Cumacea from the West Coast of Africa

by

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CONTENTS

INTRODUCTION

The Cumacea reported on in this paper were obtained from the following sources:—

1. The West African Expedition of the University of Copenhagen by M.Y. "Atlantide", 1945—1946.
2. The Danish Deep Sea Expedition by R.V. "Galathea", 1950—1952.
3. Dr. J. CADENAT, Chef de la Section de Biologie Marine de l'IFAN, Gorée, Sénégal.
4. Dr. A. R. LONGHURST, West African Fisheries Research Institute, Freetown, Sierra Leone.
5. Dr. D. T. GAULD, Department of Zoology, University College, Achimota, Gold Coast.

The "Atlantide" stations at which Cumacea were obtained were as follows (from BRUUN 1950):

Station	Position	Date	Depth	Gear	Bottom
44	10°22′ N. 16°22′ W.	17.12.45	41 m.	V. G.	Brown sand, shells.
49	7°29′ N. 13°38′ W.	30.12.45	74 m.	–	Muddy sand.
51	7°14′ N. 12°57′ W.	31.12.45	108 m.	–	Sand and mud.
53	Off Port Marshall	7.1.46	12 m.	–	
72	4°52′ N. 1°42′ W.	23.1.46	24 m.	–	Muddy sand.
76	4°50′ N. 1°17′ W.	–		S. 100	
77	Off Accra	29.1.46	10 m.	V. G.	Muddy sand.
123	2°03′ S. 9°05′ E.	5.3.46	50 m.	S. T.	Mud, sand, shells, coral.
145	9°20′ N. 14°15′ W.	13.4.46	32 m.	–	
147	9°28′ N. 14°58′ W.	14.4.46	45 m.	–	
148	9°57′ N. 15°22′ W.	–	25 m.	–	
153	10°49′ N. 16°39′ W.	16.4.46	42 m.	P. G.	Grey sand.
160	Off Bathurst	24.4.46	14 m.	–	Grey, very fine sand.
161	—	–	18 m.	O. T.	Very fine sand.

The "Galathea" stations at which Cumacea were obtained were as follows:

Station	Position	Date	Depth	Gear	Bottom
46	5°36′ N. 0°48′ E.	26.11.50	220 m.	P. G. O. 2	Blue mud.
116	12°13′ S. 13°27′ E.	20.12.50	100 m.	P. G. O. 2	Clayey sand.
127	17°13′ S. 11°42′ E.	22.12.50	30 m.	V. G. O. 2	Sand.
128	—	—	40 m.	—	Sand.
129	—	—	50 m.	—	Muddy sand.
139	Walvis Bay	24.12.50	6 m.	V. G. O. 1	Dark greenish mud smelling strongly of H_2S.
141	Entrance of Walvis Bay	25.12.50	17 m.	—	—
144	23°16′ S. 14°02′ E.	—	100 m.	P. G. O. 2	Green mud with small shells, strong smell of H_2S.
145	—	—	50 m.	—	Green mud with slight smell of H_2S.
146	23°15′ S. 14°26′ E.	—	35 m.	—	Green muddy sand.
147	23°54′ S. 14°29′ E.	—	22 m.	—	Green muddy sand smelling of H_2S.
148	23°54′ S. 14°26′ E.	—	40 m.	—	Rocks.
149	—	—	54 m.	—	Green mud smelling of H_2S.
150	23°54′ S. 14°22′ E.	—	76 m.	—	Mud smelling of H_2S.
151	23°54′ S. 14°19′ E.	—	100 m.	—	Mud with faint smell of H_2S.

Nearly all the specimens from Gorée, numbering more than 2000 individuals, were collected by Dr. CADENAT at dawn at the water's edge on a sandy beach during the years 1950 to 1954. A few only were obtained by dredging in about 8 m. depth offshore.

The specimens from the W. A. F. R. I. are mainly from the estuary of the Sierra Leone River at Freetown, and were obtained from townet hauls taken by Mr. V. BAINBRIDGE and from fish stomachs. Those from the Gold Coast were obtained by Mr. J. B. BUCHANAN in grab hauls off Accra and by Dr. D. T. GAULD on a sandy beach at Busua, about 200 miles west of Accra. Details are included under "occurrence" in the systematic section.

I am most grateful to Dr. TORBEN WOLFF of the University Zoological Museum, Copenhagen, for placing the Cumacea from the "Atlantide" and "Galathea" Expeditions at my disposal, and to Dr. CADENAT, Dr. LONGHURST and Dr. GAULD for sending me the other material.

22 species were identified among the available material as follows:—

Cumopsis wafri sp. n.
Cumopsis elongata sp. n.
Heterocuma africana Zimmer
(= *H. intermedia* Fage)
Bodotria africana Zimmer
Bodotria pulchella (G. O. Sars)
Bodotria lata sp. n.
Upselaspis caparti (Fage)
Eocuma dimorpha Fage
Eocuma ferox (P. Fischer)
Eocuma calmani Fage
Eocuma cadenati Fage
Iphinoe tenella G. O. Sars
(= *I. hupferi* Zimmer)
Iphinoe fagei N. S. Jones
Iphinoe senegalensis sp. n.
Iphinoe crassipes Hansen
Iphinoe africana Zimmer
Iphinoe brevipes Hansen
Epileucon galatheae gen. et sp. n.
Campylaspis glabra G. O. Sars
Pseudocuma chevreuxi Fage
Diastylis laevis Norman
Diastylis denticulata sp. n.

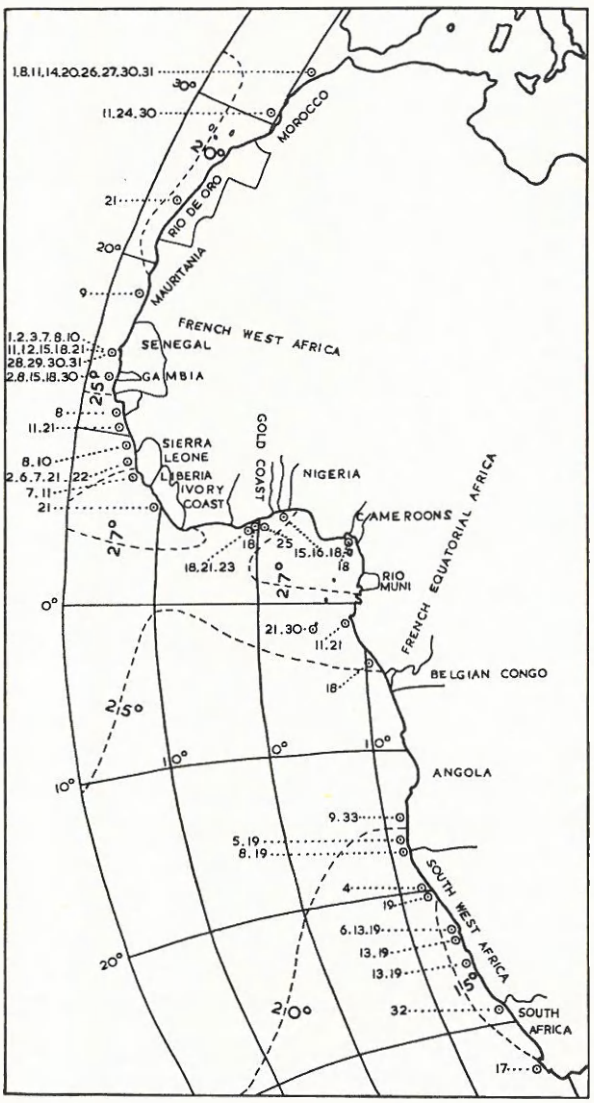
In addition to these *Iphinoe stebbingi* sp. n. is described from specimens in the British Museum (Natural History) collected off South Africa. I am indebted to Dr. I. GORDON of the Crustacea Section for the loan of the specimens.

A single immature male of the genus *Diastylis* occurred at St. 129 of the "Galathea" Expedition, but was too badly damaged to be identified to species.

Type specimens of *Cumopsis wafri*, *C. elongata* and *Iphinoe stebbingi* will be deposited in the British Museum (Natural History), of *Epileucon galatheae* and *Diastylis denticulata* in the University Zoological Museum, Copenhagen, and of *Bodotria lata* and *Iphinoe senegalensis* in the Museum of Natural History at Paris.

DISTRIBUTION

33 definite species of Cumacea have now been recorded from the west coast of Africa between the Straits of Gibraltar and Capetown. Those additional to the 22 species listed above include *Bodotria magna* Zimmer, *Bodotria glabra* N. S. Jones, *Iphinoe trispinosa* (Goodsir), *Iphinoe robusta*



Key to Species

1. *Bodotria pulchella*
2. *B. africana*
3. *B. lata*
4. *B. glabra*
5. *B. magna*
6. *Upselaspis caparti*
7. *Eocuma ferox*
8. *E. dimorpha*
9. *E. calmani*
10. *E. cadenati*
11. *Iphinoe tenella*
12. *I. senegalensis*
13. *I. fagei*
14. *I. trispinosa*
15. *I. crassipes*
16. *I. robusta*
17. *I. brevidactyla*
18. *I. brevipes*
19. *I. africana*
20. *Vaunthompsonia cristata*
21. *Heterocuma africana*
22. *Cumopsis wafri*
23. *C. elongata*
24. *Eudorella truncatula*
25. *Epileucon galatheae*
26. *Cumella limicola*
27. *Nannastacus unguiculatus*
28. *Campylaspis glabra*
29. *Pseudocuma chevreuxi*
30. *Diastylis laevis*
31. *D. dollfusi*
32. *D. rufescens*
33. *D. denticulata*

Fig. 1. Map of the West Coast of Africa by azimuthal equal area projection, showing approximate positions at which Cumacea have been recorded. Positions shown ⊙ are not accurate for distance offshore. Each species is represented by the number shown in the key. The interrupted lines represent mean annual isotherms.

