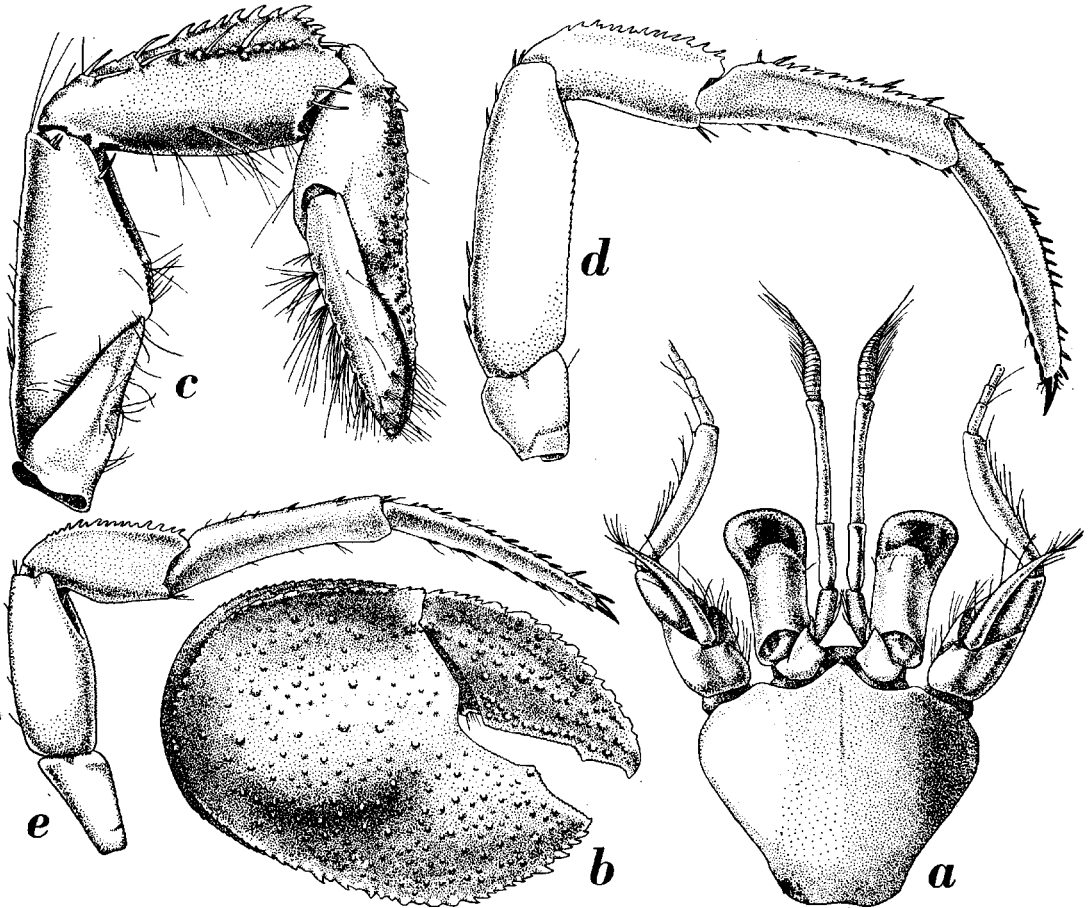


Fig. 29. *Pylopagurus spinulosus* new species, holotype. a, anterior part of body in dorsal view; b, large chela; c, smaller cheliped; d, second pereiopod; e, third pereiopod. a, b,  $\times 10$ ; c,  $\times 15$ ; d,  $\times 12$ ; e,  $\times 7.5$ . W. C. G. Gertenaar del.

ing size: some of these are somewhat constricted near the base, but none is actually mushroom-shaped as described by A. Milne Edwards & Bouvier for *P. unguatus*. The largest spinules of the outer surface are arranged in two parallel oblique rows. The median part of this surface is slightly elevated.

The dactylus is narrower than the fixed finger. The cutting edge of each finger bears a single small tooth; the tooth of the dactylus is placed before that of the fixed finger. The inner surface of the palm is granular and shows two sharp carinae which begin at the articulations with the carpus and are directed obliquely distally and medially. When the chela is flexed inward (as it is when used for closing the tube in which the animal lives), these two carinae fit tightly to the carinae on the inner and outer surface of the carpus. The left chela is very small. The fingers are distinctly longer than the palm and

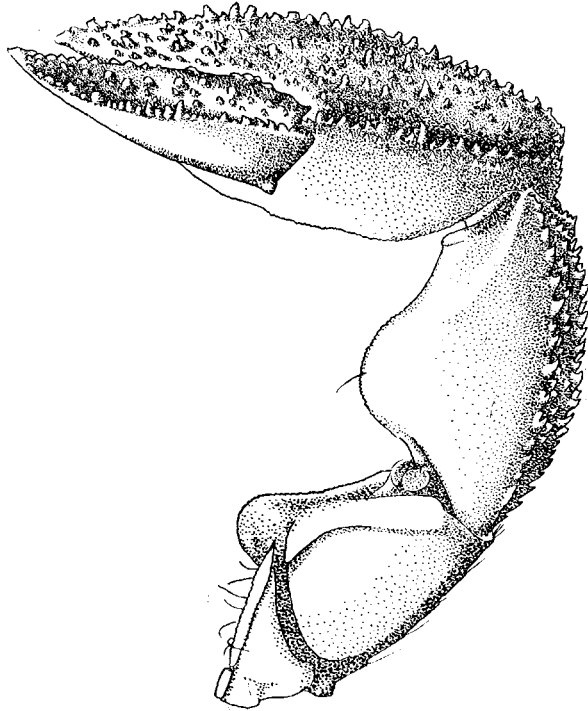


Fig. 30. *Pylopagurus spinulosus* new species, holotype. Larger cheliped.  $\times 12$ .  
W. C. G. Gertenaar del.

close over their entire length. The cutting edges are provided with a row of closely placed, comb-like arranged horny spinules. Minute, often blunt spinules are placed on the other surface of the chela, those in the lower basal part being largest. A distinct carina extends over the lower margin of the chela; a similar carina is found on the upper margin of the dactylus. The inner surface of the chela bears many tufts of hair, which are especially dis-

tinct near the upper margin of the dactylus. The carpus has a strong antero-dorsal spine, behind which there is a long row of somewhat smaller spines. On the anterior margin, to the interior of the antero-dorsal spine, three smaller spines are visible, while on the inner surface, somewhat below the dorsal row of spines, there is a parallel row of spinules. The merus has two spines on the outer antero-ventral angle. In the walking legs the propodi are slightly shorter than the dactyli. The latter have both the upper and the lower margin provided with movable spinules. Spine-like hairs are present in the upper part of the propodus, carpus and merus. In the second pereiopods the upper margin of the carpus and the propodus are finely and closely serrate, in the third leg this serration is visible in the carpus only. The lower margin of the merus is sometimes finely serrate.

Colour. Only very faint traces of the original coloration are visible as scattered reddish dots on the larger cheliped.

Remarks. The species is most closely related to *Pylopagurus unguatus* (Studer), which originally was described from off the Cape of Good Hope and was later reported by A. Milne Edwards & Bouvier (1893) from Yucatan Bank. The differences from this species have already been mentioned in the description.

The holotype is placed in the collection of the Leiden Museum under Reg. No. Crustacea D 11981.

***Pylopagurus operculatus*** (Stimpson, 1859) (textfig. 31)

Coquette Investigations

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 male. (L)

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

Description. The anterior shield of the carapace is about as long as broad; it bears a few scattered hairs. The rostrum is visible only as a broad convexity of the anterior margin of the carapace; it almost fails to reach the base of the ophthalmic scales. The lateral teeth are angular, each bears a small outwards directed sharp tip.

The eyestalks are distinctly shorter than the anterior breadth of the carapace. The cornea is much broader than the end of the stalk and is rounded; dorsally its basal margin shows a more or less distinct emargation. The ophthalmic scales are separated by a short distance; they are broad at the base and taper regularly towards the sharp top, being longer than broad; they distinctly overreach the base of the eyes. The upper surface of the distal part of the scales is concave.

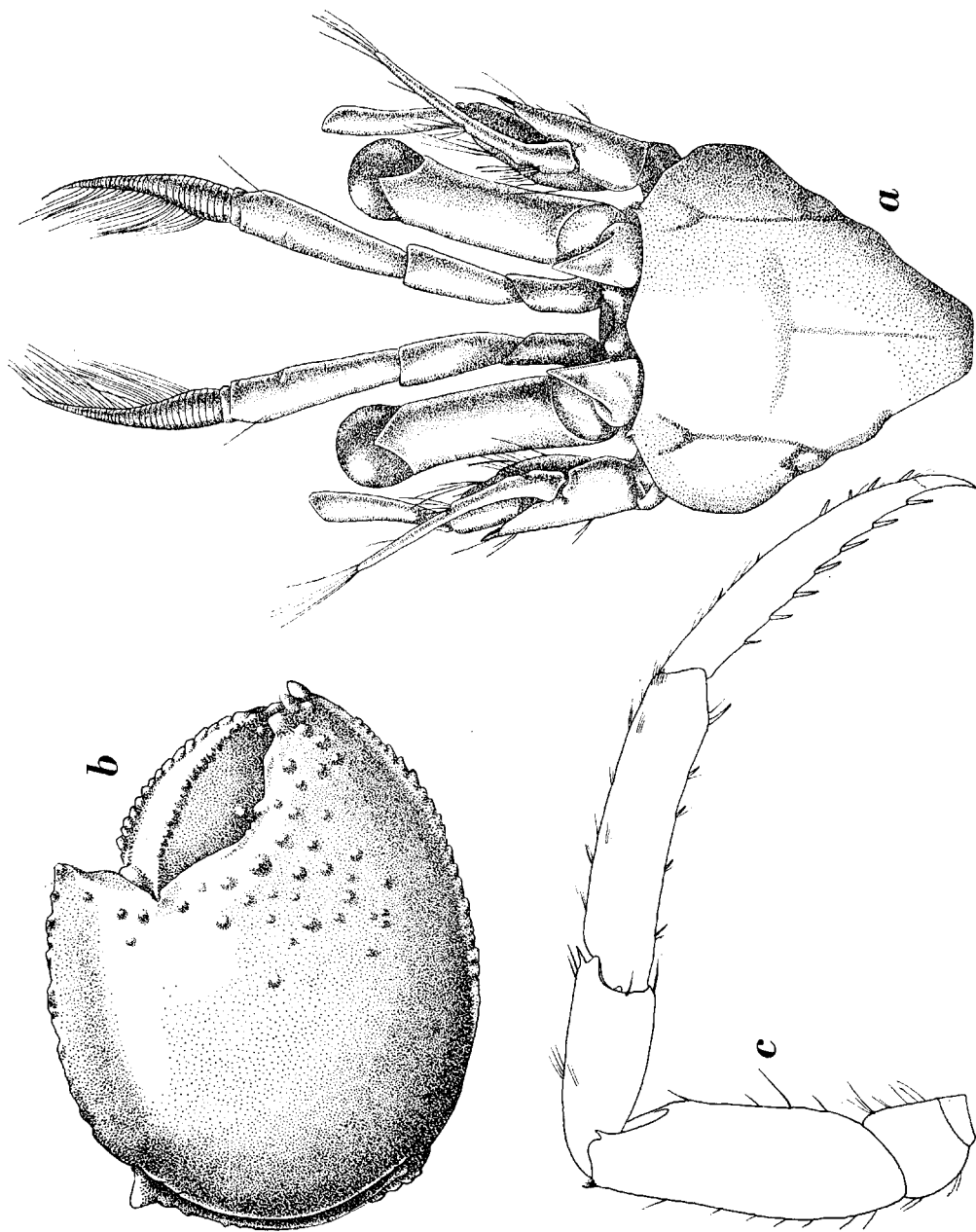


Fig. 31. *Pylotpagurus operculatus* (Stimpson). a, anterior part of body in dorsal view; b, large chela; c, second pereopod. Specimen from "Coquette" Sta. 30. a,  $\times 12$ ; b, c,  $\times 9$ . a, b, W. C. G. Gertenaar del.



The antennular peduncle in the male reaches beyond the eyes with half the last segment, in the female the peduncle surpasses the eye with the entire last segment. The antennal peduncle attains the end of the cornea or reaches slightly beyond it. The scaphocerite overreaches the middle of the last segment of the antennal peduncle; it is curved outwards and bears some stiff hairs but no spines. The second segment of the peduncle bears a small antero-internal spine on the upper surface near the base of the scaphocerite, and a strong, pointed antero-external process.

The right cheliped is far stronger than the left. Hardly any hair is visible on it. The palm has both upper and lower margin sharply carinate and more or less distinctly serrate. The outer surface is smooth but for a number of rounded tubercles. In the male these tubercles are very small, except in the upper half of the fixed finger and the adjoining part of the palm, where they are conspicuously larger; in the female the palm shows granules on the fixed finger and the distal part of the palm, the rest of the surface being smooth. The cutting edge of the fixed finger in the male bears about six large teeth, which are extremely inconspicuous in the female. The dactylus of my specimens has the upper margin carinate and serrate; it lies distinctly below the upper margin of the palm so that the two do not form a continuous line as shown in Stimpson's (1858) figure. A longitudinal serrate carina extends over the entire length of the middle of the outer surface of the dactylus. The inner surface of the chela is slightly convex and shows some small flattened tubercles. The outer surface of the carpus bears a few small inconspicuous tubercles and a few small and blunt spines. On the lower margin an indistinctly serrated carina is present while the upper margin is provided with two antero-dorsal spines, behind the outer of which there is a row of about four strong and pointed spines between which some smaller blunt ones are placed. The inner surface of the carpus bears in its upper part some tubercles, while furthermore two carinae are present. These carinae start at the antero-dorsal and antero-ventral angles of the carpus, then run close along the inner anterior margin, to curve backwards near the middle of the inner surface. When the chela is flexed inwards, it rests against these carinae, just like in the other species of *Pylopagurus*. The merus is smooth and shining; in the male it bears two strong antero-ventral spines, in the female only one such spine is visible. The lower margins of the merus are indistinctly serrate, the outer bears a well-developed anterior spine. The left cheliped is short and slender. The chela is about twice as long as broad and bears no spines at all. The fingers are longer than the palm; the cutting edges close over practically their entire length and are provided with many closely placed, comb-like arranged horny denticles, exactly like in *P. spinulosus*. The carpus bears two antero-

dorsal spines, behind each of which there is a longitudinal row of spines. The outer surface bears a strong antero-ventral spine. The lower margins of the merus are indistinctly serrate; the outer bears a strong anterior spine.

