

rum is unarmed, there are no dorsal sub-apical teeth. The lower margin of the rostrum bears five to eight teeth, the ultimate two of which often are extremely small and inconspicuous. A minute tubercle is placed on the mid-dorsal carina of the carapace just before the posterior margin. On each half of the carapace two strong, longitudinal carinae are present. The upper of these starts immediately behind the posterior margin of the orbit and almost attains the posterior margin of the carapace, it fades out just before reaching this margin. The other carina starts at the very strong pterygostomian spine and also runs over the larger part of the carapace before becoming inconspicuous. The antennal spine is supported by a distinct but short carina, which runs parallel with the anterior part of the post-orbital carina. Finally a short longitudinal carina is visible in the posterior part of the carapace at a short distance below the post-ptyergostomian carina. No other carinae are present. Both the antennal and pterygostomian spines are strong and end in a very slender point; that of the antennal spine being more slender than that of the pterygostomian.

The first and second segments of the abdomen bear no dorsal carina, but each is provided with a transverse groove in the postero-median part; these grooves almost reach the bases of the pleurae. The third segment bears a very distinct and sharply defined median longitudinal carina, which extends over the full length of the segment. The upper surface of the carina is flattened and it ends posteriorly in a distinct tooth. The fourth and fifth abdominal segments bear dorsally a rounded median carina which is not very distinct. No carina is visible in the sixth segment. In some specimens the posterior margin of the fourth segment shows a small and indistinct median tooth, which, however, completely lacks in others. The first three abdominal segments have the pleurae rounded, the pleurae of the fourth and fifth segments each end in a sharply pointed tooth. The fifth segment has about $\frac{3}{4}$ of the length of the sixth. The pleurae of the sixth segment are very small, and like the postero-lateral angles, end in a spine. The telson is about twice as long as the fifth ab-

dominal segment. It is elongate triangular, gradually narrowing posteriorly. The upper surface bears two indistinct longitudinal carinae, between which there is a conspicuous depression. Each of these carinae bears three (rarely 4) dorsal spines; the first of these spines is situated slightly before the middle of the telson. The posterior margin of the telson ends in a distinct sharp point and bears three pairs of spines. The outer of these spines are short, the intermediate are very heavy and rather long, the inner spines are more slender and shorter than the intermediates.

The surface of the carapace and the abdomen is covered with minute scales (length abt. 0.3 mm). These scales (fig. 27a, b) are strongly curved, their outline is about oval and they taper to a very narrow point. Their midrib in its basal part shows a strong ventral tubercle.

On the abdominal segments small, rounded or oval, sunken spots may be seen in the texture. The exact nature of these spots is not altogether clear, but they may be photophores. The arrangement of these spots is constant in the material examined: The first segment shows four round spots which are placed in one transverse line slightly before the middle of the segment. Each half of the segment bears one spot just above the base of the pleura and a second, which is situated about midway between the first and the median line of the segment. The second segment has a slightly oval spot placed somewhat in front of the articulation with the third segment, and a second, rounded, spot somewhat below and anterior to the first. The third segment shows two spots in each half, both being

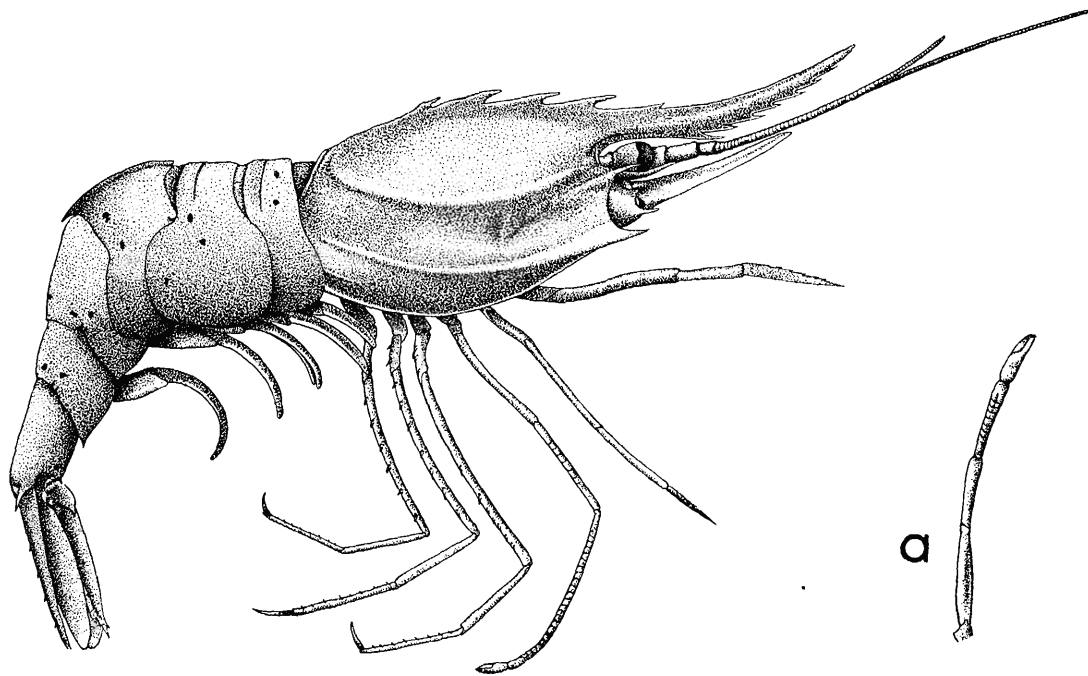


Fig. 26. *Heterocarpus grimaldii* A. MILNE EDWARDS & BOUVIER. Specimen from Sta. 41. a, smaller second leg. x 1.

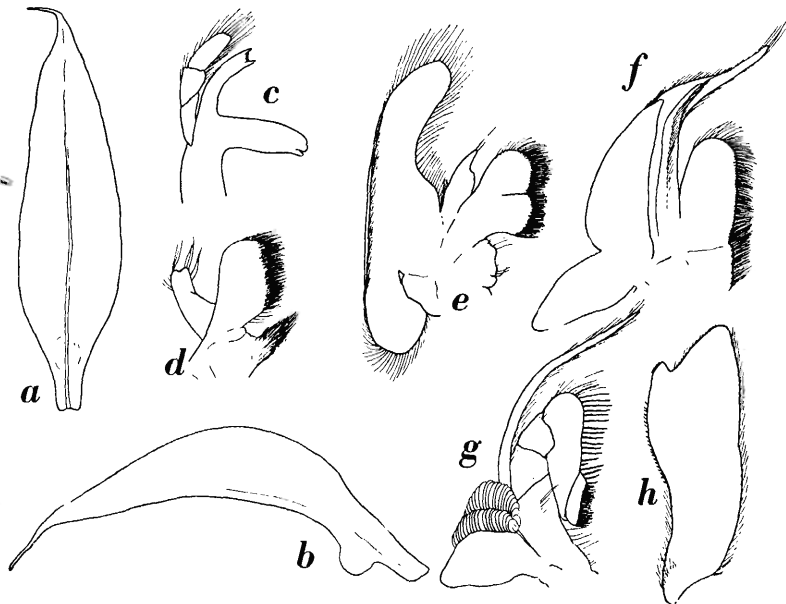


Fig. 27. *Heterocarpus grimaldii* A. MILNE EDWARDS & BOUVIER. Specimen from Sta. 41. a, body scale, in dorsal view; b, body scale, in lateral view; c, mandible; d, maxillula; e, maxilla; f, first maxilliped; g, second maxilliped; h, endopod of first pleopod of male. a, b, x 200; c—g, x 3; h, x 7.5.

situated at a short distance before the posterior margin of the segment; the lower of these spots is placed slightly above the base of the pleurae, the second about halfway between the first spot and the dorsal carina. The fourth segment shows a rounded spot somewhat before and an oval spot somewhat above the articulation with the fifth, while there furthermore is an almost round spot on the dorsal carina at about 1/4 of the length of the segment from the posterior margin. The fifth segment has a spot before the articulation with the sixth and one about halfway between this articulation and the dorsal carina of the segment. Finally a round spot is found on the pleura of the sixth abdominal segment.

The eyes have the cornea well developed and broader than the peduncle, which strongly narrows towards the base. No ocellus is present.

The stylocerite of the antennular peduncle ends in a very slender needle-shaped tip, which reaches slightly beyond the anterior end of the second segment of the peduncle. A short, blunt and anteriorly directed process is placed on the base of the stylocerite. The inner surface of the first segment is strongly produced ventrally and bears there a small spine. The second segment of the peduncle is shorter than the first and longer than the third.

The scaphocerite reaches with about half its length beyond the antennular peduncle. It is about three times as long as broad, and narrows slightly anteriorly. The outer margin is convex and ends in a strong tooth which reaches about as far forwards as the lamella. The antennal pe-

duncle fails to reach the middle of the scaphocerite; in its basal part it bears a long and slender external spine.