Hansen, *Iphinoe brevidactyla* Hale, *Vaunthompsonia cristata* Bate, *Eudorella truncatula* (Bate), *Cumella limicola* G. O. Sars, *Nannastacus unguiculatus* (Bate), *Diastylis dollfusi* Fage and *Diastylis rufescens* N. S. Jones (Hansen, 1895; Zimmer, 1908, 1921; Fage, 1928b; Hale, 1952; Jones, 1955). A further 28 species have been recorded from South Africa south and east of Capetown, a number of them from deep water (Stebbing, 1910, 1912, 1913; Zimmer, 1908, 1913; Hale, 1952). The known occurrence of species found off the west coast is shown in Fig. 1.

All the species taken off the west coast are shelf forms, with the possible exception of *Epileucon galatheae* which was taken at a depth of 220 m. Of the 33 species, 23 belong to the Bodotriidae, which Zimmer (1941) describes as a negatively amphipolar family, with the genera *Bodotria, Eocuma* and *Iphinoe* well represented. The apparent scarcity of representatives of the genus *Cyclaspis*, which is usually abundant in tropical waters, is noteworthy (2 unnamed species have been recorded off the west coast of Africa by Hansen, 1895) but may be due to unspecialized collecting, the smaller species being missed. This remark also applies to the other negatively amphipolar family—the Nannastacidae—of which only one member extends into the tropical region of the west coast, while an unnamed species of *Nannastacus* is recorded from Luderitz Bay (Zimmer, 1916). The positively amphipolar families Leuconidae and Diastylidae are poorly represented, as might be expected, although the genus *Diastylis*, with 4 species, is an exception, while no member of the Lampropidae has been found.

There are still large stretches of coastline where no collections have been made, and there can be little doubt that further and more intensive collecting will produce a number of new species and extend the known range of others. The results from Gorée, where Dr. Cadenat has obtained 15 species on or close to the shore, show what may be achieved. The deep water cumacean fauna is entirely unknown throughout the whole area.

According to Ekman (1953) the West African tropical fauna is poorer in species than any other tropical coastal fauna, and is restricted to a considerably thinner surface layer of water than in any other tropical region. It is not possible to compare in detail the West African tropical cumacean fauna with that of any other tropical region as none of them is sufficiently well known, but bearing in mind that further coastal species remain to be discovered, there are indications that the number of species is limited in comparison with other regions of similar extent. Fage (1945), for example, identified 29 species collected by townet using artificial light at Nhatrang on the coast of Annam, and Kurian (1951) 21 species from Travancore, South India. Only a very few species—*Iphinoe brevipes, I. crassipes,* perhaps *I. robusta* and *I. senegalensis, Bodotria africana,* perhaps *B. lata, Heterocuma africana, Cumopsis wafri, C. elongata,* possibly *Upselaspis caparti, Eocuma dimorpha, E. calmani, E. cadenati,* and perhaps *Pseudocuma chevreuxi* may

be regarded as stenothermal warm water species. Of these *Heterocuma africana* and *Eocuma dimorpha* extend for some distance northward into the Mauritanian region, while *Upselaspis caparti* is also found in Walvis Bay, though in warmer shallow water, and *Iphinoe crassipes* is recorded from South Africa (Stebbing, 1910). Some more eurythermal species extend southward from the Mediterranean-Atlantic region into the tropical region, including *Eocuma ferox*, *Iphinoe tenella*, and *Diastylis laevis*.

It is doubtful if any species is truly endemic to the Mauritanian region. *Diastylis dollfusi* has been recorded from Gorée by Fage (1950), although it is not present in any of the material examined by me. The following Mediterranean-Atlantic species in addition to the three already mentioned extend into the Mauritanian region—*Iphinoe trispinosa*, *Vaunthompsonia cristata*, *Eudorella truncatula*, *Cumella limicola*, and *Nannastacus unguiculatus* only for a comparatively short distance, and *Bodotria pulchella* and *Campylaspis glabra* to the edge of the tropics. Fage (1928b) points out that the isotherms from 18° to 20° C. bend towards the south near the coast, so that a Mediterranean temperature is found along the coast of Mauritania.

Bodotria magna, *B. glabra*, and *Diastylis denticulata* may be endemic to the southern sub-tropical region, with *Eocuma dimorpha* extending southward from the tropical region, but too little is known for any firm statement to be made.

The warm-temperate region of the south-west coast, the Namaqua region of Michaelsen (Ekman, 1953), which is dominated by the Benguela Current, contains the species *Iphinoe fagei*, *I. africana*, and *Diastylis rufescens*, while *Upselaspis caparti* occurs there, as mentioned above. With the exception of *Iphinoe crassipes* none of the species found off South Africa south or east of Capetown is known to occur on the west coast, but this is probably due to lack of collecting.

Some of the tropical species or those which extend to the tropics also occur in the Indo-West-Pacific region. *Iphinoe brevipes*, *I. crassipes*, and *I. tenella* have been recorded from the coast of Travancore (Kurian, 1951) and *Campylaspis glabra* from the coast of Annam (Fage, 1945). This, as Ekman points out for the marine fauna as a whole, is presumably the result of the former existence of the Tethys Sea, and is not due to migration round the southern tip of Africa. No comparison can yet be made with the West Indian region as the latter is too little known.

On the whole the affinities of the Cumacea of the west coast of Africa are with those of the Mediterranean-Atlantic region. Of the genera so far identified 11 are also found in the Mediterranean, while only 3, 2 so far with a single species, do not extend north of Morocco. 10 species are found both north and south of Morocco, while only 5, 3 of which also occur in the Mediterranean, have been found in any other region.

KEY TO SPECIES

The following key will enable the species described from the west coast of Africa to be distinguished from one another but it should be noted that it will not always distinguish them from other described species that may be found within the area, while it is certain to require modification for new species.

1. No telson ..... 2.
   Telson present ..... 31.
2. Mandibles normal ..... 3.
   Mandibles broad at base ..... 30.
3. 5 pairs of pleopods in male; female with 4 or 2 thoracic exopodites 4.
   Male without pleopods; female with 3 thoracic exopodites..... 28.
4. Male and female with more than 2 exopodites..... 5.
   Male and female with only 2 exopodites ..... 8.
5. Male with 5, female with 4 well developed exopodites *Vaunthompsonia cristata.*
   Male and female with 2 well developed and 2 rudimentary exopodites 6.
6. Third maxilliped with carpus dilated internally..... *Heterocuma africana.*
   Third maxilliped with carpus not dilated..... 7.
7. Uropods longer than the last 3 abdominal somites together *Cumopsis elongata.*
   Uropods shorter than the last 3 abdominal somites together *Cumopsis wafri.*
8. Second peraeopod with 7 joints (inc. coxa) ..... gen. *Cyclaspis.*
   Second peraeopod with only 6 joints..... 9.
9. First pedigerous somite visible above ..... 10.
   First pedigerous somite fused to the carapace ..... 19.
10. Uropod with the first joint of the endopod longer than the second.. 11.
    Uropod with the first joint of the endopod not longer than the second 12.
11. Pseudorostrum upturned..... *Iphinoe crassipes.*
    Pseudorostrum not upturned ..... *Iphinoe brevidactyla.*
12. Male with 3 pairs of lateral carinae on the last 3 pedigerous somites *Iphinoe robusta.*
    No lateral carinae..... 13.
13. Second peraeopod much shorter than the third ..... 14.
    Second peraeopod not much shorter than the third..... 16.
14. Pseudorostrum distinctly toothed above the antennal notch *Iphinoe africana.*
    Pseudorostrum not distinctly toothed above the antennal notch... 15.
15. Length up to 18 mm.; female with a ventral process of the carapace below the pseudorostrum ..... *Iphinoe stebbingi.*
    Length up to 10 mm.; female without ventral process.... *Iphinoe brevipes.*
16. Basis of the first peraeopod shorter than the remaining joints together *Iphinoe tenella.*
    Basis of the first peraeopod at least as long as the remaining joints together ..... 17.
17. Prolongation of the basis of the third maxilliped reaching at least to the end of the prolongation of the merus ..... 18.
    Prolongation of the basis of the third maxilliped not reaching to the end of the prolongation of the merus..... *Iphinoe trispinosa.*

