

tion to consider that "le spécimen de *H. maltzani* Miers signalé par T. Odhner (1923 p. 20) de Port Alexandre (Angola), appartient vraisemblablement à cette espèce nouvelle [= *Solenolambrus noordendei*]." Monod (1956:590, 595) seemed to accept Capart's conclusions. Guinot and Ribeiro (1962: 80, 81) showed that *H. maltzani* does occur rather commonly in Angola and concluded that "on peut donc supposer que l'échantillon d'Odhner appartient bien à *H. maltzani*." This conclusion seems to be accepted by Crosnier (1967:340, 1970: 1219). As long as Odhner's specimen has not been reexamined, speculation on its identity is futile: The size of the specimen may fit either species, the locality of it lies within the known range of *H. maltzani*, but outside that of *Solenolambrus noordendei*, while the depth at which Odhner's specimen was collected lies well within the depth range of *S. noordendei*, but is much greater than at present known for tropical West African *H. maltzani*.

BIOLOGY.—Monod (1956:593) gave the depth range of the species as "sublittoral, jusqu'à 400 mètres." Our specimens were obtained at depths of 33 to 70 m. All previous West African records also are from far less than 100 m depth: 18–28 m (Miers, 1881a: type-locality), 10 m, 20–22 m (Balss, 1921), 10, 14–15, 15, 15, 15–20, 15–20, 16–18, 19, 19, 20, 20, 22, 23–24, 25, 25, 27–28, 30, 30, 31, 32, 32, 35, 36, 37, 38, 38, 40–41, 41, 46–50, 50 m (Monod, 1956), 0–10, 3–17 m (Sourie, 1954b), 18–60 m (Longhurst, 1958), 19–37 m (Gauld, 1960), 5, 8, 11–12, 13, 16, 22 m (Guinot and Ribeiro, 1962), 6–8 m (Rossignol, 1962), 8 m (Ribeiro, 1964), 18 m (Forest and Guinot, 1966), 30–40 m (Maurin, 1968b), 40, 57 m (Türkay, 1975a). On the other hand all the records of the species from the Mediterranean, the Bay of Biscay, the Azores, and north of the Cape Verde Islands are much deeper: 100 to 550 m. The West African specimens were found on the following types of bottom: shelly and muddy (Miers, 1881a), sand with *Palythoa* and *Molgula* (Monod, 1956), coarse shelly sand with *Arca* and *Pyura* (Sourie, 1954b), muddy sand, shelly sand, and shelly mud (Longhurst, 1958), sand (Guinot and Ribeiro, 1962), mud and shells

(Forest and Guinot, 1966), and sand or shelly sand (Maurin, 1968b).

DISTRIBUTION.—*Heterocrypta maltzami* has been reported from the Bay of Biscay, the Mediterranean (as far as the Adriatic Sea), the Azores, N of the Cape Verde Islands (16°55'–16°51'N, 27°27'–27°29'W of Paris = 25°07'–25°09'W of Greenwich), and from tropical West Africa. Monod (1956) summarized earlier records and reported material from Senegal, Ghana, and Gabon; records not in Monod include the following:

Spanish Sahara: Off Cabo Blanco, 20°43.5'N, 17°10.8'W, 40 m, and 20°37.3'N, 17°24.4'W, 57 m (Türkay, 1975a).

Mauritania: Banc d'Arguin, 30–40 m (Maurin, 1968b).

Cape Verde Islands: Baía de Porto Grande, São Vicente (Guinot and Ribeiro, 1962; Ribeiro, 1964).

Senegal: Anse de Hann and Anse Bernard near Dakar (Sourie, 1954b).

Guinea: 09°40'N, 14°05'W, 18 m (Forest and Guinot, 1966).

Sierra Leone: No specific locality, 18–60 m (Longhurst, 1958).

Ghana: Off Accra, 18–37 m (Gauld, 1960).

Congo: Baie de Pointe-Noire, 6–8 m (Rossignol, 1962).

Angola: Baía da Caota, 11–12, 13, and 16 m; Sombreiro, 5 m; and Baía Farta, 22 m (all Benguela) (Guinot and Ribeiro, 1962).

Genus *Sakaila*, new genus

TYPE-SPECIES.—*Sakaila africana*, new species.

ETYMOLOGY.—It is with great pleasure that we dedicate this genus to Professor Tune Sakai, the eminent Japanese carcinologist, who pointed out the differences between the species assigned here to the new genus and the species of *Osachila* sensu stricto, here restricted to the American and central Atlantic species (Rathbun, 1937:248). The gender of the generic name is feminine.

DEFINITION.—Carapace broad, suboval in shape, narrowing anteriorly, regularly arcuate laterally, margins thin, scalloped or lobed. Front narrow, produced anteriorly, bilobed. Orbits small. Eyes scarcely or not at all visible in dorsal view. Antennules oblique. Antennae at inner angle of orbit. Buccal cavity broad anteriorly. Efferent branchial orifices separated, not meeting at midline. Merus of third maxilliped shorter than

ischium, anterior margin of merus divided into 2 lobes. Chelipeds symmetrical. Walking legs compressed, dorsally toothed or with large, irregular tubercles.

REMARKS.—*Sakaila* can readily be distinguished from *Osachila* Stimpson, 1871, by the position of the orbits, the distinctly separated efferent branchial channels, by the ischium of the third maxillipeds being shorter than the merus and being notched anteriorly, and by the spined or tuberculate walking legs.

Guinot (1966:754) noted "pour des raisons d'ordre taxonomique, la séparation d'*O. stimpsoni*, *O. japonica*, et *O. imperialis* dans un genre ou sous-genre nouveau pourrait se justifier car plusieurs caractères concomitants les distinguent des autres *Osachila*." Guinot (1968b) referred to *O. stimpsoni* [sensu Monod, 1956] as a primitive *Osachila*. As a result of her study of the affinities of *Osachila* sensu lato, she assigned it, *Aethra*, *Hepatus*, *Hepa-tella*, and *Actaeomorpha* to a group that she called "parthénoxystomienne," and tentatively assigned this group to the Parthenopinae (Guinot, 1967b: 841). This group was retained in the parthenopids by Sakai (1976). Pending further studies, we retain *Sakaila* in the Parthenopidae, subfamily Aethrinae, following Sakai (1976:288).

In addition to the type-species, *Sakaila africana*, new species, we assign two other species to this genus, both from Japanese waters: *Osachila imperialis* Sakai, 1963, and *Osachila japonica* Sakai, 1963 (Sakai, 1963, 1965). *Osachila expansa* Takeda (1977), from the Ogasawara Islands, in which the maxillipeds are strongly narrowed anteriorly, may be retained in *Osachila* sensu stricto.

**Sakaila africana*, new species

FIGURE 83

Osachila stimpsoni.—Monod, 1956:100, 624, figs. 874–876.—Forest, 1959:15.—Forest and Guinot, 1966:51.—Guinot, 1966:747, 750, 752–755, figs. 2, 6, 14; 1967b:828–830, 832–838, figs. 26, 29, 32, 33; 1968b:165, fig. 15 [discussion]. [Not *Osachila stimpsonii* Studer, 1883.]

MATERIAL EXAMINED.—*Pillsbury Material*: Annobon: Sta 284, 73 m, black basaltic rocks, 1♂ (holotype) (L).

Geronimo Material: Gabon: Sta 235, 100 m, 1♂ (W).

DIAGNOSIS.—Carapace (Figure 83a) with 6 major dorsal protuberances, protogastric very inflated, rounded anteriorly, pitted and eroded dorsally. Branchial protuberances oblique, narrowing anteromesially, extending to and fusing with protogastric. Median protuberances much less prominent than protogastric or branchial. Lateral margins very thin, upturned, appearing serrated, subdivided into distinct teeth posterolaterally, sutures visible ventrally indicating presence of 8 distinct teeth. Inner surface of propodus of cheliped tuberculate, with line of enlarged tubercles near midline. Walking legs (Figure 83d) strongly sculptured with irregular, rounded tubercles, especially on carpus and propodus.

DESCRIPTION.—Monod, 1956:624–627.

Male Pleopod: Guinot, 1967b, figs. 32, 33 (Senegal).

MEASUREMENTS.—The male holotype has a carapace length of 23 mm and a carapace width of 30 mm. The carapace length of the smaller male paratype is 11.5 mm, the width is 15 mm. Monod's (1956) male measured 15 × 20 mm, his ovigerous females 12 × 14 and 12 × 16 mm. The male from southern Senegal reported by Forest and Guinot (1966) measured 22 × 30 mm (see figure legends in Guinot, 1966, 1967b).

REMARKS.—Our two male specimens agree very well with Monod's description and with the descriptive data and illustrations provided by Guinot (1966, 1967b). We have added a diagnosis to distinguish *S. africana* from the other two species of the genus, *S. imperialis* (Sakai), and *S. japonica* (Sakai) (see Sakai, 1963, 1965, 1976 for accounts and illustrations of these species). Monod's description is so complete that we see no need to duplicate it here; the following notes are given to supplement published accounts of the species.

The cornea (Figure 83b) is small and occupies only a section of the distal surface of the ophthalmic peduncle. Near the anterior part of the base of the cornea the peduncle bears a distinct tubercle.

The figure by Guinot (1966, fig. 6) of the

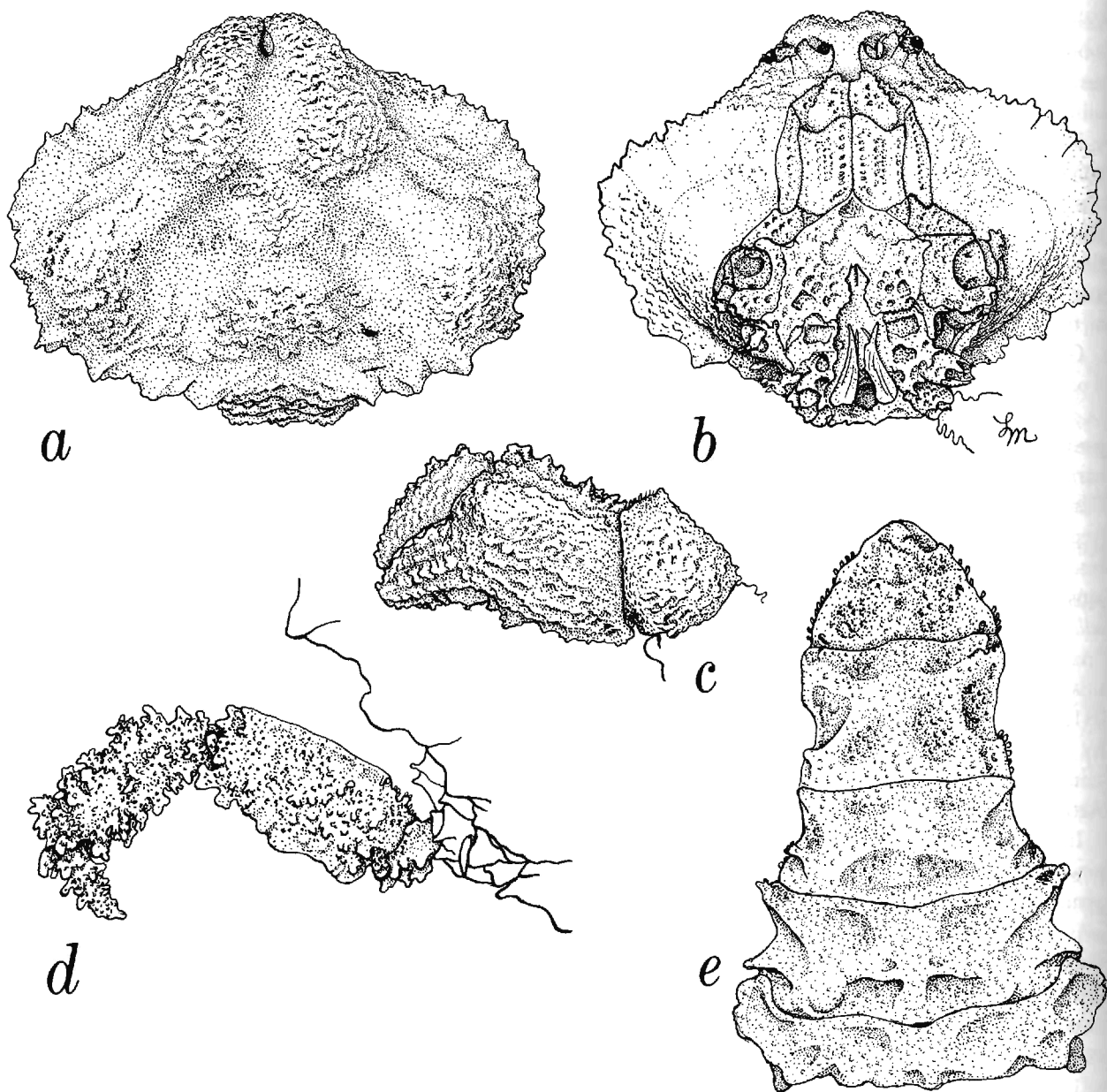


FIGURE 83.—*Sakaila africana*, new genus, new species, holotype, male cl 23 mm, Pillsbury Sta 284: a, carapace, dorsal view; b, carapace, ventral view; c, chela; d, fifth pereopod; e, abdomen.

buccal area shows correctly that the infraorbital tooth, which lies against the outer margin of the antennal peduncle, continues posteriorly and medially as a flattened lobe, which partly overlaps the area along the anterolateral margin of the mouthfield. In our specimen this lobe ends in the anterior and largest of the three deep pits in the

subhepatic region. These pits are not shown in Guinot's figure.

