

numerous specimens from localities in Mauritania, Senegal, Ghana, and Cameroon, and noted that its range in the Atlantic extended from Portugal to the equatorial region.

We have examined material of *A. lunulatus* from the Gulf of Tunis, Messina and Trapani, Sicily, Naples, Nice, and Cadaqués, Spain (all W) and have provided here some sketches of a young female from the Gulf of Tunis (Figures 60c, 63) to help distinguish this species from the three others occurring off West Africa.

Our discovery of two previously undescribed species of *Acanthonyx* in West African waters and our recognition of *A. brevifrons* from the Cape Verde Islands and other localities indicate that earlier records of *A. lunulatus* may have been based on one or more of the four species now known to occur off West Africa. The specimens reported in Monod, the literature records cited by him, and the records given below all need to be verified.

**DISTRIBUTION.**—Mediterranean Sea and adjacent Atlantic, from Portugal to South-West Africa, generally in shallow water, littoral and subtidal. Records since 1956 include the following.

Morocco: Rabat, Temara, Skhirat, Oued Cherrat, David, Tillet [?], Sidi Moussa, Agadir, and Foum Assaka (all Forest and Gantès, 1960).

Cape Verde Islands: Matiota, São Vicente, beach and shore, and Tarrafal do Monte Trigo, Santo Antão (Guinot and Ribeiro, 1962; Ribeiro, 1964).

Guinea: No specific locality (Uschakov, 1970).

Ivory Coast: Lagoon of Abidjan, 05°16'12"N, 04°00'20"W (Forest and Guinot, 1966).

Ghana: Tenkopobo to Dixcove (Gauld, 1960).

São Tomé: Ilhéu Macao (as ilot dos Cocos), 3–8 m, and Sant'Ana, shore (Forest and Guinot, 1966).

Congo: Pointe Indienne (Rossignol, 1957). Baie de Loango and near Pointe-Noire (Rossignol, 1962).

Angola: Baía do Lobito, shore; Praia das Conchas, Moçâmedes, shore; and Baía das Vacas, Benguela, shore (all Guinot and Ribeiro, 1962).

South-West Africa: Rocky Point, 18°59'S, 12°29'E (Kensley, 1970; Penrith and Kensley, 1970b). Kunene River mouth, 17°15'S, 11°45'E, and Möwe Point, 19°23'S, 12°42'E (Kensley, 1970).

Möwe Point is the southernmost record for *Acanthonyx* on the West African coast.

### \**Acanthonyx minor*, new species

FIGURES 60d, 64

?*Acanthonyx brevifrons*.—Balss, 1914:101 [not *A. brevifrons* A. Milne Edwards, 1869].

**MATERIAL EXAMINED.**—*Pillsbury Material*: Annobon: Sta 271, shore, 6♂ (includes holotype), 4♀ (1 ov) (L, W). Sta 273, shore, 1♂ (L).

**DESCRIPTION.**—Carapace (Figure 64a, f, i) smooth, rather wide, length 1.1 to 1.3 times greatest width in adults, about 1.5 times width in juveniles. Greatest width at level of anterior anterolateral teeth in juveniles (Figure 64i), at level of posterior anterolateral teeth in adults (Figure 64a, f). Surface of carapace coarsely pitted, with normal elevations: 2 protogastric, 1 mesogastric, 1 cardiac, all low, each bearing 2 or more broad setae. Rostral teeth elongate-triangular, separated by wide, V-shaped sinus, rostrum not markedly depressed (Figure 60d). Dorsal surface of carapace, behind rostrum, with normal 2 divergent rows of curved, hook-shaped hairs. Preorbital tooth short, blunt, much shorter than rostral teeth. Orbital margin continuing gradually into anterior margin of first anterolateral tooth, latter not distinctly set off as in *A. lunulatus*. Orbital margin with small tooth or lobe situated about halfway between eye and first anterolateral tooth (Figure 64a, f); this tooth absent in all other Atlantic species of *Acanthonyx*, present in all but smallest specimens of *A. minor* (Figure 64i). First anterolateral tooth large, wide, rounded apically, second and third teeth distinct, smaller, subequal; each tooth with several broad setae. Eyes relatively large, in comparison with those of *A. lunulatus* of similar size. Ventral surface of carapace with subhepatic tooth behind orbit.

Basal segment of antennal peduncle with distinct outer anterolateral tooth (Figure 64b). Antennal peduncle variable in length, shorter than or slightly longer than rostrum.

Cheliped of adult female (Figure 64c) small.

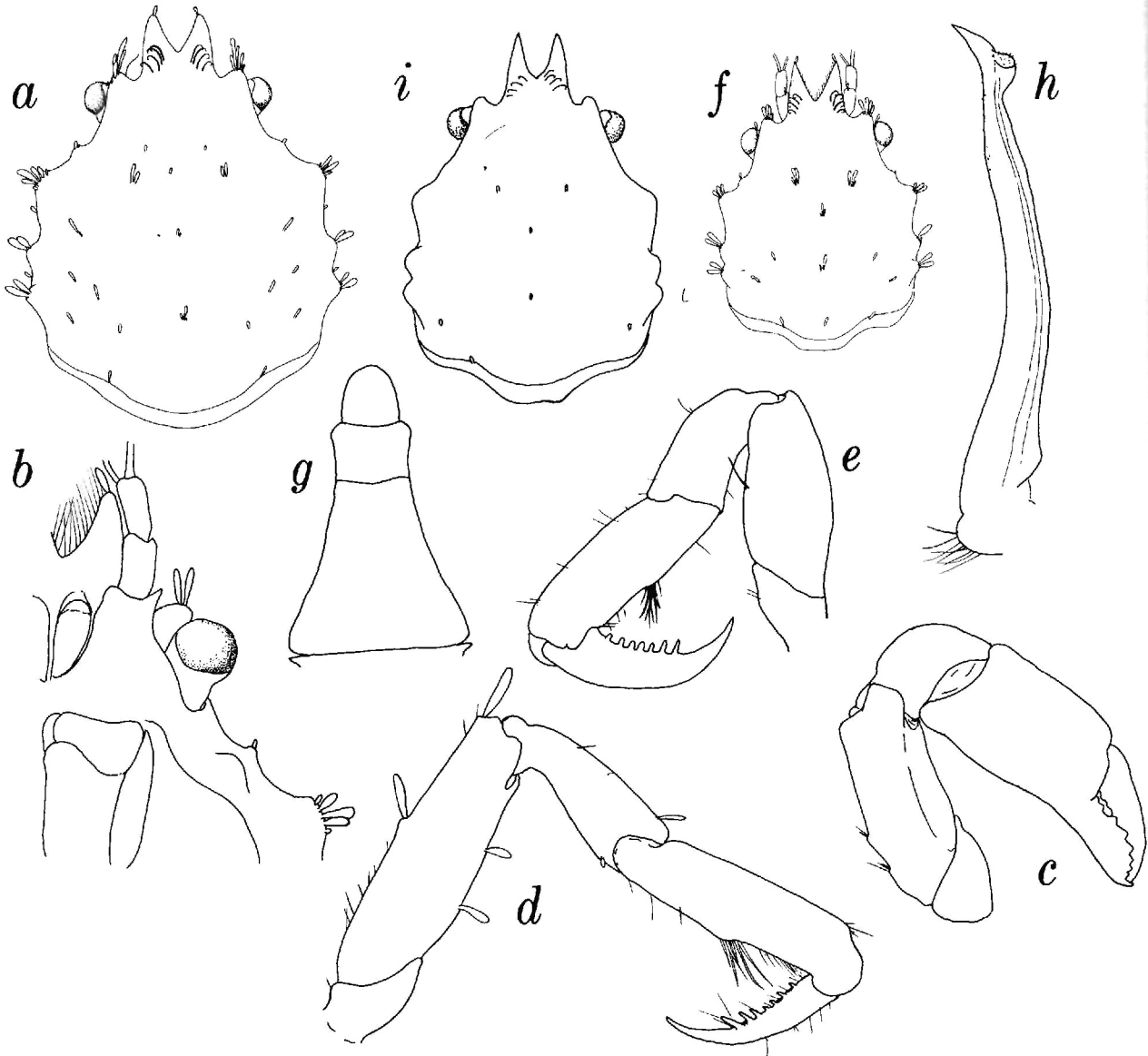


FIGURE 64.—*Acanthonyx minor*, new species, Pillsbury Sta 271. Female paratype, cl 3.8 mm: *a*, carapace; *b*, front, ventral view; *c*, cheliped; *d*, second pereiopod; *e*, fifth pereiopod. Male paratype, cl 2.6 mm: *f*, carapace; *g*, abdomen; *h*, first pleopod. Male paratype, cl 1.7 mm: *i*, carapace.

Fingers almost as long as palm (measured along upper surface). Cutting edges dentate, with only slight gape proximally. Palm smooth. Carpus globular, smooth, bearing no carinae or tubercles, shorter than palm, much shorter than merus. Latter smooth except for 2 blunt tubercles on basal half.

Walking legs similar to those of other *Acanthonyx* species, but dactylus appearing more slender, with tip less strongly curved, terminating in slender apex, posterior margin with 7 or 8 small but distinct teeth. Second pereiopod (first walking leg) dactylus about as long as propodus (measured dorsally). Latter 4 times as long as high,

outer surface ending in disc-like projection covering base of dactylus. Posterior margin of propodus with low tubercle or prominence near mid-length ornamented with strong, stiff hairs. Carpus as long as propodus, much shorter and narrower than merus. First walking leg longer than remainder, latter of similar shape but decreasing in size posteriorly. Fifth pereopod (Figure 64*e*) shortest. Dactylus slightly longer than propodus, more robust than that of second leg. Propodus about 2.5 times as long as wide. Tubercle on posterior margin low but distinct because of tuft of hairs. Carpus distinctly shorter than propodus, merus about as long as propodus.

Male abdomen (Figure 64*g*) narrow. Telson tongue-shaped. Sixth somite broad proximally, distinctly narrowing at telson. Abdomen of largest females very broad, reaching to bases of legs; sixth somite widest.

First male pleopod as shown in Figure 64*h*. It does not differ significantly from that of *A. sanctaehelenae* Chace from Saint Helena (Chace, 1966, fig. 12*f*).