18. Carapace less than twice as long as high ..... *Iphinoe senegalensis.*
    Carapace more than twice as long as high ..... *Iphinoe fagei.*
19. Peduncle of the uropod longer than the rami..... 20.
    Peduncle of the uropod shorter than the rami ..... 24.
20. Carapace with 2 pairs of lateral carinae..... 21.
    Carapace with 1 pair of lateral carinae or none..... 22.
21. Basis of the second peraeopod with recurved spines..... *Bodotria pulchella.*
    Basis of the second peraeopod without recurved spines..... *Bodotria lata.*
22. Endopod of the uropod 1-jointed..... *Bodotria glabra.*
    Endopod of the uropod 2-jointed..... 23.
23. Carapace without lateral carinae..... *Bodotria magna.*
    Carapace with well developed carinae..... *Bodotria africana.*
24. Basis of the first peraeopod not produced distally ..... *Upselaspis caparti.*
    Basis of the first peraeopod produced distally ..... 25.
25. Lateral borders of the carapace carinate ..... *Eocuma cadenati*
    Lateral borders of the carapace not carinate ..... 26.
26. Carapace with 2 pairs of lateral horns ..... *Eocuma calmani.*
    Carapace with 1 pair of lateral horns or none..... 27.
27. Second peraeopod shorter than the third ..... *Eocuma dimorpha.*
    Second peraeopod as long as the third..... *Eocuma ferox.*
28. Molar process of the mandibles styliform, pointed..... *Campylaspis glabra.*
    Molar process of the mandibles thick and truncate..... 29.
29. A single median ocular group ..... *Cumella limicola.*
    Two widely separated ocular groups ..... *Nannastacus unguiculatus.*
30. Pseudorostrum well developed with the efferent orifice anterior....
    Epileucon galatheae.
    Pseudorostrum indistinct; efferent orifice placed dorsally *Eudorella truncatula.*
31. Telson short, semicircular ..... *Pseudocuma chevreuxi.*
    Telson longer, with narrow post-anal part..... 32.
32. Post-anal part of the telson the shorter..... *Diastylis denticulata.*
    Post-anal part of the telson the longer..... 33.
33. Telson with not more than 8 pairs of lateral spines..... *Diastylis dollfusi.*
    Telson with more than 10 pairs of lateral spines..... 34.
34. Carapace more than twice as long as high ..... *Diastylis rufescens.*
    Carapace less than twice as long as high..... *Diastylis laevis.*

SYSTEMATIC ACCOUNT

In the following account where the colour in life is described, the description is from notes taken by Dr. CADENAT.

Family BODOTRIIDAE

Sub-Family VAUNTHOMPSONIINAE

Genus *Cumopsis* G. O. Sars, 1878.

Cumopsis wafri sp. n. (Figs. 2 and 3).

Occurrence:

W. A. F. R. I., Sierra Leone Estuary, 26.1.55, townet, 10 m., 22 ♂♂, 5 ♀♀ (1 ovig.); do., 27.1.55, from stomachs of juv. *Galeoides decadactyla*, 12 m., 1 ♂, 2 ♀♀; do., 8.3.55, from *Galeoides* stomachs, 100 ♀♀; do., May 1955, medium townet, 5 ♀♀ (1 ovig.), 50 + juv.; coarse townet, 208 ♂♂, 49 ♀♀ (11 ovig.).

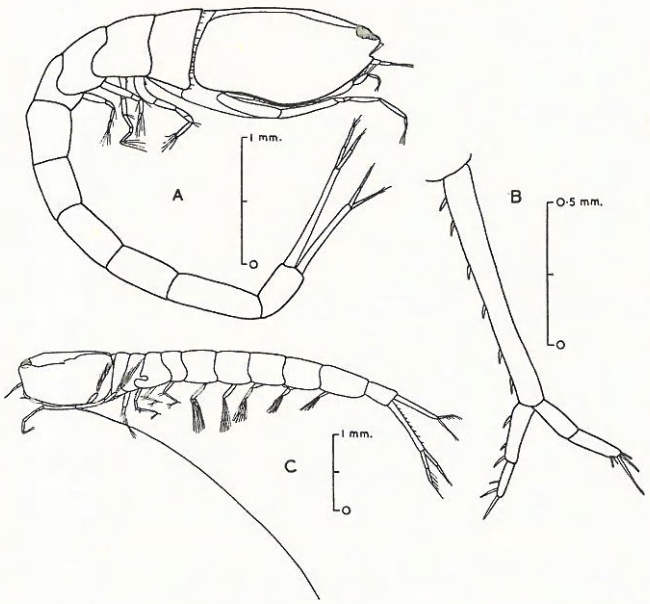


Fig. 2. *Cumopsis wafri* sp. n. A, adult female from the side; B, uropod of female from above; C, adult male from the side.

Adult Female. Length 5.7 mm. Carapace less than twice as long as high, with a fold at the hind end on each side of the mid-dorsal line and a further fold on each side running back from behind the eyelobe, but without distinct lateral folds; dorsal side convex; pseudorostrum very short; antero-

lateral angle rounded at tip, prominent; eyelobe nearly reaching the front of the pseudorostrum; eye pigmented.

First antenna with the basal joint longer than the other two joints of the peduncle. Third maxilliped with the basis rather produced distally, the merus produced to a point, the carpus not dilated internally. The exopodites of the second and third peraeopods about $^1/_6$ the length of the basis,

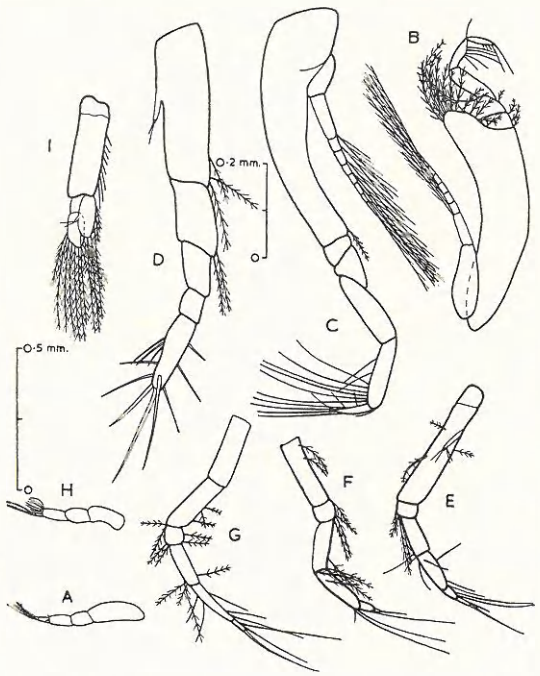


Fig. 3. *Cumopsis wajri* sp. n. Adult female. A, first antenna; B, third maxilliped; C—G, first to fifth peraeopods. Adult male. H, first antenna; I, second pleopod.

with a minute second joint. The uropods shorter than the last three abdominal somites together, the peduncle about $2^1/_2$ as long as the exopod, with 6-7 internal spines; the inner ramus with 3 spines internally on each joint; the outer ramus with the proximal joint unarmed, the distal joint with 2 internal and 3 end spines. Otherwise similar to *Cumopsis goodsiri* (v. Beneden) (G. O. Sars, 1870).

Colour in alcohol—yellowish-white with purplish-brown markings on the front of the carapace and on the first three thoracic somites and their appendages.

Adult Male. Length 5.0 mm. Differs from the female in the following respects: the carapace without an appreciable antero-lateral angle; the first antenna with the basal joint relatively shorter, the third joint with a circlet of sen-

sory setae; the second antenna reaching beyond the last abdominal somite; the pleopods with a median process on the external border of the endopodite; the uropods with more spines and setae.

Cumopsis wafri is similar in general form to the other species of the genus but differs in some respects, including the more produced distal end of the basis of the third maxilliped, and the rather more developed exopods of the second and third peraeopods. From *C. goodsiri* it is easily distinguished by the absence of lateral folds on the carapace and from *C. longipes* (Dohrn) (G. O. Sars, 1870, as *C. laevis*) by the different structure and armature of the uropods.

The genus is near to *Heterocuma* Miers, the most important distinguishing character being the shape of the third maxilliped, which in *Heterocuma* has the carpus dilated to form an internal lamella.

Cumopsis elongata sp. n. (Fig. 4).

Occurrence:

Gauld coll.: Sandy beach at Busua, Gold Coast, 25 ovig. ♀♀.

Ovigerous Female. Length 4.3 mm. Carapace about $1^1/_2$ as long as high, without lateral folds; dorsal surface somewhat corrugated posteriorly, al-

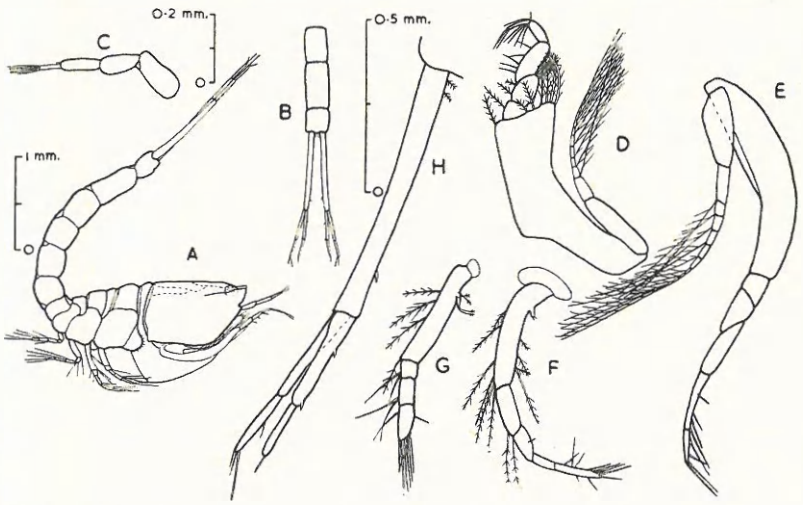


Fig. 4. *Cumopsis elongata* sp. n. Ovigerous female. A, lateral view; B, last three abdominal somites and uropods from above; C, first antenna; D, third maxilliped; E—G, first to third peraeopods; H, uropod from above.

most straight; antero-lateral angle prominent, acute; eyelobe set some way behind the projecting pseudorostral lobes; eye darkly pigmented.