The mandible (fig. 27c) has a slender incisor process, which ends in two large and about three small teeth. The molar process is heavy and bears some blunt distal teeth. The palp consists of three large segments. The maxillula (fig. 27d) has the lower endite slender, the upper is high, it bears a row of spines and numerous hairs; the palp is well developed and somewhat bilobed distally. Of the maxilla (fig. 27e) the lower endite is strongly reduced, the upper endite is large and quite deeply cleft; the palp narrows rather suddenly in its distal part and ends in a few hairs; the scaphognathite is elongate and slender. Exopods are present in the first and second maxillipeds. The endites of the first maxilliped (fig. 27f) are separated by a distinct notch; the palp is elongate and well developed; the exopod is rather large, though the flagellum is not very long, the caridean lobe is distinct; the epipod is distinctly bilobed. The second maxilliped (fig. 27g) has the last joint connected with its longer side to the distal end of the penultimate joint; the exopod is well developed; the epipod bears a large podobranch. The third maxilliped reaches slightly beyond the scaphocerite. The last joint is about 1.5 times as long as the penultimate, it ends in a sharp point and bears some spines on the upper margin. The antepenultimate joint is almost as long as the two distal joints together. No exopod is present. The branchial formula of this species is the following:

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

The first leg almost reaches the end of the scaphocerite. The fixed finger of the chela is reduced to a spine which is about half as long as the dactylus. The carpus is about 1.5 times as long as the propodus and is somewhat shorter than the merus. Of the second legs the longer reaches with the chela and about 1/3 to 1/2 of the carpus beyond the scaphocerite. The carpus consists of 21 to 24, the merus of 8 to 10 joints. The merus is about half as long as the carpus and the chela combined and is about as long as the ischium. The basal part of the ischium is slightly widened and bears some curved hairs there on the inner margin. The shorter second leg (fig. 26a) is far more robust than the longer, it reaches somewhat beyond the middle of the scaphocerite. The chela is more than half as long as the carpus. The dactylus ends in two teeth which

fit around the tip of the fixed finger when the chela is closed. The carpus consists of 7 to 9 joints, it is about as long as the ischium and slightly longer than the merus. Like in the larger leg the basal part of the ischium is somewhat swollen and bears some hairs on the inner margin. The third leg reaches with about half the propodus beyond the scaphocerite. The dactylus is slender, it measures slightly more than 1/3 of the length of the propodus. Its posterior margin bears about 6 small spinules in its basal part and is unarmed distally. A double row of spines is placed on the posterior margin of the propodus, a similar but very inconspicuous double row is present in the carpus. The carpus is almost as long as the propodus. The merus also bears a double row of spines on the posterior surface, these spines are stronger than those of the propodus. Two spines are present on the ischium. The merus is about as long as the propodus and carpus together. The ischium is small. The fourth leg is very similar to the third. The fifth differs from the two preceding by having the dactylus shorter and by lacking the spines on the ischium.

The endopod of the first pleopod of the male (fig. 27h) is slightly more than half as long as the exopod, it is oval in shape and bears a short appendix interna. The second pleopod of the male has the appendix masculina about as long as the appendix interna. In the female the first pleopod has the endopod rather long and ending in a slender point. The uropods are elongate ovate. The outer margin of the exopod ends in a sharp tooth at the inner side of which is a strong movable spine.

The eggs are numerous and small, their diameter varies between 0.45 and 0.7 mm.

A specimen of this species (cl. 29 mm) from Station 228 of the Monaco Expeditions (Azores, between Pico and São Jorge, 38°22'23" N, 28°22'32" W, August 15 and 16, 1888, fish trap at 1294 m depth) differs from the «Michael Sars» material by having the rostrum more strongly upturned. On the other hand a specimen (cl. 38 mm) from off Portuguese Guinea (10°24' N, 17°30' W, depth 540 m, May 29, 1952, West African Fisheries Research Institute) has the rostrum only slightly longer than the scaphocerite and hardly curved at all; this specimen on the whole is somewhat more robust than the «Michael Sars» material, but no essential differences could be found.

The present species is extremely closely related to the Indo-West Pacific *Heterocarpus laevigatus* BATE (1888) from which it differs in having the rostrum generally with less ventral teeth. Though BATE (1888, p. 636) reports that the type of *H. laevigatus* possesses only 6 ventral rostral teeth, later authors found many more (10 to 13) teeth there in their material of that species. Furthermore *Heterocarpus laevigatus* differs from *H. grimaldii* in having the dorsal carina of the third abdominal segment blunt

and rounded, while the segment does not end in a distinct postero-median tooth. A direct comparison of material of the two species might reveal more differences.

COUTIÈRE (1911, p. 157; 1938, p. 266) states that «*Heterocarpus laevigatus* Alcock est représenté dans l'Atlantique par une forme si voisine que je l'ai distinguée seulement comme var. *occidentalis*». *Heterocarpus laevigatus occidentalis* COUTIÈRE is a nomen nudum since COUTIÈRE does not give any description of it; we cannot help to feel, however, that it might be identical with *H. grimaldii*.

Distribution. Until now the species was known only from the type locality: between Pico and São Jorge, Azores, 38°33'21" N, 28°08'30" W, in fish trap at 1300 m depth, August 17 and 18, 1888, Monaco Expedition Sta. 232¹. The above mentioned specimen from Station 228 of the Monaco Expeditions, which is preserved in the Zoological Museum at Amsterdam, though collected close to the type locality at an earlier station of the 1888 Monaco Expedition, has not been mentioned in A. MILNE EDWARDS & BOUVIER's (1900a) paper. The «Michael Sars» material and the above mentioned specimen from off Portuguese Guinea (the latter forming part of the collection of the Rijksmuseum van Natuurlijke Historie at Leiden), somewhat extend our knowledge of the range of distribution of the species. *Heterocarpus grimaldii*, which is a bottom-dweller, is known from depths between 540 and 1365 m.

***Chlorotocus crassicornis* (COSTA)** (textfigs. 28, 29, pl. III fig. 3)

Pandalus crassicornis COSTA, 1871, Annu. Mus. zool. Univ. Napoli, vol. 6, p. 89, pl. 2 fig. 2.

Station 21, west of Gibraltar, 35°31' N, 6°35' W, depth 535 m, May 5, 1910. 3 specimens (1 ovigerous female, cl. 25 mm), cl. 20 to 25 mm.

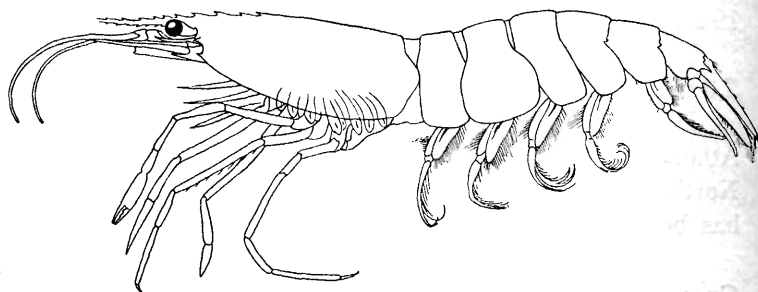


Fig. 28. *Chlorotocus crassicornis* (COSTA). Specimen from Sta. 21 (cl. 20 mm).

¹ A. MILNE EDWARDS & BOUVIER (1900 a) make a mistake in stating the station number of this locality as 233, it should be 232. The position of these two stations is the same, but the material of Station 232 was collected in a fish-trap, that of Station 233 with the dredge.



Fig. 29. *Chlorotocus crassicornis* (COSTA). Body scale of specimen from Sta. 21. x 162.

The specimens are in a good condition and agree well with the descriptions and figures of this species. The rostrum bears 11 to 13 dorsal teeth of which 4 or 6 are placed behind the orbit, the lower margin bears 4 to 7 teeth. SUND's figures of the ovigerous female (pl. III fig. 3) and that of the smallest specimen (textfig. 28) are reproduced here.

Like most, if not all, other Pandalidae *Chlorotocus crassicornis* possesses small scales that are implanted on the integument of the carapace and the abdomen. These scales (fig. 29) are elongate ovate and end in a slender point.

Distribution. The species has been reported from the Western Mediterranean, the Bay of Biscay, from West, South and East Africa and from the Andaman Sea. It has been found at depths between 74 and 5800 m.

Crangonidae

Sabinea hystrix (A. MILNE EDWARDS)

Paracrangon hystrix A. MILNE EDWARDS, 1881 a, Ann. Sci. nat. Zool., ser. 6 vol. 11 pt. 4, p. 6.

Station 70, S.E. of Newfoundland, 42°59' N, 51°15' W, depth 1100 m, June 30, 1910. 3 specimens (1 ovigerous female, cl. 24 mm), cl. 19 to 24 mm.

The specimens at hand agree well with the descriptions given of the species in the literature, except for the length of the rostrum. The latter is relatively much longer in our specimens than e.g., in SMITH's (1882, p. 40) material. In our two females (cl. 24 and 19 mm) the rostrum is 24 and 18 mm long respectively, in our male specimen (cl. 19 mm) the rostrum measures 20.5 mm.

The diameter of the eggs in our material is 2.2 by 2.0 mm.

Distribution. The species inhabits the western Atlantic from the Davis Strait and S.W. of Iceland in the North to the West Indies (Guadeloupe) in the south. It has been found in depths between 550 and 3600 m.

Crangon allmanni KINAHAN

Crangon Allmanni KINAHAN, 1857, Proc. nat. Hist. Soc. Dublin, vol. 2, p. 28, 2 figs.

Station 96, S.W. of Ireland, 50°57' N, 10°46' W, depth 100 m, July 27, 1910. 1 specimen, cl. 5.3 mm.

Distribution. The species inhabits the eastern Atlantic from S.W. Norway to the Bay of Biscay. It occurs in depths down to 360 m.

Sclerocrangon jacqueti (A. MILNE EDWARDS)

Pontophilus Jacqueti A. MILNE EDWARDS, 1881, C. R. Acad. Sci. Paris, vol. 43, p. 933.

Station 70, S.E. of Newfoundland, 42° 59' N, 51°15' W, depth 1100 m, June 30, 1910. 2 specimens, cl. 6.5 and 9 mm.

The larger specimen has the left half of the carapace deformed by the presence of a bopyrid Isopod in the left branchial chamber.

Distribution. The species is known from off the eastcoast of the U.S.A. (between Massachusetts and S. Carolina) and the British Isles (off the Hebrides and off S. W. Ireland). The type originates from the eastern Atlantic, but the exact locality is not known. The species has been found in depths between 450 and 1700 m.

Pontophilus spinosus (LEACH)

Crangon spinosus LEACH, 1815, Trans. Linn. Soc. Lond., vol. 11, p. 346.

Station 96, S.W. of Ireland, 50°57' N, 10°46' W, depth 100 m, July 27, 1910. 2 specimens, cl. 3 mm.

Distribution. The species has been reported from Iceland and N. Norway in the north to the Mediterranean in the south, from depths between 20 and 1550 m.

Pontophilus norvegicus (M. SARS)

Crangon norvegicus M. SARS, 1861, Nyt Mag. Naturvidensk., vol. 11, p. 248.

Station 4, S.W. of Ireland, 49°38' N, 11°35' W, depth 1000 m, May 10 and 11, 1910. 5 specimens, cl. 9 to 14 mm.

Distribution. From Greenland, Iceland and Spitsbergen south to New York, the British Isles and the Bay of Biscay. Found in depths between 54 and 1450 m.

Pontophilus bispinosus HAILSTONE

Pontophilus bispinosus HAILSTONE, 1835, Mag. nat. Hist., vol. 8, p. 271, fig. 30.