The second legs have the dactylus slightly longer than the propodus. The tip of the dactylus is of a horny colour, while about 7 movable spines of the same colour are implanted on the lower margin. The ventral margin of the propodus also possesses some, but much smaller spines, only the antero-ventral being as large as the spines of the dactylus. The carpus bears a distinct antero-dorsal spine. The merus shows an antero-ventral spine on the outer surface. The third leg is very similar to the second, but no spine is present here on the merus.

A pair of pleopods is present on the first abdominal segment of the female, just like in the previous species. These pleopods are absent in the male.

Colour. In the female the colour pattern is still partly visible: The carapace bears two orange-red spots near the anterior margin behind the bases of the eyes, and a lighter spot near the antero-lateral margin. The ophthalmic scales and the peduncles of the eyes are pale orange-red, the peduncles becoming paler distally. The basal two segments of the antennular peduncle are pale orange, in its basal part the ultimate joint shows a violet band. The base of the antennal peduncles is again of an orange colour. The merus and carpus of the large chela are orange with small white spots. The palm is of a much paler colour; the upper part is whitish but for a small orange spot on the upper margin; the lower margin of the palm bears several small orange spots. The fingers are white. The smaller cheliped has a pale orange-red band over the palm, one over the middle of the carpus, and one over the middle of the merus. In the walking legs the dactylus shows two orange-red bands, one in the distal and one in the proximal part; the propodus, carpus, and merus are provided with a single band each. In the propodus this band lies slightly distally of the middle, while in the two other segments it is situated in the basal part.

The specimen from Sta. 30 inhabited the shell of a species of *Fusinus*.

Remarks. The specimens differ from Stimpson's original description of *Pagurus operculatus* by the slightly different outline of the chela, and by having the dactyli of the walking legs longer than the propodi. Because of these differences and because of the fact that Stimpson's description is very short, I am not quite certain that the above specimens are correctly assigned to Stimpson's species. The shape of the chela and the presence of the first pleopods in the female show that the species belongs to the genus *Pylopagurus*.

Type locality. Tortugas, Florida, U.S.A.

Distribution. The original record is the only one known to me.

## Section Galatheidea

## Family Porcellanidae

**Minyocerus angustus** (Dana, 1852)

## 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 specimen. (L)

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. — 1 specimen. (W)

Description. Dana, 1852, p. 423; 1855, pl. 26 fig. 12.

Remarks. The specimen from Station 260 (cl. 3 mm) lacks all its legs; the other (cl. 5 mm) has the left frontal tooth of the carapace extremely short, this tooth has evidently broken off, and is now in the process of regeneration.

Dana's description and figures fit well for the material at hand. The larger specimen, however, differs from the figure in having the fingers of the cheliped less than  $\frac{2}{3}$  of the length of the palm; as this character is not discussed in Dana's text, his figure may be erroneous. In Müller's (1863, pl. 1 fig. 1) figure of the species the fingers appear even shorter than they are in my specimen; in this figure the spines on the merus and carpus, which are correctly figured by Dana, have been entirely omitted.

In my larger specimen the chelipeds are similar in shape, but the left is more heavy than the right.

Type locality. Rio de Janeiro, Brazil.

Distribution. Panama?, Venezuela, Brazil (S. to Desterro). Commensally living on sea stars. The species is now reported for the first time from Suriname.

**Porcellana sayana** (Leach, 1820)

## Coquette Investigations

20 miles N.N.W. of the mouth of the Coppename River; depth 31 m; 1-5 April 1957; first voyage. — 4 specimens (2 ovigerous). (L)

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

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)

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

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. — 2 specimens. (W)

Description. Benedict, 1901, p. 137, pl. 3 fig. 10.

Remarks. The specimens have cl. ranging between 4 and 7 mm, in the

ovigerous females it is 6 and 7 mm. In some of the specimens traces of the original colour pattern are still visible, closely agreeing with the description given by Benedict (1901).

Type locality. "Habite les côtes de la Géorgie et de la Florida dans l'Amérique" (Leach, 1820, p. 55).

Distribution. Atlantic coast of America from North Carolina (U.S.A.) to Mexico, Panama, and Venezuela; the Bahama Islands and the Antilles from Cuba to Barbados. The species is now reported for the first time from Suriname.

***Petrolisthes galathinus*** (Bosc, 1801-1802)

Coquette Investigations

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. — 2 specimens (1 ovigerous). (L)

Description. Benedict, 1901, p. 133 (as *P. sexspinosus*); see also Haig, 1956, p. 22.

Remarks. The specimens are remarkably large, the ovigerous female has cl. 14 mm, while in the other specimen it is 15 mm. Neither specimen shows spines on the dactylus of the chelipeds. The carapace has many transverse and some oblique purple streaks; no longitudinal colour lines are visible.

Type locality. Unknown.

Distribution. North Carolina (U.S.A.) to Brazil and the West Indies. The species is now reported for the first time from French Guiana.

Suborder Brachyura

Section Dromiacea

Family Dromiidae

***Dromidia antillensis*** Stimpson, 1859

Coquette Investigations

Between the mouths of the Nickerie and Coppename Rivers, 20 miles offshore; depth 27 m; 15-20 April 1957; third voyage. — 1 female. (L)

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 female. (W)

Description. Rathbun, 1937, p. 33, textfig. 12, pl. 7 figs. 1-3.

Remarks. The first mentioned specimen has cl. 19 mm, the other 14 mm. Both carried a compound ascidian; in the smaller specimen the ascidian covered the carapace completely, in the larger it showed a large hole in the middle which exposed the central part of the carapace.

Type localities. Key Biscayne and Tortugas (Florida, U.S.A.), and St. Thomas.

Distribution. Bermuda and North Carolina (U.S.A.) to Brazil and the West Indies. Until now the species was not known from Suriname.

**Hypoconcha arcuata** Stimpson, 1859

## Coquette Investigations

N.N.W. of the mouth of the Marowijne River, about 20 miles offshore; depth 35 m; 8-12 April 1957; second voyage. — 1 female. (L)

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. (L)

Description. Rathbun, 1937, p. 47, pl. 11.

Remarks. The female specimens have cl. 13 and 9 mm, the male 8 mm.

Type locality. "Sandy shores of South Carolina", U.S.A., and St. Thomas, West Indies.

Distribution. North Carolina (U.S.A.) to Brazil and the West Indies. The species is now reported for the first time from Suriname.

## Section Oxystomata

## Family Calappidae

**Calappa nitida** Holthuis, 1958 (textfigs. 32-35)

*Calappa nitida* Holthuis, 1958, p. 172, figs. 46-50.

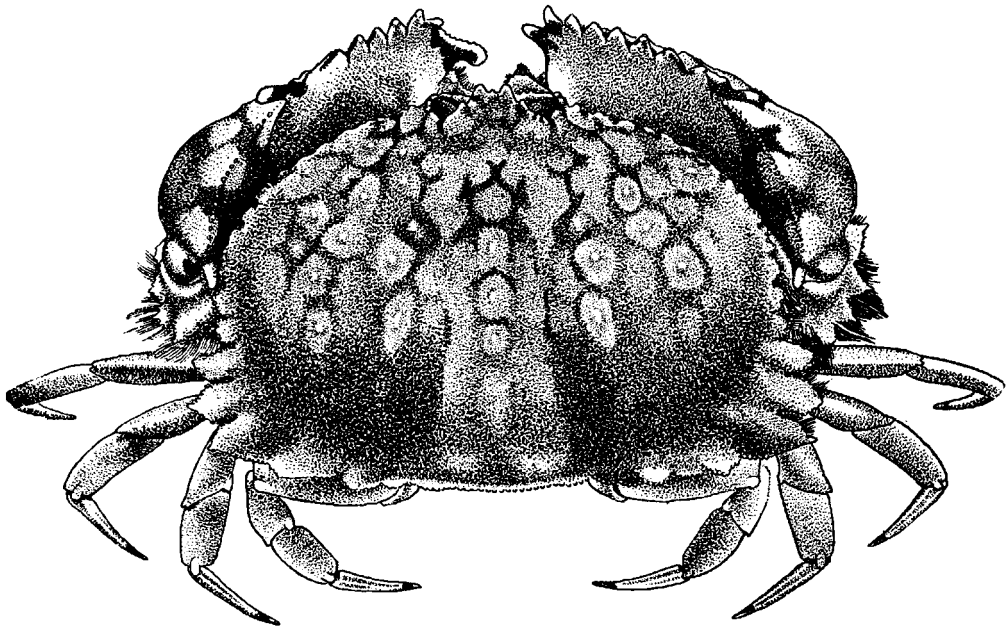


Fig. 32. *Calappa nitida* Holthuis. Male paratype from N.N.W. of the mouth of the Marowijne River. Natural size. After Holthuis, 1958.

## Coquette Investigations

N.N.W. of the mouth of the Marowijne River, about 20 miles offshore; depth 35 m; 8-12 April 1957; second voyage. — 1 male, 1 female, 2 juveniles. (L)

Between the mouths of the Nickerie and Coppename Rivers, 20 miles offshore; depth 27 m; 15-20 April 1957; third voyage. — 2 males, 1 female, 1 juvenile. (L)

20 miles N. of the mouth of the Marowijne River; depth 27 m; 23-27 April 1957; fourth voyage. — 2 males, 3 females. (L)

N.N.W. of the mouth of the Marowijne River, about 30 miles offshore; depth 0 to 37 m; 29 April-3 May 1957; fifth voyage. — 15 males, 7 females (2 ovigerous). (L)

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

Station 2, off the mouth of the Suriname River, 6° 23' N 55° 05.5' W; bottom mud;

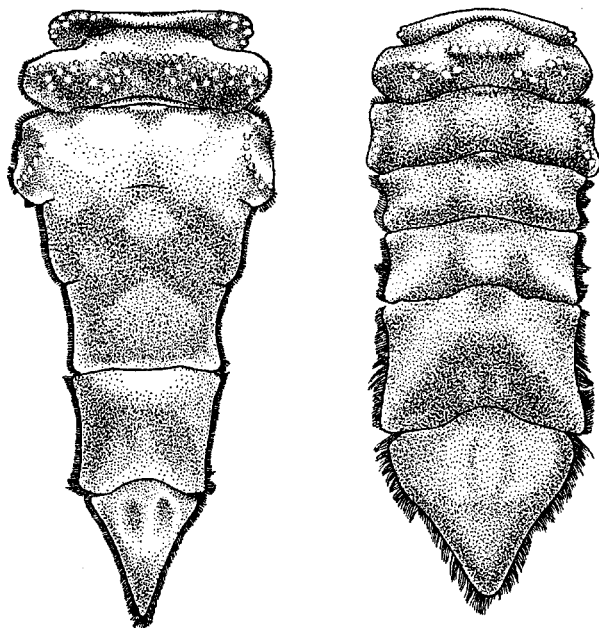


Fig. 33. *Calappa nitida* Holthuis. a (left figure), abdomen of male; b (right figure), abdomen of female. a, specimen from N.N.W. of mouth of Marowijne River; b, specimen from "Coquette" Sta. 11. a, b,  $\times 2$ . After Holthuis, 1958.

depth 27 m; 11 May 1957. — 3 females (1 ovigerous), 2 juveniles. (L + W)

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

Station 11, off the mouth of the Suriname River, 6° 24' N 55° 01' W; bottom mud; depth 27 m; 11 May 1957. — 2 females (1 ovigerous). (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. — 2 juveniles. (W)

Station 30, N.E. of the mouth of the Suriname River,  $6^{\circ} 49.5' N$   $54^{\circ} 54' W$ ; bottom hard mud and shells; depth 48 m; 12 May 1957. — 1 female. (W)

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



Fig. 34. *Calappa nitida* Holthuis. First male pleopod. Specimen from N.N.W. of mouth of Marowijne River.  $\times 7$ . After Holthuis, 1958.

Fig. 35. *Calappa nitida* Holthuis. Second male pleopod. Specimen from N.N.W. of mouth of Marowijne River.  $\times 7$ . After Holthuis, 1958.

Station 33, N.E. of the mouth of the Suriname River,  $6^{\circ} 52' N$   $54^{\circ} 53' W$ ; bottom mud and shells; depth 51 m; 12 May 1957. — 1 ovigerous female. (W)

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

Station 213, between the mouths of the Suriname and Marowijne Rivers, 6° 46' N 54° 29.5' W; bottom mud; depth 44 m; 14 June 1957. — 1 female. (W)

Station 214, between the mouths of the Suriname and Marowijne Rivers, 6° 47' N 54° 29' W; bottom mud and fine shells; depth 44 m; 14 June 1957. — 1 male. (W)

Station 235, between the mouths of the Suriname and Marowijne Rivers, 6° 23.5' N 54° 29.5' W; bottom mud; depth 29 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 42 m; 20 June 1957. — 1 male, 2 females. (W)

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

Description. Holthuis, 1958, p. 172, figs. 46-50.

Remarks. The original description of this species is based on the above specimens of the Leiden Museum, the material of the Washington Museum was received too late to have it reported upon in my 1958 paper.

Neumann (1878, p. 28) reported "*C. [alappa] marmorata* Fabr." from "Surinam" and gave as a synonym *Cancer flammeus* Herbst. Without examination of Neumann's material it is impossible to know its identity. As has been pointed out on a previous page (p. 14) it is probable that all of Neumann's so-called Suriname material actually originated from the Antilles.

In the collection of the Hamburg Museum is preserved a male specimen of *Calappa ocellata* Holthuis, which is labelled "Surinam", but which, as Dr. A. Panning kindly pointed out to me, might in reality have been collected at Barbados. For this reason the species is omitted here. This seems the more justified as *Calappa ocellata* is a species which seems to prefer a habitat of coral sand and therefore is not likely to occur on the muddy Suriname coast.

Type locality. N.N.W. of the mouth of the Marowijne River, Suriname, about 30 miles offshore, depth 0 tot 37 m.

Distribution. Until now the species is known only from off the coast of Suriname, where it proves to be far from rare.

### ***Calappa sulcata* Rathbun, 1898**

*Calappa sulcata* Holthuis, 1958, p. 179, figs. 51-54.