The thoracic somites with the side plates well defined dorsally.

First antenna geniculate between the first and second joints of the peduncle, with the basal joint shorter than the other two joints together. Third

maxilliped with the basis broad distally, little produced, the merus rounded distally, the carpus without an internal lamella. The first peraeopod slender. The second and third peraeopods with their exopodites very small, 1-jointed, about $^1/_{12}$ the length of the basis, that of the third pair ending in 2 plumose setae. The uropods nearly as long as the last four abdominal somites together, the peduncle about $1^1/_2$ the length of the exopod, with 1 (sometimes 0) internal spine, and with 2 small plumose setae near the origin; the inner ramus with the first joint armed with 2 spines internally, the second joint with a single end spine; the outer ramus with the first joint unarmed, the second joint with 1 internal and 3 end spines.

Colour in alcohol—yellowish-white without chromatophores.

The species is easily distinguished in the female from *C. wafri* by its shorter carapace, the development of the thoracic side plates, and the more elongated uropods carrying fewer spines. It is close to *C. longipes* but the uropods are even more elongated than in that species and have fewer spines.

Genus *Heterocuma* Miers, 1879.

Heterocuma africana Zimmer.

Zimmer, 1921, p. 117.
H. intermedia Fage, 1924, p. 364.

Occurrence:

Atlantide Exp.: St. 44, 1 ♀; St. 53, 5 imm. ♂♂, 3 ♀♀; St. 76, 5 ♂♂, 55 ♀♀, 1 juv.; St. 77, 1 ♀; St. 123, 2 ♂♂; St. 147, 1 ♀; St. 148, 1 ♀.

Cadenat coll.: Beach at Gorée, 70 ♂♂, 12 ♀♀, 7 juv.

W. A. F. R. I.: Sierra Leone Estuary, May 1955, townet, 1 ♂; off Freetown, Dec. 1955, grab, 1 ovig. ♀.

Previous records: Freetown (Zimmer, 1921), Rio de Oro (Fage, 1924), Gorée (Fage, 1950), and Darsen and Annobon I. (Fage, 1951 b).

Zimmer's original description was from an immature specimen. Fage, in a footnote to his description of *Heterocuma intermedia*, states that he had only just seen the description of *H. africana*, but that it was quite distinct from *H. intermedia*. I am unable to find any differences in the two descriptions that could not be ascribed to the immaturity of Zimmer's specimens. There is a considerable size range among the specimens from different localities, the only adult male from St. 76, Atlantide Exp., being 7.5 mm. in length while those from the beach at Gorée are up to 12 mm. in length, and I was at first inclined to identify the smaller specimens from the Atlantide Expedition as *H. africana* and those from Gorée as *H. intermedia*. However, further specimens from the Atlantide Expedition sent to me later included some as large as those from Gorée, and from localities completely overlapping the range of the smaller specimens, most of which are evidently

immature. A detailed comparison between the larger and smaller specimens has revealed no other differences, and I conclude that they all belong to one species. In all the females examined the antero-lateral angle is somewhat more prominent than in FAGE's figure of *H. intermedia*.

Colour in life—adult male: Carapace wine-red becoming golden on the sides. Remainder of body varying according to the somites, which may be red, orange-red, or yellow. Carapace and somites with sparse golden-yellow chromatophores. A double line of black spots behind the eyelobe, which is white with black lenses.

Sub-Family BODOTRIINAE

Genus *Bodotria* Goodsir, 1843.

Bodotria africana Zimmer.

ZIMMER, 1921, p. 118;

Occurrence:

Atlantide Exp.: St. 161, 3 ♂♂, 1 ovig. ♀.

CADENAT coll.: Beach at Gorée, 716 ♂♂, 56 ♀♀ (33 ovig.).

W. A. F. R. I.: Sierra Leone Estuary, May 1955, medium townet, 1 ovig. ♀.

Previous records: Freetown (ZIMMER, 1921), Rufisque (FAGE, 1928 a), Gorée (FAGE, 1950).

The ovigerous female from the Sierra Leone Estuary was smaller (2.8 mm.) compared with those from Gorée (4-4.2 mm.), and less heavily calcified. In immature specimens the lateral ridges on the carapace are much less prominent than in the adults.

Colour in life—adult male: Carapace orange-red to rosy, with more or less golden yellow chromatophores. Remainder of body sandy to golden-yellow with some chromatophores. Eyelobe greyish-white.

Bodotria pulchella (G. O. Sars).

SARS, 1879, p. 124. FAGE, 1951a, p. 34.

Occurrence:

CADENAT coll.: Beach at Gorée, 23 ♂♂, 2 ♀♀.

Previous records: British Isles to Mediterranean (FAGE, 1951a), Mazagan and Casablanca, Morocco (FAGE, 1928b).

Bodotria lata sp. n. (Figs. 5 and 6).

Occurrence:

CADENAT coll.: Beach at Gorée, 27 ♂♂, 2 ♀♀.

Adult Female. Length 3.4 mm. Carapace flattened dorally, less than twice as long as high, less than $1^1/_2$ as long as broad; dorsal ridge not prominent but with two lateral ridges on each side, the upper one forming a sharp line dividing the sides from the dorsal surface, the lower one less pronounced and slightly irregular; antero-lateral angle fairly small but acute; eye distinct, with lenses.

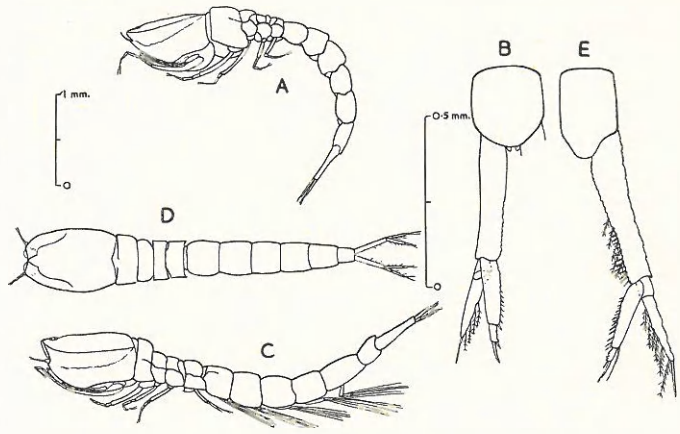


Fig. 5. *Bodotria lata* sp. n. Adult female. A, lateral view; B, last abdominal somite and left uropod from above. Adult male. C, lateral view; D, dorsal view; E, last abdominal somite and right uropod from above.

Basis of the first peraeopod less than $1^1/_2$ as long as the remaining joints together. The second peraeopod without recurved spines on the concave edge of the basis. The proximal joint of the inner ramus of the uropod with 8 spines. Similar in other respects to *B. pulchella*.

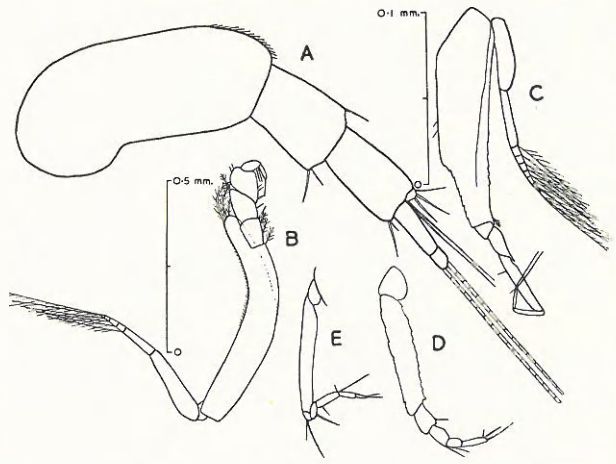


Fig. 6. *Bodotria lata* sp. n. Adult female. A, first antenna; B, third maxilliped; C—E, first to third peraeopods.

Adult Male. Length 3.7 mm. Differs from the female in its shorter but higher second pedigerous somite; the fifth thoracic somite has a mid-ventral, forward pointing projection; the second antenna reaches beyond the last abdominal somite; 5 pairs of pleopods are present; the uropods have more spines and setae, about 14 spines on the proximal joint of the inner ramus, and the distal joint of the inner ramus is relatively shorter.

Colour in alcohol—yellowish-white with a few scattered brown chromatophores in the male; the female darker with more chromatophores, concentrated on the carapace, second pedigerous somite, and second and fifth abdominal somites.

This species is near to *B. pulchella*, but is slightly larger than specimens of the latter from the same locality, and may readily be distinguished by its broader carapace (more than $1^1/_2$ as long as broad in *B. pulchella*) and by the absence of the recurved spines on the basis of the second peraeopod, characteristic of *B. pulchella*.

Genus *Upselaspis* N. S. Jones, 1955.

Upselaspis caparti (Fage).

FAGE, 1951b, p. 5. JONES, 1955, p. 284.

Occurrence:

W. A. F. R. I.: Sierra Leone Estuary, 26.1.55, coarse townet, 10 m., 9 ♂♂, 2 ♀♀ (1 ovig.); do., 27.1.55, from stomachs of juv. *Galeoides decadactyla*, 12 m., 40 ♂♂, 90 ♀♀ (18 ovig.); do., 8.3.55, from *Galeoides* stomachs, 1000 + ♂♂ and ♀♀; do., May 1955, medium townet, 16 ♂♂, 13 ♀♀ (6 ovig.), 50 + juv.; coarse townet, 32 ♂♂.