The outer surface of the merus of the cheliped (Figure 83c) is reticulate by the presence of shorter and longer ridges and tubercles, rather than being "granuleuse" as described by Monod. The upper surface of the merus, not described by Monod, is

very narrow, widening somewhat anteriorly. The inner margin shows three high teeth, which are anteroposteriorly compressed; the outer margin shows a sharp high rim-like crest, the anterior part of which is highest and is fused with the anterior inner tooth to a high screen-like structure on the anterodorsal margin of the merus. The inner surface of the carpus has an anterodorsal and an anteroventral tooth connected with a ridge-like row of smaller teeth. The ridge on the inner surface of the palm bears a row of tubercles, one near the middle being high and sharp. The fingers have some of the tubercles rather strong, especially near the upper margin (in the dactylus), the lower margin (in the fixed finger), and near the base. The fingers of both chelae are inflected downward (Figure 83c), making a blunt angle with the longitudinal axis of the palm. In Monod's (1956) figure 875 the fingers are shown directed straight forward.

Through the kindness of H.-E. Gruner, Zoologisches Museum, Berlin, we were able to compare our specimens with syntypes of *Osachila stimpsonii* Studer, 1883, from Ascension Island. Studer's species is correctly placed in *Osachila*. A redescription of *O. stimpsonii* is in preparation by Manning in collaboration with Fenner A. Chace, Jr., in a report on the marine decapods of Ascension Island.

TYPE-LOCALITY.—Annobon Island, 01°30'S, 05°36'E, in 73 m.

DISPOSITION OF TYPES.—The holotype (Crust. D. 31541), a male taken at *Pillsbury* Sta 284, is in the Rijksmuseum van Natuurlijke Historie, Leiden. The male paratype (USNM 139766) taken at *Geronimo* Sta 235 is in the National Museum of Natural History, Smithsonian Institution, Washington, D.C.

BIOLOGY.—*Sakaila africana* has been collected in depths between 65–75 and 132 m. The type of bottom on which it was found has been indicated as mud and sand, 65 to 75 m (Forest and Guinot, 1966) and black basaltic rocks, 73 m (*Pillsbury*).

Ovigerous females were collected in July (Monod, 1956).

ETYMOLOGY.—The specific epithet is derived

from Latin and refers to the occurrence of the species off the West African coast.

DISTRIBUTION.—Off tropical West Africa. It has not previously been recorded from either Gabon or Annobon. Records in the literature include the following:

Senegal: S of Gorée, 96 m; off Gorée, 132 m (Monod, 1956). 12°55.5'N, 17°33'W, 65–75 m (Forest, 1959; Forest and Guinot, 1966; Guinot, 1966, 1967b, 1968b).

Subfamily PARTHENOPINAE MacLeay, 1838

Genus *Daldorfia* Rathbun, 1904

Parthenope Fabricius, 1798:315, 352 [type-species: *Cancer horridus* Linnaeus, 1758, by selection by H. Milne Edwards, 1838, in 1836–1844, pl. 26: fig. 2; a junior homonym of *Parthenope* Weber, 1795; gender: feminine; name 1679 on *Official Index*].

Daldorfia Rathbun, 1904:171 [type-species: *Cancer horridus* Linnaeus, 1758, by monotypy; gender: feminine; name 1582 on *Official List*].

Daldorfia bouvieri (A. Milne Edwards, 1869)

Parthenope bouvieri A. Milne Edwards, 1869:350.—Capart, 1951:106, fig. 36 [Cape Verde Islands].—Monod, 1956: 595, figs. 871, 872 [Cape Verde Islands; references].—Forest and Guinot, 1966:121 [Principe, São Tomé].—Crosnier, 1967:340 [Congo]; 1969:535 [Congo].

DISTRIBUTION.—West Africa, from the Cape Verde Islands and the Gulf of Guinea at the localities listed above, in 4–5 to 91 m.

Genus *Parthenope* Weber, 1795

Parthenope Weber, 1795:92 [type-species: *Cancer longimanus* Linnaeus, 1758, by subsequent designation by Rathbun, 1904:171; gender: feminine; name 1581 on *Official List*].

Lambrus Leach, 1815a:308 [type-species: *Cancer longimanus* Linnaeus, 1758, by monotypy; gender: masculine; name 1678 on *Official Index*].

Platylambrus Stimpson, 1871a:129 [type-species: *Lambrus crenulatus* Saussure, 1858, a subjective junior synonym of *Lambrus serratus* H. Milne Edwards, 1834, by subsequent designation by Rathbun, 1925:516; gender: masculine].

Aulacolambrus Paulson, 1875:9 [type-species: *Lambrus pisoides* Adams and White, 1848, by monotypy; gender: masculine].

Pseudolambrus Paulson, 1875:9 [type-species: *Parthenope calap-*

- poides* Adams and White, 1848, by monotypy; gender: masculine].
- Enoplolambrus* A. Milne Edwards, 1878, in 1873-1881:147 [type-species: *Lambrus carenatus* H. Milne Edwards, 1834, by monotypy; gender: masculine].
- Parthenolambrus* A. Milne Edwards, 1878, in 1873-1881:148 [type-species: *Parthenope tarpeius* Adams and White, 1849, by subsequent designation by Rathbun, 1925:528; gender: masculine].
- Rhinolambrus* A. Milne Edwards, 1878, in 1873-1881:148 [type-species: *Cancer contrarius* Herbst, 1804, by original designation; gender: masculine].
- Parthenopoides* Miers, 1879a:672 [type-species: *Lambrus massena* Roux, 1830, by monotypy; gender: masculine].
- Oncodolambrus* De Man, 1906:400 [type-species: *Lambrus (Oncodolambrus) praedator* De Man, 1906, by monotypy; gender: masculine].

****Parthenope expansa* (Miers, 1879)**

FIGURE 84

- Lambrus (Parthenopoides) expansus* Miers, 1879b:25, pl. 5: fig. 9.
- Parthenolambrus expansus*.—Adensamer, 1898:611 [Mediterranean].
- Lambrus expansus*.—Monod, 1956:588 [references].—Holthuis and Gottlieb, 1958:119 [listed].—Forest and Guinot, 1966:120.
- Parthenope expansus*.—Pastore, 1975:145, 147, figs. 1-3 [Mediterranean].

MATERIAL EXAMINED.—*Pillsbury Material*: Annobon: Sta 283, 51-55 m, nodular coralline algae, 2♀ (L, W).

DESCRIPTION.—Carapace triangular in outline. Front bluntly rounded, its sides forming a straight line with sides of carapace. Orbits visible above as small cavities in lateral margin of carapace, but eyes, when retracted, exactly fill cavity and lateral margin appears unbroken. In posterior half, lateral margin slightly widened and showing 3 shallow teeth just before posterolateral angle. Posterior margin slightly and evenly convex, showing few broad, inconspicuous lobes in median part. Dorsal surface of carapace uneven, but showing hardly any tubercles. Front somewhat concave, sunk in middle. Transverse broad ridge or elevated area present in metagastric region behind sunken area. Cervical groove indicated by wide depression. Oblique ridge present over each branchial region ending in posterolateral angle

and running parallel to lateral margin of carapace. Posterior part of carapace, between branchial ridges, bearing median and 2 submedian elevations, median strongest. Surface of carapace rather uniformly and finely pitted, with few tubercles visible on elevated portions, but not very distinct. General shape of carapace in many respects resembling more that of *Heterocrypta* than that of *Parthenope*.

Eyes small, completely retractable in their orbits, visible in dorsal view.

Antennules with basal segment very wide, reaching beyond antennal peduncle and forming greater part of the lower inner margin of orbit. Antennular sockets not sharply delimited distally, ending in wide groove in ventral surface of front, groove reaching margin of front, but less distinct distally than proximally.

Basal antennal segment (Figure 84a) short, distinctly failing to reach orbit and separated from orbit by almost entire length of second segment.

Outer angle of merus of third maxilliped somewhat triangularly produced laterally.

Chelipeds markedly different, resembling those of *Parthenope massena*. Right cheliped heaviest, somewhat swollen. Upper surface of palm slightly convex, almost smooth; outer margin bearing ridge with 3 large blunt teeth, more pronounced in smaller than in larger cheliped. Inner margin of the upper surface of palm bearing about 5

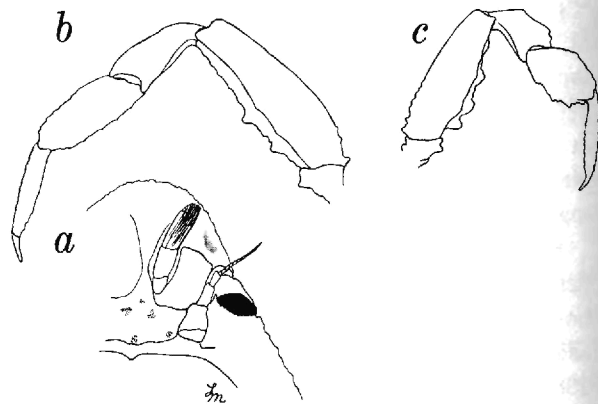


FIGURE 84.—*Parthenope expansa* (Miers), female, cl 7.5 mm, *Pillsbury* Sta 283: a, basal antennal segment; b, second pereopod; c, fifth pereopod.

blunt teeth, middle largest. Outer surface of palm with some longitudinal rows of tubercles. Inner surface of palm smooth, slightly concave. Fingers somewhat more than half as long as palm, upper surface of dactylus bearing few large and several smaller tubercles proximally. Cutting edge of fixed finger of large cheliped with single large molariform tooth, occupying greater part of edge, flanked by small denticle distally. Cutting edge of fixed finger in small chela with 3 large distal and 3 small proximal teeth. Edges of dactylus of both chelipeds bearing 3 or 4 low small teeth. Carpus short, cup-shaped, with small irregular tubercles, forming more or less distinct longitudinal rows. Merus short and wide, inner margin bearing distinct larger and smaller teeth, on outer margin teeth less conspicuous. Lower margin of merus with longitudinal row of large tubercles, inner surface bearing some scattered tubercles, outer surface almost smooth.

In following legs (Figure 84*b,c*) lower surface of merus bearing 2 rows of granules, 1 on either margin; upper margin of merus armed with tubercles in extreme proximal part only. Carpus with lower surface unarmed, upper carrying angular tubercle; in addition, last leg with few distal tubercles on upper margin. Propodus with some ventral and dorsal denticles; denticles and tubercles far more distinct in posterior than in anterior legs. Dactylus of second pereopod (= first walking leg) about as long as, but narrower than, propodus, somewhat longer than carpus; merus about twice as long as, and broader than, carpus. Third and fourth pereopods similar to second. Fifth pereopod (Figure 84*c*) shortest of all legs. Dactylus longer than, but half as high as, propodus; carpus about as long as propodus, and half or less than half as long as merus.

Female abdomen with all somites free.

MEASUREMENTS.—The two examined females have cl 6 and 7.5 mm and cb 7 and 10 mm. The holotype had cb 11 mm (Miers, 1879*b*). The measurements given in the literature are: cl 10 mm, cb 11 mm (Miers, 1886); cl 8 mm, cb 10 mm (A. Milne Edwards and Bouvier, 1894); for 12♂ cl 4.0–9.5 mm, cb 5.0–12.0 mm, for 2 oviger-

ous ♀ cl 5.0 and 6.0 mm, cb 5.5 and 7.5 mm, and 2 non-ovigerous ♀ cl 5.0 and 6.5 mm, cb 5.8 and 7.5 mm (Pastore, 1975:150; in Pastore's table, length and width have evidently been interchanged by accident). The known size range for the species thus is cl 4–10 mm, cb 5–12 mm.

REMARKS.—Capart (1951:106, fig. 36) described and figured a female of what he considered to be a juvenile *Daldorfia bouvieri* (A. Milne Edwards). This specimen (cl 9 mm, cb 12 mm) originated from Boa Vista, Cape Verde Islands. The description and figure given by Capart show a great similarity to the present species, and a reexamination of Capart's specimen might be of interest. Our specimens differ from that described by Capart in having the carapace uniformly and evenly minutely pitted and not eroded. Capart's specimen might be abnormal in having two equal chelipeds, both corresponding with the smaller cheliped in the present species.

BIOLOGY.—The species has been found in depths between 30 and 185 m. The bottom at the localities where it was found was noted in some instances: gravel, sand and broken shell (A. Milne Edwards and Bouvier, 1894, 1899); coral, rock and sand, sand and rock, sand, shell and coral, sand and shell (A. Milne Edwards and Bouvier, 1900); calcareous and other algae (Forest and Guinot, 1966); nullipores and coarse sand (Adensamer, 1898).

Ovigerous females have been collected in June and August (Monod, 1956; Pastore, 1975).

DISTRIBUTION.—Eastern Atlantic, from the Mediterranean, Madeira, Seine Seamount, the Azores, the Canary Islands, and West Africa from Spanish Sahara to São Tomé and Annobon islands in the Gulf of Guinea. This species has not been recorded previously from Annobon. The Mediterranean records are: NW of Crete, 36°-03'N, 23°06'E (Adensamer, 1898; Pastore, 1975) and Acitrezza, Bay of Catania, Sicily (Pastore, 1975). Monod (1956) summarized earlier records and reported material from Madeira, the Canary Islands, and the Cape Verde Islands. West African records since 1956 include the following:

Canary Islands: No specific locality (Pastore, 1975).