MEASUREMENTS.—Carapace lengths of males 1.7 to 3.4 mm, of non-ovigerous females 1.8 to 3.8 mm, of the ovigerous female 3.7 mm.

REMARKS.—*Acanthonyx minor*, like *A. depressifrons*, is a very small species, as the name implies. It can be distinguished from all of the Atlantic species now known by the distinct projection on the orbital margin; that margin is evenly concave in the other species.

It is likely that the two specimens reported by Balss (1914:101) from Annobon under the name *A. brevifrons* belong to the present species; Balss indicated that they were juveniles. Later, Balss (1922:72) identified this material with *A. lunulatus*, synonymizing *A. brevifrons* with that species.

TYPE-LOCALITY.—Annobon Island, 01°25'S, 05°38'E, equatorial Guinea.

DISPOSITION OF TYPES.—The holotype (Crust. D. 31762), a male from Pillsbury Sta 271 with a carapace length of 3.4 mm, and seven paratypes are in the Rijksmuseum van Natuurlijke Historie, Leiden; two male and one female paratypes are in the collection of the Smithsonian Institution.

ETYMOLOGY.—The specific epithet is from the Latin and refers to the diminutive size of this species.

BIOLOGY.—The present material all originates from Annobon. It was collected at two fish poison stations on the shore of Annobon. The first (Sta 271) was situated on the NE shore between Punta Yoyo and Punta Pedrinha, the coast here was rocky with rubble and a small sandy beach; collecting was done in the surge where the water was rather turbid. The second station (Sta 273) was on the north shore of Annobon near Islote Pirámide on a rocky and sandy shore. Because of the high surf, collecting was difficult, but most of the fishes and invertebrates killed at this station were gathered at the outer edge of the surf zone in about 5 to 8 feet (1.5 to 2.4 m) of water over rocks.

DISTRIBUTION.—Known only from the type-locality, Annobon Island, equatorial Guinea.

#### Subfamily INACHINAE MacLeay, 1838

REMARKS.—The extensive Pillsbury collections of inachine crabs has necessitated a much more detailed coverage of this subfamily than we had originally expected. Eight genera of this subfamily occur off West Africa. Two of these are characterized and named herein. Representatives of six genera are included in the Pillsbury material; *Dorhynchus* and *Ergasticus*, each represented in the eastern Atlantic by one species, were not collected. 37 species of inachine crabs are now known to occur in the eastern Atlantic, a surprising increase in recognized species since 1956 when Monod recognized 22 species, 19 from tropical West African waters; we recognize 29 tropical species below.

Because the Pillsbury collections included what appear to be representatives of two new genera, we have examined representatives of *Achaeopsis*, *Dorhynchus*, *Ergasticus*, *Physachaeus*, and several related genera in order to better understand generic characters and relationships. As a result, we believe that *Dorhynchus* Thomson, 1873, is distinct from *Achaeopsis* Stimpson, 1858. We have in-

cluded a diagnosis of *Dorhynchus* (p. 279), under which our conclusions are discussed.

We also believe that three interrelated "major" morphological features of inachine crabs are subject to misinterpretation: the supraorbital spine, the postorbital spine(s), and whether or not the eyes are retractile.

The supraorbital spine of *Dorhynchus* (Barnard, 1950, fig. 4d) or of *Macropodia gilsoni* probably should be interpreted as an outgrowth of the supraorbital eave rather than as being homologous with the intercalated spine or lobe in the Majinae. Balss (1929) stressed the importance of the intercalated spine in majid classification but his conclusions do not appear to have gained general acceptance. Garth (1958:37), however, includes in his key to American genera of Inachinae the genus *Achaeopsis*, which can be distinguished by the presence of a spine intercalated between pre- and postorbital spines. Griffin (1966b:35) suggested that "if the supraorbital spine found in *Achaeopsis* species is regarded as homologous with the intercalated spine of other majids, *Achaeopsis* becomes widely separated from these genera . . ." We agree with Griffin, for *Achaeopsis* and the closely related *Dorhynchus* (which Griffin considered a synonym of *Achaeopsis*), are otherwise similar to *Macropodia*, differing primarily in having the rostral spines divergent rather than appressed. Further, the West African *Macropodia gilsoni* and *M. intermedia*, which have a supraorbital spine but otherwise closely resemble the other species of the genus, would have to be separated into a distinct genus, a taxon which, to us, would be unnecessary and unnatural. We suspect that the supraorbital spine, like that of *Dorhynchus* and *Macropodia gilsoni*, which clearly arises from the supraorbital eave, should not be considered homologous to the intercalated spine. In the case of *M. gilsoni*, it is one of several specific characters that can be used to distinguish that species.

The question of homologies of the postorbital or postocular spine in the subfamily Inachinae is

perhaps more troublesome. The term has been used for a spine arising from the posterior margin of the orbit (Rathbun, 1925, fig. 1, for example), as well as for any spine that may be situated on the lateral margin of the carapace between the orbital margin and the hepatic lobe, i.e., posterior to the orbit (Griffin, 1966a, fig. 1, upper left figure). If this latter spine, which is situated between the orbit and the hepatic lobe, is considered to be a displaced, "true" postorbital spine like that of *Inachus*, then, again, *Macropodia gilsoni* would have to be generically distinct from *M. rostrata*, which lacks it. We believe that this latter spine should not be considered to be a true postorbital spine; we propose to call this the nuchal spine to differentiate it from the postorbital. Among the eastern Atlantic genera of Inachinae, a postorbital spine is found only in *Inachus* and *Ergasticus*; in *Dorhynchus*, *Achaeopsis*, *Stenorhynchus*, and in some species of *Macropodia*, there is a nuchal spine but no postorbital spine. Indeed, the eastern Atlantic species of *Macropodia* show a complete range of development of the nuchal spine.

Finally, the question of whether the eye is retractile or not may be one of semantics but it is a feature that can be difficult to interpret. Among the eastern Atlantic genera of Inachinae, all of which have movable eyes, the eye in some appears to be retractile, that is, it can be moved into a position adjacent to the postocular spine. This occurs only in two genera, *Inachus* and *Ergasticus*. In *Dorhynchus*, in which the eye is said to be retractile to the sides of the carapace (Rathbun, 1925:27, definition of *Achaeopsis*) (and which also has been described as having a postocular spine but which we interpret as a nuchal spine), the eye in material available to us is no more retractile than in our material of *Macropodia*. In *Macropodia* the eye is described as not retractile (Christiansen, 1969:110), that is, the eye in representatives of the two genera folds backward about to the same level. The eye can approach the carapace in *Dorhynchus*, but, we suspect, only because the carapace is broader in that genus and the angle

formed by a line extending from the orbit to the hepatic lobe is quite different in *Dorhynchus* than it is in *Macropodia*. We would describe the eye as retractile only when it can be folded back into a postocular process like that of *Inachus*.

Finally, although *Ergasticus* was assigned to the subfamily Pisinae by Bouvier (1940) and by Zariquicy Alvarez (1968), we can see no reason to

exclude it from the Inachinae, where it was placed by Balss (1957) and Monod (1956). The basal antennal article is extremely slender and the orbit is incomplete, with a supraorbital eave divided into spines, a large, postorbital spine, but no ventral orbital margin. We have not examined the male pleopod, which does not appear to have been illustrated.

**Key to Eastern Atlantic Genera of Inachinae**

1. Rostrum undivided, elongate (as long as or longer than postrostral carapace), with spinules laterally. Basal antennal article convex ventrally, not longitudinally sulcate. [Abdomen of 6 somites in male, 5 in female] ..... ***Stenorhynchus***  
 Rostrum distinctly bilobed or very short, anteriorly truncate. Basal antennal article flattened or longitudinally channelled ventrally ..... 2
2. Orbit with distinct spine or cupped process on posterior margin against which eye can be folded ..... 3  
 Orbit lacking distinct spine or process on posterior margin. [Carapace, between orbit and hepatic lobe, smooth, tuberculate, or with erect spine (nuchal). Abdomen of 6 somites in both sexes] ..... 4
3. Supraorbital spines present. Postorbital spine slender, not a cupped process. Rostrum composed of 2 long, slender, divergent spines. First walking leg not markedly longer than second. Abdomen of 7 somites in male, 6 in female ..... ***Ergasticus***  
 Supraorbital margin unarmed dorsally. Postorbital spine a broad, cupped process. Rostrum short, of 2 blunt lobes or broad, triangular spines. First walking leg much longer than second, noticeably enlarged. Abdomen of 6 somites in both sexes ..... ***Inachus***
4. Rostral spines slender, divergent, upturned, extending anteriorly slightly beyond end of antennal peduncle. [Distinct supraorbital spine present. Antennular fossae grading into rostrum, lacking anterior rim. Nuchal spine present. Merus of pereopods with distal spine(s). Dactyli of posterior 2 pereopods not falciform] ..... ***Dorhynchus***  
 Rostral spines usually short, separate, triangular or with spiniform apices, or composed of 2 appressed spines of varying length ..... 5
5. Front truncate, simple or obscurely bilobed, overreached slightly by interantennular septum. Carapace lacking spines dorsally. [Antennular fossae with anterior rim. Interantennular septum not produced ventrally into beak. None of dactyli falciform] ..... ***Capartiella***, new genus  
 Front produced into 2 spines or spined lobes. Carapace with spines or tubercles dorsally. [Interantennular spine may be visible at base of rostral teeth] ..... 6

6. Interantennular septum distinct but not strongly produced ventrally, scarcely if at all visible in lateral view below level of basal antennal segment. [Rostrum bilobed. Antennular fossae lacking anterior rim, grading into rostrum. Chelae of male inflated. Dactyli of posterior 2 or 3 pereopods falciform] ..... **Achaeus**
- Interantennular septum produced ventrally into distinct, prominent beak, visible in lateral view, extending well below level of basal antennal segment ..... 7
7. Rostrum produced into 2 distinctly separate spines, spinulous laterally, truncated and spinulous apically. Chelae compressed, palm cristate above and below in both sexes. Orbital margin spinulous above. [Basal article of antenna lined with spines on inner and outer margins. Dactyli of posterior 2 pereopods falciform] ..... **Calypsachaeus**, new genus
- Rostrum produced into 2 smooth, unarmed spines, contiguous throughout their length. Chelae inflated, especially in adult males. Orbital margins unarmed above or with 1 or 2 dorsal spines, not lined with spinules. [Basal article of antenna, if armed, with 1 line or irregular row of tubercles or spines] ..... **Macropodia**

### Genus *Achaeus* Leach, 1817

*Achaeus* Leach, 1817, in 1815-1875, legend of pl. 22C [type-species: *Achaeus cranchii* Leach, 1817, by monotypy; gender: masculine; name 1605 on *Official List*].