Previous records: Walvis Bay (FAGE, 1951b; JONES, 1955).

Genus *Eocuma* Marcusen, 1894.

Eocuma dimorpha Fage.

FAGE, 1928a, p. 332.

Occurrence:

Atlantide Exp.: St. 153, 1 ♀; St. 160, 3 ovig. ♀♀; St. 161, 27 ♂♂, 37 ♀♀ (10 ovig.).

Galathea Exp.: St. 128, 1 ovig. ♀; St. 129, 1 ♂.

CADENAT coll.: Beach at Gorée, 56 ♂♂, 1 ♀, 4 juv.

Previous records: Rufisque (FAGE, 1928a), Casablanca (FAGE, 1928b).

FAGE (1928b) records that while the males from Senegal possess lateral horns on the carapace and the females are without them, a single female from Morocco was provided with horns. In the present collections none of the females possessed horns, while the male specimen from St. 129, Galathea Exp., was without them.

The size range of the two sexes was as follows:—Length (from tip of pseudorostrum to hind end of last abdominal somite):

Adult males: 6.2 to 9.0 mm.
Adult females: 6.0 to 7.5 mm. (Up to 8 mm. according to FAGE, 1928a).

Colour in life—adult male: Carapace varying from orange to rosy red, granular without spots. Remainder of body yellow to rosy orange. The eyelobe white with two small anterior rose-coloured lenses.

Eocuma ferox (P. Fischer).

FISCHER, 1872, p. 47, as *Bodotria ferox*. FAGE, 1951a, p. 39.

Occurrence:

Atlantide Exp.: St. 145, 2 ovig. ♀♀.
CADENAT coll.: Beach at Gorée, 24 ♂♂, 12 ♀♀ (6 ovig.), 5 juv.
W. A. F. R. I.: Sierra Leone Estuary, May 1955, coarse townet, 3 ♂♂, 1 ovig. ♀.

Previous records: Gulf of Gascony and Mediterranean (FAGE, 1951a).

Eocuma ferox, as stated by FAGE (1928a), is very similar in appearance to *E. dimorpha*. The two species may, however, be distinguished by the relative sizes of the second and third peraeopods. The second pair are about the same length as or only very little shorter than the third in *E. ferox*, while in *E. dimorpha* they are always distinctly shorter than the third. Although *E. ferox* tends to be smaller, there is an overlap in the size ranges of the two species from different localities, at least in the case of adult females. The size range of *E. ferox* is as follows:—

Length: Adult males: 4.8 to 6.2 mm. (Up to 6.8 mm., FAGE, 1928a).
Adult females: 3.8 to 7.6 mm.

Among the characters mentioned by FAGE the shape of the carapace in ovigerous females distinguishes the two species, while in both sexes the prolongation of the basis of the first peraeopod does not extend beyond the distal end of the ischium in *E. dimorpha*, reaching the middle of the merus in *E. ferox*. In addition the propus of the first peraeopod is longer than the carpus in *E. dimorpha* while the two joints are subequal in *E. ferox*.

Eocuma calmani Fage.

FAGE, 1928a, p. 335.

Occurrence:

Atlantide Exp.: St. 51, 1 ♀.
Galathea Exp.: St. 116, 1 ♂, 2 ovig. ♀♀.

Previous records: Coast of the Sahara, 17° 02′ N, 16° 39′ W. (FAGE, 1928a).

The length of the adult females was up to 8.6 mm. The single immature male had a carapace similar in shape to that of the female.

Eocuma cadenati Fage.

Fage, 1950, p. 451.

Occurrence:

Atlantide Exp.: St. 145, 1 ♂.
Cadenat coll.: Beach at Gorée, 22 ♂♂.

Previous records: Beach at Gorée (Fage, 1950).

The female of this species remains unknown. Colour in life—adult male: Carapace reddish to yellowish orange. Rest of body orange to yellow. Eyelobe whitish.

Genus *Iphinoe* Bate, 1856.

Iphinoe tenella G. O. Sars.

G. O. Sars, 1878, p. 505 (as *I. gracilis*). Fage, 1951a, p. 47.
I. hupferi Zimmer, 1916, p. 59.

Occurrence:

Atlantide Exp.: St. 49, 2 ♀♀; St. 123, 1 ♂; St. 151, 1 ♂.
Cadenat coll.: Beach at Gorée, 240 ♂♂, 14 ♀♀ (6 ovig.), 13 juv.

Previous records: Atlantic coast of France to Mediterranean and Black Sea (Fage, 1951a), Casablanca and Agadir (Fage, 1928b, as *I. serrata*), Gorée (Zimmer, 1916), Rufisque (Fage, 1928a), Travancore (Kurian, 1951).

Zimmer's *Iphinoe hupferi* was characterized by the inner ramus of the uropod which had the two joints of almost equal length. Fage, however, points out (1951a) that some specimens of *I. tenella* from various localities have the two joints subequal, and there is no other character in Zimmer's description by which *I. hupferi* can be distinguished from *I. tenella*. The specimens in the present collections from Gorée have the distal joint of the inner ramus distinctly longer than the proximal joint. The teeth on the dorsal crest of the carapace are somewhat smaller than in typical *I. tenella* from the Mediterranean, but I am able to find no other difference. An adult male was 10 mm. long.

Colour in life—adult male: Carapace wine-red to rosy red with more or less deep yellow chromatophores. Rest of body rosy red with some spots. Eyelobe white with white lenses.

Iphinoe fagei N. S. Jones.

Jones, 1955, p. 285.

Occurrence:

Galathea Exp.: St. 146, 1 ♀; St. 147, 1 ♂, 80 ♀♀ (58 ovig.); St. 150, 1 ♂.

Previous records: South West Africa, south of Walvis Bay (Jones, 1955).

Iphinoe senegalensis sp. n. (Figs. 7 and 8).

Occurrence:

CADENAT coll.: Beach at Gorée, 18 ♂♂, 18 ♀♀ (11 ovig.), 19 juv.

Adult Female. Length 7.0 mm. Carapace less than twice as long as high: dorsal crest moderately prominent, with usually two small teeth behind the eyelobe, about $^1/_3$ of the carapace length from the front end; antero-lateral angle acute, slightly serrated below; eye well developed and darkly pigmented.

Last abdominal somite evenly rounded posteriorly; anal valves without setae.

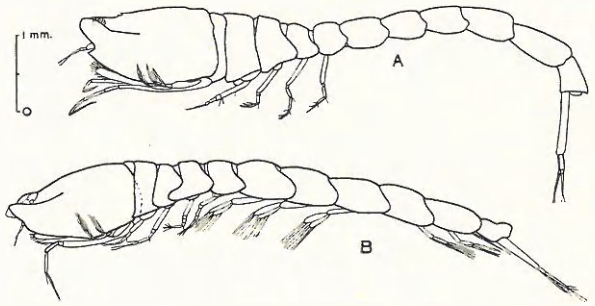


Fig. 7. *Iphinoe senegalensis* sp. n. A, adult female from the side; B, adult male from the side.

First antenna slender with the first joint the longest, the second the shortest; flagellum 2-jointed with 1 aesthetasc. Third maxilliped with the basis less than twice as long as the remaining joints together, its prolongation reaching beyond the end of the merus. First peraeopod with the basis about as long as the remaining joints together. Second peraeopod slightly shorter than the third. Uropods longer than the last two abdominal somites; the peduncle nearly $1^1/_2$ the length of the subequal rami, with 17 spines on its inner edge; the proximal joint of the inner ramus about $^3/_4$ the length of the distal joint, and armed internally with 3 small and 1 large spines, the distal joint with 6 internal and 3 end spines; the distal joint of the outer ramus with several plumose setae internally and 3 end spines.

Adult Male. Length 6.7 mm. Differs from the female in the usual respects for the genus. The dorsal crest of the carapace is without teeth; the thoracic sternites resemble those of *Iphinoe tenella* (FAGE, 1951 a); the second antenna is as long as the body.

Colour in life—adult female: Carapace sandy yellow with whitish spots, the ventral part orange-yellow. Thoracic and abdominal somites variegated with rosy yellow and brown.