São Tomé: 00°25'40"N, 06°40'10"E, 50 m (Forest and Guinot, 1966).

*** *Parthenope massena* (Roux, 1830)**

?*Lambrus massena*.—Capart, 1951:105, fig. 35.

Lambrus massena.—Sourie, 1954b:147, 150.—Monod, 1956: 572, 632, figs. 840–856.—Gauld, 1960:72.—Rossignol, 1962:123.—Crosnier, 1964:31.—Forest and Guinot, 1966: 118.—Zariquiey Alvarez, 1968:441, fig. 147 [Spain; references].

Lambrus sp.—Monod, 1956:583, figs. 857, 858.

Lambrus massenae.—Longhurst, 1958:89 [erroneous spelling].

SYNONYMS.—? *Parthenope contracta* Costa, 1840; ? *Parthenope hexacantha* Costa, 1840; *Lambrus pumilus* Costa, 1851; *Lambrus rugosus* Stimpson, 1857; *Lambrus setubalensis* De Brito Capello, 1866; *Lambrus pulchellus* A. Milne Edwards, 1868; *Lambrus massena* var. *atlanticus* Miers, 1881; *Lambrus massena* var. *spinifer* Miers, 1881; *Lambrus massena* var. *goreensis* Miers, 1881; *Lambrus bicarinatus* Miers, 1881.

MATERIAL EXAMINED.—*Pillsbury Material*: Liberia: Sta 70, 33 m, branched Foraminifera, 2♀ (L).

Ghana: Sta 22, 51 m, rough bottom, 2♂, 1 juv (L). Sta 23, 42 m, foliate brown to orange bryozoans, 1♂, 4♀ (1 ov) (W). Sta 24, 35–37 m, dark red bryozoans, 14♂, 14♀ (6 ov) (L). Sta 26, 27 m, shell bottom (scallops), 2♂, 1♀ (W).

Nigeria: Sta 248, 33 m, 30♂, 22♀ (4 ov) (W). Sta 250, 24 m, brackish water, mud, 2♂ (L). Sta 253, 33–40 m, mud, 1♀ ov (L).

Annobon: Sta 283, 51–55 m, nodular coralline algae, 1♂ (W).

Other Material: Madeira: S of Madeira, 32°38'N, 16°50'W, 98–105 m, triangular dredge, 16 Mar 1976, *Onversaagd* Sta 93, 1♂ (L).

Dahomey: Grand-Popo, 30 m, Petersen grab, 23 Feb 1964, Guinean Trawling Survey, Tr 34, Sta 2, 1♂ (L).

DESCRIPTION.—Bouvier, 1940:312; Zariquiey Alvarez, 1968:441.

Figures: Monod, 1956, figs. 840–856.

Male Pleopod: Monod, 1956, figs. 846–856 (Senegal).

MEASUREMENTS.—The carapace length in the material examined by us varies between 6 and 14 mm, that of the ovigerous females between 9 and 12 mm.

REMARKS.—The great variability of the various characters of this species have been commented upon by many authors. Monod (1956) provided good figures of the various forms of this species, and so did Zariquiey Alvarez (1968). Monod distinguished several forms or varieties, but admitted that these could not be sharply separated. We prefer just to use the specific name and have not attempted to assign our specimens to Monod's various forms.

It seems very likely that the specimens which Bouvier (1922:76, pl. 2: fig. 3, pl. 6: fig. 8) reported upon as "*Lambrus Miersi*" (= *Parthenope miersii* (A. Milne Edwards and Bouvier, 1898)), at least partly belong to the present species. The specimen from Sta 1242 (Seine Seamount, NE of Madeira), which is figured on Bouvier's plate 2: figure 3, shows the characters of *P. massena*: the rostrum is not toothed, the chelipeds are asymmetrical and the rest of the figure checks well with the present species; also the brown color of the finger tips is found in *P. massena*. Whether Bouvier's plate 6: figure 8 belongs here is not certain, as the rostrum shows traces of two lateral teeth. Unfortunately, Bouvier did not indicate after which specimen this figure was made; it even might have been the holotype of *P. miersii*. It is possible that Bouvier later recognized his mistake, because in his later discussion of "*Lambrus Miersi*" (1940:311) he only mentioned the type material and not his own specimens of 1922, a fact to which Monod (1956:583) already has drawn attention. This all goes to show that the eastern Atlantic *Parthenope* species are still extremely poorly known and that a revision of them is urgently needed.

BIOLOGY.—Monod (1956) gave as the depth range of the species 5 to 500 m; however, his West African specimens came from depths of 5 to 110 m, and 95% of these from depths between 5 and 48 m. Later authors reported it from the following depths off West Africa: 0–17 m (Sourie, 1954b), 10–106 m (Longhurst, 1958; about 90% of these from 10–40 m), 20–44 m (Gauld, 1960), 10–50 m (Crosnier, 1964), 5–90 m (Forest and Guinot, 1966; about 90% between 5 and 37 m). The

material reported upon here was taken between 24 and 51 m. The species was taken on the following types of bottom: sand with *Palythoa* and *Molgula* (Monod, 1956); coarse shelly sand, bottom with *Arca* and *Pyura* (Sourie, 1954b); sand and shells, sand and mud (Longhurst, 1958); mud and shells (Longhurst, 1958; Forest and Guinot, 1966); sand with Foraminifera on rocky bottom with gorgonians (Crosnier, 1964); rock and shells, mud, calcareous algae and shells, calcareous algae, calcareous algae, sand and shells, sand and calcareous and other algae, mud and calcareous algae (Forest and Guinot, 1966).

Ovigerous females have been recorded in all months but January, April, and August, suggesting that off West Africa the species spawns all year (Monod, 1956; Forest and Guinot, 1966; Pillsbury).

DISTRIBUTION.—Eastern Atlantic, from Brittany, Atlantic coast of France, southward to the Congo, including the Mediterranean. Monod (1956) summarized the literature and reported material from Senegal, Guinea, Sierra Leone, Ghana and Principe. Other records in the literature include the following:

Senegal: Anse Bernard and Anse de Hann, Baie de Dakar, 0–17 m (Sourie, 1954b).

Sierra Leone: No specific locality, in 10–106 m (Longhurst, 1958).

Ghana: Off Accra, 20–40 m (Gauld, 1960). 04°37'N, 00°50'W, 90–100 m (Forest and Guinot, 1966).

Nigeria: Off the mouths of the Niger River, 04°03'N, 06°12'E, 32 m (Forest and Guinot, 1966).

Cameroon: No specific locality, in 10–50 m (Crosnier, 1964).

Principe: 01°38'25"N, 07°22'05"E, 31 m; 01°43'10"N, 07°28'20"E, 73 m; 01°43'N, 07°28'55"E, 37 m; [Cais de] Santana, 11 m; Praia Grande, 3–12 m (all Forest and Guinot, 1966).

São Tomé: 00°25'15"N, 06°43'05"E, 8–30 m; Baía de Ana de Chaves, 5 m (Forest and Guinot, 1966).

Annobon: 01°27.5'S, 05°36.5'E, 35 m (Forest and Guinot, 1966).

Gabon: W of Pointe Gombé, 40 m (Rossignol, 1962).

Congo: W of Pointe-Noire, 10 m (Rossignol, 1962).

Parthenope miersii (A. Milne Edwards and Bouvier, 1898)

Lambrus miersii.—Capart, 1951:105 [discussion].—Monod, 1956:583 [references].

Parthenope miersii.—Zariquiey Alvarez, 1968:439 [Spain; references].

DISTRIBUTION.—Eastern Atlantic, from Portugal, the Bay of Cadiz, Seine Seamount, and the Cape Verde Islands; sublittoral, in depths between 91 and 240 m.

**Parthenope notialis*, new species

FIGURES 85, 86a,b

Lambrus mediterraneus.—Studer, 1882:335 [not *Lambrus mediterraneus* Roux, 1828 = *Cancer macrochelos* Herbst, 1790].

Lambrus Mediterraneus.—Studer, 1883:9.

Lambrus macrochelos.—Rathbun, 1900a:295.—Monod, 1956:585, figs. 859–861.—Longhurst, 1958:89.—Gauld, 1960:72.—Guinot and Ribeiro, 1962:80.—Rossignol, 1962:123.—Crosnier, 1964:34. [Not *Cancer macrochelos* Herbst, 1790.]

Lambrus macrocheles.—Doflein, 1904:87 [part], pl. 32: fig. 5.—Balss, 1921:54.—Odhner, 1923:20.—Capart, 1951:102, fig. 34, pl. 2: figs. 5, 6.—Forest and Guinot, 1966:119.—?Maurin, 1968a:59, 62; 1968b:480, 486, 489.—Crosnier, 1970:1215 [listed], 1219. [Not *Cancer macrochelos* Herbst, 1790.]

Lambrus (Lambrus) macrocheles.—Monod, 1933b:498 [not *Cancer macrochelos* Herbst, 1790].

Parthenope.—Voss, 1966:19, 22.

Lambrus.—?Maurin, 1968b, fig. 9.

MATERIAL EXAMINED.—*Pillsbury Material*: Liberia: Sta 68, 70 m, broken shell, 6♂, 12♀ (2 ov) (L).

Ivory Coast: Sta 42, 62–75 m, mud with brown branched Foraminifera, 6♂, 4♀ (W). Sta 46, 38–42 m, mud with dense *Jullienella*, 1♂, 2♀ (W). Sta 50, 128–192 m, 1♀ ov (L). Sta 59, 55–64 m, mud with dense branched Foraminifera, 1♂, 1♀ (W). Sta 60, 79–82 m, coral or rock, 1 carapace, 2♀, 1 juv (W). Sta 62, 46 m, brown, branched and foliate Foraminifera, 4♂ (L). Sta 63, 64 m, sandy mud with shells, 1♂, 2♀ (L). Sta 64, 68 m, 5♂, 3♀ (1 ov) (W).

Ghana: Sta 17, 48 m, fine sand and green mud, 1♂, 1♀ (L). Sta 22, 51 m, rough bottom, 4♀ (L). Sta 23, 42 m, foliate brown to orange bryozoans, 3♂, 5♀ (4 ov) (L). Sta 24, 35–37 m, dark red bryozoans, 1♂, 2♀ (1 ov) (L).

Cameroon: Sta 260, 46 m, 5♂ (largest is holotype), 5♀ (L).

Geronimo Material: Gabon: Sta 235, 100 m, 1♂ (W).

Undaunted Material: Angola: Sta 95, 126 m, 2♂, 2♀ ov (L). Sta 96, 162 m, 11♂, 11♀ (7 ov) (L).

Other Material: Guinea-Bissau: 10°19'N, 16°34'W, 60–73 m, mud, shells and *Cidaris*, *Calypto* Sta 6, 1♀ (W).

DESCRIPTION.—The present new species is very close to *Parthenope macrochelos* (Herbst), from which

it was not distinguished by the authors that have dealt with it. We found, however, a number of characters that made it impossible to consider the present West African specimens and typical Mediterranean specimens of *P. macrochelos* as belonging to the same species or subspecies.

The shape of the carapace (Figure 85), which in adult specimens is distinctly wider than long (proportion length:width being about 5:6), has the same general shape as in *P. macrochelos*. The rostrum is narrow and bears a tooth at either side. The inner orbital angle bears two teeth and a strong tubercle. The upper margin of the orbit is provided with a strong tubercle (Figure 86a), behind which sometimes a trace of a smaller tubercle may be visible; in *P. macrochelos* (Figure 86c) this second tubercle is quite distinct. Some distance behind the orbits, in the median area of the mesogastric region, there are four tubercles placed in a quadrangle. The anterior pair stands close to the posterior pair and its tubercles are placed slightly wider apart than those of the posterior pair. The four tubercles thus form a trapezium with the widest margin anteriorly. In *P. macrochelos*, the posterior tubercles are wider apart than the anterior, so that the trapezium formed by the four tubercles has the narrowest

margin anteriorly; in *P. macrochelos* the two pairs of tubercles are separated from each other by a greater distance than in *P. notialis*. Behind the group of four tubercles there is a strong median gastric spine. Behind the cervical groove there is a median row of 3 strong spines (1 urogastric and 2 cardiac); the posterior of these is the largest. In *P. notialis* these spines are relatively longer than in *P. macrochelos*; the arrangement of the spines is the same in the two species. The median gastric region is swollen and so is the branchial region. In the depressed area between these two swollen regions there is a row of three blunt tubercles close to and parallel with the median row of spines. The branchial region ends posterolaterally in three large teeth, between which there are small tubercles. In *P. macrochelos*, instead of these tubercles, there are teeth that often are only slightly smaller than the large teeth. The middle of the three large teeth is placed at the posterior end of a blunt oblique ridge, which carries another spine more anteriorly. The anterolateral margin of the carapace bears a row of about 7 teeth, which are distinctly shorter and narrower than the outer posterolateral tooth; in *P. macrochelos* these anterolateral teeth are much larger, reaching almost the size of the outer posterolat-

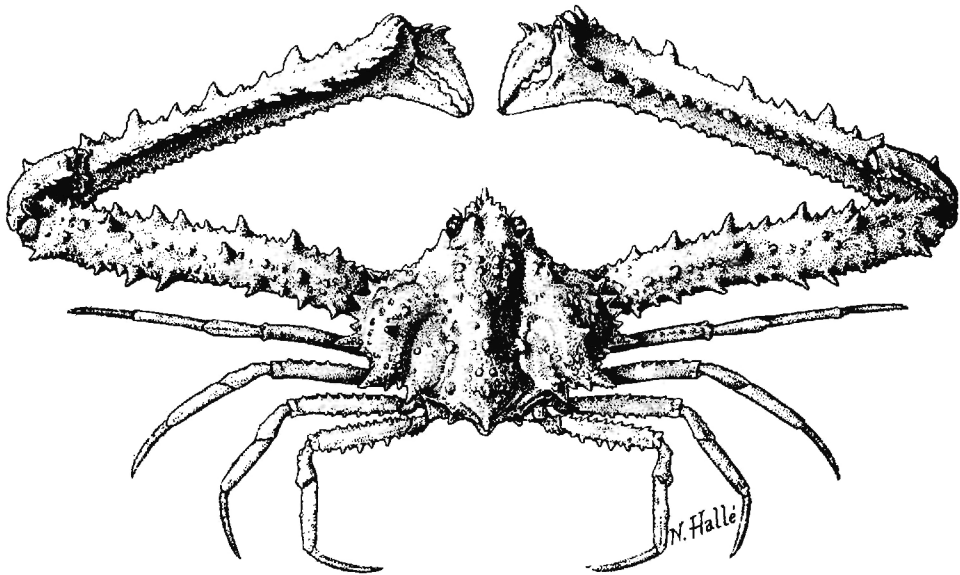


FIGURE 85.—*Parthenope notialis*, new species (from Monod, 1956, fig. 859).