DIAGNOSIS.—Carapace pyriform to elongate triangular, length usually greater than width, somewhat narrowed behind orbit as a neck, smooth or ornamented with tubercles, spinules, or, rarely, with long dorsal spine on cardiac or gastric region or both (as in *A. monodi* sensu stricto). Rostrum very short, of 2 acute or rounded lobes or of 2 spinules. Orbit dorsally with only narrow supra-orbital cave, laterally spinulated or smooth; postorbital spine absent, nuchal lobe or spine, if present, not prominent. Eyestalks long, nonretractile, cornea obliquely subterminal, slightly ventral, large, ovoid. Interantennular septum not produced into ventrally directed beak. Basal antennal article extremely slender, smooth, channelled longitudinally, weakly tuberculate, spinulous, or armed with lateral spines, spines not arranged in 2 rows flanking longitudinal channel. Merus of third maxilliped ovate, not notched distally, narrower than ischium, palp articulating at summit. Chelipeds usually spinous, greatly enlarged with inflated palm in males. Walking legs long and slender, dactyli of posterior 2 or 3

pairs usually strongly falcate and ventrally spinulated. Abdomen of 6 somites in both sexes, male abdomen widest at middle of third somite. Male first pleopod bluntly pointed, aperture located subterminally in groove (modified from Griffin, 1966b).

REMARKS.—*Achaeus* now includes more than 30 species (Serène, 1968, listed 25 Indo-West Pacific species) occurring in the eastern Atlantic and in the Indo-West Pacific, from South Africa to Japan (Griffin, 1966b, 1968a; Griffin and Yaldwyn, 1965).

The *Pillsbury* collections, comprising four species, bring to six the number of nominal species known from tropical West Africa, between Senegal and Angola. Two of the species taken by the *Pillsbury* are described here as new, and the other two are redescribed. One species, originally assigned to *Achaeus* and described from the *Calypso* collections in 1966 (Forest and Guinot, 1966), is transferred to another genus, *Calypsachaeus*.

The seventh eastern Atlantic species, *A. gracilis* (O. Costa, 1839) (= *A. gordonae* Forest and Zariquiey Alvarez, 1955), occurs in the Mediterranean and so far has not been recorded from Atlantic localities. Monod (1956:542, figs. 767-770) supplemented the original description.

It seems very likely that several additional species of *Achaeus* from West Africa remain to be recognized and described. Monod (1956:539, figs. 747-766) almost certainly included two species in his account of *A. cranchii*: *A. cranchii* sensu stricto from European waters and an undescribed species from Senegal. The male pleopods of the two species, as figured by Monod (1956, figs. 760-762 from Senegal and figs. 763-766 from Spain, France, and the Canary Islands) are quite different. Monod's account of *Achaeus monodi* (1956:548, figs. 782-810), which he, as well as Forest and Guinot (1966:110), considered to be an extremely variable species, may be represented in Monod's account by three distinct species: (1) *A. monodi* sensu stricto (fig. 782, reproduced from Capart, 1951, pl. 1: fig. 11); a broad, pyriform species from the Congo and Angola with spiniform rostral spines and slender, erect spines dorsally on the gastric and cardiac regions of the carapace; (2) a slender, elongate-triangular species from Senegal with broad, triangular rostral spines and no dorsal spines (figs. 783-785); and (3) a second species from Senegal with appressed rostral spines (figs. 786-789), similar to those of the South African *A. spinosissimus* Griffin, 1968(b). None of these species was represented in the Pillsbury collections.

Our generic diagnosis, based on Griffin (1966b), has been modified to include *A. monodi*, sensu stricto, with its erect dorsal spines. That species should be restudied, however, because it is different enough from the other species of *Achaeus* for Capart (1951) to have assigned it to *Podocheila*.

The relative proportions of the carapace, even though they may vary within a species with size and sex, provide a helpful recognition character for species of *Achaeus*. They allow the immediate distinction between slender species, like *A. turbator*, new species (in which the carapace width varies from 0.64 to 0.72 times the carapace length), from the broader species, like *A. foresti* (in which the carapace width varies from 0.86 to 0.90 times the length). Key characters employed for species not in the collections have been extracted from the

literature: Forest and Zariquiey Alvarez, 1955, for *A. cranchii* and *A. gracilis* (as *A. gordonae*); Forest and Guinot, 1966, for *A. trifalcatus*; and Forest, 1968, for *A. foresti*. A similar feature to illustrate the relative proportions of the carapace, the relation of the width at the hepatic lobes to the distance between the summit of the gastric prominence and the anterior margin of the rostral spines, also proves to be helpful. In *A. turbator*, new species, for example, the width of the carapace at the hepatic lobes is less than the distance from the gastric prominence to the anterior margin of the rostral spines, whereas in *A. buderes*, new species, the hepatic width is far greater. The relative length of the neck also provides a helpful recognition character: the neck is almost absent in *A. buderes*, new species, whereas it is quite distinct and elongate in *A. turbator*, new species. The shape of the rostral spines or projections also is important and appears to be characteristic. In *A. trifalcatus* the rostrum is made up of two rounded, unarmed lobes; in *A. turbator*, new species, it is made up of two rounded lobes, each of which has an anterior spinule. There is a definite shoulder on each side of the apical spinule; and in *A. cranchii* and *A. gracilis* the rostrum is made up of two slender, separate spines, tapering evenly from the base to the apex and lacking a distinct shoulder posteriorly. Note that in *A. cursor* (*A. Milne-Edwards and Bouvier, 1900:161, pl. 21: figs. 15, 16, and pl. 22: figs. 1-3*), considered a synonym of *A. cranchii* by Forest and Zariquiey Alvarez, 1955, there may be a distinct shoulder at the base of the rostrum. The proportions of the segments of the pereopods also appears to be important. Forest (1968), for example, pointed out that in *A. foresti* the dactylus of the fourth pereopod, measured across its arc, is equal to the length of the ischium and merus together; in *A. monodi*, according to the figure of the holotype (Capart, 1951, fig. 31), the dactylus, measured across its arc, is less than half as long as the merus alone. The size of the eye (compare Figures 65 and 66b of the eye in *A. foresti* and *A. buderes*, new species) appears to be important. Finally, the relative height of the gastric and cardiac promi-

nences and whether or not they are produced into erect spines seems to be important; in none of the eastern Atlantic species are these spines so well developed as in *A. monodi* sensu stricto.

The key to eastern Atlantic *Achaeus* given below should be used with caution, for it does not take into account the "variants" identified with *A. cranchii* and *A. monodi* by Monod (1956).

### Key to Eastern Atlantic Species of *Achaeus*

1. Rostrum unarmed, scarcely bilobed. Posterior 3 pereopods with falciform dactyli. [Carapace lacking erect dorsal spines. Width between hepatic lobes greater than distance between gastric prominence and anterior margin. Carapace width 0.70 to 0.83 times carapace length] ..... *A. trifalcatus*  
 Rostrum with apical spinules or spines. At most posterior 2 pereopods with falciform dactyli ..... 2
2. Rostrum consisting of 2 sharp spines, tapering evenly from base to apex. .... 3  
 Rostrum consisting of 2 lobes, each with apical spinule (i.e., rostrum posteriorly with distinct shoulder) ..... 4
3. Fissure between rostral spines narrow. Orbits usually unarmed dorsally, occasionally with tubercle or spinules. Posteromedian margin of carapace unarmed. Cardiac protuberance rounded, lower than gastric protuberance. Width between hepatic lobes equal to distance between gastric prominence and anterior margin. [Carapace width 0.65 to 0.79 times carapace length in males, 0.75 to 0.86 times carapace length in females] ..... *A. gracilis*  
 Fissure between rostral spines wide, U- or V-shaped. Orbits armed dorsally. Posteromedian margin of carapace usually tuberculate or lightly spinulose. Cardiac protuberance conical, as high as gastric protuberance. Width between hepatic lobes greater than distance between gastric prominence and anterior margin. [Carapace width 0.73 to 0.87 times carapace length in males, 0.75 to 0.95 times carapace length in females] ..... *A. cranchii*
4. Carapace with erect spines on both cardiac and gastric regions. [Width between hepatic lobes greater than distance from gastric protuberance to anterior margin. Carapace width greater than 0.8 times carapace length. Only 1 pereopod with falciform dactylus (?)] ..... *A. monodi*  
 Carapace without erect spines on either cardiac and gastric regions .... 5
5. Supraorbital margin spinulate. Posterior margin of carapace with strong spines posterolaterally, smaller spinules and tubercles posteriorly. Eyes slender, diameter of stalk about one-fourth length. [Width between hepatic lobes greater than distance from gastric protuberance to anterior margin. Carapace width 0.86 to 0.90 times carapace length] . *A. foresti*  
 Supraorbital margin unarmed. Posterior margin of carapace unarmed, with at most low, inconspicuous tubercles posterolaterally. Eyes stout, diameter about half length ..... 6



6. Carapace stout, pyriform, greatest width 0.67 to 0.81 (mean 0.75) times carapace length. Width at hepatic lobes greater than distance from gastric protuberance to anterior margin. Hepatic lobe with apical spine and several subapical spinules. Neck very short, stout ..... *A. buderes*, new species
- Carapace slender, elongate triangular, greatest width 0.64 to 0.72 (mean 0.68) times carapace length. Width at hepatic lobes subequal to or less than distance from gastric protuberance to anterior margin. Hepatic lobe angled apically, unarmed. Neck very long, tapering anteriorly ..... *A. turbator*, new species

\**Achaeus buderes*, new species

FIGURE 65

**MATERIAL EXAMINED.**—*Pillsbury Material*: Ghana: Sta 17, 48 m, fine sand and green mud, 1♂, 4♀ (3 ov) (L). Sta 22, 51 m, rough bottom, 1♀ (W). Sta 23, 42 m, foliate brown to orange bryozoans, 1♀ ov (holotype, L). Sta 24, 35–37 m, dark red bryozoans, 1♀ ov (W).