Station 96, S.W. of Ireland, 50°57' N, 10°46' W, depth 100 m, July 27, 1910. 6 specimens (1 ovigerous female, cl. 4 mm), cl. 2.5 to 4 mm.

Distribution. The species has been reported from Iceland, the Faeroes and W. Norway south to the Mediterranean and the Azores. It has been collected from depths down to 360 m.

Pontophilus sculptus (BELL)

Crangon sculptus BELL, 1847—1850, Hist. Brit. stalk-eyed Crust., p. 263, fig.

Station 38, off Cape Bojador, Rio de Oro, 26°3' N, 14°36' W, depth 83 m, May 20, 1910. 1 specimen, cl. 4.6 mm.

The specimen agrees very well with the West African specimens collected by the «Atlantide» Expedition dealt with by HOLTHUIS (1951, p. 169).

Distribution. The species inhabits not too deep waters (down to 160 m) and is known from the eastern Atlantic (from the British Isles to the Mediterranean and West Africa).

Polychelidae

Polycheles validus (A. MILNE EDWARDS)

Pentacheles validus A. MILNE EDWARDS, 1880, Bull. Mus. comp. Zoöl. Harvard, vol. 8, p. 65.

Polycheles MURRAY & HJORT, 1912, Depths of the Ocean, p. 420.

Station 25, west of Gibraltar, 35°46' N, 8°16' W, depth 2055 m, May 8, 1910. 1 female, 101 mm.

Station 88, north of the Azores, 45°26' N, 25°45' W, depth 3120 m, July 18, 1910. 2 specimens, 59 and 85 mm.

Station 95, S.W. of Ireland, 50°22' N, 11°44' W, depth 1797 m, July 26 and 27, 1910. 1 specimen, 89 mm.

The specimens agree well with the descriptions given of this species in the literature. The specimens from Sta. 88 have been mentioned by MURRAY & HJORT (1912, p. 420).

Distribution. The species is known from the western Atlantic (from off New England to the West Indies), from near the Azores and from near the Canary Islands; furthermore there is an uncertain record from the Mediterranean. It has been found in depths varying between 1700 and 3120 m.

Stereomastis sculpta (SMITH)

Polycheles sculptus SMITH, 1880, Proc. U.S. Nat. Mus., vol. 2, p. 346, pl. 7.

Station 24, west of Gibraltar, 35°34' N, 7°35' W, depth 1615 m, May 6, 1910. 1 male, 48 mm.

Station 41, near the Canary Islands, 28°8' N, 13°35' W, depth 1365 m, May 23, 1910. 1 ovigerous female, 112 mm, 1 damaged female.

The arrangement of the spines of the lateral margin of the carapace in the present specimens is quite normal. In most specimens the formula is 6—3—7; only one specimen has 8 spines in the posterior part of one of the margins, while another specimen has 4 instead of three intermediate spines.

Distribution. The species has been reported from the Atlantic Ocean (from S. of Iceland to the West Indies, the Cape Verde Islands and West Africa as far south as Angola), from South and East Africa, the Arabian Sea and the Malay Archipelago. It was found in depths between 380 and 2865 m.

Willemoesia forceps A. MILNE EDWARDS (figs. 30, 31)

Willemoesia forceps A. MILNE EDWARDS, 1880, Bull. Mus. comp. Zoöl. Harvard, vol. 8, p. 64.

Pentacheles p. p. MURRAY & HJORT, 1912, Depths of the Ocean, p. 420.

Station 53, south of the Azores, 34°59' N, 33°1' W, depth 2615 m, June 8 and 9, 1910. 1 male, 122 mm.

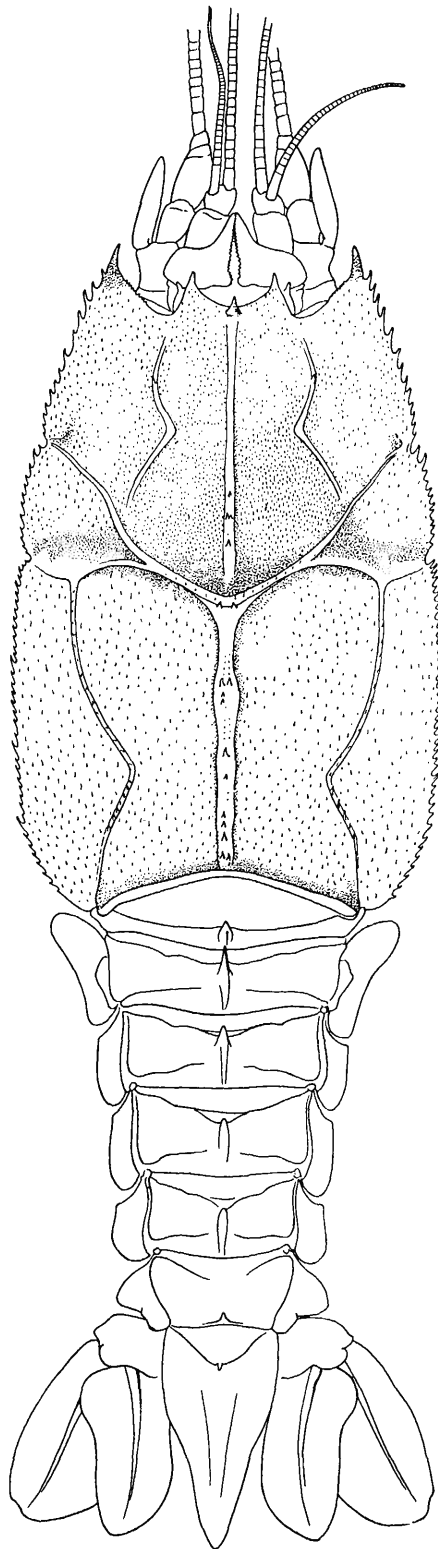


Fig. 30. *Willemoesia forceps* A. MILNE EDWARDS. Specimen from Sta. 53. x 1.3.

The specimen agrees well with BOUVIER's (1925, p. 424, textfigs. 1—4, pl. 10 figs. 1, 2, pl. 11 figs. 1—6) description and figures. The spine-formula of the median carina of the carapace in our specimen is 1.1.2.1 + 2.2.1.1.

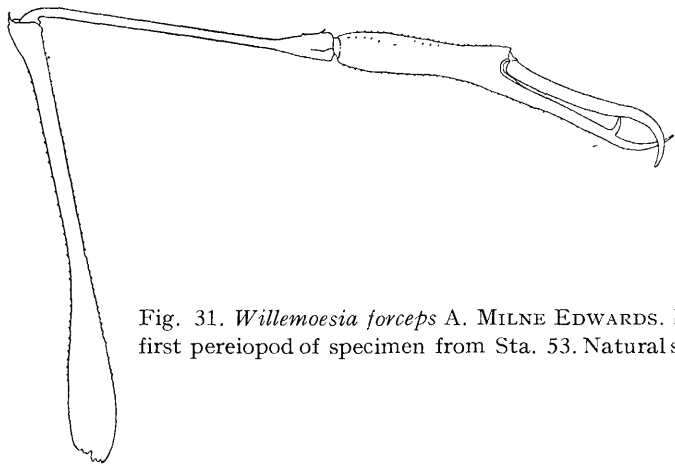


Fig. 31. *Willemoesia forceps* A. MILNE EDWARDS. Left first pereiopod of specimen from Sta. 53. Natural size.

1.1.1.1.1.2. The gastro-orbital carina in this specimen does not join with the precervical carina, but becomes obsolete posteriorly. There is a large number (32) of distinct, though small, spinules on the upper branchial carina. The spine-formulae of the lateral carinae are: 14 — 12 — 41 and 15 — 13 — 39.

The carpus of the first leg is slightly shorter than the chela. On the upper inner side of the carpus there is a longitudinal row of small denticles, which is not shown in fig. 31. The palm of the cheliped bears a double row of spinules on the lower surface; slightly beyond the base of the fixed finger this row becomes single and ends at about the middle of the length of the finger. On the upper surface of the palm there are about four more or less distinct longitudinal rows of spinules; the length of these rows is variable.

Like in the female type specimen, the present male has the dactylus of the last leg longer than the fixed finger, also in the other features the two legs resemble each other. BOUVIER (1925) evidently makes a mistake when he states (p. 427): «la portion palmaire de cette pince [of the fifth leg of the female] est plus étroite et beaucoup plus courte que le carpe». Both BOUVIER's figure (pl. 11 fig. 6) and our specimen show that the palm actually is longer than the carpus.

The median spine on the second abdominal segment is very strong and pointed, in the third segment it is blunter, while in the fourth and fifth segments the anterior end of the median carina is angular and shows no spine at all.

Distribution. The species is known from the West Indies (west of Tortugas), from the Sargasso Sea (31°45'30" N, 42°42'30" W) and from off N.W. Africa (off Cape Garnet, Rio de Oro). It has been found in depths between 2615 and 3465 m. ALCOCK's (1899, p. 33; 1902, p. 155) records of the present species from the Bay of Bengal, obviously are based on specimens of *Willemoesia indica* ALCOCK.

Willemoesia leptodactyla (WILLEMÖES-SUHM)

Deidamia leptodactyla WILLEMÖES-SUHM, 1873, in THOMSON, Nature, vol. 8, p. 51, fig. 2.

Pentacheles p. p. MURRAY & HJORT, 1912, Depths of the Ocean, p. 420.

Station 53, south of the Azores, 34°59' N, 33°1' W, depth 2615 m, June 8 and 9, 1910. 3 females, 65 to 67 mm.

The spine-formula of the median dorsal carina of the carapace in our specimens is 1.(1).(1).(1).1.1.1.2.1. + 2.2.1.1.1.1, which agrees excellently with the formula given for this species by BOUVIER (1917, p. 33), but differs somewhat from that given by SUND (1920, p. 222) for the type of the species. SUND mentions only one double spine on the posterior half of the carina; the first of the double spines often is indistinct and may have been overlooked by SUND. The gastro-orbital carina bears 5 spines in our material, while on the superior branchial carina 16 to 20 spinules are present. The spine-formula of the lateral margin in our specimens is 6 to 9 — 4 to 7 — 15 to 22, which agrees well with the formulae published in the literature (BOUVIER, 1917: 7 to 8 — 5 to 6 — 20; SUND, 1920: 7 — 4 — 18).