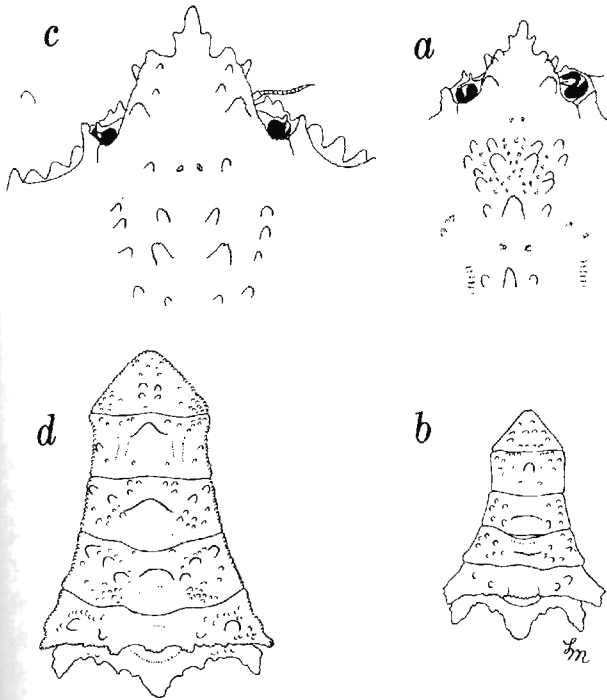


FIGURE 86.—*Parthenope notialis*, new species, paratype, male, cl 17.5 mm, Pillsbury Sta 260: a, front; b, abdomen. *Parthenope macrochelos* (Herbst), male, cl 32.8 mm, Naples: c, front; d, abdomen.

eral. The general shape and tuberculation of the carapace of *P. notialis* is very similar to that of *P. macrochelos*.

The epistome, oral field, and third maxilliped are like in *P. macrochelos*, only the spines are sharper and more distinct. The subhepatic region just lateral of the oral cavity is smooth in *P. notialis*, uniformly tuberculated in *P. macrochelos*.

In *P. notialis* the chelipeds of the adult males are relatively distinctly longer than in *P. macrochelos*. The second pereopod in *P. notialis* does not attain the end of the merus of the chela, while in *P. macrochelos* it reaches beyond. The fingers of the chelipeds in *P. notialis* are more laterally compressed than in *P. macrochelos*, where they are more cylindrical. The teeth on the palm in *P. notialis* also are more compressed and have the margins with small serrations, sometimes small tubercles may be seen on the lateral surfaces of these teeth. In *P. macrochelos* the teeth on the palm are more

conical and have spinules on all sides. The upper surface of the palm of the chelipeds in *P. notialis* is almost smooth, only a few indistinct tubercles are seen; in *P. macrochelos* this surface is very rough with many spines and tubercles. The lower outer surface of the palm is slightly convex with a few rows of small tubercles, of which the median is the most conspicuous. In *P. macrochelos* this surface is more convex and the tubercles are larger. In *P. notialis* the merus of the cheliped has the slightly convex upper surface almost smooth, except for a median row of spinules; in *P. macrochelos* the surface is more uniformly spinuliferous. The spines on the margins of the upper surface of the merus are more flattened and less numerous in *P. notialis* than in *P. macrochelos*.

The following pereopods are very similar in *P. notialis* and *P. macrochelos*. The dactylus is covered with a very short felt-like pubescence; it is practically as long as the propodus in the second pereopod, becoming gradually relatively longer in the following legs. The carpus also is about as long as the propodus in pereopod 2, but it becomes gradually shorter in the following legs. The merus is the longest segment and is as long as propodus and carpus combined. A row of spinules is present on the upper and the lower margins of the merus, and on the upper margin of the carpus and propodus of all legs. The spinules are distinct on the merus, faint to very faint on the carpus and propodus; in the posterior legs they are more distinct than in the anterior.

The shape and armament of the male thoracic sternum and abdomen is about the same in the two species. The second abdominal segment shows one median and two lateral teeth with tubercles in between; in *P. notialis* (Figure 86b) these teeth are large and bluntly lobiform, flattened and higher than wide, the tubercles are few, small and inconspicuous; in *P. macrochelos* (Figure 86d) the teeth are placed wider apart, are less flattened, lower and more triangular, while the tubercles are distinct and rather large. The general shape of the abdomen is the same in the two species, but the last somite is narrower in *P. notialis*. The third to fifth somites of the abdomen

are fused: sutures rather than articulations indicate the lines between the somites.

Figures: Figures of the whole animal were published by Doflein (1904, pl. 32: fig. 5), Capart (1951, fig. 34), and Monod (1956, fig. 859).

Male Pleopod: Figures of the male pleopods are provided by Capart (1951, pl. 2: figs. 5, 6) (Zaire) and Monod (1956, figs. 860–861) (Senegal). They do not essentially differ from those of *P. macrochelos*.

MEASUREMENTS.—The carapace length of the specimens seen by us varies between 5 and 21 mm, that of the ovigerous females between 14 and 18 mm. Odhner's (1923) specimen had the carapace width between 11 and 19 mm. Both Capart's (1951) largest male and largest female had the carapace 18.5 mm long and 21 mm wide. Monod (1956:585, 586) gave the following measurements for six of his males: cl 12 to 18 mm, cb 13 to 23 mm; and for three ovigerous females: cl 10 to 14 mm, cb 11 to 16 mm. The single specimen reported upon by Guinot and Ribeiro (1962:80) was a male with the carapace length and width both 5 mm. It is clear that the present species is a small one compared to *P. macrochelos*, which may attain a carapace length of 39 mm. The eggs of *P. notialis* are numerous and small, they are spherical and are 0.3 to 0.35 mm in diameter. Zariquiey Alvarez (1968:441), in citing ovigerous females of *P. macrochelos* with cl 10 mm, based his information on Monod's (1956) data of the present new species.

REMARKS.—*Parthenope notialis* very strongly resembles *P. macrochelos*, and it is not surprising that the two species have always been confused. They may finally prove to be only subspecifically distinct. Our extensive material of the present species, however, differs consistently from the specimens of *P. macrochelos*, with which we could compare it.

So far as we could ascertain all previous records of *P. macrochelos* from tropical West Africa pertain to the present species.

Studer (1883), in discussing his Liberian specimens (males and females), described the upper surface of the palm of the cheliped (which he

inadvertently named "Carpus") as "fast glatt, nur mit wenig Höckern besetzt" and also described the outer lower surface of the palm with its median row of tubercles, and remarked that in these features his specimens differed from Mediterranean *P. macrochelos*. This clearly proves the identity of his material with the present species.

Doflein (1904:87) mentioned two lots of "*Lambrus macrocheles*" from West Africa. One of these consisted of a single damaged male from Seine Seamount, NE of Madeira at 33°43.8'N, 14°20'W, ca. 150 m deep. This male might well belong to *Parthenope massena* (Roux). Doflein remarked that it had "auffallend kürzere Scheren mit dunkel-rotbraunen Fingerenden," which would fit *P. massena* quite well, as we examined numerous specimens of that species which, after long preservation, still showed distinct reddish brown finger tips. Bouvier (1922:76, pl. 2: fig. 3), under the name *Lambrus Miersi*, described and figured (in color) *P. massena*, remarking that "le bout des doigts des pinces [sont] d'un brun noirâtre," which color also is clearly shown on the figure. Doflein's specimen had the rostrum broken ("dessen Rostrum abgebrochen ist"), and thus lacked a character that undoubtedly would have made Doflein recognize the true identity of the species.

Doflein's second lot came from off the mouth of the Congo River and the male figured by him (1904, pl. 32: fig. 5) clearly belongs to the present species.

Odhner (1923) considered his specimens to be juveniles of *P. macrochelos* as none had a carapace width of more than 19 mm; it is more probable that his specimens are *P. notialis*.

Capart's (1951:102, fig. 34) illustration of a female from off Angola identified as "*Lambrus macrocheles*" clearly shows that it belongs to *P. notialis* as probably does also Capart's other material, since he remarked that the specimens in his collection "ne montrent pas entre eux de variations notables." As shown above the measurements of Capart's specimens fall entirely within the range that we found for the present species.

Monod (1956:585, figs. 859–861) gave excellent

figures of the present species, while the measurements given by him check well with those of *P. notialis* (p. 334). Of one of his lots (from S of Cap Vert) Monod stated specially "petite forme, face supérieure des chélicèdes plus ou moins lisses entre les crêtes." There is thus no indication that any of his specimens do not belong to *P. notialis*. Longhurst's (1958) and Gauld's (1960) specimens were identified by Monod.

We examined a specimen from Guinea-Bissau reported upon by Forest and Guinot (1966) as *P. macrochelos* and found that it belongs to *P. notialis*.

The characters used in various keys (Bouvier, 1940:309, 310; Monod, 1956:572; Zariquiey Alvarez, 1968:437, 438) to distinguish between *P. macrochelos* and *P. miersii* (A. Milne Edwards and Bouvier), also serve to distinguish *P. macrochelos* from *P. notialis*. This notwithstanding, we believe that *P. notialis* is closer to *P. macrochelos* than to *P. miersii*. *Parthenope miersii* has the carapace narrower than in either *P. macrochelos* or *P. notialis* and the chelipeds are shorter. *Parthenope verrucosa* (Studer, 1883) from Ascension has the rostrum similar to that of *P. macrochelos* and *P. notialis*, but its chelipeds are shorter than in these two species, and the tuberculation of the carapace seems to be different. Additional information on both *P. miersii* and *P. verrucosa* is badly needed; material of neither species was available to us.

TYPE-LOCALITY.—The male holotype was collected at Pillsbury Sta 260, off Cameroon, 03°45'N, 09°05'E to 03°43'N, 09°10'E, depth 46 m.

DISPOSITION OF TYPES.—The holotype (Crust. D. 31545) is deposited in the collection of the Rijksmuseum van Natuurlijke Historie, Leiden. Some of the paratypes are in the Leiden Museum and some in the National Museum of Natural History, Smithsonian Institution, Washington, D.C.

ETYMOLOGY.—The specific epithet is from the Latin *notialis* (southern).

BIOLOGY.—The species has been reported from depths between 18 and 162 m (one of Maurin's uncertain records is from 300 to 500 m); however, more than 80% of the records are from depths between 30 and 110 m. The species usually is

found on bottoms of mud, sandy mud or sand, almost always mixed with broken shells, bryozoans, branched or foliate Foraminifera, corals or rocks. The records in the literature are the following: shelly mud (Longhurst, 1958; Forest and Guinot, 1966); sand, mud, coral and rock; sand, brown mud and coral; sand, mud and rock (Capart, 1951); sand, mud and shells; mud, shells and *Cidaris*; mud, stones, calcareous algae, sand and Foraminifera; gravel, shells and Foraminifera (Forest and Guinot, 1966); sandy mud with shells; mud with dense *Jullienella* (Voss, 1966); bottom with *Jullienella foetida* Schlumberger (Monod, 1956); sand and broken shells; sand, clayish sand and broken shells (Odhner, 1923); rock and shells (Forest and Guinot, 1966); sand and mud or sandy mud (Capart, 1951; Guinot and Ribeiro, 1962; Forest and Guinot, 1966); and mud (Capart, 1951; Forest and Guinot, 1966). The present material has been taken on similar types of bottom.

Ovigerous females were observed in February, May, July, and September (Monod, 1956), March (Crosnier, 1970), May (Forest and Guinot, 1966), May and June (present paper), November (Capart, 1951).

DISTRIBUTION.—Most of the records of *P. macrochelos* from tropical West Africa are based on the present species. Whether Maurin's (1968a, 1968b) material from off Spanish Sahara and Mauritania belongs here, to *P. macrochelos*, or to *P. miersii* is not clear; this can only be decided after reexamination of his material. The range of the present species extends at least from Senegal to Angola, but it might go north as far as the Spanish Sahara. If we include Maurin's material in the present species, the published records for it are the following:

Spanish Sahara: Médano de Aaiún and W of Cabo Bojador, 300–500 m (Maurin, 1968b).