**DESCRIPTION.**—Carapace (Figure 65a) pyriform, width 0.67 to 0.81 (mean 0.75) times length, slenderer in males and juveniles, not markedly constricted behind orbits, neck short, branchial regions swollen, lateral margins and dorsal surface with some tubercles or sharp denticles, re-

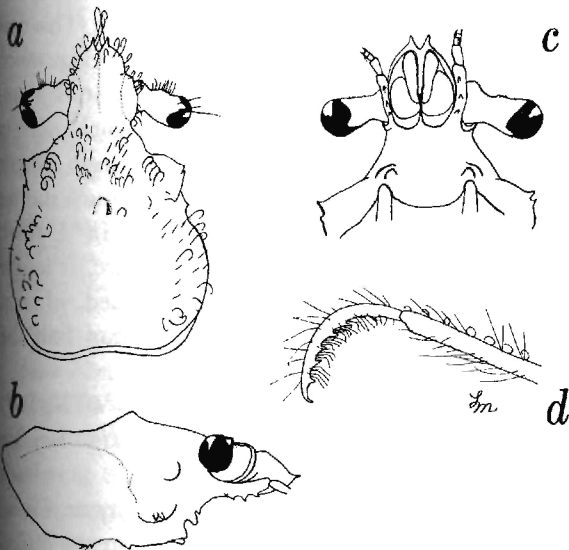


FIGURE 65.—*Achaeus buderes*, new species, female paratype, cl 4.5 mm, *Pillsbury* Sta 22: a, carapace, dorsal view; b, carapace, lateral view; c, front, ventral view; d, dactylus of fifth pereopod.

gions generally poorly defined. Surface appearing smooth, not markedly granular.

Rostrum (Figure 65a-c) consisting of 2 short, sharp spines arising from broader, rounded frontal lobes, separated by a deep V-shaped emargination, base of emargination extending posterior to base of spinules. Apices of rostrum directed anteriorly, not upturned in lateral view (Figure 65b).

Supraorbital eave (Figure 65a) smooth, not denticulate or spined. Postorbital margin smooth, unarmed. Eystalks stout, expanded distally, anterior margin with low, broad prominence, anteroventral margin minutely spinulose and ornamented with setae. Narrow process on anterior margin extending to rounded, setigerous tubercle over cornea. Latter large, oval, obliquely terminal.

Hepatic region well defined, distinctly projecting laterally, with apical spine, directed obliquely forward, and smaller tubercles. Carapace width at hepatic lobes exceeding distance from gastric prominence to anterior margin.

Dorsal surface of carapace with 2 low, conical prominences in midline, gastric slightly higher than cardiac. Protogastric region with low, unarmed tubercle. Branchial region smooth, with inconspicuous mesobranchial tubercle centered dorsally. Epibranchial swelling distinct. Low swelling present on metabranchial region above posterior pereopods. Lateral margin with irregularly placed low spinules, posterolateral margins with inconspicuous tubercles, posterior margin smooth.

Basal antennal article (Figure 65b) with 2

spines distally and 1 or 2 tubercles or spinules proximally. Antennal segments unarmed.

Antennular fossae large, longitudinally sub-oval, margins of fossae smooth. Basal antennular segment with line of tubercles ventrally. Interantennular process slender, terminating posteriorly in rounded right angle. Anterior process of epistome very thin.

Epistome (Figure 65c) broader than long, widening posteriorly, most of surface smooth, with sharp spinule anterolateral to opening of antennal gland. Pterygostomian region with sharp spine along lateral border.

Third maxillipeds not meeting in midline, hairy, not heavily spined. Ischium with 2 parallel lines of sharp denticles, mesial margin tuberculate or with small spines, lacking large spines. Merus with line of sharp denticles on surface, several small spines on mesial margin. Palp with slender dactylus, shorter than stout carpus and propodus combined. Carpus and propodus each with distal spine mesially.

Chelipeds slender in adult female, merus not extending beyond orbit. Ischium with line of spines ventrally. Merus with line of spines, some large, on ventrolateral border, 2 widely separated and 1 distal spine dorsally, and 1 distal spine mesially. Carpus with proximal outer spine, 2 spines on oblique dorsal line, and 1 inner distal spine, flanked proximally by sharp tubercle. Chela shorter than remainder of cheliped, fingers longer than palm. Palm with row of spines dorsally and ventrally, inner and outer surfaces smooth. Fingers flattened, lacking prominent gape (in ♀), cutting edges crenulate, lacking enlarged tooth on movable finger. Chela largely naked, with few long and short hairs scattered over surface.

Walking legs short, slender, merus and propodus of first walking leg each shorter than carapace, with curled hairs arising singly on dorsal surface of carpus and propodus, longer hairs scattered over surfaces of both segments. First walking leg longest, remainder decreasing in length posteriorly. Proximal segments of walking legs unarmed, merus lacking conspicuous distal dorsal

spine. Dactylus of first walking leg straight proximally, slightly curved distally, unarmed ventrally, more than half as long as propodus, latter slightly shorter than merus. Dactylus of second walking leg shorter than that of first, more evenly curved, with 1 subdistal tooth ventrally; dactylus, measured across arc, more than half as long as propodus, latter shorter than merus. Dactylus of third walking leg falciform, with 3 large distal and 3 smaller proximal ventral teeth, length, measured across arc, slightly more than half propodus length, latter  $4/5$  as long as merus. Dactylus of fourth walking leg (Figure 65d) falciform, with 5 or 6 large distal and several smaller proximal teeth ventrally, length, measured across arc, more than half that of propodus, latter shorter than merus. Sternum unarmed. Male too damaged to determine details of abdomen and gonopod.

MEASUREMENTS.—Carapace length of male 4.7 mm, of non-ovigerous females 3.4 to 4.0 mm, of ovigerous females 3.0 to 7.0 mm.

REMARKS.—*Achaeus buderes*, with its stout, pyriform carapace with a very short neck, most closely resembles *A. foresti*. As in that species, there is a spinulose patch on the anterior margin of the eye, the hepatic lobes are armed, and there are spines and tubercles laterally on the carapace. This new species differs from *A. foresti* in having much stouter eyes, with the diameter of the stalk about half its length, having the supraorbital margin unarmed, having the posterior margin of the carapace unarmed, and in having a much shorter dactylus on the fourth pereopods. In *A. foresti* that dactylus, measured across its arc, is longer than the ischium and merus combined, whereas in *A. buderes* it is slightly longer than half the length of the merus.

TYPE-LOCALITY.—Off Ghana,  $05^{\circ}10'N$ ,  $00^{\circ}25'W$  to  $05^{\circ}08'N$ ,  $00^{\circ}28'W$ , in 42 m (*Pillsbury Sta 23*).

DISPOSITION OF TYPES.—The holotype (Crust. D. 23903), an ovigerous female, is in the Rijksmuseum van Natuurlijke Historie, Leiden. One lot of paratypes is also deposited there and two lots of paratypes are in the National Museum of

Natural History, Smithsonian Institution, Washington, D.C.

ETYMOLOGY.—The specific epithet is derived from the Greek prefix *bou-*, large, and *dere*, neck.

BIOLOGY.—This species was taken by the *Pillsbury* in depths between 35 and 51 m, usually on soft bottom, fine sand and green mud, with bryozoans. Ovipigerous females were taken in May.

DISTRIBUTION.—Known only from type-locality, in 35 to 51 m.

### *Achaeus cranchii* Leach, 1817

*Achaeus cranchii*.—Monod, 1956:539, 632, figs. 747–766 [Europe, Mediterranean, Canary Islands, Senegal, Sierra Leone].—Longhurst, 1958:89 [Sierra Leone].—Forest and Gantès, 1960:357 [Morocco].

*Achaeus cranchii*.—Zariquiey Alvarez, 1968:474, fig. 160e,f [Spain; references].—Christiansen, 1969:109, fig. 45, map 38 [North Atlantic].

SYNONYM.—? *Achaeus cursor* A. Milne Edwards and Bouvier, 1898.

DISTRIBUTION.—Eastern Atlantic from the British Isles southward to Sierra Leone, including the Azores and the Canary Islands; Mediterranean. Littoral to at least 68 m.

### \* *Achaeus foresti* Monod, 1956

FIGURE 66

*Achaeus foresti* Monod, 1956:545, figs. 771–776.—Forest, 1968:1096, figs. 1–6.

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

Ghana: Sta 17, 48 m, fine sand and green mud, 1♂ (?).

DESCRIPTION.—Forest, 1968:1096.

*Male Pleopod*: Forest, 1968, fig. 6 (Ghana).

MEASUREMENTS.—Carapace length of male 2.8 mm, of female 3.7 mm. The only other known specimen, the holotype, is an ovigerous female with a carapace length of 5 mm.

REMARKS.—Forest (1968) redescribed this species from two specimens collected by the *Pillsbury*. His figures have been reproduced here (Figure 66) for the sake of completeness and to facilitate

the recognition of this species and the other species from the *Pillsbury* collections.