The shape of the median part of the anterior margin of the carapace in our specimens resembles more BOUVIER's (1917) pl. 1 fig. 6 and BATE's (1888) pl. 18, than BATE's (1888) pl. 19 fig. c', furthermore the scaphocerite is more slender and blunter than the one figured in BATE's (1888) pl. 19 fig. c''. SUND (1920) showed that BATE's material of *Willemoesia leptodactyla* actually consists of 4 species and that only the type specimen from the North Atlantic belongs to the true *Willemoesia leptodactyla*.

An interesting feature of the present material is the difference in the outline of the carapace of two of the specimens. In one, which is 70 mm long, the carapace is slightly more arched than in the other and is distinctly broader behind the cervical groove than in front of it; in this specimen the length of the carapace is 34.5 mm, the greatest breadth of the carapace (just before the posterolateral angles) is 24 mm, and the breadth at the middle of the anterior part of the lateral margin is 18 mm. The other specimen is 67 mm long, here the carapace is less swollen and is only slightly broader behind the cervical groove than in front of it; the corresponding measurements for the length, the greatest breadth and the anterior breadth of this specimen are 31 mm, 19.5 mm and 17.5 mm.

Distribution. Thus far only three specimens were known of this species. The type originates from the Mid-Atlantic (21°38' N, 44°39' W), the two other specimens were collected near the Azores (BOUVIER, 1917). It was found at depths between 3420 and 4360 m.

Nephropsidae

Nephrops norvegicus (L.)

Cancer norvegicus LINNAEUS, 1758, Syst. Nat., ed. 10 vol. 1, p. 632.

Station 1, off S.W. Ireland, 49°27' N, 8°36' W, depth 146 m, April 9, 1910. 1 female, 93 mm.

Station 21, west of Gibraltar, 35°31' N, 6°35' W, depth 535 m, May 5, 1910. 4 males, 106 to 188 mm, 1 female, 129 mm.

Distribution. The species is known from Iceland and N. Norway south to the Mediterranean. It has been reported from depths between 40 and 615 m.

Nephropsis atlantica NORMAN

Nephropsis atlantica NORMAN, 1882, Proc. Roy. Soc. Edinb., vol. 11, p. 684.

Station 4, off S.W. Ireland, 49°38' N, 11°35' W, depth 923 m, April 10 and 11, 1910. 2 males, 69 and 79 mm, 4 females (1 ovigerous, 87 mm), 74 to 87 mm.

Station 23, west of Gibraltar, 35°32' N, 7°7' W, depth 1215 m, May 6, 1910. 2 males, 55 and 68 mm, 2 females, 71 (ovigerous) and 77 mm.

Station 24, west of Gibraltar, 35°34' N, 7°35' W, depth 1615 m, May 6 and 7, 1910. 4 males, 63 to 71 mm, 4 females 70 to 78 mm.

Distribution. The species is known from the eastern Atlantic (from the Faeroes south to the Cape Verde Islands), from S. Africa and the Arabian Sea. It has been found in depths between 628 and 1804 m.

DECAPODA ANOMURA

Galatheidae

***Munidopsis bermudezi* CHACE (pl. IV fig. 2)**

Munidopsis bermudezi CHACE, 1939, Mem. Soc. Cubana Hist. nat. vol. 13, p. 46.

Munidopsis MURRAY & HJORT, 1912, Depths of the Ocean, p. 420.

Station 88, north of the Azores, 45°26' N, 25°45' W, depth 3120 m, July 18, 1910. 1 male, 69 mm.

The specimen agrees with CHACE's (1942, p. 83, figs. 29, 30) extensive description and figures except for a few minor details. The rostrum is longer and has the distal part narrower, its outline thereby is more narrowly triangular. In the first to third ambulatory legs (= second to fourth pereopods) the upper margin of the propodus bears one spine, which is situated in the proximal third. The merus of the first to third pereopods possesses five dorsal spines, that of the fourth pereopod only 4; the carpus of the second to fourth pereopods bears two dorsal spines. The posterior carina of the fourth abdominal segment is only slightly less strong than the anterior. In all essential details, however, our specimen resembles the type.

SUND made the following notes on this specimen: «Richly pubescent. Long fur on the legs, on the body a short dense velvet which obscures the sculpturation, though the sulci corresponding to those found in *Munidopsis crassa* Smith are visible. In the present species the branchio-cardiac sulci are not so sharply cut and have more the character of shallow furrows. The species is distinguished from *Munidopsis similis* Smith by the shorter legs, and especially by the shorter chelipeds, which do not appear to be regenerated, being here of equal length. The three spines on the upper surface of the carpus of the chelipeds do not form a row as in *M. similis*, since the innermost spine is placed farther backwards. The spines on the anterior margin of the carapace are much shorter than those shown in the figure of *M. similis* and the portion of the margin between the orbital and the antero-lateral spines is relatively longer and is placed nearly at right angles with the body-axis. In Smith's (1886) figure of *M. similis* this part of the anterior margin of the carapace is very oblique. The propodi are circular in cross-section.»

The present specimen has been mentioned by MURRAY & HJORT (1912, p. 420) as *Munidopsis*.

Distribution. The species until now only has been reported from off the north and off the south coast of Oriente Province, Cuba, where it was found in depths between 2400 and 3000 m.

***Munidopsis sundi*, new species (pl. IV figs. 3,4)**

Munidopsis, n. sp. MURRAY & HJORT, 1912, Depths of the Ocean, p. 420.

Station 53, south of the Azores, 34°59' N, 33°1' W, depth 2615 m, June 8 and 9, 1910. 1 female, 218 mm.

The carapace is somewhat broader than long (as its length the distance between the gastric spines and the median point of the posterior margin is taken), being broadest in the anterior part. In the median region it is somewhat raised, sloping down towards the lateral margins. The surface of the carapace is naked, at least no hairs are visible in our specimen. The cervical groove is very distinct throughout its course, and so is its anterior branch. An indistinct transverse groove, which in its median region is directed slightly forwards, is visible near the base of the rostrum. Another groove, which likewise is rather indistinct, runs from the lateral end of the cervical groove to the median part of the posterior margin of the carapace. The whole of the dorsal surface of the carapace and rostrum bears tubercles which, especially behind the cervical groove, take the shape of shorter or longer transverse ridges. In the postero-lateral parts of the carapace, behind the last mentioned indistinct groove, the transverse ridges are short and placed close together. In the median post-cervical region these ridges are long and more widely spaced. In the remaining lateral post-cervical regions the elevations are more tuberculiform and not ridge-like. They are also tuberculiform in the part of the carapace that is situated before the cervical groove. The dorsal surface of the carapace bears no spines except for two small gastric ones. The lateral margin of the carapace shows several teeth. Immediately behind the anterior branch of the cervical groove it bears a strong tooth which is much stronger than

the antero-lateral tooth. The anterior margin of the former tooth bears one or two small spinules. At some distance behind this tooth there is a second of almost the same size. Since the lateral margin between the two branches of the cervical groove is rather strongly convex, the second large tooth is situated more or less externally of the first. Between the two teeth one or two spinules are present; behind the second tooth the lateral margin of the carapace is serrate, showing some four or five larger and four or five smaller spines. Behind the posterior branch of the cervical groove the lateral margin of the carapace bears a very small tubercular spine; no other spines are present here, the rest of the margin being somewhat granular. The posterior margin of the carapace is granular too and bears no spines at all.

The rostrum is straight. The lower surface is smooth and flat with a faint indication of a median carina. On the upper surface there is a longitudinal median carina which becomes inconspicuous posteriorly. In its anterior part this carina bears five distinct spinules. The breadth of the rostral base, measured at the level of the corneae is equal to the length, measured from the tip to the level of the corneae. The rostrum tapers rather rapidly from the base to the middle of its length and then gradually narrows towards the tip. The lateral margins of the rostrum thereby are concave. These margins each bear about 15 distinct but small spinules, which are regularly distributed over their entire length. The anterior margin of the carapace, from the base of the rostrum to the antero-lateral spine, is concave and is distinctly separated from the lateral margin of the rostrum. A strong post-antennal spine is present, being slightly stronger than the antero-lateral spine.

The sternum is smooth, it only shows some shallow hair-filled pits in the anterior part and on the lines that separate the segments.

The abdomen has the first segment entirely smooth and for the larger part covered by the carapace. The second, third, and fourth segments have their anterior half smooth, the posterior half is roughened and raised. This posterior half shows a distinct transverse groove, which is most distinct in the second, and vaguest in the fourth segment. Short hairs are visible on the anterior part of the raised portion of the segments and in the transverse grooves. The fifth and sixth segments show no grooves at all, they have the larger part of their dorsal surface covered with tubercles. The pleurae of the abdominal segments are elongate and bluntly topped. Their posterior half bears tubercles, their anterior half is smooth, except in the second where the pleurae are tuberculate all over. The posterior margin of the sixth segment is about straight with rounded lateral angles. The telson consists of 8 calci-

fied pieces. Three of these are very small and triangular: one situated in the center of the telson, the two others in the antero-lateral corners. Furthermore there is a large basal piece which is about triangular with each of the angles truncate. These truncate angles touch one of the above mentioned small triangular pieces each. Finally there are two large lateral pieces on each side; the anterior of these are triangular, the posterior have their posterior margin (which at the same time forms half of the posterior margin of the telson) rounded.

The eyes are practically immovable. The cornea is small, globular and without pigment. It is far outreached by a strong apical spine, which is placed on its inner side; no other spines are present.

The basal segment of the antennular peduncle is provided with two strong spines which are placed externally of the base of the next segment. The inner of these spines is slightly stronger than the outer. Near the inner side of the base of the second segment the anterior margin of the basal segment bears a denticulated lobe.

The basal segment of the antenna is broad and bears two tooth-like spines, one just over the opening of the green gland, the other externally of the base of the second segment. The anterior margin of the second segment bears three broad spines, one internally, one externally and one dorsally, the latter being shorter and blunter than the first two. The third segment too has three anterior spines: one small dorso-internal, one larger dorso-external and one small ventro-internal. The last segment of the peduncle possesses a shallow denticulated dorso-external lobe.