#### Coquette Investigations

N.N.W. of the mouth of the Marowijne River, about 20 miles offshore; depth 35 m; 8-12 April 1957; second voyage. — 1 male, 1 female, 3 juveniles. (L)

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

20 miles N. of the mouth of the Marowijne River; depth about 27 m; 23-27 April 1957; fourth voyage. — 1 male, 10 juveniles. (L)

N.N.W. of the mouth of the Marowijne River, about 30 miles offshore; depth 0-37 m; 29 April-3 May 1957; fifth voyage. — 3 males, 4 females. (L)

15 miles N. of the lightvessel "Suriname Rivier"; depth 18 m; 3 May 1957; fifth voyage. — 1 juvenile. (L)



20 miles N. of the mouth of the Suriname River; depth 0 to 9 m; 6-9 May 1957; sixth voyage. — 3 juveniles. (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. — 3 juveniles. (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. — 3 juveniles. (W)

Station 188, N.E. of the mouth of the Suriname River, 6° 24' N 54° 55' W; bottom mud; depth 27 m; 10 June 1957. — 1 female, 2 juveniles. (W)

Station 209, between the mouths of the Suriname and Marowijne Rivers, 6° 41' N 54° 33' W; bottom mud and shells; depth 40 m; 14 June 1957. — 1 male. (W)

Station 213, between the mouths of the Suriname and Marowijne Rivers, 6° 46' N 54° 29.5' W; bottom mud; depth 44 m; 14 June 1957. — 2 males. (W)

Station 214, between the mouths of the Suriname and Marowijne Rivers, 6° 47' N 54° 29' W; bottom mud and fine shells; depth 44 m; 14 June 1957. — 1 male, 1 female. (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. (W)

Station 217, N.W. of the mouth of the Marowijne River, 6° 41.5' N 54° 14.5' W; bottom mud; depth 44 m; 14 June 1957. — 1 male, 1 female. (W)

Station 218-219, N.W. of the mouth of the Marowijne River, 6° 42' N 54° 13.5'—54° 12.5' W; bottom mud; depth 44 m; 14 June 1957. — 2 males, 1 female. (W)

Suriname. — 3 females. (W)

Description. Rathbun, 1937, pp. 205 (as *C. springeri* Rathbun), 211, pl. 60 fig. 2 (as *C. springeri*), pl. 64 figs. 7, 8, pl. 65 fig. 1.

Remarks. The Coquette material of the Leiden Museum has already been dealt with by Holthuis (1958).

Type locality. Off Louisiana, U.S.A., 29° 24' 30" N 88° 01' W, 35 fms.

Distribution. North Carolina, northern Gulf of Mexico, Puerto Rico, Margarita Island (Venezuela), Suriname. The only previous Suriname record is the one by Holthuis (1958).

### **Hepatus pudibundus** (Herbst, 1785) (textfigs. 36, 37, 38 a, b)

#### Coquette Investigations

About 20 miles N. of the mouth of the Coppename River; depth 30 m; 1-5 April 1957; first voyage. — 3 males. (L)

N.N.W. of the mouth of the Marowijne River, about 20 miles offshore; depth 35 m; 8-12 April 1957; second voyage. — 6 males, 11 females. (L)

Between the mouths of the Nickerie and Suriname Rivers, 20 miles offshore; depth 27 m; 15-20 April 1957; third voyage. — 4 males, 2 females. (L)

20 miles N. of the mouth of the Marowijne River; depth 27 m; 23-27 April 1957; fourth voyage. — 3 males, 8 females (1 ovigerous). (L)

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

15 miles N. of "Suriname Rivier" lightvessel; depth 18 m; 3 May 1957; fifth voyage. — 2 females. (L)

20 miles N. of the mouth of the Suriname River; depth 9 m; 6-9 May 1957; sixth voyage. — 4 males, 13 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, 1 female. (W)

Station 2, off the mouth of the Suriname River,  $6^{\circ} 23' N$   $55^{\circ} 05.5' W$ ; bottom mud; depth 27 m; 11 May 1957. — 3 males, 2 females. (L + W)

Station 15, N.E. of the mouth of the Suriname River,  $6^{\circ} 24.5' N$   $54^{\circ} 59.5' W$ ; bottom mud and shells; depth 29 m; 11 May 1957. — 1 male. (W)

Station 20, N.E. of the mouth of the Suriname River,  $6^{\circ} 28' N$   $54^{\circ} 57.5' W$ ; bottom shells; depth 31 m; 11 May 1957. — 1 female. (W)

Station 235, between the mouths of the Suriname and Marowijne Rivers,  $6^{\circ} 23.5' N$   $54^{\circ} 29.5' W$ ; bottom mud; depth 29 m; 15 June 1957. — 1 male, 1 female. (W)

#### Museum Leiden

Near "Suriname Rivier" lightvessel; bottom clay; trawled; depth 7 m; 12 January 1954; Suriname Fisheries Service. — 1 male, 1 female.

Description. Rathbun, 1937, p. 235, pl. 70 figs. 1, 2 (as *H. princeps*).

Remarks. The present material has cl. ranging between 16 and 55 mm in the males, between 14 and 46 in the females, while cb. ranges between 21 and

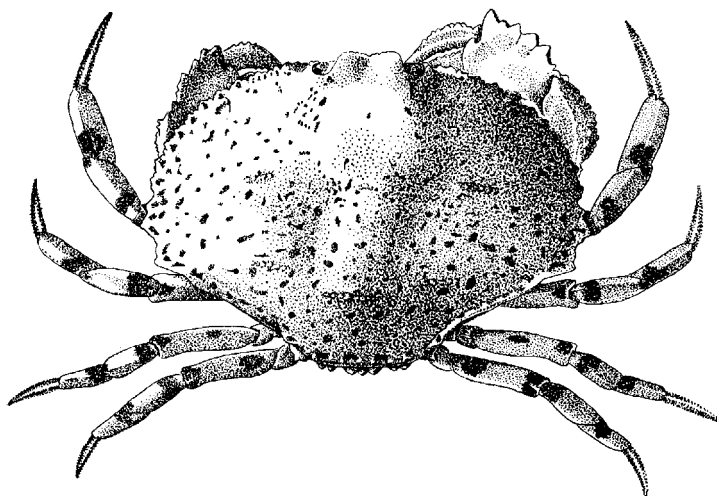


Fig. 36. *Hepatus pudibundus* (Herbst). Female in dorsal view. Specimen from second voyage of the "Coquette".  $\times 1.25$ . W. C. G. Gertenaar del.

76 mm in the males and between 18 and 62 mm in the females. The only ovigerous female has cl. 41 mm, cb. 55 mm. Several of the specimens carry one or more sea anemones on the carapace, one specimen some balanids.

Rathbun's (1937) account of this species is rather short, so that the discovery of two new related species makes it necessary to give here some additional details.

The carapace is 1.30 to 1.45 times as broad as long. In the juvenile specimens it is relatively somewhat narrower than in the adults. So in my specimens with cb. 20 to 30 mm the carapace is 1.30 to 1.40 times as broad as long,

while in the specimens with cb. 50 to 76 mm this ratio is 1.34 to 1.44. In the adults the surface of the carapace is almost smooth, only faint indications of

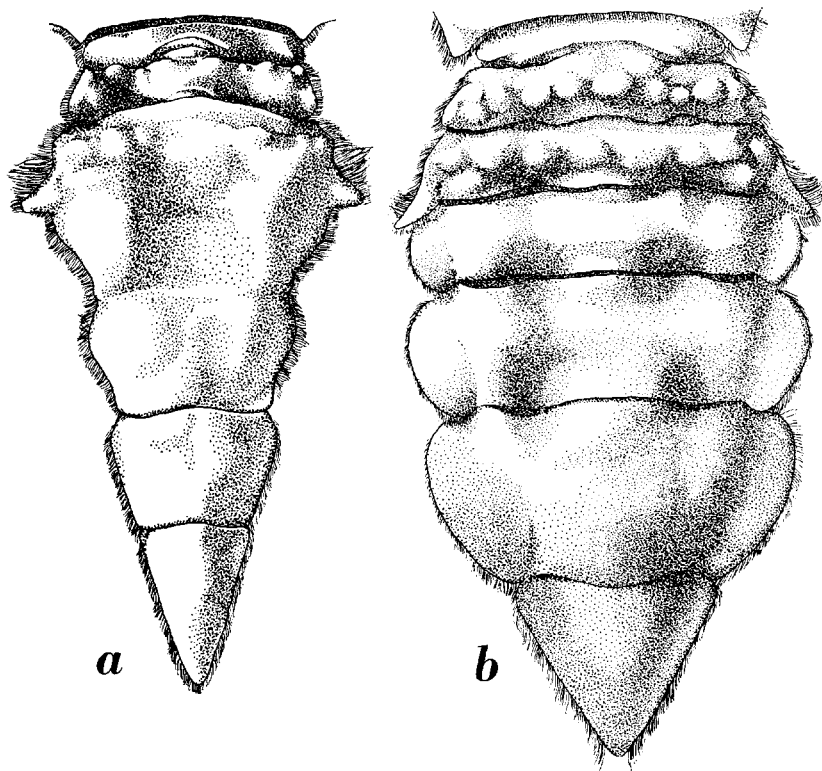


Fig. 37. *Hepatus pudibundus* (Herbst). a, abdomen of male; b, abdomen of female. Specimens from second voyage of the "Coquette". a, b,  $\times 4$ . W. C. G. Gertenaar del.

transverse rows of tubercles are visible. In the juveniles, however, there are eight very distinct short transverse rows of tubercles. Three of these lie in a transverse line in the broadest part of the carapace with two other rows in front, also in a transverse line, and three behind, similarly arranged. The larger the animals are, the less conspicuous the tubercles. The surface of the carapace is strongly convex, sloping down to all sides. The angle where the antero-lateral and postero-lateral margins meet is not very distinct and the one passes gradually into the other. As a rule this angle lies behind the broadest part of the carapace. The anterior part of the postero-lateral margin consists of a double row of tubercles; the two rows are placed side by side without any space in between, the outer row consisting of very inconspicuous tubercles. In the middle of this double row there is a rather distinct tooth, while furthermore a small tooth is present in the posterior part of the postero-lateral margin of the carapace.

In the adult female all abdominal segments are free. The telson is triangular, being about as long as broad. The sixth segment is distinctly broader

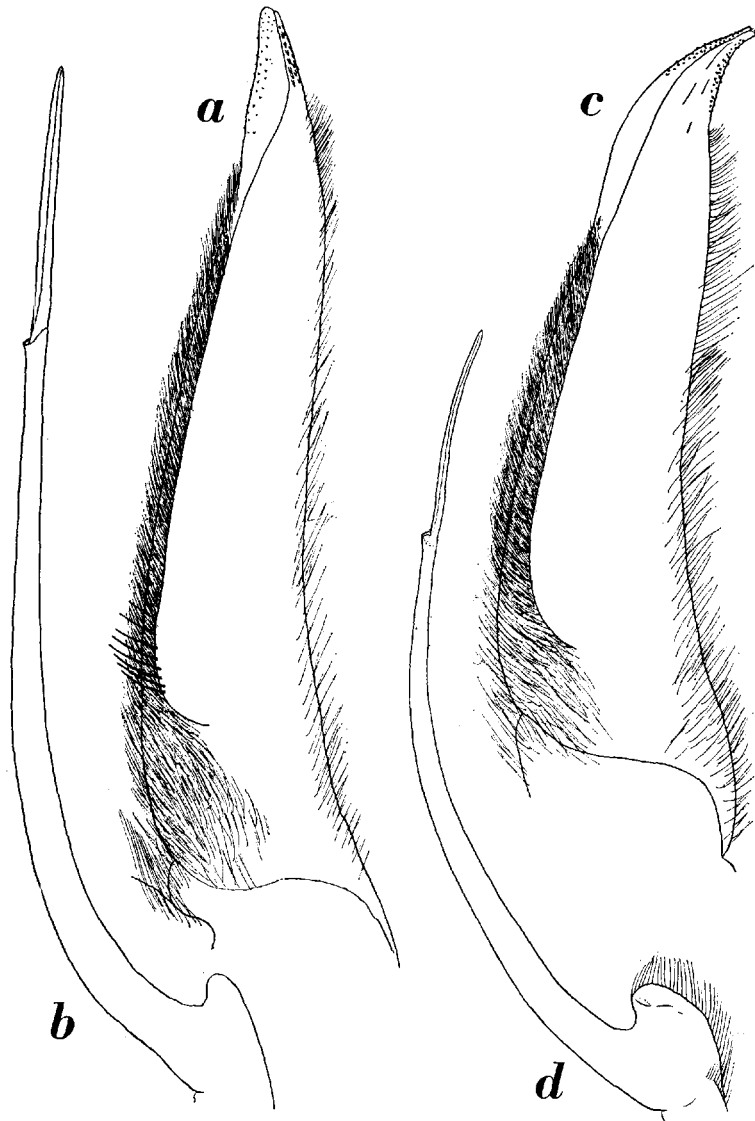


Fig. 38. *Hepatus pudibundus* (Herbst), male specimen from second voyage of the "Coquette". a, first pleopod; b, second pleopod. *Hepatus scaber* new species, male paratype from second voyage of the "Coquette". c, first pleopod; d, second pleopod. a-d,  $\times 16$ .

than the telson and has the lateral margin convex, forming a kind of pleura. Similar pleurae are also visible in the third, fourth, and fifth segments. The

sixth segment is about as long as the telson, but longer than the fifth: the segments become gradually narrower and shorter from the sixth to the first. The pleurae of the third segment are in the form of an acute process which is directed obliquely distally. In the middle of the second and third segments there is a transverse ridge, which is provided with some rather distinct blunt teeth. In the young females the abdomen is far narrower, more closely resembling that of the male. The abdomen of the male is naked except for a short pubescence on the lateral margins; the outline of the abdomen thereby is distinctly visible. The telson is elongate triangular. It is distinctly longer than broad and furthermore is longer than the sixth abdominal segment. The posterior margin of the telson is practically straight. The sixth segment has the anterior breadth about equal to the length of the segment. The lateral margins diverge proximally to converge again close near the base of the segment. Both the anterior and the posterior margins of the segment are straight. The third, fourth, and fifth segments of the male abdomen are fused. The fifth segment is about as long as, but broader than the sixth, it narrows anteriorly; the lateral margins are slightly concave in the distal half, distinctly convex in the proximal part. The fourth segment is of about the same shape as the fifth, but is still broader. Its exposed surface is practically flat. The third segment shows a transverse somewhat tuberculated ridge; the lateral margins just before the base of the fourth segment are produced to a narrow process, which is directed obliquely distally. The second segment is rather narrow and short; it bears a transverse tuberculated ridge.