The holotype, in the Muséum national d'Histoire naturelle, Paris, is in poor condition. As Forest (1968:1098) pointed out, all that remains of the type is the carapace on which the apices of the rostrum have been broken. Thus, these rostral spinules are shown by Forest (1968, fig. 1) but the rostrum appears unarmed in the illustrations given by Monod (1956, figs. 771–773); this latter figure also does not show the marginal spinules on the basal portion of the rostrum. Monod (1956, fig. 776) illustrates one of the pereiopods of the type on which the merus is

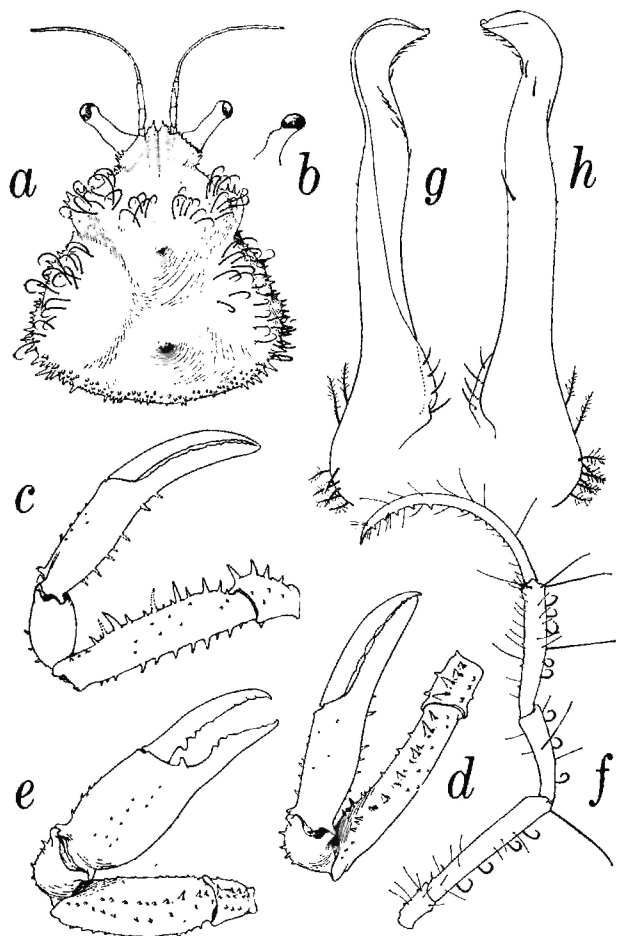


FIGURE 66.—*Achaeus foresti* Monod. Female, cl 3.7 mm, *Pillsbury* Sta 68: a, carapace; b, eye; c, d, right cheliped, viewed from different angles. Male, cl 2.8 mm, *Pillsbury* Sta 17: e, right cheliped; f, fifth pereiopod; g, h, gonopod in anterior and posterior views. (All from Forest, 1968, figs. 1–6.)

considerably longer than the propodus and the dactylus is subequal to the propodus; he may have shown the second pereopod, for in the other species of *Achaeus* reported here that is the only pereopod with the dactylus unarmed. Forest (1968) described the second pereopod as having the merus shorter than the propodus and the dactylus 0.7 times as long as the propodus; his account of the third pereopod indicates that the merus is slightly longer than the propodus and, as on the second pereopod, the dactylus is 0.7 times as long as the propodus. Finally, the strong spines near the opening of the antennal gland mentioned by Forest in the *Pillsbury* specimens are not shown in Monod's original illustration of the species. We have not had an opportunity to reexamine the two *Pillsbury* specimens.

**BIOLOGY.**—Almost nothing is known of the biology of this species, represented by three specimens, one taken in 40 m off Senegal, one in 70 m on broken shell off Liberia, and one from 48 m on fine sand and green mud off Ghana. The only ovigerous female so far known was collected in March.

**DISTRIBUTION.**—Known from the following three localities off West Africa.

Senegal: S of Île de la Madeleine, near Dakar, 40 m (Monod, 1956).

Liberia: 04°23'N, 08°05.5'W to 04°24'N, 08°07.5'W, 70 m (Forest, 1968).

Ghana: 05°35'N, 00°10'E to 05°36'N, 00°11.5'E, 48 m (not 42 m) (Forest, 1968).

### *Achaeus monodi* (Capart, 1951)

*Podocheila monodi* Capart, 1951:95, fig. 31, pl. 1: figs. 8, 11, pl. 2: figs. 17, 18, 20 [Cabinda, Zaire, Angola].

*Achaeus monodi*.—Monod, 1956:548, figs. 782–810 [Senegal, Guinea, Sierra Leone, Gabon].—Longhurst, 1958:89 [Sierra Leone].—Rossignol, 1962:122 [Congo].—Forest and Guinot, 1966:109 [Guinea, Ivory Coast, Nigeria, Principe, São Tomé].—Le Loeuff and Intès, 1968, table 1 [Ivory Coast].

**DISTRIBUTION.**—West Africa, from Senegal to Angola, including the offshore islands of the Gulf of Guinea, Principe, and São Tomé; sublittoral, 0–4 to 100 m.

### *Achaeus trifalcatus* Forest and Guinot, 1966

*Achaeus* sp.—Monod, 1956:547, figs. 777–781 [Annobon].  
*Achaeus trifalcatus* Forest and Guinot, 1966:110, figs. 15–17, [Principe, São Tomé, Annobon].

**DISTRIBUTION.**—Known only from the offshore islands of the Gulf of Guinea, Principe, São Tomé, and Annobon, in depths from 0–6 to 37 m.

### \* *Achaeus turbator*, new species

FIGURE 67

**MATERIAL EXAMINED.**—*Pillsbury Material*: Nigeria: Sta 248, 33 m, 9♂ (includes holotype), 2♀ ov (L, W).

**DESCRIPTION.**—Carapace (Figure 67*a,c*) elongate triangular, width 0.64–0.72 (mean 0.68) times length, strongly narrowed anteriorly, slightly constricted behind orbits, neck appearing elongate, branchial regions swollen, regions well defined. Surface appearing smooth, not markedly granular.

Rostrum (Figure 67*a,c*) consisting of 2 very short, slender spinules with distinct posterior or basal shoulder, arising from truncate lobe or from 2 lobes separated by very shallow median emargination. Rostral spines directed anteriorly, not upturned in lateral view (Figure 67*b*).

Supraorbital eave (Figure 67*a,b*) smooth or lightly tuberculate, not armed with spinules. Postorbital margin smooth, unarmed. Eyestalks stout, width about half length, expanded distally, anterior margin sinuous, lacking well-marked projection. Narrow process on anterior margin of stalk extending to rounded tubercle over cornea. Latter large, oval, obliquely terminal.

Hepatic region moderately expanded, produced into acute or subacute unarmed lobe, anterior margin almost perpendicular to body line, occasionally with lateral tubercle but lacking apical spine. Width at hepatic lobes subequal to or less than distance from gastric protuberance to anterior margin.

Dorsal surface of carapace with 2 prominences on midline, gastric prominence an inflated tubercle, smaller and lower than cardiac prominence,

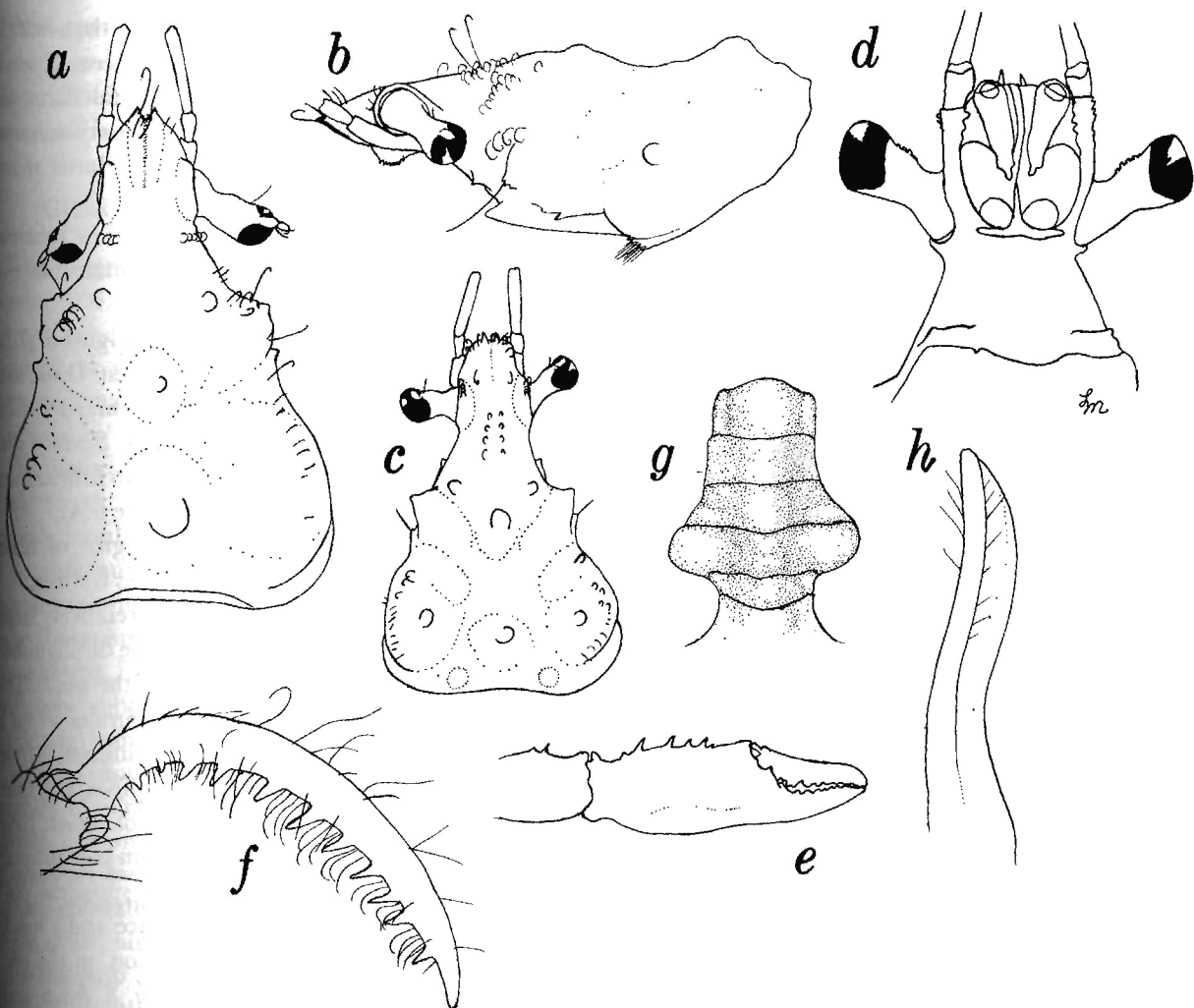


FIGURE 67.—*Achaeus turbator*, new species. Ovigerous female paratype, cl 6.0 mm, Pillsbury Sta 248: *a*, carapace, dorsal view; *b*, carapace, lateral view. Male paratype, cl 6.6 mm, Pillsbury Sta 248: *c*, carapace, dorsal view; *d*, epistome; *e*, chela; *f*, dactylus of fifth pereiopod; *g*, abdomen; *h*, gonopod.

neither spined dorsally. Protogastric region with low, unarmed tubercle. Branchial region smooth, with low mesobranchial tubercle centered dorsally. Epibranchial swelling, if present, low, inconspicuous. Low swelling present on metabranchial region above posterior pereiopods. Posterior and posterolateral margins unarmed, tubercles present anteriorly on margin above chelipeds.