The antepenultimate segment of the exopod of the third maxilliped reaches beyond the end of the merus. The ischium bears no spines except for a small tuberculiform spinule at the anterior end on the ventral carina. The merus is slightly longer than the ischium. The inner margin bears no spines but is faintly and irregularly serrate, one or two of the denticles may be larger than the others. The outer margin is entire and ends in a small but distinct spinule.

Like the carapace, all the legs are covered with tubercles. No epipods are present on any of the legs. The chelipeds are short and heavy, they are about as long as the carapace (rostrum excluded) and reach with the fingers beyond the tip of the rostrum. The chelae are flattened and are about $\frac{2}{3}$ as high as long. The fingers are as long as the palm, their cutting edges are crenulate and their tips spoon-shaped; they close over their full length. Both surfaces of the chela bear tubercles, these are most distinct on the palm. The lower margin of the fixed finger bears a single row of about 7 spinules which are placed close together. The lower margin of the palm shows a rather irregular double row of spinules which becomes inconspicuous

proximally, while a few scattered spinules are present in the lower part of the outer surface. The upper margin bears a row of four or five spinules. The carpus is about as long as the palm. The anterior margin dorsally bears four spines. Two more spines are placed behind the inner anterior spine, forming an oblique row with it. A longitudinal row of about 4 spinules is placed behind the outer median anterior spine. No spines are found on the lower surface. The anterior margin of the merus also bears four spines, two dorsal and two ventral. The ventral spines are placed at the external and internal angles; one of the dorsal spines is situated somewhat above the external ventral spine, the other is placed in the middle of the dorsal part of the anterior margin. This last spine forms the end of a dorsal ridge which bears 6 or 7 spines. The ischium possesses a small dorsal spinule on the anterior margin. The inner margin of the ischium bears a strong spine which is placed at some distance behind the anterior margin; behind this large spine there is a row of 5 to 8 smaller spinules. Some tufts of hairs are placed on the fingers, while long scattered hairs may be seen on the upper and lower margin of the chela, on the upper surface of the carpus (also a few on the lower surface) and on the anterior part of the upper surface of the merus.

The three ambulatory legs resemble each other very much. The second pereopod reaches with the dactylus beyond the tip of the chela. The lower margin of the dactylus bears a row of about 14 denticles. The tubercles on the upper and lateral surfaces of the dactylus are arranged in more or less distinct longitudinal rows. The upper part of the inner surface of the propodus is smooth, the lower part bears tubercles; an indistinct ridge separates these two parts. The outer surface bears two longitudinal rows of spiny tubercles. A similar row of spiny tubercles is present on the lower margin. The upper margin bears some 7 to 12 spinules which are most distinct in the third and least distinct in the fifth leg. A fringe of long hairs is placed on the upper margin of the propodus. The carpus is somewhat more than half as long as the propodus. There are three spines placed in the upper outer part of its anterior margin. Two to four spines are found on the upper margin behind the upper anterior spine, while a single row of spiny granules is visible behind the lower of the three anterior spines. The anterior margin of the merus bears one dorsal and one lower external spine, the former being much stronger than the latter. A row of 7 to 11 spines is placed on the upper margin behind the upper anterior spine.

The uropods have the protopod provided in the inner half of its posterior margin with a small spine and some denticles, the latter being placed externally of the former. The exopod bears a row of some granules which are placed parallel with and close to the external margin. A very few

scattered granules are placed on the rest of the upper surface, which, however, gives a very smooth impression. The endopod has the external part of the upper surface covered with many tubercles which are similar to those of the telson.

Colour. MURRAY & HJORT (1912, p. 420) describe the present specimen as a «large white decapod».

Munidopsis sundi is a typical member of the Orophorhynchus-group of the genus *Munidopsis*. It is closely related to *M. subsquamosa* HENDERSON and its variety *pallida* ALCOCK. The present new species agrees with *M. subsquamosa pallida* and differs from the typical form of that species in possessing only two gastric spines. From both forms it differs in the shape of the rostrum and the anterior part of the carapace. In *M. subsquamosa* the rostrum tapers regularly towards the top and is not suddenly narrowed in the middle of its length, furthermore the post-antennal spine is less strong than the antero-lateral, and the latter reaches farther outwards than the following spine. In *M. subsquamosa pallida* the chelipeds possess a large epipod, which is missing in *M. sundi*.

With a total length of 218 mm and a carapace length (including the rostrum) of 102 mm, the present species is one of the largest, if not the largest, of the known Galatheids.

We have named this new species for OSCAR SUND, who was the first to recognise our specimen as belonging to an undescribed species, but who did not get the opportunity of publishing an account of it.

***Munidopsis crassa* SMITH (pl. IV fig. 1)**

Munidopsis crassa SMITH, 1885, Proc. U.S. Nat. Mus., vol. 7, p. 494' «chalk-coloured crab» MURRAY & HJORT, 1912, Depths of the Ocean, p. 62.

Station 10, Bay of Biscay, 45°26' N, 9°20' W, depth 4700 m, April 19 to 21, 1910. 1 specimen, 98 mm.

The rostrum in our specimen is less elongate than in BOUVIER's (1922, pl. 1 fig. 5) figure. The two gastric spines are distinctly larger than the other spines that are placed in the same area. Behind the cervical groove the lateral margin of the carapace bears three teeth, behind these the margin only shows some spinuliferous granules.

SMITH (1885, p. 494; 1886, p. 646) described this species as having the eye with two spines, an apical and an outer spine, which are well shown in his (1886) figure. The lateral spine lacks in our specimen and also is absent in BOUVIER's (1922, p. 47) animal from the Bay of Biscay. In both CHACE's (1942, p. 73) and BENEDICT's (1902, p. 276) keys to species of the genus *Munidopsis*, *M. crassa* is stated to lack the outer spine. Dr. FENNER A. CHACE, JR., curator of the division of marine invertebrates of the U.S. National Museum, Washington, D.C., was kind enough to

examine SMITH's (1885 and 1886) material for us, and found that in the holotype of *M. crassa* from «Albatross» Sta. 2224 the outer spine of the eye indeed is present and that the eye is very accurately figured by SMITH (1886). In the specimen from «Albatross» Sta. 2566, however, the outer spine is vestigial and practically non-existent; in other respects the two «Albatross» specimens are very similar. A direct comparison of our specimen with that from «Albatross» Sta. 2566, which we received on loan from the U.S. National Museum, did not reveal any worth while differences so that we do not entertain the least doubt as to the specific identity of these two specimens.

The basal segment of the antennular peduncle bears two slender spines which are of about equal size, the inner being slightly longer and stronger than the outer.

The merus of the third maxilliped ends dorsally in a distinct anterior spine. Its ventral margin bears five or six bluntly triangular teeth of unequal size, which often are alternately large and small.

The ischium of the cheliped on the anterior margin bears a strong dorsal and a weaker ventro-external spine; a ventro-internal spine is placed at some distance behind the anterior margin. The anterior margin of the merus bears the following four strong spines: (a) an external and (b) an internal spine on the lower surface, (c) a dorsal spine which forms the end of a dorsal row of 6 large spines and some spinules, and (d) a fourth spine which is placed somewhat internally of the dorsal spine. The dorsal part of the anterior margin of the carpus bears five spines, the internal of which is the strongest and forms the end of a longitudinal row of three dorsal spines. The lower part of the anterior margin bears one spine in the external half. In our specimen the carpus of the left cheliped is abnormal by having eight spines crowded in the outer part of the anterior margin.

Colour. MURRAY & HJORT (1912, p. 62) described the specimen collected by the 1910 «Michael Sars» Expedition as a «chalk-coloured crab».

Distribution. The species is known from off the east coast of the U.S.A. between 36° and 41° N, from the Bay of Biscay and from between the Azores and Portugal. It has been found in depths between 3100 and 4700 m.

Munidopsis curvirostra WHITEAVES

Munidopsis curvirostra WHITEAVES, 1874, Amer. Journ. Sci., ser. 3 vol. 7, p. 212.

Station 70, S.E. of Newfoundland, 42°59' N, 51°15' W, depth 1100 m, June 30, 1910. 2 males, 18 and 26 mm.

The specimens agree well with SELBIE's (1914, p. 84) description. The rostrum is slightly more than 2/3 of the length of the carapace. No accessory spine is found with the antero-lateral spine. In the smaller specimen the cara-

pace bears one median spine in the gastric region, in the larger specimen there are four such spines there. Neither of the specimens possesses a spine on the fourth abdominal segment. The carpus of the chelipeds bears one dorsal and one outer ventral spine on the distal margin.

Distribution. The species is known from Greenland and Iceland southwards to North Carolina, the British Isles and N.W. Africa. It has been reported from depths between 330 and 2200 m.

Paguridae

Dardanus arrosor (HERBST)

Cancer arrosor HERBST, 1796, Vers. Naturgesch. Krabb. Krebse, vol. 2, p. 170, pl. 43 fig. 1.

Station 38, off Cape Bojador, N.W. Africa, 26°3' N, 14°36' W, depth 83 m, May 20, 1910. 1 female, cl. 35 mm.

Distribution. The species is known from the Mediterranean and the eastern Atlantic from Portugal to Senegal. It has been reported from depths between 25 and 100 m. There are records of this species from a great many localities all over the world, but the correctness of these needs confirmation.

Parapagurus pilosimanus SMITH

Parapagurus pilosimanus SMITH, 1879, Trans. Connect. Acad. Arts Sci., vol. 5, p. 51.

Hermit crabs, *Parapagurus* MURRAY & HJORT, 1912, Depths of the Ocean, pp. 63, 419, 420.

Station 10, Bay of Biscay, 45°26' N, 9°20' W, depth 4700 m, April 20, 1910. 1 male, cl. 17.5 mm, and 1 female.

Station 53, south of the Azores, 34°59' N, 33°1' W, depth 2615 m, June 8 and 9, 1910. 12 specimens, cl. 14 to 16 mm.

Station 88, north of the Azores, 45°26' N, 25°45' W, depth 3120 m, July 18, 1910. 2 females, cl. 19 (ovigerous) and 15 mm.

The specimens from Stations 10 and 53 were found in shells that each are covered by a large Actinian.