Mauritania: Banc d'Arguin, 40–60 m (Maurin, 1968b), and 90–100 m (Maurin, 1968a,b). Tamzak, 70–75 m (Maurin, 1968a, 1968b).

Senegal: Off Saint-Louis, 100–300 m; off Kayar; S of Cap Vert, 97–98 m; SE of Île de la Madeleine, 48 m; off Dakar, 140 m; near Gorée, 40–41 m, 50 m, 96 m, 132 m (all

Monod, 1956). 13°01'N, 17°24'W, 51–55 m; 12°55.5'N, 17°33'W, 65–75 m (Forest and Guinot, 1966).

Guinea-Bissau: 10°19'N, 16°34'W, 60–73 m (Forest and Guinot, 1966).

Guinea: 09°40'N, 14°05'W, 18 m (Forest and Guinot, 1966).

Sierra Leone: No specific locality, 54–106 m (Longhurst, 1958).

Liberia: 04°40'N, 09°40.6'W, 90 m (Studer, 1882, 1883). 04°34.5'N, 08°31'W, 64 m (Forest and Guinot, 1966).

Ivory Coast: 05°07'N, 04°32'W to 05°07'N, 04°36'W, 38–42 m, and 04°35'N, 06°40'W to 04°35'N, 06°41'W, 64 m (Voss, 1966).

Ghana: 04°40'N, 02°08'W to 04°39'N, 02°05'W, 50 m; 04°36.5'N, 01°31'W, 50 m; 04°37'N, 00°50'W, 90–100 m (Forest and Guinot, 1966). Accra, 43 m, 44 m, 65 m (Monod, 1956; Gauld, 1960).

Cameroon: No specific locality, depth more than 50 m (Crosnier, 1964).

Gabon: 00°25'N, 09°00'E, 73 m (Forest and Guinot, 1966). Off Pointe Banda, 03°57.5'S, 10°36.5'E, 85 m (Capart, 1951).

Cabinda: West of Landana, 50–65 m (Rossignol, 1962).

Angola: Off Moita Seca, 06°16'S, 12°07'E, 50 m; 06°21'S, 11°53'12"E, 100 m (Capart, 1951). Off the mouth of the Congo River, 06°18.7'S, 12°02.1'E, 44 m (Doflein, 1904). 09°47'S, 13°11'E, 30–35 m; 09°40'S, 13°02'E, 80 m (Capart, 1951). Baía Farta, Benguela, 22–28 m (Guinot and Ribeiro, 1962). Baía dos Elefantes, 13°05'S, 12°46'E, 100–110 m; 13°05'S, 12°45'E, 100–110 m; Baía de Salinas, 14°05'S, 12°17'E, 110 m (Capart, 1951). Off Porto Alexandre, 72 m, 108 m (Odhner, 1923). 16°37'S, 11°22'E, 126 m; 16°41'S, 11°21'E, 162 m (Crosnier, 1970).

Genus *Solenolambrus* Stimpson, 1871

Solenolambrus Stimpson, 1871a: 132 [type-species: *Solenolambrus typicus* Stimpson, 1871, by use of *typicus*; gender: masculine].

Pisolambrus A. Milne Edwards, 1878, in 1873–1881: 157 [type-species: *Pisolambrus nitidus* A. Milne Edwards, 1878, by monotypy; gender: masculine].

* *Solenolambrus noordendei* (Capart, 1951)

Heterocrypta noordendei Capart, 1951: 108, fig. 37, pl. 2: figs. 14, 15.

Solenolambrus noordendei.—Monod, 1956: 593, figs. 868–870.—Longhurst, 1958: 89.—Gauld, 1960: 72.—Crosnier, 1967: 340; 1970: 1215 [listed], 1219.

MATERIAL EXAMINED.—*Pillsbury Material*: Liberia: Sta 68, 70 m, broken shell, 1♂ (L).

Ivory Coast: Sta 42, 62–75 m, mud with brown, branched Foraminifera, 5♂, 5♀ (3 ov) (W). Sta 45, 73–97 m, 2♂, 1♀ ov

(L). Sta 49, 73–77 m, 2♂, 5♀ (4 ov) (L). Sta 50, 128–192 m, 2♂, 1♀ (W). Sta 59, 55–64 m, mud with dense branched Foraminifera, 1♂ (L). Sta 60, 79–82 m, coral or rock, 1♂ (L). Nigeria: Sta 237, 101 m, 4♀ (1 ov) (W).

Undaunted Material: Angola: Sta 96, 162 m, 1♀ ov (L).

Other Material: Congo: Off Pointe-Noire, 04°56'S, 11°31'E, 95 m, muddy sand, 3 Sep 1965, A. Crosnier, 1♂ (W).

DESCRIPTION.—Capart, 1951: 108.

Figures: Capart, 1951, fig. 37; Monod, 1956, 593, figs. 868–870.

Male Pleopod: Capart, 1951, pl. 2: figs. 14, 15 (Zaire).

MEASUREMENTS.—The ovigerous females in the present collection had the carapace length 6 to 9 mm. Capart (1951) mentioned ovigerous females with cl 7 and 10 mm, cb 7 and 11 mm; Monod's (1956) ovigerous females had cl 7 to 9 mm and cb 8 to 10 mm. The carapace length in the rest of our material varies between 6 and 12 mm. Capart's (1951) largest specimen had cl 11 and cb 11.5 mm; Monod's (1956) smallest and largest male had cl 5 and 11.5 and cb 4.5 and 12 mm, respectively, while Crosnier's (1967) males had cl 6.6 to 8.7 mm and cb 7.0 to 9.1 mm.

BIOLOGY.—The species is known from depths between 64 and 215 m; the shallowest record is 55–64 m (present material), the deepest 215–220 m (Capart, 1951; Monod, 1956). Of the records 90% are from between 70 and 140 m. It has been reported from mud (Capart, 1951; Crosnier, 1967), sandy mud (Capart, 1951; Crosnier, 1967), and shelly mud (Longhurst, 1958).

Ovigerous females have been found in the months of February, March, May, July, and November (Capart, 1951; Monod, 1956; Crosnier, 1970; present paper).

DISTRIBUTION.—Tropical West Africa, from localities between Senegal and Angola. It has not been recorded previously from Liberia or Nigeria, but these records are well within its known range. Records since Monod's (1956) include the following:

Sierra Leone: No specific locality, 72 m (Longhurst, 1958).

Ivory Coast: No specific locality (Crosnier, 1967).

Ghana: Off Accra, 80 m (Gauld, 1960).

Congo: 04°52'S, 11°39'E, 70 m, and 04°56'S, 11°31'E, 95 m (Crosnier, 1967).

Angola: 16°41'S, 11°21'E, 162 m (Crosnier, 1970).

Appendix I: Station Data

RV Pillsbury COLLECTIONS

Collections made in the Gulf of Guinea in 1964 and 1965 (data from Bayer, 1966; OT = otter trawl).

1. Nigeria. Lagos harbor, 06°28'N, 03°23'E, shore collecting, 23 May 1964: *Callinectes marginatus*, *Cyclograpsus integer*, *Geograpsus lividus*, *Goniopsis pelii*, *Metagrapsus curvatus*, *Pachygrapsus gracilis*, *Panopeus africanus*, *Sesarma (Chiromantes) buettikoferi*, *Uca tangeri*
2. Nigeria. Lagos harbor, 06°28'N, 03°23'E, dipnet at surface, outgoing tide, 23 May 1964: *Callinectes amnicola*, *Callinectes pallidus*
16. Ghana. 05°40'N, 00°30'E to 05°40'N, 00°17'E, 46 m, mud with Foraminifera, shells, 6' OT, 26 May 1964: *Capartiella longipes*, *Eurynome parvirostris*, *Ilia spinosa*, *Inachus angolensis*, *Inachus nanus*, *Machaerus oxyacantha*, *Macropodia gilsoni*, *Macropodia spinulosa*, *Medorippe lanata*
17. Ghana. 05°35'N, 00°10'E to 05°36'N, 00°11.5'E, 48 m, fine sand and green mud, 40' OT, 26 May 1964: *Achaeus buderes*, *Achaeus foresti*, *Calappa pelii*, *Calyps-*

- achaeus calypso*, *Ebalia affinis*, *Inachus biceps*, *Macropodia spinulosa*, *Parthenope notialis*, *Pisa carinimana*
18. Ghana. [05°04'N, 00°12'E] to 05°01'N, 00°12'E, 3047-3129 m, soft dark gray clay, Blake Trawl, 26 May 1964: *Ethusina beninia*
 22. Ghana. 05°25'N, 00°01'W to 05°22'N, 00°02'W, 51 m, rough bottom, 6' OT, 27 May 1964: *Achaeus buderes*, *Calappa pelii*, *Calypsachaeus calypso*, *Ebalia tuberculata*, *Ethusa vossi*, *Herbstia condyliata*, *Ilia spinosa*, *Inachus angolensis*, *Inachus nanus*, *Macropodia hesperiae*, *Nanocassiope melanodactyla*, *Parthenope massena*, *Parthenope notialis*, *Stenorhynchus lanceolatus*, *Sternodromia spinirostris*
 23. Ghana. 05°10'N, 00°25'W to 05°08'N, 00°28'W, 42 m, foliate brown to orange bryozoans, 6' OT, 28 May 1964: *Achaeus buderes*, *Calappa pelii*, *Capartiella longipes*, *Ebalia affinis*, *Ebalia tuberculata*, *Ethusa vossi*, *Eurynome parvirostris*, *Heterocrypta maltzami*, *Ilia spinosa*, *Inachus biceps*, *Inachus nanus*, *Macropipus rugosus*, *Macropodia gilsoni*, *Macropodia spinulosa*, *Medorippe lanata*, *Nanocassiope melanodactyla*, *Parthenope massena*, *Parthenope notialis*, *Pilumnus perrieri*, *Pisa carinimana*, *Stenorhynchus lanceolatus*
 24. Ghana. 04°56'N, 00°47.5'W to 04°56'N, 00°50'W, 35-37 m, dark red bryozoans, 6' OT, 28 May 1964:

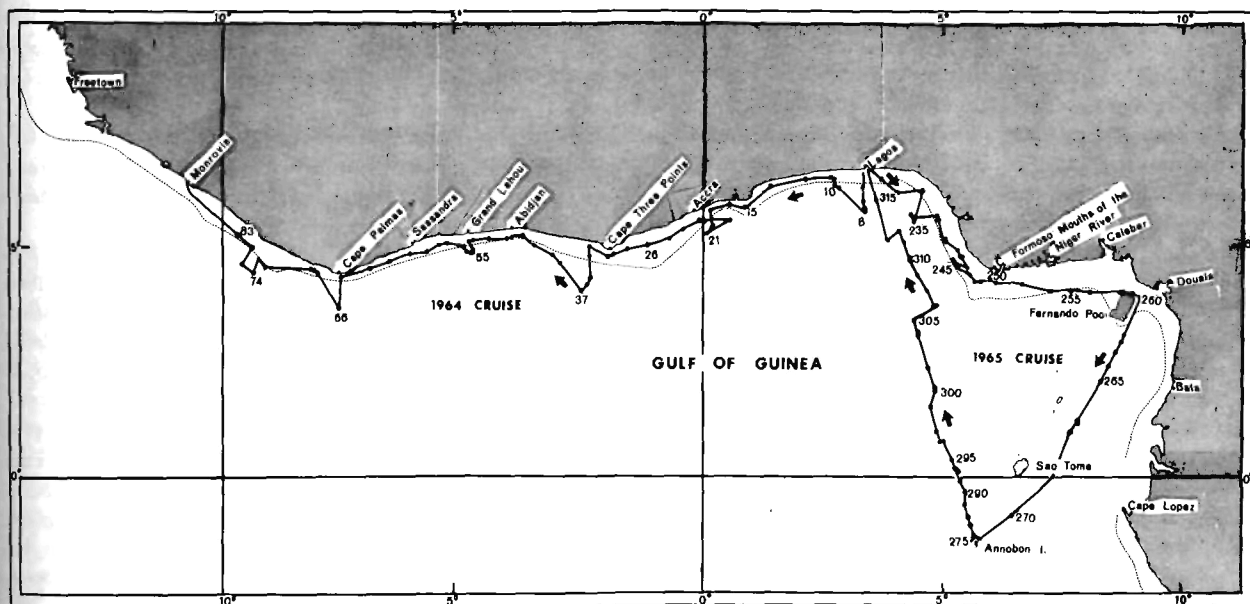


FIGURE 87.—Cruise track of the R/V Pillsbury in the Gulf of Guinea, 1964 and 1965 (from Voss, 1966, fig. 2).