This species is close to *Iphinoe fagei* but may be distinguished by the following characters: The carapace is shorter in relation to its height (more

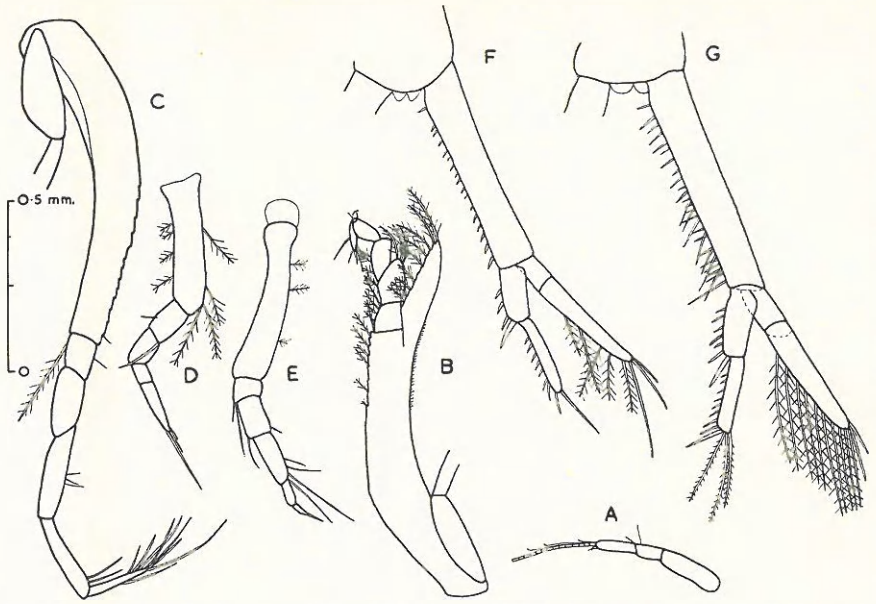


Fig. 8. *Iphinoe senegalensis* sp. n. Adult female. A, first antenna; B, third maxilliped; C—E, first to third peraeopods; F, uropod from above. Adult male. G, uropod from above.

than twice as long as high in *I. fagei*); the basis of the third maxilliped is shorter in relation to the remainder of the appendage (about $2^1/_2$ the length of the remaining joints together in *I. fagei*); the peduncle of the uropod has fewer spines on its inner edge (about 24 in the female *I. fagei*). From *I. inermis* G. O. Sars (FAGE, 1951a) the female may be distinguished by the absence in *I. inermis* of dorsal teeth on the carapace (on the rare occasions when they are present they are set farther back on the carapace than in *I. senegalensis*, see FAGE, 1940), by the greater number of teeth on the inner edge of the peduncle of the uropod (about 8 in *I. inermis*), and by the longer second antenna of the adult male.

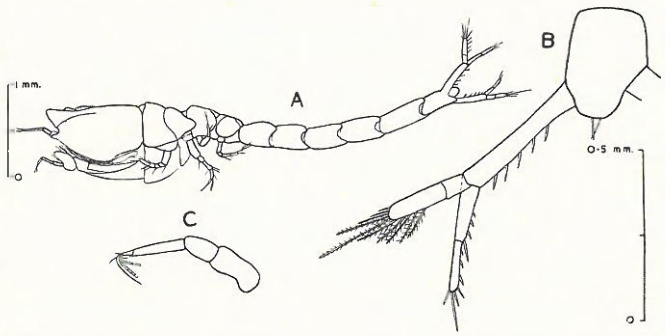


Fig. 9. *Iphinoe crassipes* Hansen. Adult female. A, lateral view; B, last abdominal somite and left uropod from above; C, first antenna.

Iphinoe crassipes Hansen (Fig. 9).

HANSEN, 1895, p. 53. STEBBING, 1910, p. 412. KURIAN, 1951, p. 85.

Occurrence:

Atlantide Exp.: St. 161, 1 ♂, 1 ovig. ♀.
CADENAT coll.: Dakar, 1 ♂.

Previous records: Cotonu, Gulf of Guinea (HANSEN, 1895), Gulf of Manaar (CALMAN, 1904, as *I. macrobrachium*), South Africa (STEBBING, 1910), Rufisque (FAGE, 1928a), Travancore (KURIAN, 1951).

The female is figured as only the male has been drawn previously.

Iphinoe africana Zimmer (Fig. 12).

ZIMMER, 1908, p. 163. FAGE, 1951b, p. 4.

Occurrence:

Galathea Exp.: St. 127, 1 ♀; St. 128, 4 ♂♂; St. 129, 5 ♂♂, 10 ♀♀ (6 ovig.); St. 139, 12 ♂♂, 49 ♀♀ (13 ovig.); St. 141, 1 ♂, 2 ♀♀; St. 144, 1 ♂; St. 145, 5 ♂♂, 14 ♀♀ (8 ovig.); St. 146, 41 ♂♂, 26 ♀♀ (8 ovig.); St. 147, 217 ♂♂, 1510 ♀♀ (670 ovig.), 190 juv.; St. 148, 2 ovig. ♀♀; St. 149, 3 ♀♀ (1 ovig.); St. 150, 1 ♀; St. 151, 1 ovig. ♀.

Previous records: Great Fish Bay (ZIMMER, 1908), Walvis Bay (FAGE, 1951b), South West Africa, north and south of Walvis Bay (JONES, 1955).

The collections were taken in much the same area as those reported in JONES (1955). The largest female was 15 mm. long. The number of teeth on the dorsal crest of the carapace varied between 10 and 18.

Iphinoe brevipes Hansen (Fig. 12).

HANSEN, 1895, p. 54. ZIMMER, 1916, p. 56.

Occurrence:

Atlantide Exp.: St. 72, 1 ♀; St. 77, 1 ♂; St. 160, 1 ♀.
CADENAT coll.: Dakar, 1 ♂, 1 ♀; Pointe de Bel Air, Dakar, 8 m., 1 ♂; 1 ovig. ♀.
W. A. F. R. I.: Banana Island, 30 miles south of Freetown, Dec. 1955, grab, 4 ♀♀ (2 ovig.).
BUCHANAN coll.: Off Accra, Gold Coast, grab, 9—12 m., 1 ♂, 3 ♀♀ (2 ovig.).

Previous records: Cotonu, Gulf of Guinea (HANSEN, 1895), Gold Coast, Dahomey, Cameroons, French Congo (ZIMMER, 1916), Travancore (KURIAN, 1951).

The length of the ovigerous female was 8 mm. The figure of the front end of the carapace of a female attributed to *I. brevipes* in JONES (1955) was drawn from a specimen from South Africa, now in the British Museum

(Natural History), identified by STEBBING as *I. brevipes*; this should now be referred to *Iphinoe stebbingi* sp. n. described below. The front end of the carapace of an adult female of *I. brevipes* is shown in Fig. 12.

Colour in life—clear rose without spots. Eyelobe with white lenses on a black background.

Iphinoe stebbingi sp. n. (Figs. 10, 11, and 12).

Occurrence:

South Africa—23° 54′ S, 25° 53′ E, St. Francis Bay, off Cape Point Lighthouse, off Sebastian Bluff (STEBBING, 1910).

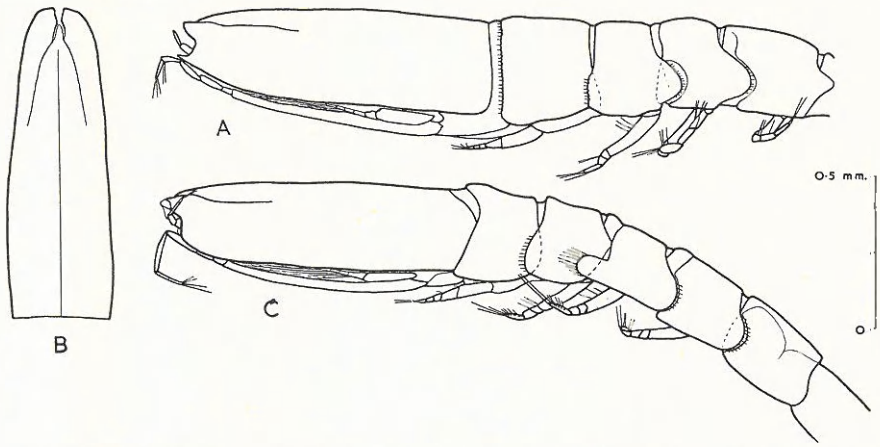


Fig. 10. *Iphinoe stebbingi* sp. n. Adult female. A, carapace and thoracic somites from the side; B, carapace from above. Adult male. C, carapace and thoracic somites from the side.

Comparison of undoubted specimens of *Iphinoe brevipes* Hansen from Senegal and from the Atlantide Expedition with some specimens from South Africa in the British Museum (Natural History), identified by STEB-

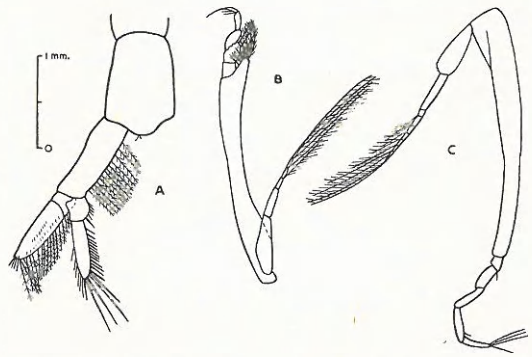


Fig. 11. *Iphinoe stebbingi* sp. n. Adult female. A, last abdominal somite and left uropod from above; B, third maxilliped; C, first peraeopod.

BING as *I. brevipes* (STEBBING, 1910), has convinced me that the latter belong to a separate species. The South African specimens are much larger and their range appears to be discontinuous from that of the true *I. brevipes*, which is probably confined to tropical waters. There have now been a number of collections taken in the region of South West Africa and neither *I. brevipes* nor the South African species occur in any of them, whereas *I. africana* Zimmer has been found abundantly. ZIMMER (1916) expressed the opinion that the South African specimens would prove to belong to a third species in the *brevipes*-group.