The material from Station 10 has already been mentioned by MURRAY & HJORT (1912, pp. 63, 419) as «hermit crabs», the specimens from Stations 53 and 88 were indicated by the same authors (MURRAY & HJORT, 1912, p. 420) as «hermit crabs» and «*Parapagurus*» respectively.

Distribution. The species has been reported from the Atlantic Ocean from Iceland in the north to Tristan da Cunha in the south, furthermore from the entire Indo-West Pacific and from the East Pacific regions. It was found in depths between 450 and 4000 m.

Pagurus prideauxi LEACH

Pagurus Prideaux LEACH, 1815, Malac. podophth. Brit., pl. 26 figs. 5, 6.

Station 96, S.W. of Ireland, 50°57' N, 10°46' W, depth 184 m, July 27, 1910. 1 male, cl. 16 mm, 1 ovigerous female, cl. 15 mm.

SUND made the following note on the above specimens:

«A male and a female in shells of *Fusus* and with an actinian under the mouth of the shells. From the sexual orifices of the male protrude two spirally twisted bodies, the one on the left side being somewhat larger than the other. These bodies are very brittle and presumably are spermatophores».

The original spelling *Prideaux* of the specific name of this species cannot be maintained and has to be changed to *prideauxi*. During the XIIIth International Congress of Zoology held in Paris in 1948 it was decided that where a specific name is published in the form of an unchanged surname of a modern personage and the author treated the name, so formed, as a Latin or latinized word, the form of the specific name so published is to be corrected so as to comply with the requirements of the paragraph of Article 14 of the Rules which deals with the formation of specific names based on modern patronymics (HEMMING, 1950, p. 252).

Distribution. The species is known from S.W. Norway south to the Mediterranean and the Cape Verde Islands. It has been reported from depths between 18 and 390 m.

***Pagurus variabilis* (A. MILNE EDWARDS & BOUVIER)**

Eupagurus variabilis A. MILNE EDWARDS & BOUVIER, 1892, Ann. Sci. nat. Zool., ser. 7 vol. 13, p. 217.

Station 96, S.W. of Ireland, 50°57' N, 10°46' W, depth 184 m, July 27, 1910. 1 female, cl. 6 mm.

Distribution. The species is known from the west coast of Norway southwards to the Mediterranean, the Canary Islands and Cape Blanco (N.W. Africa). It has been reported from depths between 125 and 1560 m.

Lithodidae

***Neolithodes grimaldii* (A. MILNE EDWARDS & BOUVIER)**

Lithodes Grimaldii A. MILNE EDWARDS & BOUVIER, 1894, Rés. Camp. sci. Monaco, vol. 7, p. 62, pl. 3 figs. 1—6.

Station 101, off the Hebrides, 57°41' N, 11°48' W, depth 1853 m, August 6 and 7, 1910. 1 specimen, cl. (without rostrum) 18 mm.

The specimen agrees very well with the descriptions given in the literature of this species. The fingers of the chela (only the left chela is present) are fully 1.5 times as long as the palm.

Distribution. The species has been reported from the western Atlantic from Iceland and Greenland southwards to off North Carolina, in the eastern Atlantic it is known from near the Azores and from near the Cape Verde Islands. It was found in depths between 800 and 2000 m.

DECAPODA BRACHYURA

Majidae

Rochinia carpenteri (THOMSON)

Amathia carpenteri THOMSON, 1874, Depths of the Sea, pp. 175, 176, fig. 35.

Station 23, west of Gibraltar, 35°32' N, 7°7' W, depth 1215 m, May 5 and 6, 1910. 1 ovigerous female, cl. 44 mm.

The present specimen is a well developed female (carapace with a length of 44 and a breadth of 30 mm), which has the spines flattened in a similar fashion as the specimen figured by A. MILNE EDWARDS and BOUVIER (1900, pl. 20 figs. 6 to 9). The eggs are numerous, their diameter is 0.45 mm.

NORMAN is often quoted as the author of the present species, this however, is incorrect. The name *Amathia carpenteri* was first published in WYVILLE THOMSON'S (1874) book «The Depths of the Sea»; the name was mentioned on p. 176 and furthermore placed under fig. 35 on p. 175. The name was credited by THOMSON to A. M. NORMAN, but at that time NORMAN had not yet published a description or figure of the species. The figure given by THOMSON makes the name *Amathia carpenteri* a nomenclatorially available name as from the date of publication of «The Depths of the Sea» and THOMSON has to be cited as its author.

Distribution. The species has been reported from the eastern Atlantic from S. of Iceland and the west coast of Norway south to the Azores, the Canary Islands and N.W. Africa. It is known from depths between 350 and 1350 m.

Inachus dorynchus LEACH

Inachus Dorynchus LEACH, 1814, Edinburgh Encycl., vol. 7, pp. 431, 436.

Station 96, S.W. of Ireland, 50°57' N, 10°46' W, depth 184 m, July 27, 1910. 2 specimens, cl. 11.5 and 12.5 mm.

Distribution. The species is known from the eastern Atlantic from the west coast of Norway southwards to the Mediterranean and the Cape Verde Islands. It has been reported from depths down to about 300 m.

Portunidae

Polybius henslowii LEACH (textfig. 32, pl. III fig. 4)

Polybius Henslowii LEACH, 1820, Malac. podophth. Brit., pl. 9B.
Polybius henslowii MURRAY & HJORT, 1912, Depths of the Ocean, pp. 65, 66, fig. 46.

Station 14, off Portugal, 41°15' N, 8°54' W, depth 69 m, April 22, 1910. 2 males, cl. 36 and 40 mm, 14 females (2 ovigerous, cl. 33 and 35 mm), cl. 33 to 39 mm.

Station 15, off Portugal, 40°56' N, 9°28' W, depth 50 m, April 22 and 23, 1910. 15 juveniles, cl. 4.5 to 12.5 mm, and 7 megalopa stages; the same, depth 300 m. 8 juveniles, cl. 4.5 to 9.5 mm.

LEBOUR (1928, p. 516, pl. 4 fig. 6) described and figured the first zoea of this species, in 1944 (p. 15, fig. 5f) the same author gave a description of the colour of the same stage and of the pre-zoea. As far as we can check no further stages have ever been described in the literature. The present material collected by the 1910 «Michael Sars» Expedition contains what doubtless are megalopae and young post-larval stages of this species.

The megalopa is about 5.5 mm long. The rostrum is broad, with rounded antero-lateral corners and a sharp antero-median spine, which is abruptly directed down-

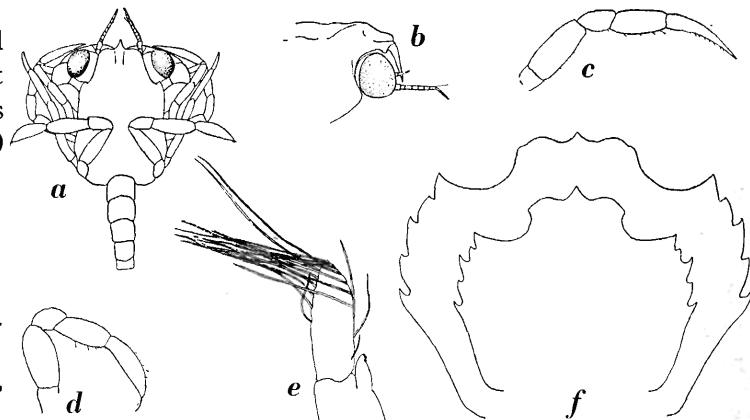


Fig. 32. *Polybius henslowii* LEACH. Specimens from Sta. 15. a, megalopa, in dorsal view; b, anterior part of megalopa in lateral view; c, fourth pereopod of megalopa; d, fifth pereopod of megalopa; e, last pleopod of megalopa; f, outline of the carapace of young crab stages. a, f, x 5.7 b—d, x 8; e, x 40.

wards. The dorsal surface of the rostrum is deeply concave. The carapace is rather high with an uneven surface, but without a dorsal spine. The abdomen, being about as long as the carapace, is narrow and ends in a quadrangular telson. The first pereopod carries a curved hook on the ventral surface of the ischium. The second to fourth pereopods have hooks on the coxae. The dactyli of the second to fourth pereopods are elongate and somewhat flattened. The fifth leg is already a characteristic swimming leg, with the various joints short and broad, and with the dactylus shaped as an actual paddle. The last pleopod bears numerous setae.

The young crab stages have the rostrum with the median tooth triangular and pointed; it is much longer than the low and broadly rounded lateral teeth. The antero-lateral margin bears five teeth. The first, third and fifth of these are rather slender and pointed, the second and fourth being broader and blunter. Like in the adult the dactyli of the second to fourth legs are broadened and flattened.

MURRAY & HJORT (1912, p. 65) report that the species has been observed in large numbers at Station 17 of the «Michael Sars» Expedition (off S. Portugal, 38° 20' N, 9° 43' W, surface, April 23, 1910); no material from that station, however, has been seen by us.

Distribution. The species is known from the eastern Atlantic from the south coast of the British Isles to Morocco and Mediterranean. It lives near the surface of the water, but seems also to occur at greater depths.

Portunus sayi (GIBBES)

Lupa Sayi GIBBES, 1850, Proc. Amer. Ass. Adv. Sci., vol. 3, p. 178.

Station 51, S.W. of the Azores, 31°20' N, 35°7' W, surface, in floating gulfweed (*Sargassum* spec.), June 5, 1910. 1 ovigerous female, cl. 26.5 mm.

Station 66, S.E. of Newfoundland, 39°30' N, 49°42' W, surface, in floating gulfweed (*Sargassum* spec.), June 26, 1910. 2 males, cl. 8 and 34 mm, 2 females, cl. 30 (ovigerous) and 17 mm.

Station 69, S.E. of Newfoundland, 41°39' N, 51°4' W, surface, in floating gulfweed (*Sargassum* spec.), June 29, 1910. 1 male, cl. 11 mm.

This species and *Planes minutus* are the typical gulfweed crabs.

Distribution. The species is especially common on the floating gulfweed in the Mid-Atlantic and along the east coast of America from Nova Scotia southwards to Brazil. Furthermore it has been reported from off Morocco and from the Kerguelen Islands.

Atelecyclidae

Atelecyclus septemdentatus (MONTAGU)

Cancer (Hippra) septemdentatus MONTAGU, 1813, Trans. Linn. Soc. London, vol. 11, p. 1, pl. 1 fig. 1.