- Achaeus buderes*, *Calappa rubroguttata*, *Capartiella longipes*, *Ebalia affinis*, *Ebalia tuberculata*, *Ethusa vossi*, *Heterocrypta maltzami*, *Ilia spinosa*, *Inachus biceps*, *Machaerus atlanticus*, *Macropipus rugosus*, *Macropodia spinulosa*, *Medorippe lanata*, *Nanocassiope melanodactyla*, *Palicus caronii*, *Parthenope massena*, *Parthenope notialis*, *Pilumnus stebbingi*, *Pisa carinimana*, *Portunus inaequalis*, *Stenorhynchus lanceolatus*, *Sternodromia spirostris*, *Typhlocarcinodes integrifrons*
26. Ghana. 04°57'N, 01°16'W to 04°59'N, 01°16.5'W, 27 m, shell bottom (scallops), 6' OT, 28 May 1964: *Dromia monodi*, *Ethusa vossi*, *Ilia spinosa*, *Inachus biceps*, *Parthenope massena*, *Portunus inaequalis*, *Stenorhynchus lanceolatus*
27. Ghana. 04°48'N, 01°42'W to 04°49'N, 01°47'W, 33 m, 6' OT, 28 May 1964: *Ebalia tuberculata*, *Pilumnus perrieri*, *Pisa carinimana*, *Portunus inaequalis*
28. Ghana. 04°40'N, 02°00'W to [04°39'N, 02°02'W], 49–53 m, 6' OT, 28 May 1964: *Capartiella longipes*, *Inachus angolensis*, *Machaerus oxyacantha*, *Macropodia gilsoni*, *Macropodia spinulosa*, *Medorippe lanata*, *Pseudomyra mbizi*, *Raninoides bouvieri*, *Stenorhynchus lanceolatus*, *Sternodromia spirostris*
29. Ghana. [04°38'N, 02°02'W to 04°36'N, 02°00'W], 58–60 m, 40' OT, 28 May 1964: *Inachus nanus*, *Pseudomyra mbizi*
30. Ghana. 04°46'N, 02°30'W to 04°45'N, 02°33'W, 61–64 m, coral, 40' OT, 28 May 1964: *Macropodia gilsoni*, *Medorippe lanata*, *Stenorhynchus lanceolatus*
32. Ghana. 04°37'N, 02°32'W to 04°38'N, 02°35'W, 110 m, 40' OT, 28 May 1964: *Macropodia gilsoni*, *Pseudomyra mbizi*
34. Ghana. 03°53'N, 02°33'W to [03°47'N, 02°33'W], 1948–1984 m, mud, Blake Trawl, 29 May 1964: *Ethusa beninia*
41. Ivory Coast. 04°47'N, 03°33'W to 04°47'N, 03°35'W, 641–842 m, 6' OT, 30 May 1964: *Ethusa rosacea*, *Geryon maritae*
42. Ivory Coast. 05°02.5'N, 03°49.5'W to 05°05'N, 03°52'W, 62–75 m, mud with brown, branched Foraminifera, 6' OT, 30 May 1964: *Atlantotlos rhombifer*, *Calappa pelii*, *Capartiella longipes*, *Ilia spinosa*, *Inachus angolensis*, *Inachus nanus*, *Macropipus rugosus*, *Macropodia gilsoni*, *Macropodia straeleni*, *Medorippe lanata*, *Nanocassiope melanodactyla*, *Parthenope notialis*, *Pisa carinimana*, *Pseudomyra mbizi*, *Solenolambrus noordendei*, *Stenorhynchus lanceolatus*
43. Ivory Coast. Surface tow during Sta. 42, 0.5 m net, 30 May 1964: *Callinectes pallidus*
44. Ivory Coast. 05°05'N, 04°00'W to 05°04'N, 04°02'W, 403–586 m, hard dark gray mud, 6' OT, 30 May 1964: *Bathynectes piperitus*, *Carcinoplax barnardi*, *Ethusa rosacea*, *Geryon maritae*
45. Ivory Coast. 05°05'N, 04°04.5'W to 05°06'N, 04°06'W, 73–97 m, 40' OT, 30 May 1964: *Macropodia gilsoni*, *Monodaenus rouxi*, *Pseudomyra mbizi*, *Solenolambrus noordendei*
46. Ivory Coast. 05°07'N, 04°32'W to 05°07'N, 04°36'W, 38–42 m, mud with dense *Jullienella*, 6' OT, 30 May 1964: *Calappa pelii*, *Capartiella longipes*, *Cronius ruber*, *Ethusa vossi*, *Heterocrypta maltzami*, *Ilia spinosa*, *Leopoldius pisifer*, *Machaerus atlanticus*, *Machaerus oxyacantha*, *Macropodia spinulosa*, *Medorippe lanata*, *Nanocassiope melanodactyla*, *Parthenope notialis*, *Phyllodorippe armata*, *Pisa carinimana*, *Stenorhynchus lanceolatus*, *Sternodromia spirostris*
47. Ivory Coast. 05°04.5'N, 04°51.5'W, 37 m, bottom with *Jullienella*, 6' OT, 31 May 1964: *Calappa pelii*, *Calappa rubroguttata*, *Ebalia affinis*, *Ethusa vossi*, *Leopoldius pisifer*, *Machaerus oxyacantha*, *Macropodia gilsoni*, *Macropodia spinulosa*, *Medorippe lanata*, *Nanocassiope melanodactyla*, *Neodorippe armata*, *Philyra laevidorsalis*, *Phyllodorippe armata*, *Pisa carinimana*, *Portunus inaequalis*, *Sternodromia spirostris*
48. Ivory Coast. [05°05'N, 04°59.5'W], 22 m, 6' OT, 31 May 1964: *Cronius ruber*, *Ilia spinosa*, *Machaerus oxyacantha*, *Macropodia spinulosa*, *Phyllodorippe armata*, *Stenorhynchus lanceolatus*
49. Ivory Coast. 05°00'N, 05°00'W to 04°59'N, 05°00'W, 73–77 m, 6' OT, 31 May 1964: *Calappa pelii*, *Ethusa rugulosa*, *Inachus angolensis*, *Inachus nanus*, *Monodaenus rouxi*, *Phyllodorippe armata*, *Pseudomyra mbizi*, *Solenolambrus noordendei*
50. Ivory Coast. 04°58'N, 05°00'W to 04°57'N, 05°01'W, 128–192 m, 6' OT, 3 May 1964: *Ethusa rugulosa*, *Inachus angolensis*, *Macropodia gilsoni*, *Monodaenus rouxi*, *Parthenope notialis*, *Pseudomyra mbizi*, *Solenolambrus noordendei*
51. Ivory Coast. 04°56'N, 05°01'W to 04°56.6'N, 05°03'W, 329–494 m, 6' OT, 31 May 1964: *Acanthocarpus brevispinis*, *Bathynectes piperitus*, *Carcinoplax barnardi*, *Geryon maritae*
59. Ivory Coast. 04°57.5'N, 05°02'W to 04°57'N, 05°03'W, 55–64 m, mud with dense branched Foraminifera, 6' OT, 1 Jun 1964: *Macropodia gilsoni*, *Parthenope notialis*, *Pseudomyra mbizi*, *Solenolambrus noordendei*
60. Ivory Coast. 04°55'N, 05°34.5'W to 04°54'N, 05°37'W, 79–82 m, coral or rock, 6' OT, 1 Jun 1964: *Capartiella longipes*, *Ethusa rugulosa*, *Inachus nanus*, *Macropodia hesperiae*, *Macropodia straeleni*, *Medorippe lanata*, *Parthenope notialis*, *Pisa carinimana*, *Pseudomyra mbizi*, *Solenolambrus noordendei*
62. Ivory Coast. 04°45'N, 06°13.5'W to 04°44'N, 06°16'W, 46 m, brown, branched and foliate Foraminifera, 6' OT, 1 Jun 1964: *Calappa pelii*, *Ilia spinosa*, *Inachus angolensis*, *Machaerus atlanticus*, *Macropodia gilsoni*, *Medorippe lanata*, *Monodaenus rouxi*, *Parthenope notialis*, *Pisa carinimana*, *Pseudomyra mbizi*, *Raninoides bouvieri*, *Sternodromia spirostris*
63. Ivory Coast. 04°35'N, 06°40'W to 04°35'N, 06°41'W, 64 m, sandy mud with shells, 6' OT, 2 Jun 1964:

- Atlantollos rhombifer*, *Ilia spinosa*, *Inachus angolensis*, *Macropodia gilsoni*, *Parthenope notialis*, *Pseudomyra mbizi*, *Sternodromia spinirostris*
64. Ivory Coast. 04°23'N, 07°06.5'W to 04°22'N, 07°08.5'W, 68 m, 6' OT, 2 Jun 1964: *Calappa pelii*, *Inachus angolensis*, *Inachus nanus*, *Macropipus rugosus*, *Macropodia gilsoni*, *Medorippe lanata*, *Parthenope notialis*, *Pisa carinimana*, *Pseudomedeus africanus*, *Raninoides bouvieri*
65. Ivory Coast. 04°15'N, 07°32'W to 04°12'N, 07°35.5'W, 46–49 m, 40' OT, 2 Jun 1964: *Macropipus rugosus*, *Macropodia hesperiae*, *Macropodia spinulosa*, *Macropodia straeleni*, *Medorippe lanata*, *Stenorhynchus lanceolatus*
68. Liberia. 04°23'N, 08°05.5'W to 04°24'N, 08°07.5'W, 70 m, broken shell, 6' OT, 3 Jun 1964: *Achaeus foresti*, *Atlantollos rhombifer*, *Calappa pelii*, *Calypsachaeus calypso*, *Capartiella longipes*, *Ebalia affinis*, *Ethusa vossi*, *Eurynome aspera*, *Heterocrypta maltzami*, *Homola barbata*, *Ilia spinosa*, *Inachus nanus*, *Macropipus rugosus*, *Macropodia gilsoni*, *Macropodia straeleni*, *Medorippe lanata*, *Monodaeus rouxi*, *Parthenope notialis*, *Pseudomyra mbizi*, *Raninoides bouvieri*, *Solenolambrus noordendei*, *Sternodromia spinirostris*
69. Liberia. 04°29.5'N, 08°06'W to 04°29.5'N, 08°07.5'W, 29 m, coral or rock, 6' OT, 3 Jun 1964: *Inachus nanus*, *Pisa carinimana*, *Pseudomyra mbizi*
70. Liberia. 04°30'N, 08°09'W to 04°29.5'N, 08°09'W, 33 m, branched Foraminifera, 6' OT, 3 Jun 1964: *Apionithrax violaceus*, *Ethusa vossi*, *Nanocassiope melanodactyla*, *Paractaea margaritaria*, *Parthenope massena*, *Pisa carinimana*, *Stenorhynchus lanceolatus*
73. Liberia. 04°38'N, 09°20'W to 04°40'N, 09°20'W, 311–366 m, 40' OT, 4 Jun 1964: *Bathynectes piperitus*
74. Liberia. 04°20'N, 09°26'W to 04°30'N, 09°22'W, 641–733 m, 40' OT, 4 Jun 1964: *Ethusa rosacea*, *Geryon maritae*
82. Liberia. 04°57'N, 09°30'W to 04°58'N, 09°32'W, 146–150 m, 40' OT, 5 Jun 1964: *Macropodia macrocheles*
83. Liberia. 04°59'N, 09°37'W to 04°57.5'N, 09°33'W, 156–220 m, 40' OT, 5 Jun 1964: *Macropipus rugosus*
224. Nigeria. Lagos, 06°28'N, 03°23'E, shore, sand beach, ichthyocide, 9 May 1965: *Ocyropsis cursor*, *Pilumnopus africanus*
225. Nigeria. Lagos harbor, 06°28'N, 03°23'E, shore at dock, 9 May 1965: *Plagusia depressa*
226. Nigeria. Lagos harbor, 06°28'N, 03°23'E, surface at dock, night light, 9 May 1965: *Callinectes pallidus*
227. Nigeria. Lagos harbor, 06°28'N, 03°23'E, shore, on rocks and seawall, by hand, 10 May 1965: *Goniopsis pelii*, *Pachygrapsus gracilis*
228. Nigeria. Lagos harbor, 06°28'N, 03°23'E, surface at dock, 10 May 1965: *Callinectes pallidus*
229. Nigeria. Lagos harbor, 06°28'N, 03°23'E, surface at dock, dip net, 10 May 1965: *Callinectes amnicola*, *Callinectes pallidus*
230. Nigeria. 06°11'N, 03°36'E to 06°10'N, 03°38'E, 82–97 m, hard ground, with gorgonians, coral, rock, 40' OT, 11 May 1965: *Macropodia hesperiae*, *Pisa armata*
232. Nigeria. 05°56'N, 04°27'E to 05°54'N, 04°27'E, 101–132 m, green mud, 40' OT, 11 May 1965: *Pseudomyra mbizi*
236. Nigeria. 05°20'N, 04°45'E to 05°19'N, 04°48'E, 101–128 m, coral ground, rough, 40' OT, 12 May 1965: *Pseudomyra mbizi*
237. Nigeria. 05°19'N, 04°48'E to 05°07'N, 04°55'E, 101 m, 10' OT, 12 May 1965: *Calappa pelii*, *Macropodia gilsoni*, *Monodaeus rouxi*, *Pseudomyra mbizi*, *Solenolambrus noordendei*
239. Nigeria. 04°56'N, 05°00'E to 04°54'N, 05°05'E, 73 m, 10' OT, 13 May 1965: *Atlantollos rhombifer*, *Capartiella longipes*, *Inachus angolensis*, *Inachus nanus*, *Macropodia gilsoni*, *Macropodia straeleni*, *Monodaeus rouxi*, *Pseudomyra mbizi*
240. Nigeria. 04°44'N, 05°17'E to 04°41'N, 05°19'E, 37 m, 10' OT, 13 May 1965: *Capartiella longipes*
241. Nigeria. 04°35'N, 05°18'E to 04°34'N, 05°19'E, 59–63 m, mud and shell, 10' OT, 13 May 1965: *Atlantollos rhombifer*, *Calappa pelii*, *Capartiella longipes*, *Homola barbata*, *Inachus angolensis*, *Machaerus oxyacantha*, *Macropipus rugosus*, *Macropodia gilsoni*, *Medorippe lanata*, *Portunus validus*, *Pseudomyra mbizi*, *Raninoides bouvieri*
245. Nigeria. 04°32'N, 05°07'E to 04°31'N, 05°13'E, 64–119 m, mud, 40' OT, 13 May 1965: *Pseudomyra mbizi*
246. Nigeria. 04°13'N, 05°30'E to 04°10'N, 05°33'E, 37 m, 40' OT, 13 May 1965; *Ilia spinosa*, *Portunus inaequalis*, *Pseudomyra mbizi*, *Stenorhynchus lanceolatus*
248. Nigeria. 04°03'N, 05°41'E to 04°07'N, 05°40'E, 33 m, 10' OT, 13 May 1965: *Achaeus turbator*, *Atlantollos rhombifer*, *Calappa rubroguttata*, *Calypsachaeus calypso*, *Capartiella longipes*, *Dromia monodi*, *Ebalia affinis*, *Ebalia tuberculata*, *Ethusa vossi*, *Heterocrypta maltzami*, *Ilia spinosa*, *Inachus biceps*, *Leopoldius pisifer*, *Macropodia spinulosa*, *Medorippe lanata*, *Parthenope massena*, *Phyllodorippe armata*, *Pilumnus perrieri*, *Pisa carinimana*, *Portunus inaequalis*, *Stenorhynchus lanceolatus*
250. Nigeria. 04°06'N, 05°58'E to 04°02'N, 06°04'E, 24 m, brackish water, mud, 10' OT, 14 May 1965: *Callinectes pallidus*, *Dromia monodi*, *Machaerus oxyacantha*, *Nanocassiope melanodactyla*, *Phyllodorippe armata*, *Parthenope massena*, *Portunus inaequalis*
251. Nigeria. 04°03'N, 06°03'E to 04°04'N, 06°04'E, 27 m, mud, 10' OT, 14 May 1965: *Callinectes pallidus*, *Machaerus oxyacantha*, *Phyllodorippe armata*
252. Nigeria. 04°04'N, 06°18'E to 04°05'N, 06°22'E, 30 m, mud, 10' OT, 14 May 1965: *Callinectes pallidus*, *Ilia spinosa*, *Machaerus oxyacantha*, *Phyllodorippe armata*, *Portunus inaequalis*, *Portunus validus*, *Stenorhynchus lanceolatus*
253. Nigeria. 04°04'N, 06°35'E to 04°03'N, 06°38'E, 33–40 m, mud, 10' OT, 14 May 1965: *Calappa pelii*,