Adult Female. Length 14.5 mm. Body slender, laterally compressed. Carapace more than three times as long as broad; breadth about equal to height; the upper edge carinated, without teeth; the pseudorostrum blunt, slightly

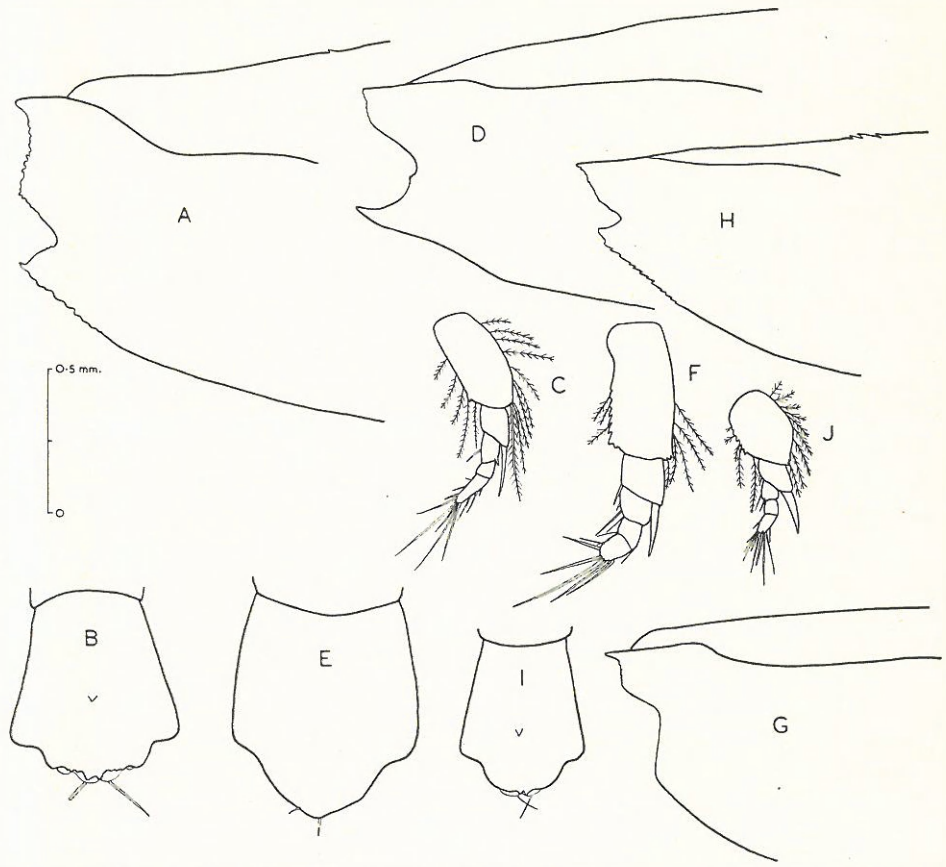


Fig. 12. *Iphinoe africana* Zimmer. Adult female. A, front of carapace from the side; B, last abdominal somite from above; C, second peraeopod.
Iphinoe stebbingi sp. n. Adult female. D, front of carapace from the side; E, last abdominal somite from above; F, second peraeopod. Adult male. G, front of carapace from the side.
Iphinoe brevipes Hansen. Adult female. H, front of carapace from the side; I, last abdominal somite from above; J, second peraeopod.

crenulated; a prominent and acute ventral process reaches forward beyond the pseudorostrum; lower edge not distinctly toothed; eyelobe narrow.

The pedigerous somites nearly as in *I. brevipes*, but the side plates of the fourth and fifth are not toothed ventrally. The last abdominal somite without dorsal tooth or central teeth at the posterior end.

Antennae and mouth-parts as in *I. brevipes*. The first peraeopods with the basis comparatively longer than in *I. brevipes*, nearly twice the length of the remaining joints together (less than $1^1/_2$ in *I. brevipes*); the propus and dactylus more robust than in *I. brevipes*. The second peraeopods with the basis more quadrangular in form, the ischial spine proportionately more slender than in *brevipes* (Fig. 12). The uropods with the peduncle and rami broader than in *brevipes*.

Adult Male. Length 15.5 mm. The front end of the carapace with a small but acute point to the pseudorostrum and without a prominent ventral process. The second antenna as long as the body. Otherwise differs from the female in the usual respects for the genus.

Family LEUCONIDAE

Genus *Epileucon* gen. n.

Differs from *Leucon* Kröyer, 1846, by the absence of a serrated dorsal crest on the carapace of the female.

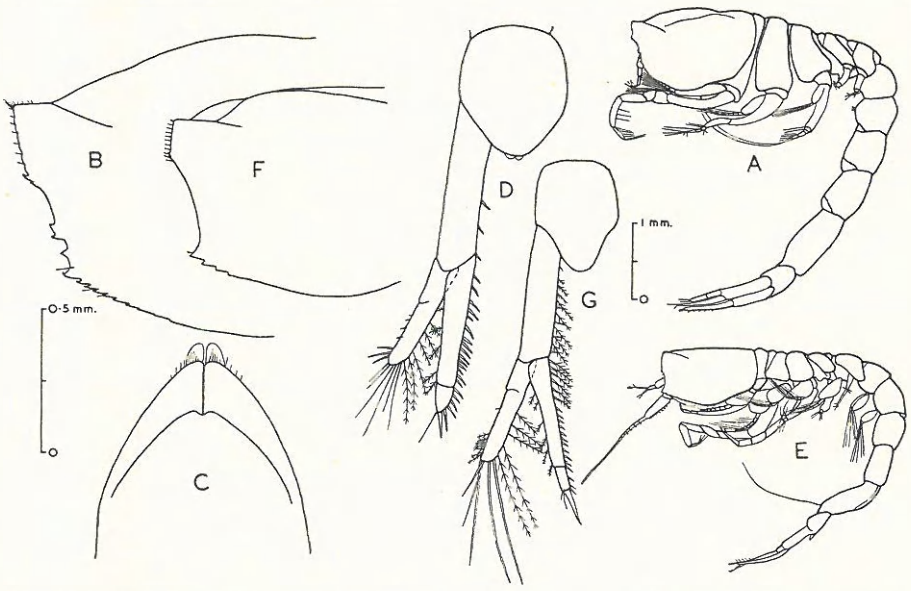


Fig. 13. *Epileucon galatheae* sp. n. Ovigerous female. A, lateral view; B, front of carapace from the side; C, front of carapace from above; D, last abdominal somite and left uropod from above. Adult male. E, lateral view; F, front of carapace from the side; G, last abdominal somite and left uropod from above.

Epileucon galatheae sp. n. (Figs. 13 and 14).

Occurrence:

Galathea Exp.: St. 46, 4 ♂♂, 16 ♀♀ (6 ovig.).

Ovigerous Female. Length 6.3 mm. Carapace $1^1/_2$ as long as high, without serrated dorsal crest; the pseudorostrum blunt, serrated at the lower edge; the infero-lateral projection not prominent, with several teeth above it, the number varying in different specimens; the lower edge of the carapace serrated anteriorly; eye absent.

5 free thoracic somites decreasing in depth posteriorly; the fifth thoracic and first and second abdominal somites each with a two-pronged ventral projection on each side of the sternite.

First antenna not geniculate, with the joints of the peduncle broad; the first joint nearly as long as the second and third together; the 1-jointed

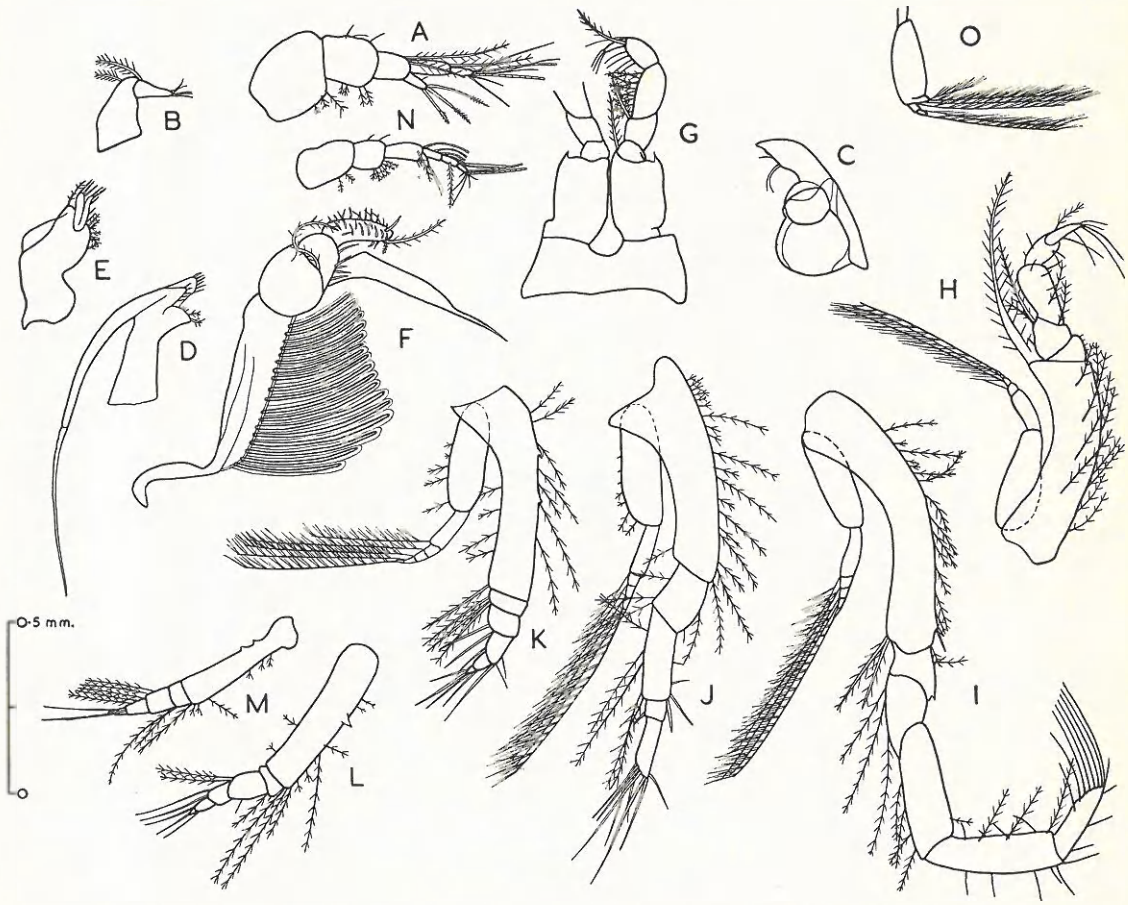


Fig. 14. *Epileucon galatheae* sp. n. Adult female. A, first antenna; B, second antenna; C, mandible; D, first maxilla; E, second maxilla; F—H, first to third maxillipeds; I—M, first to fifth peraeopods. Adult male. N, first antenna; O, first pleopod.