Station 1, S. of Ireland, 49°27' N, 8°36' W, depth 146 m April 9, 1910. 1 juvenile, cl. 8.7 mm.

Distribution. The species has been reported from Norway southwards to the Mediterranean and the Cape Verde Islands. It is known from depths down to 748 m.

Grapsidae

Planes minutus (L.) (pl. I fig. 4 and pl. II figs. 1—4)

Cancer minutus LINNAEUS, 1758, Syst. Nat., ed. 10 vol. 1, p. 625.

Planes minutus MURRAY & HJORT, 1912, Depths of the Ocean, pp. 633, 671, pl. 6.

Station 48, west of the Canary Islands, 28°54' N, 24°14' W, surface, May 31, 1910. 1 male, cl. 14 mm, 1 female, cl. 13 mm.

Station 49 C, west of the Canary Islands, 29°7' N, 25°32' W, surface, June 2, 1910. 1 ovigerous female, cl. 17.5 mm.

Station 51, S.W. of the Azores, 31°20' N, 35°7' W, surface, June 5 and 6, 1910. 28 males, cl. 5.5 to 15 mm, 34 females (11 ovigerous, cl. 10.5 to 13.5 mm), cl. 5 to 13.5 mm.

Station 52, S.W. of the Azores, 31°24' N, 34°47' W, surface, June 6 and 7, 1910. 2 juveniles, cl. 5 and 5.5 mm.

Station 53, south of the Azores, 34°59' N, 33° 1' W, surface, June 8 and 9, 1910. 1 juvenile, cl. 5 mm (not seen).

Station 56, near the Azores, 36°53' N, 29°47' W, surface, June 10 and 11, 1910. 1 juvenile, cl. 5.5 mm.

Station 61, west of the Azores, 37°7' N, 38°34' W, surface, June 20, 1910. 5 males, cl. 8.5 to 17 mm, 4 ovigerous females, cl. 13.5 to 16 mm.

Station 63, west of the Azores, 36°5' N, 43°58' W, surface, June 22, 1910. 2 juveniles, cl. 5.5 mm.

Station 64, between the Azores and Bermuda, 34°44' N, 47° 52' W, surface, June 24, 1910. 2 ovigerous females, cl. 9.5 and 11.5 mm.

Station 64 to 66, Sargasso Sea, 34°44' — 39°30' N, 47°52' — 49°42' W, surface, June 24 to 26, 1910. 11 males, cl. 5 to 16 mm, 9 females (3 ovigerous cl. 9.5 to 11 mm), cl. 5.5 to 12.5 mm.

Station 66, S.E. of Newfoundland, 39°30' N, 49°42' W, surface, June 26, 1910. 1 juvenile, cl. 6.5 mm.

Station 69, S.E. of Newfoundland, 41°39' N, 51°4' W, surface, June 29, 1910. 1 male, cl. 12 mm, 2 females, cl. 9 and 12.5 mm.

With the shrimps *Leander tenuicornis* (SAY), *Hippolyte coerulescens* (FABR.), *Latreutes fucorum* (FABR.) and the crab *Portunus sayi* (GIBBES) the present species forms the typical Decapod community of the gulfweed.

Distribution. The species is known with certainty from the southern part of the North Atlantic (from the south coast of the British Isles and south of Newfoundland southward to the West Indies, the Azores and the Canary Islands), most records from the southern Atlantic and the Indian Ocean need confirmation (see CHACE, 1951, p. 77). The species lives generally on floating or swimming organisms in the sea (algae, turtles etc.).

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PLATES

PLATE I

- Figs. 1 and 2. *Latreutes fucorum* (FABR.), x 6.5.
Fig. 3. *Leander tenuicornis* (SAY). x 3.5.
Fig. 4. *Planes minutus* (L.).

PLATE II

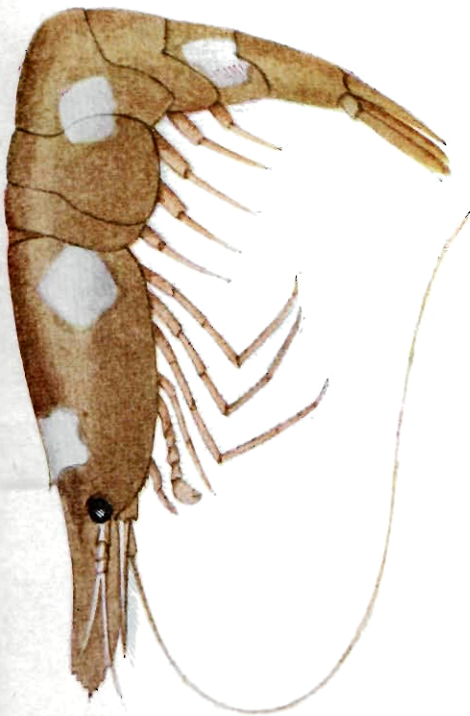
- Figs. 1—4. *Planes minutus* (L.).

PLATE III.

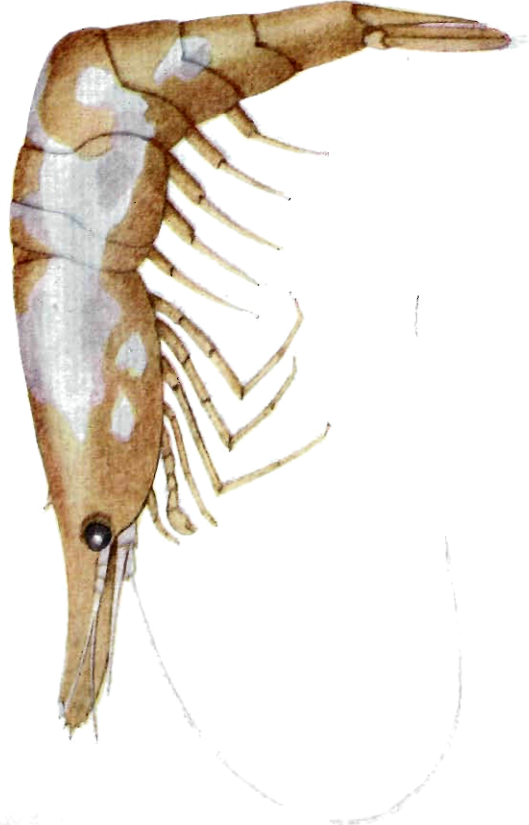
- Fig. 1. *Oplophorus spinosus* (BRULLÉ). Male from Sta. 51 (150 m depth) in dorsal view. x 2.
Fig. 2. *Oplophorus spinosus* (BRULLÉ). Same specimen, scaphocerite. x 7.
Fig. 3. *Chlorotocus crassicornis* (COSTA). Ovigerous female from Sta. 21. x 2.
Fig. 4. *Polybius henslowi* LEACH. Specimen from Sta. 14. Natural size.

PLATE IV.

- Fig. 1. *Munidopsis crassa* SMITH. Specimen from Sta. 10. x 1.7.
Fig. 2. *Munidopsis bermudezi* CHACE. Specimen from Sta. 88. x 1.5.
Figs. 3. and 4. *Munidopsis sundi* new species. Holotype in dorsal and ventral view. x 0.6.