When the third maxillipeds are in their normal position covering the oral field, their flattened tips, which then lie side by side, are situated in a single plane and do not meet each other under an angle as in the next species.

The dactyli of the walking legs are covered with a very short pubescence, which leaves the tip and a narrow longitudinal area over the anterior and posterior surface naked. None of the other segments of the legs show any pubescence at all. The carpus and propodus show two dorsal ridges, which sometimes are rather indistinct.

The first pleopods of the male are robust, straight and end in a tip which is directed forwards or slightly inwards. The second pleopods are very narrow and straight; they reach slightly beyond the first.

Colour. The carapace has a conspicuous colour pattern formed by small dots, which in preserved material have a reddish colour. These dots are sometimes arranged to conspicuous transverse bands or lines, but may also be scattered over the surface of the carapace without forming a distinct pattern. In the posterior part of the carapace these dots are larger than anteriorly. Similar dots are visible on the upper part of the carpus and the palm of

the chelipeds. The walking legs have two conspicuous broad bands of a reddish colour, one in the proximal part and one distally on the merus, while the carpus and the propodus each have one such band, which is situated proximally. The bands of the merus are very distinct in the last leg, but less so in the preceding.

The species was described for the first time by L. T. Gronovius (1764, p. 223) as *Cancer* 960. Gronovius's diagnosis runs as follows: "Cancer thorace latiusculo convexo laevi, undique emarginato crenato, postice contractiore pedes non contegent: manibus cristatis. Martinicensibus *Crabe honteuse & crête de Cocq*." In his description the species is compared with *Calappa* from which it should mainly differ "absentiâ velorum thoracis pedes posticos obtegentium". The posteriorly contracted carapace, the resemblance in other respects (e.g., in the chelipeds) to *Calappa* and the locality Martinique, show that Gronovius's animal can be nothing but a species of either of the genera *Hepatus* and *Cycloes*. The expression "thorace latiusculo" shows that *Hepatus* and not *Cycloes* is meant. The remark "thorax . . . superne est convexus, laeviusculus, punctulis prominulis hic illic scaber" in Gronovius's description very correctly describes the situation as it is found in the present species, being different from that in *Hepatus epheliticus* (L.), which seems not to be "punctulis prominulis hic illic scaber", while the two species described below as new in no way can be said to have the carapace "laeviusculus". Since the present species is the most common of the West Indian *Hepatus* species and since Gronovius's description fits it in all respects, there is no good reason not to consider *Cancer* 960 of Gronovius to be identical with it.

Gronovius did not give the species a scientific name. The first such name given to it was *Cancer arenarius*, which Meuschen published twice: first in 1778 in *Museum Gronovianum* (p. 84) and secondly in 1781 in the index to Gronovius's *Zoophylacium Gronovianum*. Both these works, however, have been rejected for nomenclatorial purposes by the International Commission on Zoological Nomenclature: *Museum Gronovianum* in Opinion 260 (1954, *Opin. Decl. Int. Comm. zool. Nomencl.*, vol. 5, pp. 265-280<sup>1</sup>), the *Index* in

1) From a bibliographic point of view it is interesting to note that the title page of the copy of the *Museum Gronovianum* seen by me, a copy in the possession of the Royal Library in The Hague, differs from the title page as given in Opinion 260. The first 23 lines of the title are exactly identical in the two title pages. In line 24 of the Hague copy the word "aliorvmqve" is printed with a q instead of with a g. Line 25 is again the same in both copies, but line 26 and following in the Hague copy are as follows: "CVRA // F.C.M. // — // LVGDVNI BATAVORVM // APVD Th. HAAK & SOCIOS J. MEERBURG. BIBLIOPOLAS. // MDCCLXXIIX." The names of the two booksellers are placed in two lines, one above the other with brackets in front and behind;

Opinion 261 (1954, Opin. Decl. Int. Comm. zool. Nomencl., vol. 5, pp. 281-296). Meuschen's names therefore cannot be used. The next name given to the species is that of *Cancer pudibundus*, first published by Herbst (1785, vol. 1, p. 199), who under this name gave a German translation of Gronovius's description of Cancer 960. This is the oldest available and valid specific name for the present species and consequently has to be used for it. In 1794 Herbst (1794, vol. 2, p. 154, pl. 38 fig. 2) described the species for a second time as new, basing himself this time on a specimen from his own collection. At this occasion Herbst proposed the name *Cancer princeps* for the species, which name has been adopted by several authors. Four years later the species was again described as new, when Fabricius (1798, p. 347) published his description of *Calappa angustata*. This description, though short, can only refer to the present form. The fact that Fabricius mentioned that the legs are "albidi fasciis violaceis" excludes the next two species, and as no mention is made of a striking colour pattern of the carapace, his species cannot be *Hepatus epheliticus* either. Latreille (1802-1803a, p. 388) after describing the genus *Hepatus*, gave the present species the new name *H. fasciatus*, citing *Calappa angustata* Fabr. in the synonymy and referring to Herbst's (1794) description and figure of *Cancer princeps*; furthermore Latreille gave a recognisable figure of the species and indicated that he considered it to be identical with Cancer 960 of Gronovius. In 1818 Lamarck (p. 268) proposed the new name *Hepathus calappoides* citing the above mentioned names given by Herbst (1794), Fabricius (1798), and Latreille (1802-1803a) as synonyms. A juvenile specimen of the present species formed the base for De Saussure's (1858) description of *Hepatus tuberculatus*, which therefore has to be added to the already long list of synonyms of *Hepatus pudibundus*.

Not only the nomenclature of the specific name causes difficulties, but also that of the generic name is rather complicated. The generic name *Hepatus* was proposed by Latreille (1802-1803, p. 22), the type species is *Calappa angustata* Fabricius, 1798. Some authors considered the name *Hepatus* Latreille to be preoccupied by either *Hepatus* Gronovius, 1763, or by *Hepatus* A. F. Röse, 1793, both names proposed for a genus of fishes. But neither Gronovius's work (*Zoophylacium Gronovianum*, vol. 1) nor that by Röse (*Artedi, Bibl. ichthyol.*, ed. 2 vol. 4) is binominal and therefore these names are unavailable nomenclatorially. I do not know of any valid use of the generic name *Hepatus* before that by Latreille, which therefore must be considered

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the word *apud* is printed in front of the middle of the first bracket and *bibliopolas* in the same way behind the second. This second title page shows that *Museum Gronovianum* not only has been sold as a sales catalogue but also as a book.

to be the valid name for the present genus. Two substitute names have been proposed for *Hepatus* Latreille by authors who thought this name preoccupied. These names are *Hepatulus* Fowler (1912, p. 590) and *Hepatoides* Balss (1957, p. 1612).

Type locality. Martinique.

Distribution. East American coast between Georgia (U.S.A.) and Brazil. Herbst (1794) reported his *Cancer princeps* from "Ostindien", which evidently is erroneous, as so many of the localities cited by Herbst. Herklots (1861, p. 139) reported "*Hepatus fasciatus*" from "Cape de bonne Espér."; his specimen, which is still preserved in the collection of the Rijksmuseum van Natuurlijke Historie at Leiden, consists of a dry carapace of the present species with the indication "Cap". The latter is evidently incorrect as no species of *Hepatus* is known from the region of the Cape of Good Hope. Rathbun (1937, pp. 235, 237) reported *Hepatus princeps* from West Africa (Guinea). Monod (1956, p. 115) showed that Rathbun's record is extremely doubtful, being only based on a very old and probably incorrectly labelled specimen of this species, preserved in the collection of the Copenhagen Museum.

The species is now recorded for the first time from Suriname.

### ***Hepatus scaber*** new species (textfigs. 38c, d, 39, 40)

#### Coquette Investigations

N.N.W. of the mouth of the Marowijne River, about 12 miles offshore; depth 35 m; 8-12 April 1957; second voyage. — 2 males, 1 female. (L)

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

15 miles N. of the mouth of the Suriname River; depth 18 m; 3 May 1957; fifth voyage. — 2 females. (L)

20 miles N. of the mouth of the Suriname River; depth 9 m; 6-9 May 1957; sixth voyage. — 6 males, 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 female. (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. — 10 males, 3 females. (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 male. (W)

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

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

Station 85, N. of Isle du Salut, French Guiana, 5° 50.5' N 53° 10' W; bottom mud and shells; depth 27 m; 22 May 1957. — 3 males, 2 females (1 ovigerous). (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. — 1 female. (W)



Station 287, N.E. of the mouth of the Coppename River,  $6^{\circ} 52' N$   $55^{\circ} 50' W$ ; bottom mud, shells and coral; depth 48 m; 26 June 1957. — 1 male. (W)

Description. The present species remains smaller than *H. pudibundus*. The males of *H. scaber* examined have the carapace lengths ranging between 8 and 27 mm and the breadths between 11 and 36 mm; in the females cl.

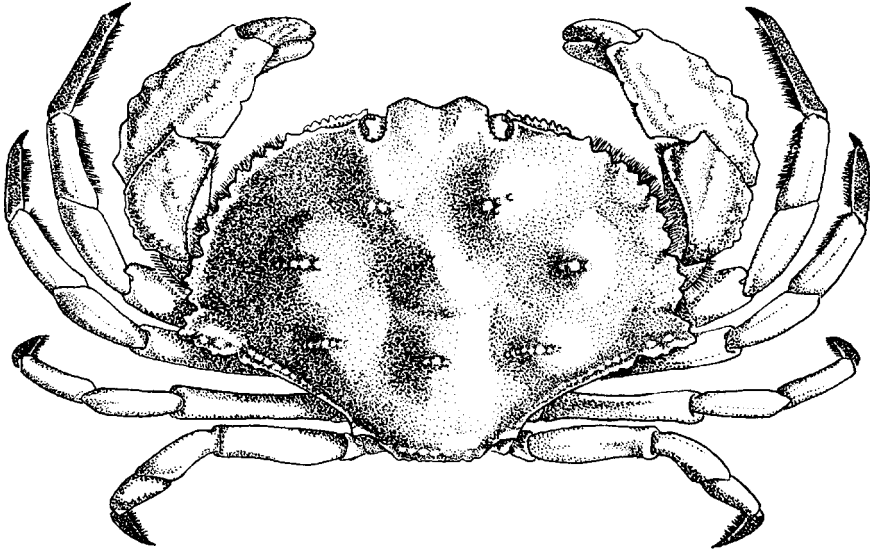


Fig. 39. *Hepatus scaber* new species. Male paratype from "Coquette" Sta. 85.  $\times 2$ .  
W. C. G. Gertenaar del.

ranges between 10 and 21 mm and cb. between 12 and 26, in the ovigerous female cl. is 18, cb. 24 mm. The ratio of breadth and length of the carapace varies between 1.24 and 1.37, being usually 1.33.

In all stages of this species eight distinct tubercles which bear granules are visible on the carapace. These tubercles are similarly arranged as in the juvenile specimens of the previous species. Each tubercle bears a single large central granule, around which there are several smaller; in the posterior three tubercles the granules are more or less distinctly placed in a transverse row. Compared to *H. pudibundus* the carapace is far less convex, being flattened dorsally and even somewhat concave near the lateral margins. The front is narrower and more deeply incised than in *H. pudibundus*, while it also projects farther beyond the orbits. The angle where the antero-lateral and postero-lateral margins of the carapace meet is very distinct and projects beyond the antero-lateral margin, the carapace being widest at this point. The anterior part of the postero-lateral margin consists, like in *H. pudibun-*

*dus*, of two rows of granules; in the present species the granules of the outer row are of the same size as those of the inner row. The two rows are separated by a narrow but distinct space. The tooth in the middle of the double row and that near the base of the postero-lateral margin are more distinct than in *H. pudibundus*.

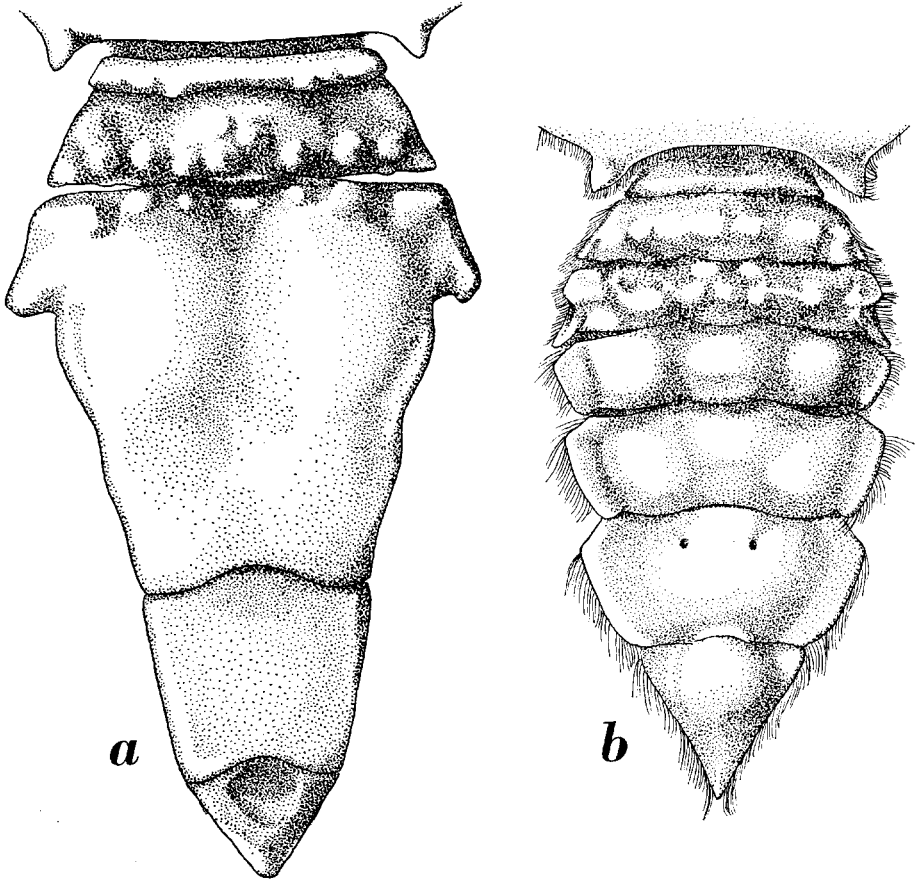


Fig. 40. *Hepatus scaber* new species. a, abdomen of male; b, abdomen of female. a, specimen from second voyage of the "Coquette" b, specimen from "Coquette" Sta. 85. a,  $\times 9$ ; b,  $\times 7.5$ . W. C. G. Gertenaar del.