Basal antennal article (Figure 67*d*) usually smooth, lightly tuberculate or with 1 or 2 low spinules in some specimens. Antennal segments unarmed.

Antennular fossae large, longitudinally subovate, lateral margins of fossae irregularly crenulate along border with basal antennal segment. Basal antennular segment bearing irregular line of tubercles ventrally. Interantennular process slender, terminating posteriorly in thin, blunt, obtuse, triangular lobe. Anterior process of epistome very slender.

Epistome (Figure 67*d*) appearing elongate, actually broader than long, widening posteriorly, most of surface smooth, with single sharp tubercle present anterolateral to opening of antennal

gland. Pterygostomian region with sharp tubercle on lateral border.

Third maxillipeds not meeting in midline, hairy, not heavily spined. Ischium with 2 parallel lines of small tubercles, mesial margin tuberculate, erect spines present on margin in some specimens. Merus largely smooth, with few surface tubercles, narrow, unarmed mesially or with tubercles or small spines. Palp with slender dactylus, shorter than stout carpus and propodus combined; carpus and propodus each with distal spine mesially.

Chelipeds (Figure 67e) long and stout, not heavily armed or setose. Ischium with several spines ventrally. Merus inflated, with row of large spines on ventrolateral border, inner distal spine mesially, upper surface largely smooth, with seta-tipped tubercle near midlength and small distal, dorsal spine. Carpus with proximal outer spine, row of spines of varying size dorsally, shorter row distolaterally, terminating in large distal spine. Chela shorter than remainder of cheliped, fingers shorter than palm. Palm with row of spines dorsally and ventrally, outer surface smooth, inner surface spinulose in males, nearly smooth in females. Fingers flattened, without prominent gape, cutting edges crenulate, proximal tooth of movable finger largest, not markedly enlarged. Chela largely naked, with few long and short hairs scattered over surface.

Walking legs very long and slender, merus and propodus of first each longer than carapace, with curled hairs arising singly on dorsal surface of carpus and propodus, longer hairs arising distally on propodus. First walking leg longest, remainder decreasing in length posteriorly. Proximal segments of walking legs unarmed, merus with distal dorsal spine. Dactylus of first walking leg straight proximally, slightly curved distally, unarmed ventrally, slightly more than half as long as propodus, latter slightly shorter than merus. Dactylus of second walking leg shorter than that of first, slightly curved, with 1 or 2 subdistal teeth ventrally, length across arc about half that of propodus, latter shorter than merus. Dactylus of third walking leg falciform, with about 12 sharp

ventral teeth, length across arc less than half that of propodus, latter shorter than merus. Dactylus of fourth walking leg (Figure 67f) falciform, with about 12 sharp teeth ventrally, length across arc more than half that of propodus, latter shorter than merus.

Sternum unarmed or with few, low tubercles, and with short, oblique carina in males posterior to articulation of cheliped.

Abdomen in male of 6 somites (Figure 67g). All somites wider than long, third widest. Distal somite not expanded laterally, not markedly wider than fifth, apex obtuse, rounded. Surface with broad elevation on first and third to fifth somites. Male pleopod as illustrated (Figure 67h).

MEASUREMENTS.—Carapace lengths of males 5.8 to 7.8 mm, of ovigerous females 6.0 mm.

REMARKS.—*Achaeus turbator* is a relatively large, slender species which can readily be distinguished from the other Atlantic species of the genus. The rostrum, comprising two small spinules set on a rounded or truncate lobe will distinguish it from *A. trifalcatus*, which lacks rostral spines, and from *A. cranchii* and *A. gracilis*, both of which have rostral spines that taper evenly from base to apex; the latter two species also have spinulose posterolateral margins on the carapace and a much more prominent anterior projection on the eye. *Achaeus turbator* resembles *A. monodi*, *A. foresti*, and *A. buderes*, but is a much slenderer species than any of these and further differs from *A. monodi* in lacking erect dorsal spines on the cardiac and gastric prominences of the carapace, from *A. foresti* in lacking supraorbital spinules and spinules and tubercles posteriorly and posterolaterally on the carapace, and from *A. buderes* in having a long neck and unarmed hepatic lobes on the carapace.

TYPE-LOCALITY.—*Pillsbury* Sta 248, off Nigeria, 04°03'N, 05°41'E to 04°07'N, 05°40'E, in 33 m.

DISPOSITION OF TYPES.—The holotype (Crust. D. 31764), a male, cl 7.0 mm, is in the Rijksmuseum van Natuurlijke Historie, Leiden. The paratypes have been deposited in the Leiden Museum and in the Smithsonian Institution.

ETYMOLOGY.—The name is from the Latin, *turbator*, meaning disturber or trouble-maker.

DISTRIBUTION.—Known only from the type-locality, off Nigeria.

### Genus *Calypsachaeus*, new genus

TYPE-SPECIES.—*Achaeus calypso* Forest and Guinot, 1966.

ETYMOLOGY.—The name is derived from the name of the vessel *Calypso* in combination with the generic name *Achaeus*; gender of the name is masculine.

DIAGNOSIS.—Carapace subtriangular, longer than broad, narrowed behind orbit, largely smooth dorsally, margins spinulose. Rostrum of 2 elongate, anteriorly truncated lobes, apex and margins spinulose. Orbit with only supraorbital cave above, lined with long spinules. Postorbital spine absent. Eyestalks long, nonretractile, cornea obliquely subterminal, slightly ventral, large, ovoid. Interantennular septum produced ventrally into cupped process with distal sharp spine, visible in dorsal view. Basal antennal article slender, channelled longitudinally, depression flanked on each side by line of tubercles, with strong distolateral spine. Merus of third maxilliped ovate, not notched distally, narrower than ischium, palp articulating at summit. Chelipeds spinous, slightly enlarged in adult male, palm strongly compressed, cristate dorsally and ventrally. Walking legs long and slender, dactyli of posterior 2 falciform, ventrally spinulated. Abdomen of 6 free somites in both sexes, male abdomen widest at third somite. Male first pleopod bluntly pointed, aperture terminal in groove.

REMARKS.—*Calypsachaeus* superficially resembles *Achaeus*, differing in the form of the rostrum, which is much better developed, in the strong development of the interantennular septum, in the ornamentation of the basal antennal segment, and in the form of the chelae, on which the palms are strongly compressed and cristate dorsally and ventrally. The male pleopod of *Calypsachaeus* (Forest and Guinot, 1966, fig. 19c-d) is similar to that of *Achaeus* in overall shape, but opens terminally

rather than subterminally. *Achaeus calypso* is the only species we assign to this genus.

### \**Calypsachaeus calypso* (Forest and Guinot, 1966), new combination

FIGURE 68

*Achaeus calypso* Forest and Guinot, 1966:113, figs. 18, 19.

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

Ghana: Sta 17, 48 m, fine sand and green mud, 1♂, 2♀ (1 ov)(W). Sta 22, 51 m, rough bottom, 1♂ (W).

Nigeria: Sta 248, 33 m, 3♂, 1♀ ov (L).

Cameroon: Sta 260, 46 m, 1♂ (W).

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

DESCRIPTION.—Carapace (Figure 68a) pyriform, width 0.75 to 0.87 (mean 0.82) times length, constricted behind orbit, branchial regions only slightly inflated, not extending over lateral margin, latter spinulose, regions not well defined. Surface sparsely granular, with scattered long, hooked hairs, especially laterally and anteriorly.

Rostrum (Figure 68a,c) consisting of 2 broad projections, separated by broad V- or U-shaped emargination, inner margins extending ventrally to sharp interantennular spine, clearly visible in dorsal view. Margins and blunt apices of rostrum spinulose, apices raised dorsally.

Orbital margin (Figure 68c) including supra

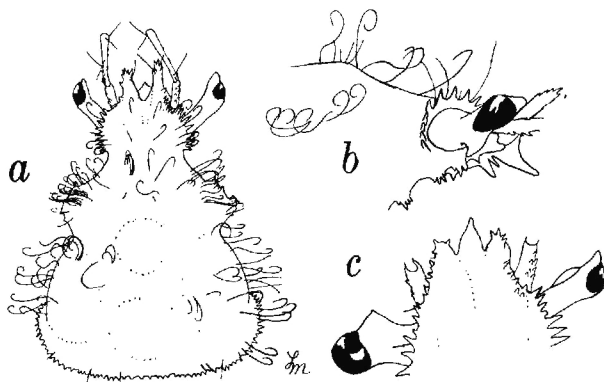


FIGURE 68.—*Calypsachaeus calypso* (Forest and Guinot), male, cl 6.8 mm, *Pillsbury* Sta 260: a, carapace; b, lateral view of front; c, oblique dorsal view of front.

orbital eave, completely lined with denticles or strong spinules. Distinct postorbital spine absent. Eystalks slender, elongate, anterior or anteroventral margin with prominent, thin, blade-like, obtuse projection, as wide as or wider than stalk, with anterior spinules. Narrow process from anterior margin extending to rounded, setiferous tubercle over cornea. Latter broad, oval, obliquely terminal.

Hepatic region well defined, strongly projecting laterally, smooth or with apical spine or with apical row of spinules flanked anteriorly by spinular crest on hepatic lobe. Carapace width at hepatic lobes subequal to or greater than distance from gastric prominence to anterior margin.

Dorsal surface of carapace with 2 prominences in midline, gastric slender, usually an erect spine, often obsolete or broken, much the higher, cardiac prominence a low, obtusely rounded, conical lobe. Branchial regions smooth, unarmed, subregions not well marked. Lateral and posterior margins of carapace completely lined with tubercles or erect spinules.

Basal antennal article longitudinally sulcate, with inner and outer lines of spinules, fewer in smaller specimens, outer line terminating in enlarged distolateral tooth. Free segments of antennal peduncle variably tuberculate or spinulose.

Antennular fossae elongate-triangular, margins unarmed, lacking anterior rim, each fossa grading anteriorly into rostral spine. Basal antennular segment with patch or line of spiniform tubercles. Interantennular process strongly produced (Figure 68*b*), projecting well beyond level of basal antennal segment, expanded laterally to form broad, anteriorly cupped lobe, curved anteriorly, apically acute or spiniform. Inner, dorsal margin of cupped lobe grading evenly into inner surfaces of rostral horns. Anterior process of epistome thin, rounded, blade-like, projecting ventrally.