accessory flagellum $^1/_2$ the length of the 3-jointed main flagellum. Second antenna with the second joint well developed. Mandibles with the base broadened, the molar process rounded. First maxilliped with 18 branchial filaments. Third maxilliped with the basal joint broad, about as long as the remaining joints together. The other mouth-parts as in *Leucon* (Sars, 1900). The first three peraeopods with well developed exopods. The first with the joints relatively broad, the second and third with the basal joint very broad proximally, the fourth with a strong spine on the posterior edge of the basis. The uropod with the 2-jointed endopod rather longer than the exopod, which is incompletely divided; the second joint of the endopod $^1/_4$ the length of the first.

Adult Male. Length 5.2 mm. Carapace relatively longer than in the female, with the infero-lateral projection more prominent, and without teeth above it. All the pedigerous somites about the same depth. The telsonic somite produced between the uropods. The first antenna more slender, with the first joint of the accessory flagellum bearing a number of sensory setae. The second antenna as long as the body. The first four peraeopods with well developed exopods, with their basal joints broader than those of the female. Pleopods present on the first two abdominal somites. The uropods comparatively more slender and with more plumose setae than those of the female.

In the shape of the body and of the appendages this species resembles *Eudorella* rather than *Leucon*. However, the pseudorostrum is distinct and the efferent aperture of the branchial cavity is at the anterior end of the carapace. The absence of a serrated dorsal crest in the female separates it from *Leucon*. The species is peculiar in the possession of a larger number of branchial filaments than is usual in the family. It is only the second member of the family to be found in the tropics.

Family NANNASTACIDAE

Genus *Campylaspis* G. O. Sars, 1865.

Campylaspis glabra G. O. Sars.

Sars, 1879, p. 77; 1900, p. 86.

Occurrence:

Cadenat coll.: Beach at Gorée, 2 ♂♂.

Previous records: Norway to the Mediterranean (Fage, 1951a), coast of Annam (Fage, 1945).

Family PSEUDOCUMIDAE

Genus *Pseudocuma* G. O. Sars, 1865.

Pseudocuma chevreuxi Fage.

FAGE, 1928a, p. 337.

Occurrence:

CADENAT coll.: Beach at Gorée, 270 ♂♂, 4 ♀♀ (3 ovig.).

Previous records: Rufisque (FAGE, 1928 a).

Family DIASTYLIDAE

Genus *Diastylis* Say, 1818.

Diastylis laevis Norman.

NORMAN, 1869, p. 270. SARS, 1900, p. 51, as *D. rostrata.*

Occurrence:

Atlantide Exp.: St. 161, 3 ♂♂, 3 ♀♀ (1 ovig.), 2 juv.

CADENAT coll.: Beach at Gorée, 470 ♂♂, 80 ♀♀ (24 ovig.), 75 juv.

Previous records: Denmark to the Mediterranean (FAGE, 1951 a), Casablanca, Mazagan, Agadir (FAGE, 1928 b), Annobon I. (FAGE, 1951 b).

Colour in life—adult male: Entirely very clear pale yellow to whitish. Eyelobe whitish, with lenses rose-coloured, as is a V-shaped patch with the point directed forwards situated between the posterior lenses.

Diastylis denticulata sp. n. (Figs. 15 and 16).

Occurrence:

Galathea Exp.: St. 116, 1 ♂, 1 ovig. ♀.

Ovigerous Female. Length 7.4 mm. Carapace about twice as long as high, about $1^1/_2$ as long as broad; the pseudorostrum pointed, rather long; the antero-lateral angle rounded; the lower edge of the carapace serrated from the antennal notch to the lowest point; a fold present on each side of the mid-dorsal line of the carapace, with three more prominent teeth on each, the hindmost the largest; numerous scattered denticles present on the sides, set in several vertical rows; eyes present.

Last thoracic somite not projecting prominently backwards, its anterior border serrated. Telson as long as the last two abdominal somites together and slightly shorter than the peduncle of the uropods, the post-anal portion slightly shorter than the pre-anal part, with about 7 spines on each side and 2 end spines.

Antennae and mouth-parts of the usual shape for the genus. First peraeopod slender, with the basis $^2/_3$ the length of the remaining joints together;

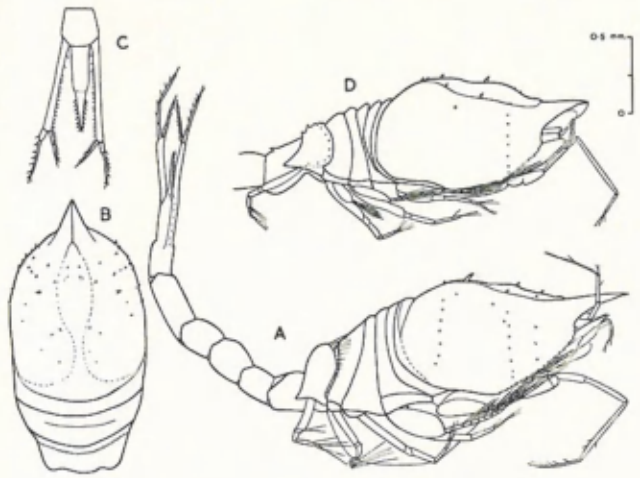


Fig. 15. *Diastylis denticulata* sp. n. Ovigerous female. A, lateral view; B, carapace and thoracic somites from above; C, last abdominal somite and uropods from above. Immature male, D, carapace and thoracic somites from the side.

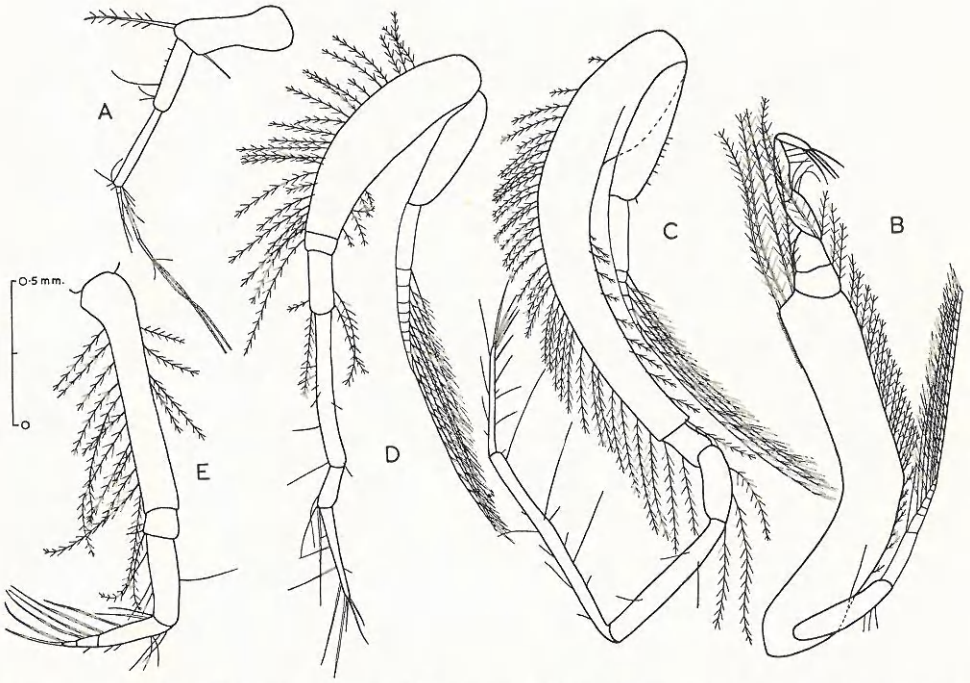


Fig. 16. *Diastylis denticulata* sp. n. Adult female. A, first antenna; B, third maxilliped; C—E, first to third peraeopods.

the propus twice as long as the dactylus and $1^1/_2$ the length of the carpus. Second peraeopod with the carpus longer than the propus and dactylus together. No exopods on the third and fourth peraeopods. The peduncle of the uropods slender, with 18 internal spines; the exopod longer than the endopod; the endopod with 6.3.2 spines on its inner margin.

Immature Male (damaged). Length 6.8 mm. Carapace similar in shape to that of the female but with fewer small denticles. The fifth pedigerous somite more prominently produced backwards, with the front edge bearing a circlet of small teeth.

From the other species of *Diastylis* so far recorded from the west coast of Africa, *D. denticulata* may be identified by the armature of the carapace and by the longer pre-anal part of the telson.

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