In the female the abdominal segments are free. The telson is somewhat longer than broad, being narrower than in *H. pudibundus*, especially so in the distal part; the tip is very narrow. The abdominal segments are narrower than in the previous species; the third to sixth have a rather distinct groove separating the pleural part from the body of the segment, and on the exposed

surface have a velvety pubescence. The segments diminish in length from the sixth to the first. The third and second segments are as in *H. pudibundus*, but the teeth on the transverse ridges are very indistinct.

The abdomen of the male shows a dense grayish brown velvety pubescence, which is especially conspicuous distally. This pubescence merges with the pubescence of the thoracic sternum so that when the abdomen is carried in the normal position its outline is extremely indistinct. The telson is about equilaterally triangular, being somewhat broader than long, it is shorter than the sixth abdominal somite. The surface of the telson is not smooth, but shows a low and blunt elevation in the middle. On this elevation a tuft of long coarse, posteriorly directed hairs is implanted. The proximal margin of the telson is distinctly convex. The distal breadth of the sixth somite is about equal to its length. The distal margin of this segment is concave, the proximal convex; the lateral margins are slightly convex. The fifth segment is shorter than the sixth. The lateral margins are almost straight, being only slightly convex in the basal part. The fourth segment is of the same shape as the fifth, but broader; it is somewhat swollen in its lateral parts and has a median longitudinal groove. The second and third segments are as in the previous species. The thoracic sternum is densely velvety pubescent. In the males there is a naked deep median longitudinal groove extending from the tip of the telson forwards.

When the third maxillipeds are in their normal position, the flattened tips form an angle with one another, the inner part being curved ventrally.

The chelipeds do not differ much from those of the previous species. The palm shows a distinct pubescent strip along the lower margin of the inner surface, which is continued on the base of the fixed finger.

The dactyli of the walking legs, except for the extreme tip, are pubescent. This pubescence is especially long on the lower surface of the second and third pereopods (= first and second walking legs), much longer than in *H. pudibundus*. The distal part of the lower margin of the propodus and the proximal part of the lower margin of the merus of the second and third pereopods also show a distinct pubescence. In the females and the smaller males such a pubescence is to be seen also on the propodus of both the fourth and fifth pereopod, and on the merus of the fourth. The dorsal ridges on the propodus and carpus of the walking legs are rather indistinct.

The first pleopods of the male are robust, straight, and end in a pointed tip, which is directed outwards and has a yellowish horn colour. The second pleopods of the male are very slender, and curved slightly outwards, they fail to reach the end of the first pleopods.

Colour. No distinct colour pattern is visible on the carapace or on the legs;

these are of a rather uniform coloration. Sometimes the carapace shows a poorly defined reddish mottling.

Remarks. The species might at first sight be mistaken for a juvenile of *H. pudibundus*, but it is readily to be distinguished by the flatness of the carapace, its outline, the hairy ventral surface, the shape of the abdomen, the pubescence of the legs, and the outward curved shape of the male pleopods.

Type. Holotype is the larger male specimen (cb. 30 mm) collected during the fourth voyage of the "Coquette" (Mus. Leiden, Reg. No. Crustacea D 12139).

### ***Hepatus gronovii*** new species (textfigs. 41-43)

#### Coquette Investigations

Station 85, N. of Isle du Salut, French Guiana, 5° 50.5' N 53° 10' W; bottom mud and shells; depth 27 m; 22 May 1957. — 3 males. (L)

Description. The specimens have the cl. varying from 24 to 25.5 and the cb. from 33.5 to 35 mm. The carapace is 1.37 to 1.40 times as broad as long. Its surface shows

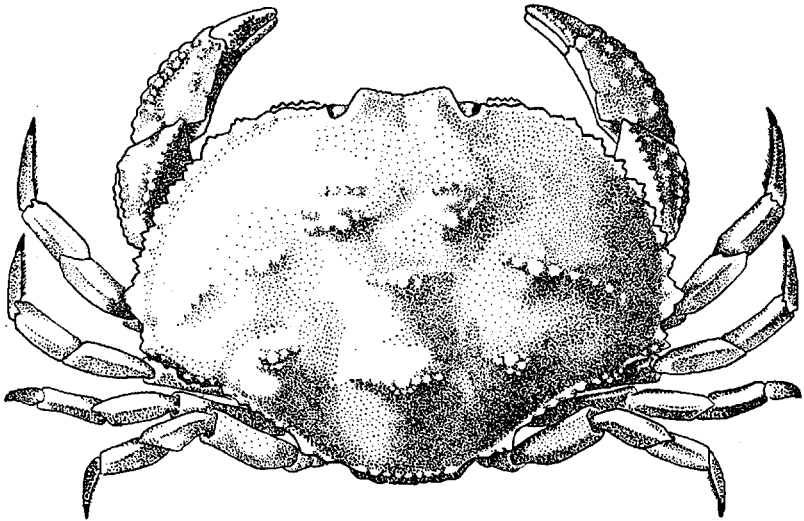


Fig. 41. *Hepatus gronovii* new species, male paratype.  $\times 2$ . W. C. G. Gertenaar del.

eight conspicuous tubercles, which are similarly arranged and of a similar shape as in the previous species. In this new species the granules of the lateral tubercles of the second row, like those of the three tubercles of the last row, are arranged in distinct transverse series. The surface of the carapace is strongly convex, much as in *H. pudibundus*, and totally different from *H. scaber*. The angle under which the antero-lateral and postero-lateral margins of the carapace meet is not very conspicuous and does not strongly differ from the preceding or from the following tooth. This angle does not reach beyond the extreme lateral point of the carapace, which is formed by the tooth preceding the lateral angle. The greatest breadth of the carapace thus lies distinctly before the angle formed by the antero-lateral and postero-lateral margins. The ante-

rior part of the postero-lateral margin consists of two rows of tubercles, which are placed so close together that there is no space left in between; the tubercles of the

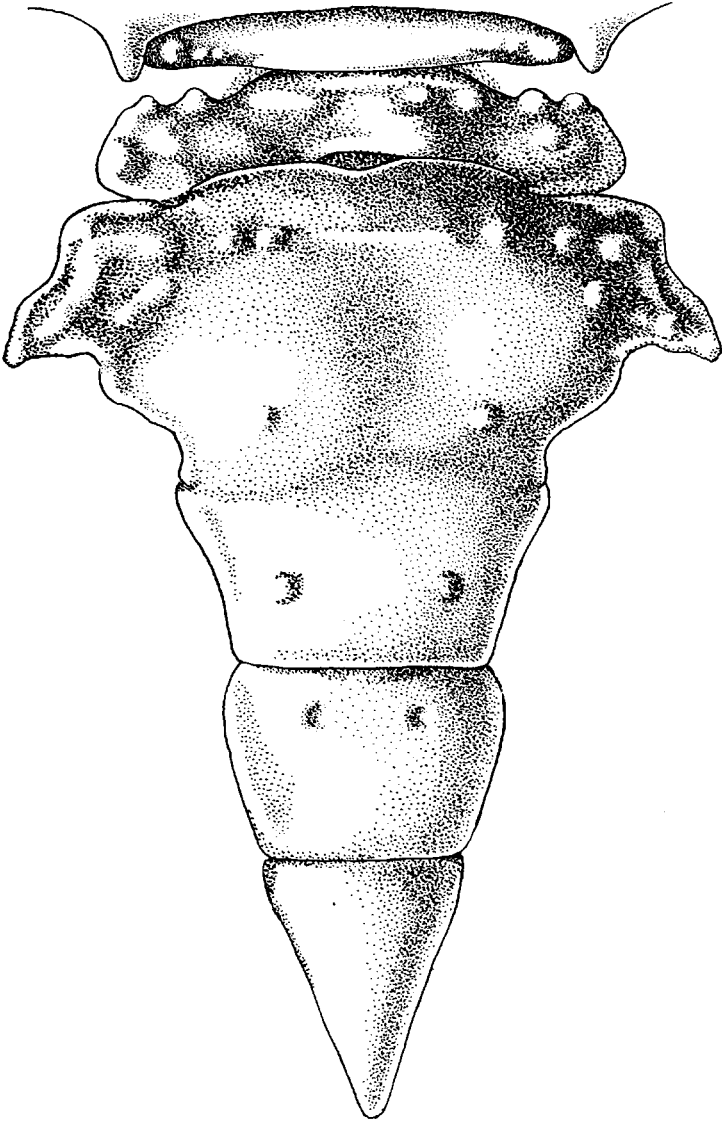


Fig. 42. *Hepatus gronovii* new species. Abdomen of male paratype.  $\times 10$ .  
W. C. G. Gertenaar del.

outer row are slightly smaller than those of the inner. There is a distinct tooth in the middle of the double row, and another may be seen in the posterior part of the postero-lateral margin. These teeth are better developed than in *H. pudibundus*.

The tips of the third maxillipeds are as in *H. pudibundus*, but for the distal margin, which is not emarginate.

The dactyli of the walking legs are covered by a short pubescence, the long ventral hairs as shown by *H. scaber* are lacking here. There are no distinct naked areas on the dactyli, though a trace of such an area may be observed in the basal part. The

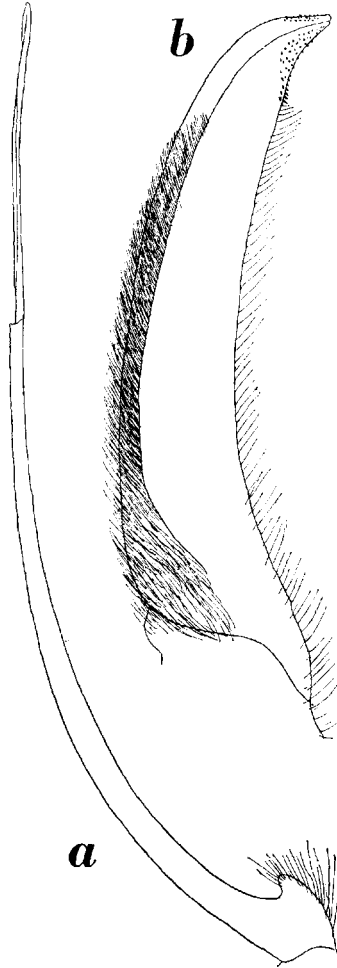


Fig. 43. *Hepatus gronovii* new species, male paratype. a, first pleopod; b, second pleopod. a, b,  $\times 16$ .

lower surface of the propodus of the second and third pereiopods shows two longitudinal lines of a short pubescence: one of these lines is placed along the anterior, the other along the posterior margin of this surface. This pubescence does not extend all the way to the base of the propodus. In the fourth pereiopod there is a single strip of pubescence in the distal part of the lower surface of the propodus, while no pubescence is to be seen on the propodus of the last leg. The lower surface of the ischium and the extreme basal part of the lower surface of the merus of the walking legs show some

pubescence, which is far less pronounced in the posterior legs than in the anterior. The carpus of the walking legs bears two dorsal carinae, the propodus one or two, which are not always distinct.

In my male specimens the abdomen is pubescent, but far less densely so than in *H. scaber*. The telson lacks the posteriorly directed tuft of long hairs. The outline of the abdomen is distinctly visible. The telson is elongate triangular and is decidedly longer than broad; it is slightly longer than the sixth abdominal segment. The basal margin of the telson is practically straight. The distal breadth of the sixth abdominal somite is somewhat shorter than the length of the somite, which is relatively longer than in *H. pudibundus*. The lateral margins are almost straight, being slightly convex in their basal part. Both the posterior and the anterior margins of this somite are straight. The third to fifth somites are fused. The fifth is slightly shorter than the sixth; it broadens posteriorly, having the lateral margins concave in its distal half, convex in its proximal half. The distal part of each half of the exposed surface shows a distinct tubercle at some distance from the lateral margins. The fourth somite is shorter and broader than the fifth but has the same general shape; the curves of the lateral margins are more pronounced than in the fifth somite; the exposed surface shows similar tubercles as in the preceding somite. Both the third and second somites are provided with a distinctly tuberculated transverse ridge. The lateral margins of the third somite show an obliquely outwards directed elongate process. Unfortunately no female specimens are available.

The first pleopods of the male are robust and resemble those of *H. scaber* by having the top curved outwards; this top, however, is less slender than in the previous species. The second pleopods are slender and straight; they reach distinctly beyond the first pair.

Colour. No colour pattern was observed in the present material.

In several respects the present new species is intermediate between *H. pudibundus* and *H. scaber*. The shape and sculpturation of the carapace, the pubescence of the walking legs, the shape of the abdomen and that of the male pleopods may serve as an easy means for a rapid identification of the species.

*Hepatus gronovii* is named in honour of Laurentius Theodorus Gronovius (also written Gronov, Gronow, or Gronouw) who was born at Leiden in 1730 as the son of the well-known botanist Dr. Johannes Fredericus Gronovius, the author of "Flora Virginica" and friend of Linnaeus. L. T. Gronovius studied law at Leiden University and after obtaining his degree became "Raadsheer en Schepen" (justice and alderman) of the town of Leiden. He died there in 1777 or 1778. Though Gronovius was not a professional biologist he was highly interested in that branch of science and devoted much of his spare time to the study of natural history, becoming especially well known as an ichthyologist. Several scientific societies like those of Basle, London and Haarlem recognized his merits by electing him as a member. In the field of carcinology Gronovius did much important work and in his Zoophylacium Gronovianum he published many interesting additions to the knowledge of Crustacea: he was the first zoologist to describe a species of the present genus (*H. pudibundus*). Unfortunately Gronovius did not adopt the system of binominal nomenclature, so that the names given by him are not valid.

Holotype is the largest of the three specimens, Museum Leiden Reg. No. Crustacea D. 12354.