Epistome subrectangular, broader than long, most of surface smooth, with spinulose crest or patch of spinules lateral to opening of antennal gland. Pterygostomian region with stalked projection, apically spinulose, on lateral border.

Third maxillipeds not meeting in midline,

hairy, heavily spined. Exopod lined with spinules. Ischium with 2 divergent rows of sharp denticles, mesial margin spinulose, tuberculate. Merus with line of sharp denticles on surface, spined mesially, with spinules laterally and distally. Palp with slender dactylus, shorter than stout carpus and propodus combined. Carpus and propodus each with distal spine mesially.

Chelipeds slender in both sexes, longer and slightly inflated in males, merus extending beyond eye in males, not extending to eye in females and juveniles. Ischium very spinous, largest spine set distoventrally. Merus with line of erect spines on sharp ventral border, outer surface smooth, upper border cristate, smooth or with line of tubercles, inner surface with some lines of tubercles. Palm strongly compressed, cristiform dorsally and ventrally, upper margin with spaced spines and tubercles, lower margin smooth, inner surface of lower margin with line of spines and denticles, outer surface smooth, inner surface tuberculate. Fingers longer than palm, flattened, lacking prominent gape, cutting edges crenulate, lacking enlarged proximal tooth on movable finger. Chelae largely naked, with few hooked hairs on outer surface, upper and lower borders with few long, stiff hairs interspersed between spines.

Walking legs long and slender (merus of second pereopod longer than carapace, propodus subequal to or slightly longer than carapace), with curled hairs arising in groups on dorsal surface of distal 4 segments and longer hairs scattered over surface, especially on propodus and dactylus. Second pereopod longest, remainder decreasing in length posteriorly. Merus of walking legs with distal arc of spinules or low tubercles dorsally. Dactylus of second pereopod straight proximally, curved distally, unarmed ventrally, more than half as long as propodus, latter shorter than merus. Dactylus of third pereopod as long as that of second, slightly more curved distally, unarmed ventrally, more than half as long as propodus, latter subequal to merus. Dactylus of fourth pereopod falciform, ventral margin with numerous triangular teeth, some swollen, proximally tuberculate, length across arc subequal to that of



propodus, latter shorter than merus. Dactylus of fifth leg falciform, armature similar to that of fourth, length across arc subequal to that of propodus, latter shorter than merus.

Male abdomen narrowed distally, apex broadly rounded, with median tubercle on each somite, sixth somite with 2 subapical tubercles or spinules. Male pleopod as figured by Forest and Guinot (1966, fig. 19c,d).

Sternum granular in both sexes, in male ornamented with anteriorly convex arc of strong spines and tubercles, with 1 enlarged spine near base of each cheliped.

MEASUREMENTS.—Carapace lengths of males 5.7 to 9.0 mm, of females 4.8 to 9.3 mm, of ovigerous females 8.6 to 9.3 mm. The male holotype has a carapace length of 10.0 mm (Forest and Guinot, 1966).

REMARKS.—This striking species can readily be recognized by its relatively smooth carapace, eyes with their flattened anterior projection, broad rostral spines, well-developed interantennular spine, flattened chelae, and the spinous ventral surface.

BIOLOGY.—This species occurs on the shelf in the Gulf of Guinea in depths between 30 and 70 m. The *Pillsbury* specimens were taken in 48 m on fine sand and green mud, in 51 m on rough bottom, and in 70 m on broken shell. The holotype was taken by the *Calypso* in 32 m on mud with *Arca*, and Forest and Guinot (1966) also recorded material taken on mud in 30, 50, and 70 m. Ovigerous females were collected in May.

DISTRIBUTION.—Gulf of Guinea, where it has been recorded from localities between Liberia and Cameroon in depths between 30 and 70 m. Records in the literature, all from Forest and Guinot (1966), include the following:

Ivory Coast: No specific locality, 30, 50, and 70 m.

Nigeria: Off the mouths of the Niger River, 04°03'N, 06°12'E, 32 m.

It has not been recorded previously from Liberia, Ghana, Dahomey, or Cameroon.

### Genus *Capartiella*, new genus

TYPE-SPECIES.—*Achaeus longipes* Capart, 1951.

ETYMOLOGY.—We take great pleasure in dedi-

cating this genus to A. Capart. His pioneering work on West African crabs published in 1951 added much to our knowledge of the brachyuran fauna there. Gender of the generic name is masculine.

DIAGNOSIS.—Carapace pyriform, length slightly greater than width, scarcely narrowed behind the orbit as a neck, lacking long spines or sharp tubercles. Rostrum a single short rounded projection, depressed anteriorly, overreached by strong interantennular spine. Orbit consisting above of narrow supraorbital cave, postorbital spines absent. Eyestalks long, nonretractile, movable. Cornea terminal, slightly ventral. Interantennular septum produced into distinct spine. Basal article of antennule slender, longitudinally sulcate, ornamented with low, rounded tubercles and distal blunt angular projection. Merus of third maxilliped subovate, not notched distally, narrower than ischium, palp articulating antero-internally. Chelipeds short, slender in both sexes. Walking legs long, slender, dactyli elongate, arched, with triangular ventral spines. Abdomen of 6 somites in both sexes. Male first pleopod with blunt apex, aperture terminal.

REMARKS.—In his original description, based on a single non-ovigerous female, Capart (1951: 63) noted that "c'est avec grande hésitation que je place cette curieuse espèce dans le genre *Achaeus*. . . ." He further noted that *C. longipes* could be separated from other species of *Achaeus* by its simple rostrum and by the shape of the dactyls of the walking legs. Monod (1956), who had no additional material, transferred the species to *Physachaeus* Alcock, with reservations, noting the superficial resemblance of *C. longipes* to *P. ctenurus* Alcock. Subsequent authors recording the species have followed Monod in placing the species in *Physachaeus*.

Forest and Guinot (1966:108, 109), in recording the first males to be collected, interpreted the rostrum as being formed of two very short lobes which were overreached ventrally by the interantennular septum, i.e., the rostrum comprised two fused lobes rather than a single one. They also pointed out differences in the eyes and the

basal antennal segment of *C. longipes* and those of species of *Physachaeus*, based on accounts in the literature, and noted (p. 109) "il est possible que l'on soit amené par la suite à créer pour elle un nouveau genre."

We have been able to compare our material with a male and female *Physachaeus ctenurus* (13°-17'15"N, 93°10'25"E, 185 fm (339 m), *Investigator*, USNM 42757) and from this comparison conclude that the resemblance between *C. longipes* and *P. ctenurus* is superficial. In *Physachaeus* the rostrum is clearly bifid, the eyes are short and fixed, with a terminal cornea, there are large gastric and cardiac spines on the carapace, the basal article of the antenna bears a long spine, and there are but 5 somites in the abdomen of the female. The condition of the eyes in *C. longipes*, long and movable, versus those of *P. ctenurus*, would be enough to exclude *C. longipes* from *Physachaeus*.

*Capartiella* most closely resembles *Achaeus* Leach, *Achaeopsis* Stimpson, *Dorhynchus* Studer, and the American *Podochela* Stimpson (definition of the latter genus in Rathbun, 1925). It resembles *Achaeus*, *Achaeopsis*, and *Dorhynchus* and differs from *Podochela* in having the abdomens of each sex composed of 6 somites. In *Podochela*, which also has an unarmed carapace and usually has a simple but anteriorly produced rostrum, the abdomen is composed of 6 somites in the male, 5 in the female. The legs of *Capartiella*, like those of *Achaeopsis*, are very long, slender, setose, with the dactyl slender, not strongly recurved, but *Capartiella* lacks the spines on the carapace. *Capartiella* shares many features with *Achaeus*, but differs in having a single rostrum, slender chelipeds that are not inflated or enlarged in adult males, and slender dactyli on the walking legs. The male pleopod of *Capartiella longipes* (figured by Forest and Guinot, 1966, fig. 14), resembles that of some species of *Achaeus* figured by Griffin (1970, figs. 13-15) in general configuration, and differs strongly from the pleopods of *Podochela*, which are apically acute with a subterminal opening flanked by a rounded flap, as shown by Garth (1958, pl. H).

**\**Capartiella longipes* (Capart, 1951),  
new combination**

FIGURES 69, 70

*Achaeus* ? *longipes* Capart, 1951:62, fig. 19, pl. 1: fig. 1, pl. 2: figs. 21, 22.

*Physachaeus* (?) *longipes*.—Monod, 1956:537, fig. 746.—Forest, 1959:15.—Rossignol, 1962:122.—Forest and Guinot, 1966:108, fig. 14.—Crosnier, 1967:340.

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

Ivory Coast: Sta 42, 62-75 m, mud with brown, branched Foraminifera, 1♂, 1♀ (L, W). Sta 46, 38-42 m, mud with dense *Jullienella*, 1♀ ov (L). Sta 60, 79-82 m, coral or rock, 2♂ (W).

Ghana: Sta 16, 46 m, mud with Foraminifera, shells, 1♂, 2♀ ov (L). Sta 23, 42 m, foliate brown to orange bryozoans, 3♀ ov (L, W). Sta 24, 35-37 m, dark red bryozoans, 1♀ (W). Sta 28, 49-53 m, 1♂, 1♀ ov (L).

Nigeria: Sta 239, 73 m, 1♀ (W). Sta 240, 37 m, 1♂ (L). Sta 241, 59-63 m, mud and shell, 1♀ (L). Sta 248, 33 m, 1♂, 1♀ (W).

*Other Material*: Congo: Off Pointe-Noire, 04°48'S, 11°-39'E, 54-56 m, sandy mud, 23 Sep 1965, *Ombango*, A. Crosnier, 2♂, 4♀ (1 ov) (W).

Cabinda: SW of Landana, 50 m, 23 May 1959, *Ombango*, A. Crosnier, 1♀ ov (W).

**DESCRIPTION.**—Capart, 1951:63.

*Male Pleopod*: Forest and Guinot, 1966, fig. 14 (Ghana).

**MEASUREMENTS.**—Carapace lengths of males 6.0 to 11.1 mm, of non-ovigerous females 4.0 to 13.9 mm, of ovigerous females 6.0 to 13.0 mm.