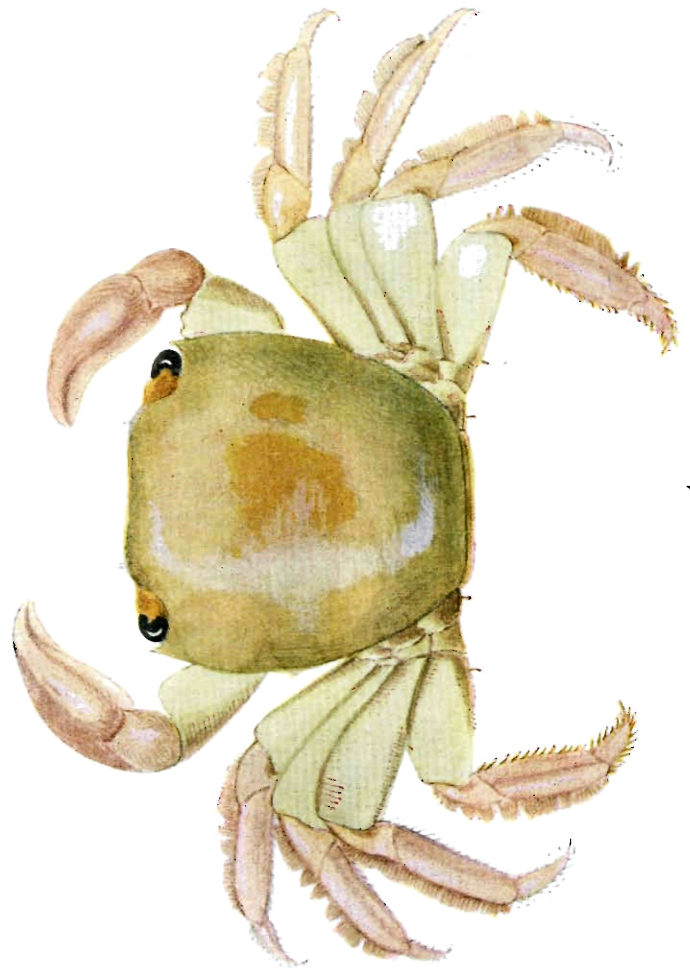
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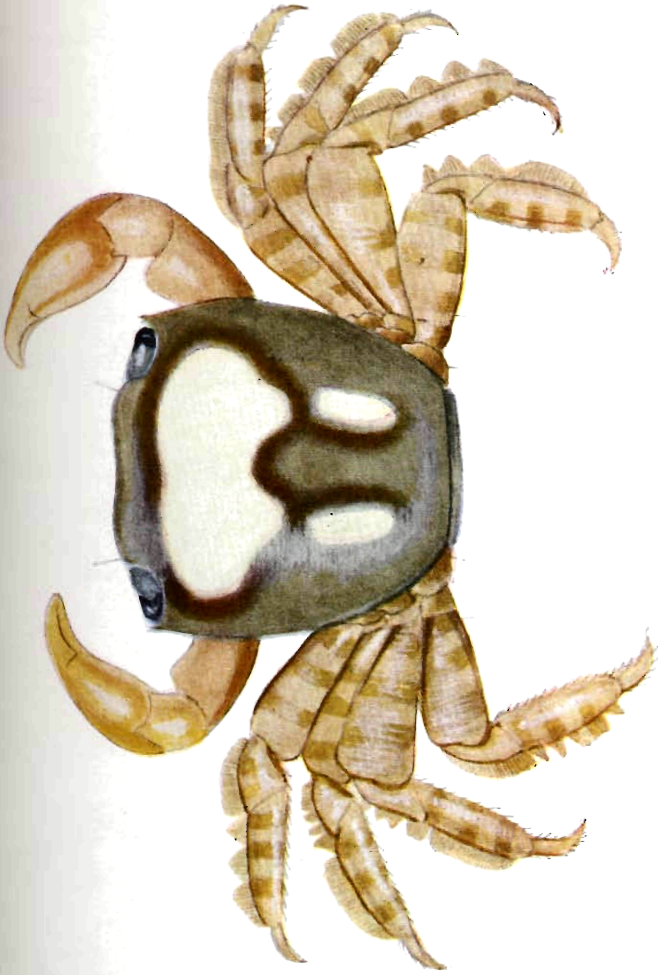
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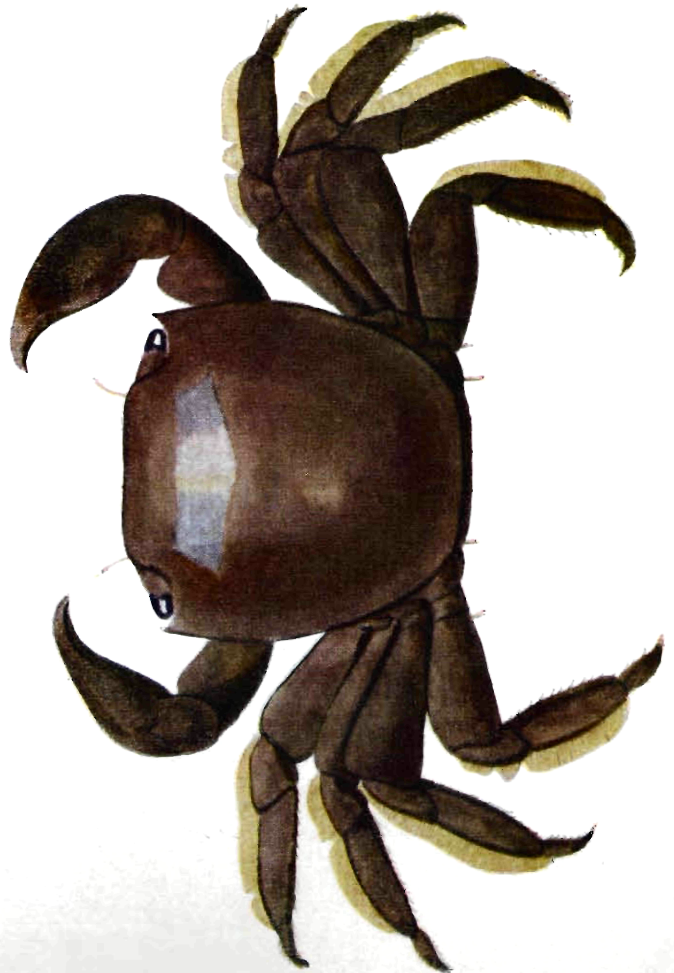
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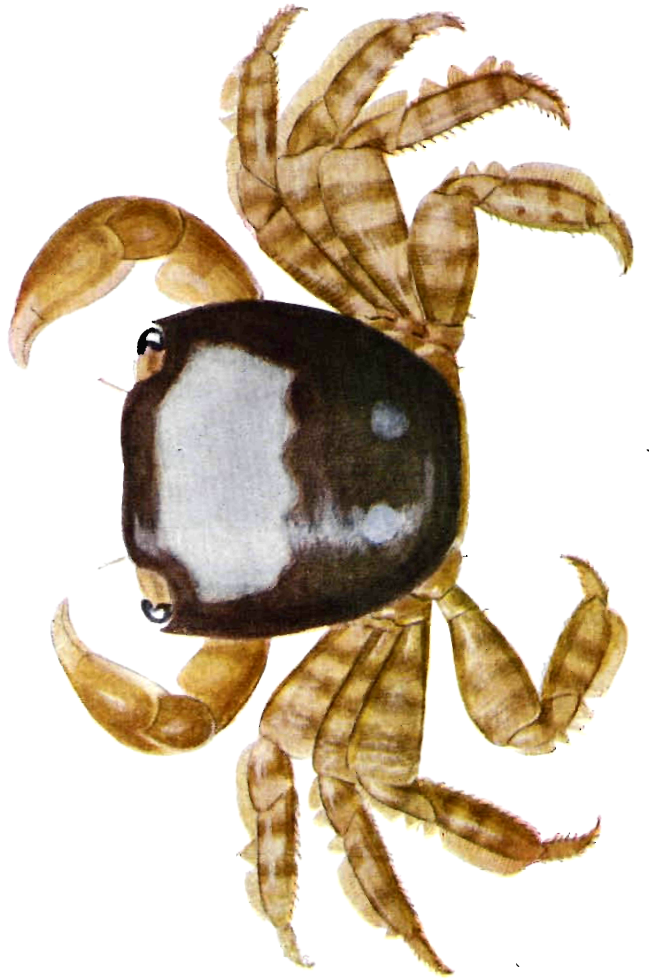
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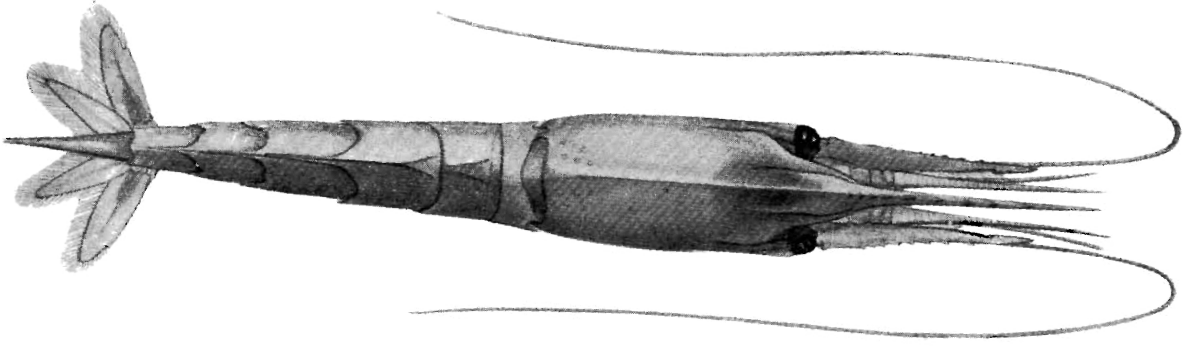
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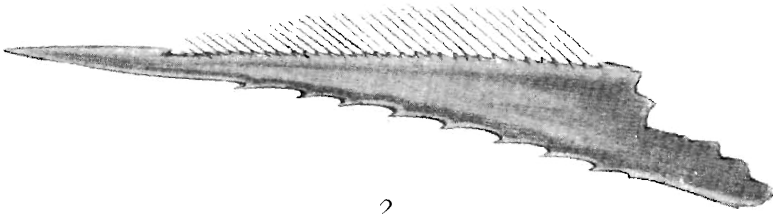
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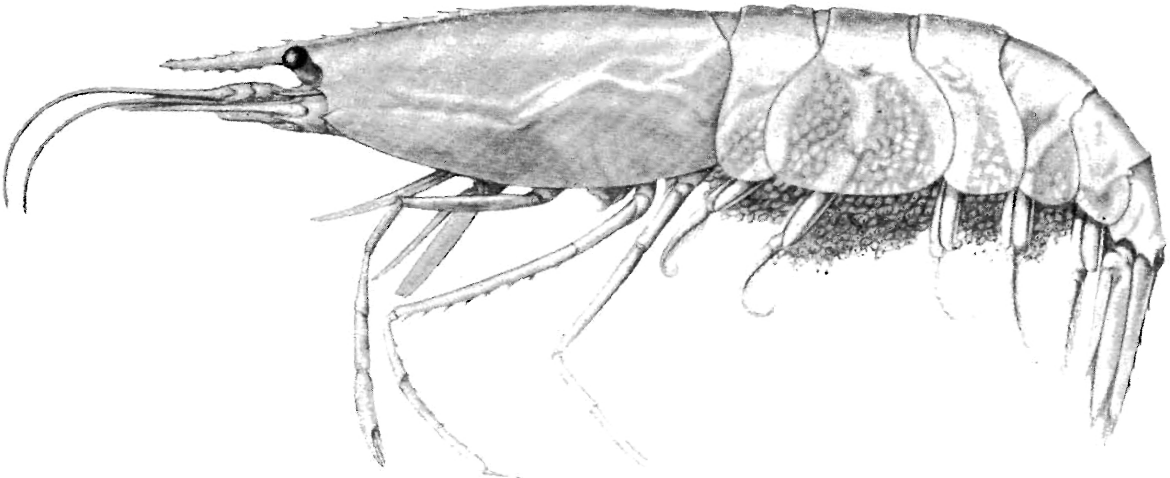
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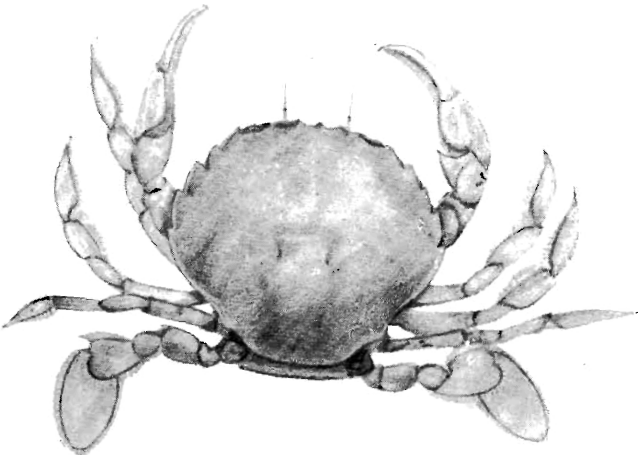
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