Family Leucosiidae

Subfamily Philyrinae

***Persephona lichtensteinii* Leach, 1817**

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 male, 2 females. (L)

N.N.W. of the mouth of the Marowijne River, about 20 miles offshore; depth 35 m; 8-12 April 1957; second voyage. — 1 female. (L)

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

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

15 miles N. of "Suriname Rivier" lightvessel; depth 18 m; 3 May 1957; fifth voyage. — 2 males. (L)

20 miles N. of the mouth of the Suriname River; depth 9 m; 6-9 May 1957; sixth voyage. — 3 males, 8 females (1 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. — 3 males. (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. — 2 males. (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 male. (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. — 2 females. (W)

Station 62, off N.W. French Guiana, 6° 02' N 53° 41' W; bottom shells; depth 26 m; 21 May 1957. — 2 females. (L)

Station 66, off N.W. French Guiana, 6° 00' N 53° 29' W; bottom hard mud; depth 27 m; 21 May 1957. — 3 males, 2 females. (L)

Station 75, off N.W. French Guiana, 5° 56' N 53° 17' W; bottom mud and shells; depth 29 m; 21 May 1957. — 7 males, 10 females. (L)

Station 157, off the mouth of the Suriname River, 6° 22' N 55° 03.5' W; bottom mud; depth 24 m; 4 June 1957. — 1 male. (W)

Description. Rathbun, 1937, p. 163, pl. 45 figs. 1, 2.

Remarks. The carapace lengths of the above specimens vary between 13 and 32 mm, in the ovigerous female it is 22 mm. The length and acuteness of the various spines on the carapace is subject to considerable variation. In some specimens the hepatic and lateral spines are pointed and slender, in others they are blunt, and even may be rather obsolete. The tubercle between the hepatic and lateral spine may be distinct or hardly discernable. Generally the median posterior spine is distinctly longer than the other two, but there are specimens in which the three spines are subequal in length. In some specimens the granulation of the carapace is coarser than in others. In the anterior part of the dorsal surface of the carapace a soft and sparse pubescence is present. The abdomen in the males has sometimes the sixth segment distinctly separated from the fifth, but in other specimens the line of separation is extremely vague, so that it seems as if the third to sixth segments were fused.

The main feature on which Rathbun (1937) seems to separate *Persephona finneganæ* Rathbun from *P. lichtensteinii* is the fact that the tubercle between the hepatic and lateral spines of the carapace is present in the former and absent in the latter species. As is shown by my material this character is very variable. On comparing my material with Rathbun's accounts of the



two species, I cannot escape the impression that *P. finneganae* falls within the range of variation of *P. lichtensteinii* and should be synonymized with that species.

Type locality. Unknown. Of *P. finneganae* the type locality is São Sebastião, Brazil.

Distribution. Haiti, Trinidad, Brazil. The species is now reported for the first time from Suriname and French Guiana.

***Persephona punctata*** (Linnaeus, 1758)

Coquette Investigations

20 miles N. of the coast of Suriname between the mouths of the Nickerie and Coppename Rivers; depth 27 m; 15-20 April 1957; third voyage. — 2 females. (L)  
15 miles N. of "Suriname Rivier" lightvessel; depth 18 m; 3 May 1957; fifth voyage. — 1 male. (L)

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

Description. Rathbun, 1937, p. 152, pl. 42 figs. 2, 3.

Remarks. The carapace lengths of the specimens range between 19 and 30 mm.

Linnaeus's (1758, p. 630) description of the species runs as follows:

"C[ancer]. brachyurus, thorace obovato punctato: postice tridentato.

*Rumph. mus. t. 10. f. C. Brown. jam. t. 42. f. 3.*

*Habitat in Asia, America."*

As Browne figured the present species and Rumphius represented *Myra fugax* (Fabr.), Linnaeus's *Cancer punctatus* is composite. Fabricius (1798, pp. 350, 351) was the first to distinguish the American from the Indo-West Pacific species; he gave the name *Leucosia fugax* to the latter, using the name *L. punctata* for the American form. As far as I know no definite lectotype selection has ever been made for *Cancer punctatus*, so that its identity is not yet officially fixed. Therefore I select now, in harmony with current usage, the specimen figured by Browne (1756, p. 422, pl. 42 fig. 3) as the lectotype of *Cancer punctatus* Linnaeus, 1758.

Type locality. "Habitat in Asia, America". By the above lectotype selection the type locality is now restricted to Jamaica, British West Indies.

Distribution. West Indies to Brazil; a subspecies *P. p. aquilonaris* Rathbun is known from the coasts of the U.S.A. (New Jersey to Texas). No Suriname records of this species have so far been published.

Subfamily Leucosiinae

***Iliacantha liodactylus*** Rathbun, 1898

Coquette Investigations

N.N.W. of the mouth of the Marowijne River, 20 miles offshore; depth 35 m; 8-12 April 1957; second voyage. — 8 males, 4 ovigerous females. (L)

Station 3, off the mouth of the Suriname River,  $6^{\circ} 24' N$   $55^{\circ} 05' W$ ; bottom shells; depth 27 m; 11 May 1957. — 1 female. (L)

Station 4, off the mouth of the Suriname River,  $6^{\circ} 25' N$   $55^{\circ} 05' W$ ; depth 29 m; 11 May 1957. — 2 females. (L)

Station 5, off the mouth of the Suriname River,  $6^{\circ} 25' N$   $55^{\circ} 04' W$ ; bottom grey mud and shells; depth 27 m; 11 May 1957. — 1 male, 1 female. (L)

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

Station 290, off the mouth of the Coppename River,  $6^{\circ} 53' N$   $55^{\circ} 55' W$ ; bottom mud, shells, and coral; depth 49 m; 27 June 1957. — 1 female. (L)

Description. Rathbun, 1937, p. 186, textfig. 41, pl. 55.

Remarks. The carapace lengths of the present material vary between 13 and 33 mm, in the ovigerous females they range between 28 and 31 mm.

Rathbun (1937) stated in her key on p. 185 that in the present species the median spine of the posterior margin of the carapace is twice as long as those of the lateral pair, while on p. 187 she remarked "lateral pair two-thirds the length of the median spine". In my specimens the median spine as a rule is only slightly longer than the laterals and in not a single instance it attains a length of more than 1.5 times that of the laterals.

Type locality. North of Trinidad, British West Indies ( $10^{\circ} 37' 40'' N$   $61^{\circ} 42' 40'' W$  and  $10^{\circ} 37' 00'' N$   $61^{\circ} 44' 22'' W$ ); depth 31 and 34 fathoms.

Distribution. West Florida, Haiti, Puerto Rico, St. John, Trinidad. The species is now reported for the first time from Suriname.

#### Family Raninidae

### **Raninoides laevis** (Latreille, 1825)

#### Coquette Investigations

N.N.W. of the mouth of the Marowijne River, about 20 miles offshore; depth 35 m; 8-12 April 1957; second voyage. — 2 specimens. (L)

Description. Rathbun, 1937, p. 8, textfig. 3, pl. 1 figs. 1, 2.

Remarks. The present specimens (cl. 25 and 30 mm) agree perfectly with Rathbun's description.

Type locality. Unknown.

Distribution. S. and W. Florida, Pacific coast of Panama, Atlantic and Pacific coast of Colombia, Barbados. The species is now reported for the first time from Suriname.

#### Section Oxyrhyncha

#### Family Majidae

### **Stenorhynchus seticornis** (Herbst, 1788)

#### Coquette Investigations

N.N.W. of the mouth of the Marowijne River, about 20 miles offshore; depth 35 m; 8-12 April 1957; second voyage. — 1 male. (L)

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

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 male. (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. — 2 ovigerous 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. — 2 males. (W)

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 ovigerous 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 ovigerous 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)

Description. Rathbun, 1925, p. 13, pls. 2, 3.

Remarks. The examined specimens have the carapace lengths ranging between 20 and 40 mm, in the ovigerous females it is 23 and 24 mm.

Type locality. "*Oost-Indien*" (Slabber, 1778, p. 162). This locality indication is incorrect as the species does not occur in the Indo-West Pacific area; evidently Slabber's animal (on which Herbst based his species) was incorrectly labelled. As Herbst (1803, vol. 3 pt. 3, p. 27) later brought a specimen from Guadeloupe to his *Cancer seticornis*, the locality Guadeloupe is chosen here as the corrected type locality of Herbst's species.

Distribution. Western Atlantic from Bermuda and North Carolina (U.S. A.) to Brazil and the West Indies; eastern Atlantic from Madeira and the Canary Islands to Angola. The species was hitherto not known from Suriname.

### ***Podochela gracilipes* Stimpson, 1871**

#### Coquette Investigations

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. — 1 ovigerous female. (L)

Description. Rathbun, 1925, p. 47, textfig. 12, pl. 17.

Remarks. Unfortunately the present specimen, which has cl. 10 mm, lacks all the legs, but the characters offered by the carapace are such that there can be little doubt that it belongs to the present species.

Type localities. West of Tortugas, off Pacific Reef, and off Carysfort Reef, Florida, U.S.A.; depth 36 to 60 fathoms.

Distribution. East coast of America from North Carolina (U.S.A.) to Brazil. The species is now reported for the first time from Suriname.

**Anasimus latus** Rathbun, 1894

## Coquette Investigations

N.N.W. of the mouth of the Marowijne River, about 20 miles offshore; depth 35 m; 8-12 April 1957; second voyage. — 1 male, 1 ovigerous female. (L)

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 male, 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 male, 2 ovigerous 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. (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, 2 females. (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 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. — 3 males, 2 ovigerous females. (W)

Station 211, between the mouths of the Suriname and Marowijne Rivers, 6° 44' N 54° 31' W; bottom mud; depth 42 m; 14 June 1957. — 1 male. (L)

Station 214, between the mouths of the Suriname and Marowijne Rivers, 6° 47' N 54° 29' W; bottom mud and fine shells; depth 44 m; 14 June 1957. — 1 male. (W)

Station 220, N.W. of the mouth of the Marowijne River, 6° 42.5' N 54° 11' W; bottom mud; depth 42 m; 14 June 1957. — 1 female. (L)

N.N.W. of "Suriname Rivier" lightvessel, 7° 2' N 55° 40' W; depth 55 m; 8 August 1957. — 1 male, 1 ovigerous female. (L)

Off Suriname; 1957. — 4 males, 7 females (3 ovigerous). (W)

Description. Rathbun, 1925, p. 65, pl. 214.

Remarks. The carapace lengths of the above specimens vary between 12 and 19 mm, those of the ovigerous females between 16 and 19 mm.

Colour. In some specimens traces of the original colour pattern are still visible. The walking legs show reddish brown rings on the various segments: two or three on the merus, one at either end of the carpus, one at either end and one in the middle of the propodus, and one in the basal part of the dactylus. Also the merus of the chelipeds shows three dark rings.

A female from Station 32 is infested with a Sacculinid parasite, while the female from Station 220 shows a similar but extremely young parasite. The smaller female from Station 8 bears a barnacle on the carapace.

Type locality. East of the delta of the Mississippi River, 29° 14' 30" N 88° 09' 30" W; depth 68 fms.

Distribution. Off the east and south coast of the U.S.A. (from South Carolina to Alabama), and near Trinidad. The present record considerably extends our knowledge of the range of this species.

**Paradasygius tuberculatus** (Lemos de Castro, 1949) (pl. VI fig. 1)

## 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 male, 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. — 1 female. (L)

15 miles N. of "Suriname Rivier" lightvessel; depth 18 m; 3 May 1957; fifth voyage. — 1 male, 4 females. (L)

20 miles N. of the mouth of the Suriname River; depth 9 m; 6-9 May 1957; sixth voyage. — 3 males, 3 females (2 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. — 1 female. (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. — 2 males, 1 female. (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. — 3 males, 1 female. (W)

Station 75, off N.W. French Guiana, 5° 56' N 53° 17' W; bottom mud and shells; depth 29 m; 21 May 1957. — 1 male, 2 females. (L)

Station 157, off the mouth of the Suriname River, 6° 22' N 55° 03.5' W; bottom mud; depth 24 m; 4 June 1957. — 1 juvenile. (L)

Description. Lemos de Castro, 1949, p. 349, figs. 1-11 (as *Dasygius tuberculatus*).

Remarks. The specimens have the carapace lengths varying between 14 and 23 mm, the two ovigerous females have cl. 17 and 18 mm.

I am much indebted to Dr. John S. Garth, Allan Hancock Foundation, Los Angeles, for help received with the identification of this material, and to Dr. Lemos de Castro for his kindness in sending me his publication which at first was inaccessible to me.

Type locality. Praia de Mucuripe, Fortaleza, Ceará State, Brazil.

Distribution. Until now the species was only known from Brazil; the present records are the first from French Guiana and Suriname.

**Libinia ferreirae** De Brito Capello, 1871 (pl. V fig. 1)

? "Spier-witte krab" Teenstra, 1835, p. 443.

? *Maja* Kappler, 1887, p. 202.

## Coquette Investigations

N.N.W. of the mouth of the Marowijne River, about 20 miles offshore; depth 35 m; 8-12 April 1957; second voyage. — 1 male. (L)

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

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. — 1 female. (W)

## Museum Leiden

Near "Suriname Rivier" lightvessel; 12 and 13 January 1953; H. W. Lijding. — 3 females.

East of "Suriname Rivier" lightvessel; trawled; 30 October 1953; H. W. Lijding. — 2 males, 2 females.

Between "Suriname Rivier" lightvessel and the coast; 27 July 1953; D. C. Geijskes. — 1 female.

Suriname coast near "Suriname Rivier" lightvessel; trawled; 13 July 1953; H. W. Lijding. — 2 females.

Description. Rathbun, 1925, p. 324, pls. 118, 119, 245 figs. 4, 5.

Remarks. The present specimens have cb. varying from 22 to 63 mm and cl. from 24 to 64 mm. Some of the specimens carried one or more sea-anemones on the carapace. One or more of the branchial spines may be lacking on one or either side of the carapace.

Type locality. Probably Brazil.

Distribution. British Guiana, Suriname, Brazil. Graham's (1955, p. 34, pl. 5 fig. 1) Spider Crab from British Guiana undoubtedly belongs to the present species.

Occurrence in Suriname. Possibly the crab which Teenstra (1835, p. 443) described as "eene spier-witte met een' langen, vooruitstekenden kop en eenige horenachtige punten gewapend" (a purely white crab with a long protruding snout and armed with horn-like spines) is the present species. Also Kappler's (1887, p. 202) "Seespinne, *Maja*", which he found "manchmal bei niederem Wasser auf den Sandbänken des Maroni", may belong here. *Libinia ferreirae*, namely, seems to be the only spider crab which is found rather close to the Suriname seashore. According to Graham (1955) in some seasons it is abundant in the fishermen's nets in British Guiana.