- Leopoldius pisifer*, *Parthenope massena*, *Phyllodorippe armata*, *Stenorhynchus lanceolatus*
254. Nigeria. 03°50'N, 07°08'E to 03°51'N, 07°12'E, 148–174 m, 40' OT, 14 May 1965: *Pseudomyra mbizi*
255. Nigeria. 03°49'N, 07°38'E to 03°48'N, 07°42'E, 264–269 m, 40' OT, 14 May 1965: *Acanthocarpus brevispinis*, *Carcinoplax barnardi*, *Inachus grillator*, *Macropodia macrocheles*
256. Nigeria. 03°45'N, 08°03'E to 03°45'N, 08°02'E, 409–485 m, 40' OT, 14 May 1965: *Acanthocarpus brevispinis*, *Carcinoplax barnardi*
257. Fernando Poo. 03°45'N, 08°48'E, shore, ichthyocide, 15 May 1965: *Callinectes marginatus*, *Callinectes pallidus*, *Eurypanopeus blanchardi*, *Pachygrapsus transversus*, *Xanthodius inaequalis inaequalis*
258. Fernando Poo. 03°45'N, 08°48'E, shore, ichthyocide, 15 May 1965: *Callinectes pallidus*, *Epixanthus hellerii*, *Eurypanopeus blanchardi*, *Grapsus grapsus*, *Pachygrapsus transversus*, *Percnon gibbesi*, *Xanthodius denticulatus*, *Xanthodius inaequalis inaequalis*
259. Cameroon. 03°53'N, 08°53'E to 03°51'N, 08°54'E, 59 m, mud and broken shell, 10' OT, 16 May 1965: *Calappa pelii*, *Inachus angolensis*, *Macropipus rugosus*, *Macropodia gilsoni*, *Pseudomyra mbizi*, *Raninoides bouvieri*
260. Cameroon. 03°45'N, 09°05'E to 03°43'N, 09°10'E, 46 m, 10' OT, 16 May 1965: *Atlantollos rhombifer*, *Calappa pelii*, *Calypsachaeus calypso*, *Ilia spinosa*, *Inachus nanus*, *Macropipus rugosus*, *Macropodia gilsoni*, *Medorippe lanata*, *Parthenope notialis*, *Raninoides bouvieri*
271. Annobon. 01°25'S, 05°38'E, NE coast between Punta Yoyo and Punta Pedrinha, shore, ichthyocide, 19 May 1965: *Acanthonyx minor*, *Grapsus grapsus*, *Nanocassiope melanodactyla*, *Pachygrapsus transversus*, *Percnon gibbesi*, *Plagusia depressa*, *Sirpus gordonae*, *Xanthodius denticulatus*, *Xanthodius inaequalis inaequalis*
273. Annobon. 01°24'S, 05°37'E, N coast, near Islote Pirámide, shore, ichthyocide, 19 May 1965: *Acanthonyx minor*, *Domecia acanthophora africana*, *Grapsus grapsus*, *Ocy-pode cursor*, *Pachygrapsus transversus*, *Plagusia depressa*
275. Annobon. 01°24'S, 05°37'E to 01°24'S, 05°38'E, 9–69 m, rubble of coralline algae, dredge, 20 May 1965: *Cataleptodius floridanus*, *Cronius ruber*, *Dynomene filholi*, *Euryozius pagalu*, *Globopilumnus stridulans*, *Herbstia nitida*, *Nanocassiope melanodactyla*, *Nanopilumnus boletifer*, *Paractaea margaritaria*, *Paractaea rufopunctata africana*, *Pisa calva*, *Ranilia constricta*, *Stenorhynchus lanceolatus*, *Xanthodius denticulatus*
278. Annobon. 01°24'S, 05°37'E, shore [collection made in transit to Crater Lake], 20 May 1965: *Ocy-pode cursor*
281. Annobon. 01°24'S, 05°37'E, shore, ichthyocide, 20 May 1965: *Callinectes marginatus*, *Grapsus grapsus*, *Ocy-pode cursor*
282. Annobon. 01°28'S, 05°36'–37'E to 01°29'S, 05°36'E, 18–37 m, nodular coralline algae, dredge, 21 May 1965: *Domecia acanthophora africana*, *Dynomene filholi*, *Euryozius pagalu*, *Globopilumnus stridulans*, *Glyptoxanthus angolensis*, *Herbstia nitida*, *Microcassiope melanodactyla*, *Paractaea margaritaria*, *Paractaea rufopunctata africana*, *Pisa calva*
283. Annobon. 01°29'S, 05°35'E, 51–55 m, nodular coralline algae, dredge, 21 May 1965: *Dynomene filholi*, *Ebalia tuberculata*, *Euryozius pagalu*, *Herbstia nitida*, *Homola barbata*, *Nanocassiope melanodactyla*, *Paractaea margaritaria*, *Parthenope expansa*, *Parthenope massena*, *Pilumnus stebbingi*, *Pisa calva*
284. Annobon. 01°30'S, 05°36'E, 73 m, black basaltic rocks, dredge, 21 May 1965: *Nanocassiope melanodactyla*, *Pilumnus stebbingi*, *Sakaila africana*
316. Nigeria. Lagos, 06°28'N, 03°23'E, shore, sand beach, ichthyocide, 28 May 1965: *Ocy-pode cursor*, *Pachygrapsus transversus*

Geronimo COLLECTIONS

Collections made by National Marine Fisheries Service vessel *Geronimo* off Gabon in 1963.

179. Off Gabon River, 00°02.2'S, 08°50.2'E, 161 fm (293 m), 31 Aug 1963: *Acanthocarpus brevispinis*, *Bathynectes piperitus*, *Carcinoplax barnardi*
185. 00°32'S, 08°42'E, 110 fm (200 m), 1 Sep 1963: *Pseudomyra mbizi*
187. 00°32'S, 08°40'E, 165 fm (300 m), 1 Sep 1963: *Pseudomyra mbizi*
191. 01°28'S, 08°24.5'E, 165 fm (300 m), 3 Sep 1963: *Bathynectes piperitus*, *Geryon maritae*
197. 01°30'S, 08°27.5'E, 110 fm (200 m), Sep 1963: *Macropodia macrocheles*
198. 01°28'S, 08°24.5'E, 165 fm (300 m), 3 Sep 1963: *Acanthocarpus brevispinis*, *Bathynectes piperitus*, *Carcinoplax barnardi*, *Geryon maritae*
199. 01°26.4'S, 08°24'E, 220 fm (400 m), 3 Sep 1963: *Bathynectes piperitus*
202. 02°00'S, 08°55'E, 55 fm (100 m), 4 Sep 1963: *Acanthocarpus brevispinis*, *Macropipus rugosus*
203. 02°01'S, 08°50.5'E, 110 fm (200 m), 4 Sep 1963: *Acanthocarpus brevispinis*, *Bathynectes piperitus*, *Carcinoplax barnardi*, *Geryon maritae*
206. 02°00'S, 08°46.5'E, 250–335 fm (455–610 m), 4 Sep 1963: *Bathynectes piperitus*
211. 02°32'S, 09°05'E, 55 fm (100 m), 5 Sep 1963: *Ateley-cyclus rotundatus*, *Eu-chirograpsus liguricus*, *Macropipus rugosus*, *Pseudomedaeus africanus*
212. 02°30'S, 08°58'E, 110 fm (200 m), 5 Sep 1963: *Calappa pelii*
213. 02°31'S, 08°51'E, 165 fm (300 m), 5 Sep 1963: *Bathynectes piperitus*, *Macropipus rugosus*

214. 02°30'S, 08°52'E, 300 fm (546 m), 5 Sep 1963: *Bathynectes piperitus*
220. 03°02'S, 09°21'E, 165 fm (300 m), 6 Sep 1963: *Bathynectes piperitus*
228. 03°31'S, 09°53'E, 165 fm (300 m), 7 Sep 1963: *Macropipus rugosus*
235. 04°01'S, 10°35'E, 55 fm (100 m), 8 Sep 1963: *Calappa pelii*, *Macropodia gilsoni*, *Parthenope notialis*, *Sakaila africana*
247. 04°38.4'S, 11°01.2'E, 220 fm (400 m), 9 Sep 1963: *Bathynectes piperitus*
95. 16°37'S, 11°22'E, 126 m, 18 Mar 1968: *Calappa pelii*, *Goneplax rhomboides*, *Macropipus australis*, *Macropodia gilsoni*, *Macropodia spinulosa*, *Parthenope notialis*
96. 16°41'S, 11°21'E, 162 m, 18 Mar 1968: *Calappa pelii*, *Eurynome aspera*, *Inachus angolensis*, *Inachus grillator*, *Macropipus australis*, *Parthenope notialis*, *Pisa armata*, *Solenolambrus noordendei*
102. 17°02'S, 11°40'E, 54 m, 24 Mar 1968: *Calappa pelii*, *Medorippe lanata*
103. 17°06'S, 11°35'E, 90 m, 24 Mar 1968: *Calappa pelii*, *Inachus angolensis*, *Macropipus australis*, *Medorippe lanata*, *Pseudomyra mbizi*
104. 17°09'S, 11°30'E, 126 m, 24 Mar 1968: *Macropipus australis*
105. 17°13'S, 11°27'E, 155 m, 24 Mar 1968: *Macropipus australis*
106. 17°18'S, 11°24'E, 225 m, 24 March 1968: *Euchirograpsus liguricus*, *Macropipus australis*, *Monodaeus couchii*
107. 17°23'S, 11°20'E, 359 m, 24 Mar 1968: *Euchirograpsus liguricus*, *Geryon maritae*
111. 10°36'S, 13°12'E, ca 366 m, 12 Apr 1968: *Bathynectes piperitus*

Undaunted COLLECTIONS

Collections made by National Marine Fisheries Service vessel *Undaunted* off Angola and South-West Africa (below 17°15'S) in 1968.

94. 16°27'S, 11°35'E, 90 m, 18 Mar 1968: *Goneplax rhomboides*, *Inachus angolensis*, *Macropipus australis*

Appendix II: Gazetteer

Localities from the literature or from specimen-associated data cited in the species accounts are listed here, alphabetically by country, along with coordinates. Spellings and coordinates are from gazetteers of the United States Board on Geographic Names. Alternate spellings and coordinates from sources other than those gazetteers are given in brackets. Localities that we have not been able to locate are identified in the text by a question-mark in brackets, [?], and are cross-referenced in this gazetteer by species name. Specific localities identified in the text as "near" another locality (e.g., Boulbinet, near Conakry) or as in another locality, (e.g., Samba, Luanda) are not listed separately here if they could not be located in the Board on Geographic Names gazetteers. Localities in the literature or from specimen labels originally accompanied by coordinates are not repeated here; in the list, coordinates added by us are set off in brackets. We have anglicized country names but not names for localities within countries. We have used older names for two of the offshore islands of the Gulf of Guinea, now part of Equatorial Guinea: Annobon, instead of Pagalu, and Fernando Poo, instead of Macias Nguema Biyogo.