**REMARKS.**—We have provided here sketches of *C. longipes*, as well as Capart's original figures (Figures 69, 70) of it, apparently one of the more common species on the shallow part of the shelf in the Gulf of Guinea. All of our specimens were completely covered with a dense coat of algae and mud, so dense that their shape was scarcely discernible. This may have caused the species to be overlooked in earlier collections, for the shelf from Ghana to Nigeria has been well sampled in the last 25 years.

**BIOLOGY.**—This species apparently lives on soft bottoms in depths of no more than 82 m. The *Pillsbury* specimens were taken in depths of 33 to 82 m, usually on mud bottom with foraminifera

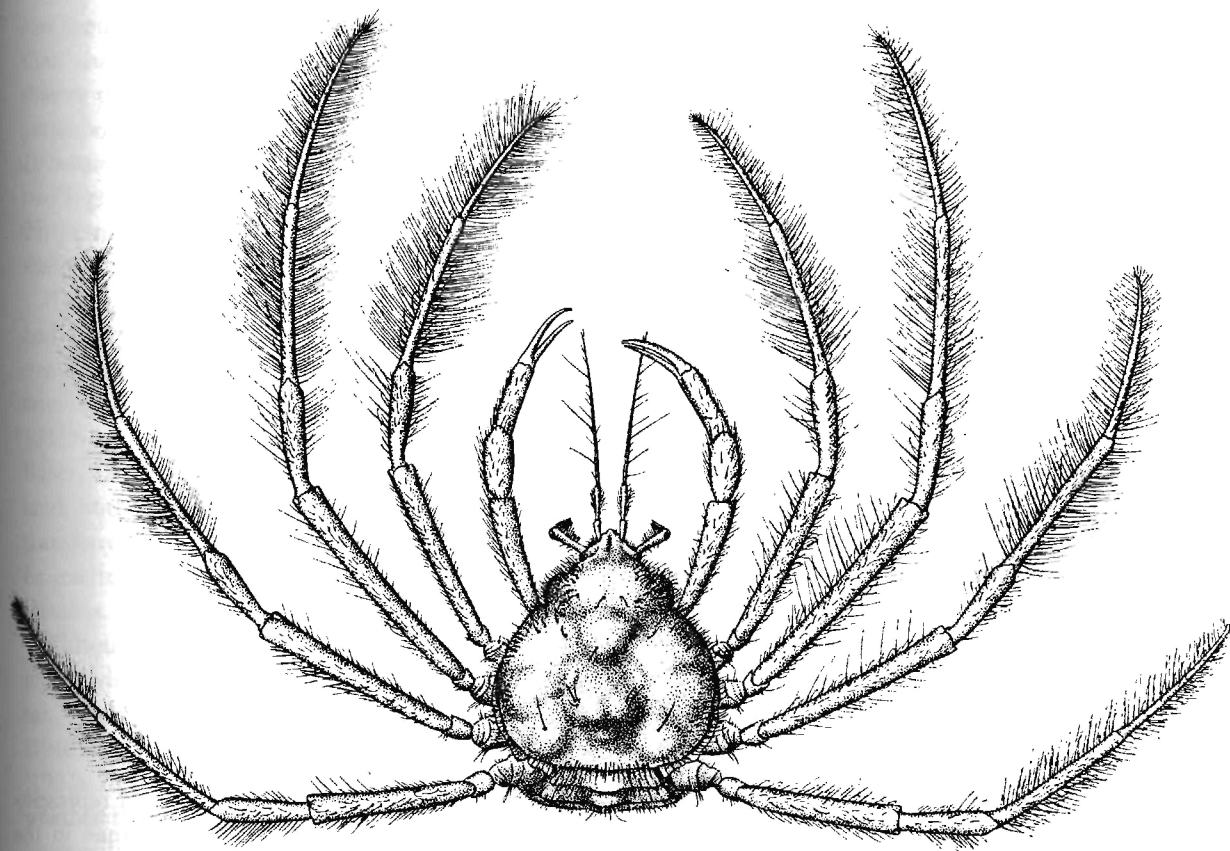


FIGURE 69.—*Capartiella longipes* (Capart) (from Capart, 1951, fig. 19.)

or Bryozoa; one sample was taken on broken shell and one on coral or rock (which terminated the haul; a rock outcrop may have been encountered on an otherwise soft bottom). Capart (1951) reported the species from a depth of 60 m in green mud. The specimens reported by Forest and Guinot (1966) came from mud, sand, and compact sand (sable construit) in 67–75 m and from mud in 50 m. Crosnier (1967) found the species on mud and sandy mud in depths between 35 and 58 m.

Ovigerous females have been collected in February, May, June, and September.

**DISTRIBUTION.**—Tropical West Africa, where it has been taken at a few localities between Senegal and Angola; sublittoral, in depths between 33 and 82 m. Records include the following:

Senegal: 12°55.5'N, 17°33'W, 65–75 m (Forest, 1959; Forest and Guinot, 1966).

Ivory Coast: No specific locality (Forest and Guinot, 1966).

Ghana: 04°40'N, 02°08'W to 04°39'N, 02°05'W, 50 m (Forest and Guinot, 1966).

Dahomey: No specific locality, 35–38 m (Crosnier, 1967).

Cabinda: W of Landana, 50 m (Rossignol, 1962).

Angola: 10 mi NxW of Luanda, 08°37'S, 13°12'E, 60 m (Capart, 1951).

### Genus *Dorhynchus* Thomson, 1873

*Dorhynchus* Thomson, 1873:175 [type-species: *Dorhynchus thomsoni* Thomson, 1873, by monotypy; gender: masculine; name 1619 on *Official List*].

*Lispognathus* A. Milne Edwards, 1881, in 1873–1881:349 [type-species: *Lispognathus furcillatus* A. Milne Edwards, 1881, by monotypy; gender: masculine].

**DIAGNOSIS.**—Carapace triangular, pyriform, longer than broad, expanded behind orbit, with dorsal spines, margins spinulous. Rostrum of 2

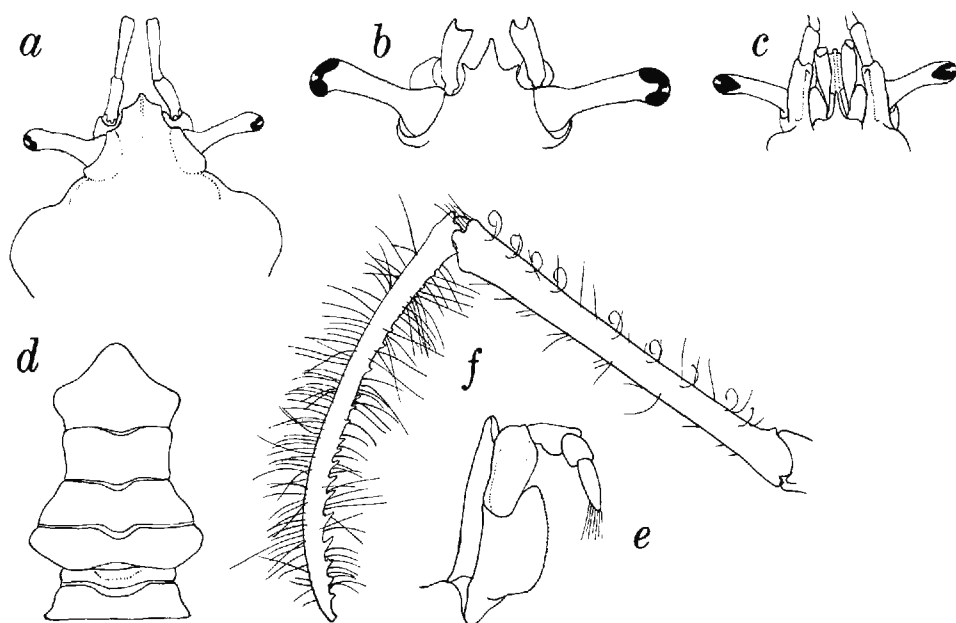


FIGURE 70.—*Capartiella longipes* (Capart). Male, cl 10.0 mm, Pillsbury Sta 248: *a*, front, dorsal view; *b*, front, oblique anterior view; *c*, front, ventral view; *d*, abdomen. Female, cl 12.0 mm, Pillsbury Sta 248: *e*, third maxilliped. Male, cl 11.1 mm, Congo: *f*, propodus and dactylus of fifth pereopod.

slender, sharp spines usually divergent anteriorly. Orbits with supraorbital cave provided with supraorbital spine(s), preorbital spine absent. Postorbital spine absent, nuchal spine present between hepatic lobe and orbit. Eystalks short, movable but nonretractile, cornea terminal, large, subglobular. Interantennular septum produced into sharp spine, usually visible in dorsal view. Basal antennal article slender, channelled longitudinally, channel flanked by inner and outer rows of spines, with enlarged terminal spine distolaterally. Merus of third maxilliped spinous, ovate or subrectangular, not notched distally, narrower than ischium, palp articulating at summit. Chelipeds spinous, slenderer in female, palm inflated. Walking legs long and slender, dactyli elongate, not falciform, posterior 2 with low teeth ventrally. Abdomen of 6 somites in both sexes. Male first pleopod bluntly pointed, with distinct subterminal lappet.

REMARKS.—Although the Pillsbury collections included no representatives of this genus, our recognition herein of some new genera in this

subfamily necessitated examination of representatives of all of the genera of Inachinae in the eastern Atlantic. In the case of *Dorhynchus*, considered by some (Rathbun, 1925; Barnard, 1950; Griffin, 1966b) but not others (Bouvier, 1940; Monod, 1956; Zariquiey Alvarez, 1968; and Christiansen, 1969) to be synonymous with *Achaeopsis* Stimpson (1858d:218; type-species: *A. spinulosa* Stimpson, 1858, by monotypy; gender: feminine; name 1604 on *Official List*), comparison of material of *D. thomsoni* (off Morocco, 1105 m, *Talisman*, USNM 22974, 3♂, cl 7.3–7.5 mm, 3♀, cl 5.8–7.5 mm) with a specimen of *A. spinulosa* (South Africa, 36°40'S, 21°26'E, 200 m, USNM: 1♂, cl 12 mm) leads us to suggest that the two should be regarded as distinct but closely related genera.

*Dorhynchus* differs from *Achaeopsis* in several features: the rostral spines are much longer; the interantennular spine is much larger, projects further ventrally, and its apex usually is visible between the rostral spines in dorsal view; the walking legs are longer and slenderer: in *D. thom-*