***Libinia bellicosa*** Oliveira, 1944 (textfig. 44)

Coquette Investigations

20 miles N. of the mouth of the Marowijne River; depth 27 m; 23-27 April 1957; fourth voyage. — 1 male, 3 females. (L)

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

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. — 2 males. (W)

Description. Oliveira, 1944, p. 87, pls. 1-3.

Remarks. The systematic position of the present species was rather uncertain till quite recently. Rathbun (1925, p. 330) considered it to be identical with *Libinia rostrata* Bell, a species at that time known only from the type specimen, which was said to be collected in Peru by H. Cuming. As this type

specimen was lost and as no other material from the American west coast was available, for a comparison of her Atlantic material Rathbun had to rely on Bell's description and figure. The few discrepancies found might have been due to individual variation or to errors in Bell's figure; therefore Rathbun decided not to consider the Atlantic and Pacific forms two different species. This was the more justified as it is a well known fact that Cuming's locality labels often were inaccurate. Oliveira (1944), basing himself on Brazilian material, decided to consider the Atlantic form a separate variety of Bell's species, *Libinia rostrata bellicosa*. It was not until 1958 that new Pacific material of *Libinia rostrata* was dealt with in a publication.

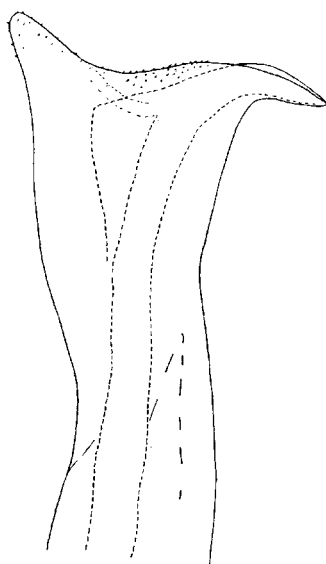


Fig. 44. *Libinia bellicosa* Oliveira. Tip of right first pleopod of male in anterior view. Specimen from fourth voyage of the "Coquette".  $\times 33$ .

Then, namely, Garth (1958, p. 328, pl. T fig. 6, pl. 37 fig. 2) gave a description and figures of this Pacific form, basing himself on four specimens from Paita, Peru. A comparison of our Suriname material with Garth's account shows that his supposition that the Atlantic and Pacific forms should be regarded as different species is correct and that Oliveira was justified in erecting a new taxon for the Atlantic form. The latter now should be known as *Libinia bellicosa* Oliveira.

In my specimens the arrangement of the spines in the median region of the carapace is very similar to that described by Garth, only the "boss on cardiac region" in the present material is a spine of about the same size as

the intestinal spine. Behind the cardiac spine there is an obscure double tubercle, which was also figured by Oliveira, but neither mentioned nor figured by Garth. The small tubercle shown in Oliveira's figure immediately behind the median anterior gastric spine is not present in any of my specimens. All the other spines and tubercles are as in Oliveira's pl. 2 fig. 4.

The upper margin of the merus of the cheliped has three or four large tubercles, one of which is subterminal; a few smaller additional tubercles may be found on this margin also. The tubercles on the rest of the surface of the merus are hardly noticeable.

The first male pleopod strongly resembles that of *Libinia rostrata* as figured by Garth (1958, pl. T fig. 6), only the inner half of the distal part is more anteriorly produced.

Type locality. Ilha do Pinheiro, Rio de Janeiro Bay, Brazil.

Distribution. The specimens from the Atlantic coast of the Panama Canal Zone and Brazil reported upon by Rathbun (1925) as *L. rostrata* undoubtedly belong in the present species. These records together with that by Oliveira from Rio de Janeiro and the present finds from off the Suriname coast, show that the species inhabits the northern coast of the S. American continent at least from Panama to Rio de Janeiro. The species had not been reported from Suriname before.

### **Mithrax caribbaeus** Rathbun, 1920

#### Coquette Investigations

20 miles N. of the coast of Suriname between the mouths of the Nickerie and Copename Rivers; depth 27 m; 15-20 April 1957; third voyage. — 1 male. (L)

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)

N.N.W. of "Suriname Rivier" lightvessel, 7° 2' N 55° 40' W; depth 55 m; 8 August 1957. — 1 female. (L)

Description. Rathbun, 1925, p. 409, pls. 148, 149.

Remarks. The carapace lengths of the specimens vary between 31 and 46 mm, the carapace breadths between 35 and 53 mm.

Type locality. St. Thomas, West Indies; from piles in harbour.

Distribution. West Indies, Venezuela. The species is now reported for the first time from Suriname.

### **Stenocionops furcata** (Olivier, 1791)

*Pericera cornuta* Thallwitz, 1892, p. 54.

Description. Rathbun, 1925, p. 449, pls. 160, 161.

Type locality. Unknown.



Distribution. East coast of America from Georgia (U.S.A.) to Brazil and the West Indies.

Occurrence in Suriname. Thallwitz (1892), who used the name *Pericera cornuta* for the present species, reported upon material in the collection of the Dresden Museum, which was said to originate from "Surinam. Westindien." I have not seen any Suriname material of the species myself.

#### Family Parthenopidae

#### **Lambrus serratus** H. Milne Edwards, 1834

#### Coquette Investigations

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

Station 4, off the mouth of the Suriname River, 6° 25' N 55° 05' W; depth 29 m; 11 May 1957. — 1 male. (L)

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 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 male, 2 females. (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 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 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 male. (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. (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 ovigerous female. (L)

N.N.W. of "Suriname Rivier" lightvessel, 7° 2' N 55° 40' W; depth 55 m; 8 August 1957. — 1 male. (L)

Description. Rathbun, 1925, p. 516, pls. 180, 181, 275 figs. 7-10.

Remarks. In the present specimens the cl. varies between 15 and 20 mm, cb. between 19 and 29 mm; in the ovigerous females cl. is 18 to 20 mm, cb. 24 to 29 mm.

Type locality. "Océan indien", an erroneous locality indication.

Distribution. East coast of America from Bermuda and North Carolina (U.S.A.) to Brazil and the West Indies. Now reported for the first time from Suriname.

**Lambrus fraterculus** Stimpson, 1871

## Coquette Investigations

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 female. (W)

N.N.W. of "Suriname Rivier" light vessel, 7° 2' N 55° 40' W; depth 55 m; 8 August 1957. — 1 male. (L)

Description. Rathbun, 1925, p. 525, pls. 186, 187, 190 fig. 2.

Remarks. The male has cl. 12 and cb. 14 mm, the female cl. 9, cb. 10 mm.

Type localities. Off Sand Key, off Carysfort Reef, West of Tortugas, and off Conch Reef, Florida (U.S.A.); depth 26 to 68 fathoms.

Distribution. North Carolina, Florida (U.S.A.), Yucatan (Mexico), Barbados. Now reported for the first time from Suriname.

**Leiolambrus nitidus** Rathbun, 1901

## Coquette Investigations

N.N.W. of the mouth of the Marowijne River, 20 miles offshore; depth 35 m; 8-12 April 1957; second voyage. — 1 male. (L)

N.N.W. of the mouth of the Marowijne River, about 30 miles offshore; depth 37 m; 29 April-3 May 1957; fifth voyage. — 1 male. (L)

20 miles N. of the mouth of the Suriname River; depth 9 m; 6-9 May 1957; sixth voyage. — 1 male, 3 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. — 2 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 male, 1 ovigerous 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. — 7 males. (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 female. (W)

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

Station 220, N.W. of the mouth of the Marowijne River, 6° 42.5' N 54° 11' W; bottom mud; depth 42 m; 14 June 1957. — 1 male, 1 female. (L)

Off Suriname; 1957. — 1 male, 1 ovigerous female. (W)

Description. Rathbun, 1925, p. 545, pls. 199, 281 fig. 1.

Remarks. The examined specimens have cl. ranging from 9 to 13 mm, and cb. from 13 to 20 mm; in ovigerous females cl. is 11 to 13 mm, cb. 18 to 20 mm.

The specimens closely agree with Rathbun's description, though some slight discrepancies were noted. These may be caused by the fact that Rathbun's holotype is rather small (cb. 10.3 mm). The "small tubercle, sometimes pointed, on postero-lateral margin at end of branchial ridge" is a distinct tooth in

my specimens, while the extremities of the posterior margin of the carapace, like in the type, are angular or marked with a small tooth. In my material the walking legs do not reach beyond the end of the arm of the cheliped.

Type locality. Mayaguez Harbor, Puerto Rico; depth 12 to 18 fathoms.

Distribution. Jamaica, Puerto Rico. Now reported for the first time from Suriname.

***Heterocrypta caledoniana*** Garth, new species (pl. VI fig. 2)

Coquette Investigations

20 miles N. of the coast of Suriname between the mouths of the Nickerie and Copename Rivers; depth 27 m; 15-20 April 1957; third voyage. — 1 ovigerous female.

15 miles N. of the mouth of the Suriname River; depth 18 m; 3 May 1957; fifth voyage. — 1 female.

Description. The present new species was first discovered by Dr. John S. Garth, Allan Hancock Foundation, Los Angeles, when studying the Hancock collections of Atlantic Oxyrhynch crabs. As it will take some time before a paper on these collections can be published, Dr. Garth kindly consented in having a diagnosis of his new species inserted in the present paper. The following is a verbatim citation of Dr. Garth's preliminary account of the new species.

*"Heterocrypta caledoniana, n. sp.*

Type: Male holotype, A.H.F. No. 399, and one male paratype, Caledonia Bay, Panama, April 4, 1939, 1 fathom, hard sand, Velero III station A7-39; one male paratype, same locality, April 26, 1939, 7-12 fathoms, mud, Velero III station A53-39; 3 males and 6 females, paratypes, presumably from the same locality but without station identification; specimens collected by the Allan Hancock Atlantic Expedition of 1939.

Measurements: Male holotype, length 8.5 mm, width 9.9 mm, front 0.3 mm, width 1.6 mm, fronto-orbit 3.0 mm, cheliped 19.0 mm, chela 9.3 mm, dactyl 3.3 mm, height of palm 2.9 mm.

Diagnosis: Carapace depressed, one and one-sixth times wide as long, anterolateral margins dentate, a prominent notch at anterior third. Posterolateral margins between branchial ridge and lateral angle straight. Branchial ridges continuing onto gastric region; gastric, cardiac, and branchial regions not especially elevated. Front arcuate, not projecting beyond eyes. Granular ridge traversing subhepatic and pterygostomial regions interrupted at middle.

Remarks: The proposed new species is not closely allied to any member of the genus. In one respect it approaches *Solenolambrus*, having the posterolateral margins concave and the carapace but slightly produced over the am-

bulatory legs. The more depressed carapace, the shape of the external maxillipeds, which gape slightly, and the elongated fingers, rather than short fingers bent at right angles to the palm, argue for its inclusion in *Heterocrypta*. The pronounced interruption of the ridge connecting the external corner of the buccal frame with the base of the cheliped is a character not found in either genus, although a minute notch is detectable in *H. lapidea* Rathbun."

Remarks. A photograph of the ovigerous female (cb. 13 mm) collected during the second voyage of the "Coquette" is reproduced here (pl. VI figure 2). In this specimen part of the front is broken so that the antennulae, which otherwise are covered by the front, are visible. The second "Coquette" specimen (cb. 14 mm) carries a small oyster on the carapace, so that the entire front and the larger part of the right antero-lateral region are covered.

Distribution. The species is now known from the Atlantic coasts of Panama and Suriname.

#### Section Brachyrhyncha

#### Family Portunidae

#### **Portunus gibbesii** (Stimpson, 1859)

#### Coquette Investigations

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

15 miles N. of "Suriname Rivier" lightvessel; depth 18 m; 3 May 1957; fifth voyage. — 2 specimens. (L)

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. — 5 males. (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. (L)

Station 7, off the mouth of the Suriname River, 6° 24.5' N 55° 02.5' W; bottom grey mud and shells; depth 27 m; 11 May 1957. — 1 ovigerous female. (L)

Station 11, off the mouth of the Suriname River, 6° 24' N 55° 01' W; bottom mud; depth 27 m; 11 May 1957. — 3 males, 7 females (4 ovigerous). (L)

Station 157, off the mouth of the Suriname River, 6° 22' N 55° 03.5' W; bottom mud; depth 24 m; 4 June 1957. — 1 juvenile. (L)

Station 182, N.E. of the mouth of the Coppename River, 6° 15' N 55° 54' W; bottom mud; depth 24 m; 6 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 42 m; 20 June 1957. — 3 males, 6 ovigerous females. (W)

Description. Rathbun, 1930, p. 49, pls. 16, 17.

Remarks. The present specimens, which closely agree with Rathbun's de-

scription and figures, have cb. 14 to 77 mm; in the ovigerous females cb. is 52 to 64 mm.

Type locality. S. Carolina, and St. Augustine, Florida.

Distribution. Atlantic coast of U.S.A. (S. Massachusetts to Texas), Venezuela. Now reported for the first time from Suriname.