Other sources, which have been helpful in identifying West African localities either by listing coordinates or by giving maps, include: Forest and Gantès, 1960 (Morocco); Guinot and Ribeiro, 1962 (Cape Verde Islands, Angola); Longhurst, 1958 (Sierra Leone and Guinea Shelf); Rathbun, 1921 (a list of West African localities, mostly in the Congo and Zaire); Rossignol, 1962 (localities between Nigeria and southern Angola); Sourie, 1954a (Senegal, especially around Dakar); and Türkay, 1976b (Madeira).

Angola

Baía do Ambriz	07°50'S, 13°06'E
Baía de Ambrizete	07°13'S, 12°51'E
Baía de Benguela	12°35'S, 13°21'E
Baía da Caota, Benguela	12°36'S, 13°16'E
Baía dos Elefantes	13°13'S, 12°44'E
Baía Farta, Benguela	12°36'S, 13°13'E
Baía do Lobito	12°20'S, 13°34'E
Baía de Luanda	08°47'S, 13°16'E
Baía de Moçâmedes	15°10'S, 12°08'E
Baía de Porto Amboim	10°42'S, 13°45'E
Baía de Santa Marta	13°51'S, 12°28'E
Baía dos Tigres	16°38'S, 11°46'E
Baía das Vacas [Ponta das Vacas]	12°37'S, 13°14'E
Benguela	12°35'S, 13°25'E
Cacuaco	08°47'S, 13°22'E
Chiloango	05°12'S, 12°08'E
Egito Praia	11°59'S, 13°46'E
Ilha de Luanda	08°48'S, 13°13'E
Luanda [St. Paul do Loanda]	08°48'S, 13°14'E
Lucira	13°51'S, 12°31'E
Moçâmedes	15°10'S, 12°09'E
Morro da Cruz	08°57'S, 13°04'E
Musserra [Mussera, Massera]	07°29'S, 12°58'E
Mussulo Grande	08°11'S, 13°17'E
Ponta da Caruíta	12°35'S, 13°16'E
Ponta da Moita Seca	06°07'S, 12°16'E
Ponta do Morro [Cap Morro?]	10°45'S, 13°43'E
Ponta de São José	12°36'S, 13°12'E
Ponta do Sombreiro	12°35'S, 13°18'E
Porto Alexandre	15°49'S, 11°53'E
Porto Amboim	10°44'S, 13°44'E
Praia Amélia, Moçâmedes	15°12'S, 12°06'E
Praia das Conchas, Moçâmedes	15°07'S, 12°07'E
Quicembo [Kinsembo]	07°44'S, 13°03'E
Rio Chiloango	05°12'S, 12°07'E
Rio Cuanza	09°19'S, 13°08'E
Rio Cunene [Kunene River]	17°20'S, 11°50'E
Santo António do Zaire [San António, Saint-Antoine]	06°07'S, 12°18'E

Annobon [Pagalu, Equatorial Guinea]	01°25'S, 05°36'E	Isla de la Gomera	28°06'N, 17°08'W
Isla Tortuga	01°24'S, 05°38'E	Isla de Gran Canaria	28°00'N, 15°36'W
Islote Pirâmide	01°24'S, 05°37'E	Isla de Lanzarote	29°00'N, 13°40'W
Punta Pedrinha	[01°24'35"S, 05°37'25"E]	Arrecife	28°57'N, 13°32'W
Punta Yoyo	[01°24'45"S, 05°37'35"E]	Playa Quemada	28°54'N, 13°43'W
San Antonio	01°27'S, 05°37'E	Isla de La Palma	28°40'N, 17°52'W
Santa Cruz	01°27'S, 05°37'E	Santa Cruz de La Palma	28°41'N, 17°45'W
Ascension Island	07°57'S, 14°22'W	Isla de Tenerife	28°19'N, 16°34'W
Azores	38°30'N, 28°00'W	Ensenada de Cristianos	28°02'N, 16°42'W
Ilha do Corvo	39°42'N, 31°06'W	Playa de los Abrigos	28°01'N, 16°35'W
Ilha do Faial [Fayal]	38°34'N, 28°42'W	Puerto de la Cruz	28°24'N, 16°33'W
Almoxarife. See <i>Acanthonyx brevifrons</i>		Puerto de Orotava	28°46'N, 17°45'W
Caldeirinhas [Caldeira Inferno]	38°30'N, 28°37'W	Cape Verde Islands	16°00'N, 24°00'W
Feteira	38°31'N, 28°41'W	Baixo João Leitão	15°48'N, 23°11'W
Horta	38°32'N, 28°38'W	Boa Vista, Ilha da	16°05'N, 22°50'W
Pasteleiro	38°31'N, 28°38'W	Ilhéu de Sal Rei	16°10'N, 22°56'W
Ilha das Flores	39°26'N, 31°13'W	Ponta Rodrigo	16°12'N, 22°43'W
Ilha da Muda. See <i>Dromia marmorea</i>		Porto de Sal Rei	16°10'N, 22°56'W
Ilha do Pico	38°28'N, 28°20'W	Ribeira do Rabil	16°09'N, 22°59'W
Madalena	38°32'N, 28°32'W	Branco, Ilhéu	16°39'N, 24°41'W
Ilha de São Miguel	37°47'N, 25°30'W	Brava, Ilha	14°52'N, 24°43'W
Caloura	37°42'N, 25°30'W	Baía de Fajã di Agua [Porto da Fajã]	14°52'N, 24°45'W
Ponta Delgada	37°44'N, 25°40'W	Ponta Garbeiro. See <i>Domecia acanthophora africana</i>	
Ponta da Galera	37°42'N, 25°31'W	Porto da Furna	14°53'N, 24°41'W
Ilha Terceira	38°43'N, 27°13'W	Fogo, Ilha do	14°55'N, 24°25'W
Ponta São Diego. See <i>Dromia marmorea</i>		Ponta da Areia	14°53'N, 24°31'W
Ilhéu da Praia	39°03'N, 27°57'W	Ilhéu Luis Carneiro	14°58'N, 24°40'W
Rochas dos Capelinhos [Volcano Capelinhos]	38°36'N, 28°50'W	Maió, Ilha de	15°15'N, 23°10'W
Cabinda		Porto Inglês	15°08'N, 23°13'W
Cabinda	05°33'S, 12°12'E	Sal, Ilha do	16°45'N, 22°55'W
Chinchoxo [Tschintschotscho, Quinchoxo]	[05°09.24'S, 12°03.75'E]	Baía da Murdeira [Murdeira]	16°41'N, 22°57'W
Landana	05°13'S, 12°08'E	Pedra Lume	16°46'N, 22°54'W
Quila [River]	05°58'S, 14°47'E	Santo Antão, Ilha de	17°05'N, 25°10'W
Cameroon		Baía do Monte Trigo	17°01'N, 25°20'W
Batanga	[ca 02°54'N, 09°55'E]	Ponta do Esbarradeiro	16°55'N, 25°14'W
Bibundi	04°13'N, 08°59'E	Ponta da Praia Formosa	16°55'N, 25°13'W
Douala	04°03'N, 09°42'E	Ponta do Sol	17°12'N, 25°06'W
Kribi	02°57'N, 09°55'E	Porto dos Carvoeiros [Baio do Porto Novo]	17°02'N, 25°04'W
Souellaba [Souelaba]	03°49'N, 09°33'E	Santa Luzia, Ilha de	16°46'N, 24°45'W
Wouri River	04°06'N, 09°43'E	São Nicolau, Ilha de	16°35'N, 24°15'W
Yaoundé	03°52'N, 11°31'E	Tarrafal	16°34'N, 24°22'W
Canary Islands	28°00'N, 15°30'W	São Tiago, Ilha de [Santiago]	15°05'N, 23°40'W
Estrecho de la Bocaina	28°47'N, 13°50'W	Baía de Santa Clara	15°01'N, 23°45'W
Isla de Fuerteventura	28°20'N, 14°00'W	Porto da Praia [La Praya, Praia]	14°54'N, 23°31'W
Puerto Cabras	28°29'N, 13°51'W	Porto de São Francisco	14°58'N, 23°28'W
Punta Morro Jable [Ponta da Matorra, Punta del Mattorral]	28°02'N, 14°20'W	Tarrafal	15°17'N, 23°46'W
		São Vicente, Ilha de	16°50'N, 25°00'W

Baía da Fateixa	16°52'N, 25°04'W	Gunjur	13°11'N, 16°46'W
Baía das Gatas	16°12'N, 22°43'W	Ghana	
Ilhéu Raso	16°37'N, 24°36'W	Accra	05°33'N, 00°13'W
Ponta da Calheta [Baía de Calheta]	16°47'N, 24°58'W	Ada	05°46'N, 00°37'E
Porto Grande	16°53'N, 25°01'W	Angaw Lagoon	05°48'N, 00°47'E
Praia da Matiota [Baía da Matiota]	16°53'N, 25°00'W	Ankobra River [Ancobra]	04°53'N, 02°17'W
Conception Bank	29°30'N, 12°45'W	Apam	05°17'N, 00°44'W
Congo		Axim	04°52'N, 02°14'W
Bahua, See <i>Cardisoma armatum</i>		Baya River	[05°05'N, 01°22'W]
Baie de Loango	04°36'S, 11°44'E	Butre [Boutry, Butry]	04°49'N, 01°55'W
Baie de Pointe-Noire	04°47'S, 11°51'E	Chorkor, near Accra	[05°33'N, 00°15'W]
Banga [Banda]	04°34'S, 12°23'E	Christiansborg	05°33'N, 00°11'W
Djeno	04°55'S, 11°57'E	Densu	05°31'N, 00°19'W
Loango	04°39'S, 11°48'E	Denu	06°05'N, 01°08'E
Loya River	04°49'S, 12°52'E	Dixcove	04°48'N, 01°57'W
Pointe Indienne	04°40'S, 11°47'E	Elmina [St. George d'Elmina]	05°05'N, 01°21'W
Pointe Kounda	04°11'S, 11°23'E	Hwini River	04°53'N, 01°47'W
Pointe-Noire	04°48'S, 11°51'E	Komenda	05°03'N, 01°29'W
Songololo River [Songolo River]	04°45'S, 11°51'E	Kumasi	06°41'N, 01°37'W
Dahomey		Labadi	05°33'N, 00°09'W
Cotonou	06°21'N, 02°26'E	Ningo	06°03'N, 00°11'W
Grand-Popo	06°17'N, 01°50'E	Prampram	05°42'N, 00°07'E
Lac Nokoué	06°26'N, 02°27'E	Sakumo Lagoon	05°31'N, 00°19'W
Zogbo, NW of Cotonou on Lac Nokoué	[06°24'N, 02°25'E]	Sekondi	04°56'N, 01°42'W
Fernando Poo [Macias Nguema Biyogo, Equatorial Guinea]	03°30'N, 08°42'E	Shama Bay	05°00'N, 01°36'W
Mongola	03°46'N, 08°44'E	Takoradi	04°53'N, 01°45'W
San Carlos	03°27'N, 08°33'E	Tema harbor	05°38'N, 00°01'E
Gabon		Tenkpobo [Tenpobo]	05°43'N, 00°08'W
Baie du Cap Lopez	00°40'S, 08°50'E	Teshi [Teshie]	05°35'N, 00°06'W
Barre des Portugais	01°16'S, 09°00'E	Volta River delta	05°55'N, 01°00'E
Cap Lopez	00°37'S, 08°43'E	Winneba	05°20'N, 00°37'W
Cap Santa Clara [Pointe Santa Clara]	00°30'N, 09°19'E	Guinea	
Crique Banjia [Banya]	00°14'N, 09°40'E	Conakry	09°31'N, 13°43'W
Ivindo River	00°09'S, 12°09'E	Fotoba	09°30'N, 13°48'W
Libreville	00°23'N, 09°27'E	Île Blanche	09°26'N, 13°46'W
Mayumba [Mayoumba]	03°25'S, 10°39'E	Île de Corail	09°26'N, 13°49'W
Nyanga	02°59'S, 10°17'E	Île Kassa [Cassa]	09°29'N, 13°45'W
Ogoué [stream]	00°49'S, 09°00'E	Îles de Los	09°30'N, 13°48'W
Owendo	00°17'N, 09°30'E	Île Marara	10°02'N, 14°02'W
Pointe Banda	03°46'S, 11°00'E	Île Roume	09°28'N, 13°48'W
Pointe Claire	01°08'S, 09°26'E	Île Tamara	09°29'N, 13°49'W
Pointe Gombé	00°18'N, 09°18'E	Matakong	09°16'N, 13°25'W
Pointe Panga	03°15'S, 10°32'E	Rio Pongo	10°03'N, 14°04'W
Port-Gentil	00°43'S, 08°47'E	Tanéne	10°03'N, 13°54'W
Sette Cama	02°32'S, 09°45'E	Guinea-Bissau [Portuguese Guinea]	
Gambia		Arquipélago dos Bijagós [Bissagos Islands]	11°15'N, 16°05'W
Bathurst	13°27'N, 16°35'W	Bissau	11°51'N, 15°35'W
Gambia River	13°28'N, 16°34'W	Ilha de Bissau	11°52'N, 15°46'W
		Ilha de Bubaque	11°15'N, 15°52'W
		Ilha Caravela	11°32'N, 16°20'W
		Ilha de Rubane [Rouban]	11°20'N, 15°49'W