**Portunus rufiremus** new species (textfigs. 45, 46)

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)

N.N.W. of the mouth of the Marowijne River, about 20 miles offshore; depth 35 m; 8-12 April 1957; second voyage. — 1 male, 1 female. (L)

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

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

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

15 miles N. of "Suriname Rivier" lightvessel; depth 18 m; 3 May 1957; fifth voyage. — 3 males. (L)

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

Station 157, off the mouth of the Suriname River, 6° 22' N 55° 03.5' W; bottom mud; depth 24 m; 4 June 1957. — 14 males, 8 females. (W)

Station 188, N.E. of the mouth of the Suriname River, 6° 24' N 54° 55' W; bottom mud; depth 27 m; 10 June 1957. — 1 male. (W)

Station 209, between the mouths of the Suriname and Marowijne Rivers, 6° 41' N 54° 33' W; bottom mud and shells; depth 40 m; 14 June 1957. — 2 females. (W)

Station 211, between the mouths of the Suriname and Marowijne Rivers, 6° 44' N 54° 31' W; bottom mud; depth 42 m; 14 June 1957. — 1 male (holotype). (L)

Description. The surface of the carapace is densely granular and pubescent. The granules are rather evenly distributed; only in the gastric area they form distinct transverse rows. These rows are two in number: one on the line between the meso- and meta-gastric regions, and one somewhat more anteriorly; the anterior row is interrupted in the middle. A very inconspicuous row of granules may be seen extending from the last antero-lateral tooth of the carapace, curving forwards over the branchial region. Like in *P. gibbesii* the carapace shows a naked spot near the postero-lateral margin above the base of the fourth pereiopod; no naked iridescent spots were to be seen near the bases of the antero-lateral teeth. The front has the submedian teeth bluntly triangular or rounded; they are narrow and are separated from one another by a rather deep U-shaped sinus. The outer teeth are very broad and have the top bluntly rounded, they are separated from the submedian teeth by a very wide sinus, and from the inner orbital teeth by a much nar-

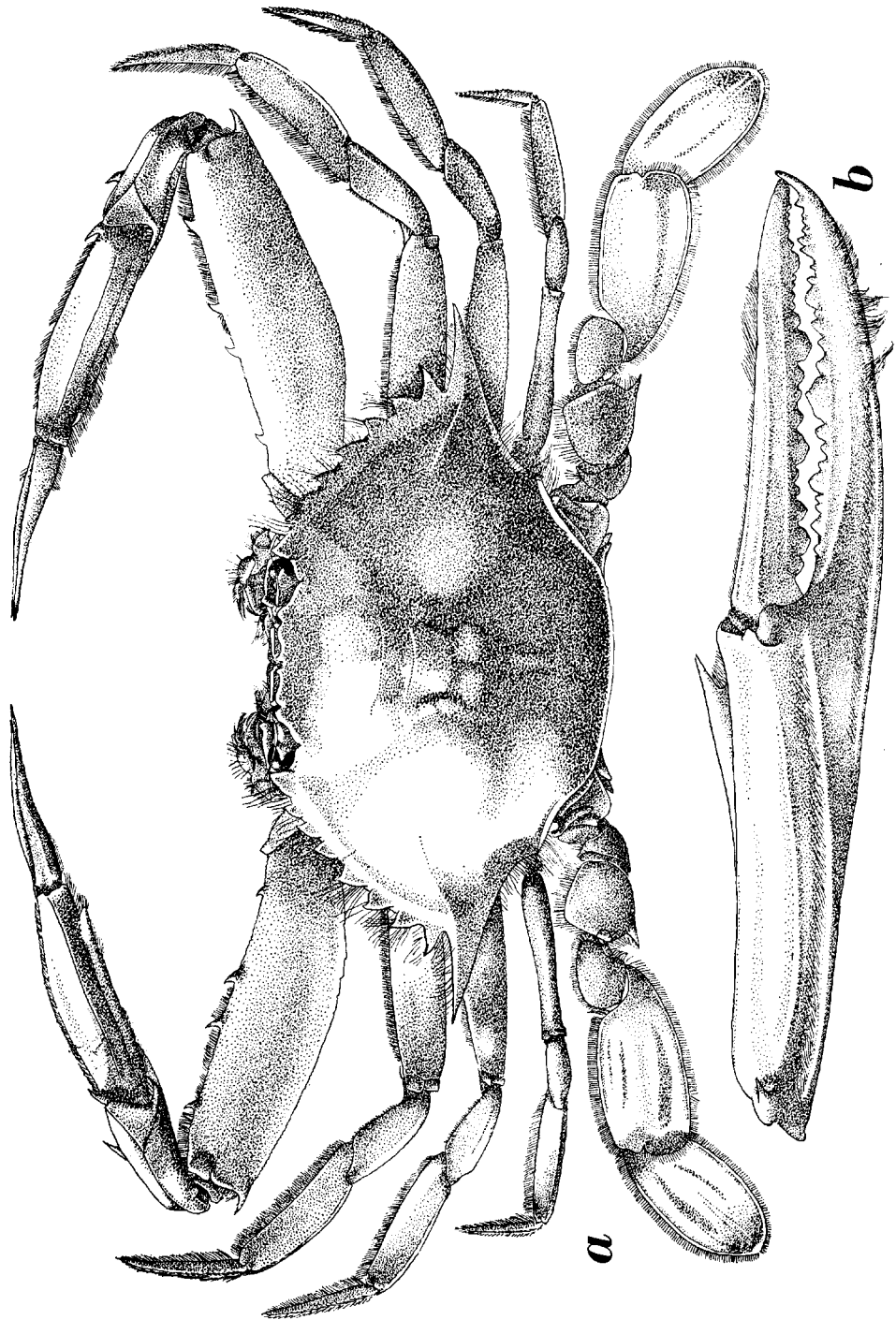


Fig. 45. *Portunus rufiremis* new species, holotype. a, animal in dorsal view; b, chela.  
a,  $\times 2$ ; b,  $\times 4$ . W. C. G. Gertenaar del.

rower sinus. The four frontal teeth reach about equally far forwards, slightly overreaching the inner orbital teeth. The latter are rounded and on their inner side bear a lobe. The upper margin of the orbit shows two fissures which are V-shaped at their distal end. The inner lower tooth of the orbit is large and well-advanced. The antero-lateral borders of the carapace together form a wide arch, the center of which is near the posterior margin of the carapace. The antero-lateral teeth, nine in number, are separated by small but distinct interspaces. The first tooth (= outer orbital tooth) is blunt, the following teeth all end in a slender spine. The anterior of these are directed forwards. The last antero-lateral tooth is very strong, being distinctly more than twice as long as the preceding; it is directed straight outwards. The postero-lateral angle of the carapace is rounded.

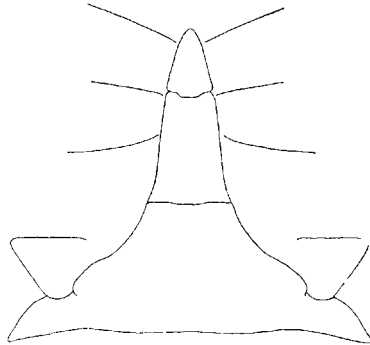


Fig. 46. *Portunus rufiremus* new species, holotype. Male abdomen.  $\times 2.5$ .  
W. C. G. Gertenaar del.

The chelipeds are very long, pubescent, and have granular carinae. The merus bears four to six strong spines on its inner margin and one at the distal end of its outer margin. The upper surface of the merus bears granules (which in the inner part form a reticular pattern) and short hairs. A fringe of long hairs extends along the inner margin of the merus below the just mentioned spines. The lower surface of the merus is smooth; it is pubescent in the outer half, almost naked in the inner. The carpus bears a strong spine in the inner and one in the outer part of the anterior margin. The upper surface bears four longitudinal carinae, the second inner of which gives off a branch to the inner spine. The palm shows seven longitudinal carinae: (1) one on the lower margin; this carina is distinct and granular on the fingers and in the distal half of the palm, but becomes inconspicuous in the proximal palmar portion, it bears a fringe of long hairs along the outer side of its distal half, (2) one on the outer surface of the palm just above the

ventral carina; it is distinct throughout its course, being especially pronounced in its basal part where it takes over the rôle of the ventral carina; along the upper side it is bordered with a fringe of long hairs, (3) one extending from the spine in the basal part of the outer surface of the palm to the base of the dactylus; it is distinct but less so than the previous one, and bears no fringe of hairs, (4) one extending midway between the previous carina and the upper margin of the palm; it is distinct but less elevated than no. 3, (5) one along the upper margin of the palm; it ends in a strong spine at a short distance behind the base of the dactylus; a fringe of hairs extends along its inner side, being most distinct distally, (6 and 7) two blunt carinae over the middle of the inner surface of the palm; they are distinct in their proximal half only. The outer surface of the dactylus shows four carinae, that of the fixed finger two; a fringe of long hairs is present on the upper margin of the dactylus and on the lower margin of the fixed finger, both forming the continuation of the fringes found on the palm. The merus of the swimming legs is about as long as broad. Its posterior margin bears a distinct spine, distally of which the margin is finely serrated.

The second and third segments of the male abdomen are provided with a sharp transverse carina and end laterally in sharply pointed upturned angles. The fused segment formed by the fourth and fifth strongly narrows anteriorly and the sixth segment is very narrowly quadrangular. On account of this the abdomen is somewhat intermediate in shape between that of a typical *Portunus* and the one found in *Callinectes*. The first pleopods of the male reach slightly beyond the middle of the sixth segment; their distal part is straight and directed slightly outwards, the tips diverging.

Colour. My preserved specimens have the carapace pale reddish brown. The legs are still paler reddish brown above. The lower surface of the specimens is yellowish white. The spines on the inner margin of the merus of the chelipeds are dark red, as are also the inner spine of the carpus and the tips of the fingers. The distal joints of the second to fourth pereopods are pinkish, while the distal half of the dactylus of the swimming legs has a dark red spot.

Remarks. The present new species is closest to *Portunus gibbesii* (Stimpson), with specimens of which it could be directly compared, and to *P. panamensis* (Stimpson). From the first species it differs in (1) the shape of the front, (2) the pattern of the granules on the carapace, (3) the absence of naked spots at the bases of the antero-lateral teeth of the carapace, (4) the presence of hairy fringes on the chela, (5) the remarkable development of the one but lowest carina on the external surface of the chela, (6) the presence of a strong spine on the merus of the fifth pereopod, (7) the shape of the



male abdomen and the male pleopods, which are S-shaped in *P. gibbesii* with the tips converging. *P. panamensis* differs from the present new species in (1) the shape of the front which has the outer teeth triangular, narrower, more pointed, and less conspicuously different from the submedian teeth, (2) the far more numerous and more distinct rows of granules on the carapace, (3) the absence of hairy fringes on the chelipeds, (4) the lower two carinae of the outer surface of the palm of the chelipeds which are of about the same strength, (5) the shape of the male abdomen which is more triangular.

Holotype is the male from "Coquette" Sta. 211. It is preserved in the Leiden Museum under Reg. No. Crustacea D. 12379.

### **Portunus spinimanus** Latreille, 1819

#### Coquette Investigations

20 miles N. of the mouth of the Suriname River; depth 27 m; 6-9 May 1957; sixth voyage. — 1 ovigerous female. (L)

Station 297, N.W. of 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. — 1 male. (W)

Description. Rathbun, 1930, p. 62, textfig. 10, pls. 26-28.

Remarks. The ovigerous female has cb. 57 mm, the male cb. 88 mm.

Type locality. Brazil.

Distribution. From Bermuda and New Jersey (U.S.A.) to S. Brazil and the West Indies. The species has not been reported from Suriname before.

### **Portunus spinicarpus** (Stimpson, 1871)

#### Coquette Investigations

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. (L)

Station 4, off the mouth of the Suriname River, 6° 25' N 55° 05' W; depth 29 m; 11 May 1957. — 1 male. (L)

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 male. (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 male, 1 female. (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. — 2 males, 1 female. (W)

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. — 5 males, 2 females. (W)

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. — 2 males, 2 females. (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. — 2 males, 5 females (1 ovigerous). (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. — 4 males, 1 ovigerous female. (W)

Station 33, N.E. of the mouth of the Suriname River,  $6^{\circ} 52' N$   $54^{\circ} 53' W$ ; bottom mud and shells; depth 51 m; 12 May 1957. — 1 ovigerous female. (W)

Station 36, N.E. of the mouth of the Suriname River,  $6^{\circ} 55' N$   $54^{\circ} 54' W$ ; bottom mud; depth 55 m; 12 May 1957. — 7 males, 5 females. (W)

Station 214, between the mouths of the Suriname and Marowijne Rivers,  $6^{\circ} 47' N$   $54^{\circ} 29' W$ ; bottom mud and fine shells; depth 44 m; 14 June 1957. — 1 male. (W)

Station 220, N.W. of the mouth of the Marowijne River,  $6^{\circ} 42.5' N$   $54^{\circ} 11' W$ ; bottom mud; depth 42 m; 14 June 1957. — 1 male. (L)

Station 298, off the mouth of the Suriname River,  $6^{\circ} 45' N$   $55^{\circ} 17' W$ ; bottom mud and fine shells; depth 44 m; 28 June 1957. — 1 male. (L)

N.N.W. of "Suriname Rivier" lightvessel,  $7^{\circ} 2' N$   $55^{\circ} 40' W$ ; depth 55 m; 8 August 1957. — 3 males. (L)

Description. Rathbun, 1930, p. 92, pl. 45.

Remarks. In the present specimens *cb.* varies between 26 and 54 mm, in the ovigerous females between 40 and 41 mm. One of the males collected on 8 August is infested with a Sacculinid parasite. The male from Station 3 is aberrant in that the left lateral tooth of the carapace is strongly reduced.

Type localities. Off the Tortugas, off Carysfort Reef, off Conch Reef, off Alligator Reef, off Pacific Reef,  $31^{\circ} 31' N$   $79^{\circ} 41' W$ , and off American Shoal, all localities near Florida, U.S.A.; depth 13 to 150 fathoms.

Distribution. East coast of America from N. Carolina (U.S.A.) to Brazil and the West Indies. The species is now reported for the first time from Suriname.

### **Callinectes ornatus** Ordway, 1863

#### Coquette Investigations

N.N.W. of the mouth of the Marowijne River, about 20 miles offshore; depth 35 m; 8-12 April 1957; second voyage. — 1 male. (L)

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

20 miles N. of the mouth of the Suriname River; depth 27 m; 6-9 May 1957; sixth voyage. — 19 specimens.

Station 1, off the mouth of the Suriname River,  $6^{\circ} 22' N$   $55^{\circ} 06' W$ ; bottom mud; depth 26 m; 11 May 1957. — 1 male. (W)

Station 2, off the mouth of the Suriname River,  $6^{\circ} 23' N$   $55^{\circ} 05.5' W$ ; bottom mud; depth 27 m; 11 May 1957. — 2 juveniles. (W)

Station 20, N.E. of the mouth of the Suriname River,  $6^{\circ} 28' N$   $54^{\circ} 57.5' W$ ; bottom shells; depth 31 m; 11 May 1957. — 1 juvenile. (W)

Station 66, off N.W. French Guiana,  $6^{\circ} 00' N$   $53^{\circ} 29' W$ ; bottom hard mud; depth 27 m; 21 May 1957. — 2 males, 1 female, 4 juveniles. (L)

Station 75, off N.W. French Guiana,  $5^{\circ} 56' N$   $53^{\circ} 17' W$ ; bottom mud and shells; depth 29 m; 21 May 1957. — 1 juvenile.

Station 157, off the mouth of the Suriname River,  $6^{\circ} 22' N$   $55^{\circ} 03.5' W$ ; bottom mud; depth 24 m; 4 June 1957. — 41 juveniles. (W)

Station 182, N.E. of the mouth of the Coppename River,  $6^{\circ} 15' N$   $55^{\circ} 54' W$ ; bottom mud; depth 24 m; 6 June 1957. — 1 male. (W)